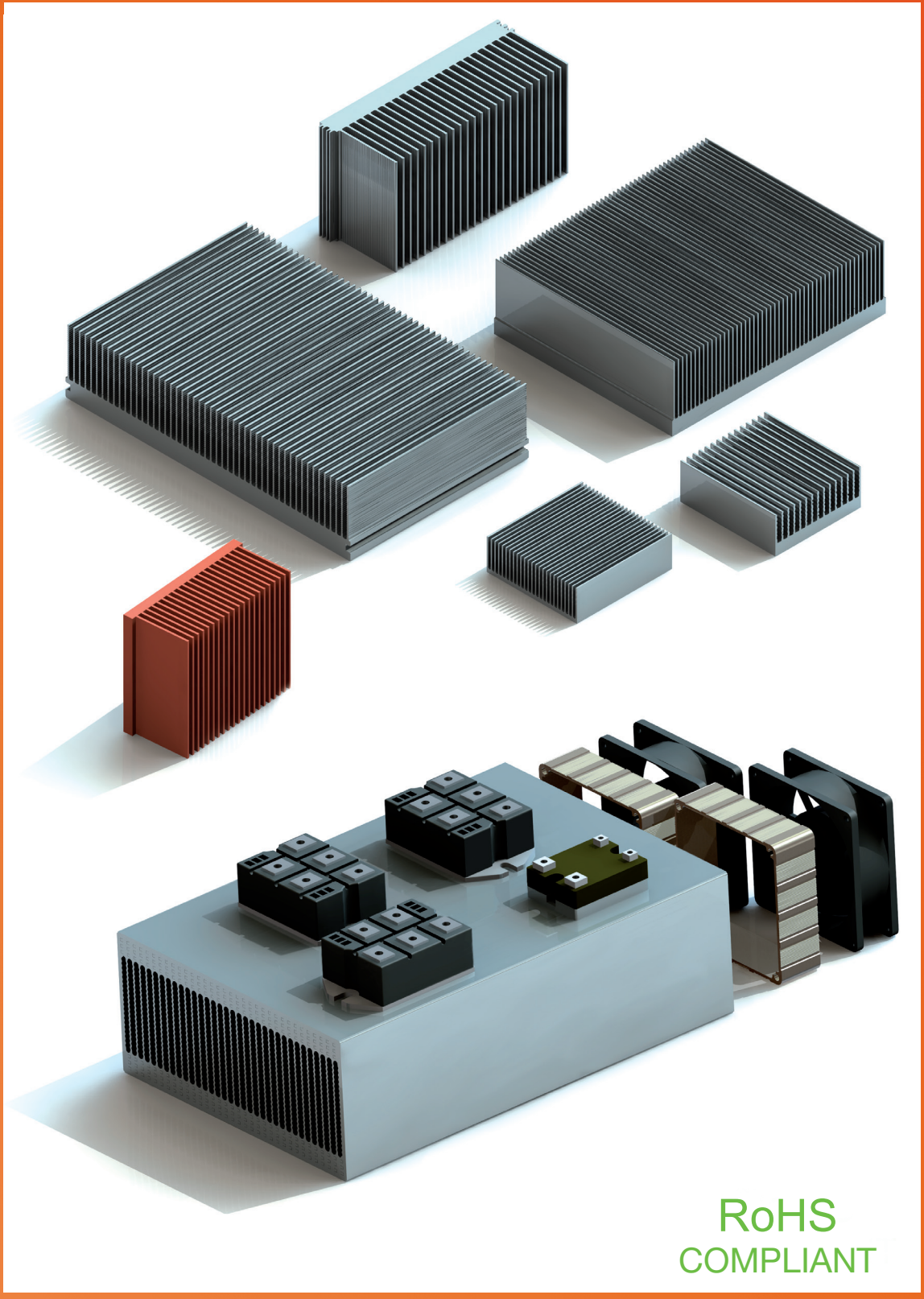
TECNOAL

MECHANICAL ENGINEERING FOR ELECTRONICS



GENERAL CATALOGUE

DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. ***CERT-10548-2002-AQ-BOL-SINCERT***

Si attesta che / This certifies that

Il sistema di gestione per la qualità di / the quality management system of

TECNOAL S.n.c.

Via Bonazzi, 19/21 - 40013 Castel Maggiore (BO) - Italy

È conforme ai requisiti della norma per i sistemi di gestione per la qualità
Conforms to the quality management systems standard

UNI EN ISO 9001:2008 (ISO 9001:2008)

Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following products or services:

(Ulteriori chiarimenti riguardanti lo scopo e l'applicabilità dei requisiti della normativa si possono ottenere consultando l'organizzazione certificata)
(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organization)

Progettazione e produzione di dissipatori e suporti meccanici per componenti elettronici

Design and manufacture of dissipators and mechanical accessories for electronic components

Data Prima Emissione
First Issue Date
2002-05-14

Luogo e data
Place and date
Agrate Brianza, (MB) 2011-03-28

Settore EA : 17

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

SGQ N°003 A PRD N°003 B
SGA N°003 D SSI N°002 G
SCR N°004 F FSM N°001 I

Membro di MLA EA per gli schemi di accreditamento SGQ, SGA, PRD, PRS, ISP e LAB,di MLA IAF per gli schemi di accreditamento SGQ, SGA, SSI, FSM e PRD e di MRA ILAC per gli schemi di accreditamento LAB

Data di scadenza
Expiry Date
2014-05-07

per l'Organismo di Certificazione
for the Accredited Unit
DET NORSKE VERITAS ITALIA S.R.L.

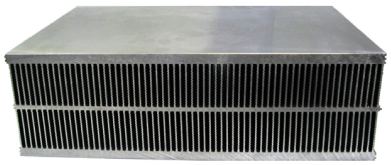
Corrado Stefani
Lead Auditor

Zeno Beltrami
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years
Le aziende in possesso di un certificato valido sono presenti nella banca dati sul sito **www.dnv.it** *e sul sito Accredia (***www.accredia.it***) – All the companies with a valid certificate are online at the following addresses:* **www.dnv.it** *and* **www.accredia.it**

TECNOAL
MECHANICAL ENGINEERING FOR ELECTRONICS

www.tecnoal.it



TECNOAL s.n.c.
Via C. Bonazzi n. 19-21
40013 Castel Maggiore
Bologna ITALY
☎ **Tel. +39 051- 7092301**
Fax. +39 051- 702335
info@tecnoal.it
tecnico@tecnoal.it
cnc@tecnoal.it
amministrazione@tecnoal.it
magazzino@tecnoal.it

QUALITY SYSTEM CERTIFICATION ISO 9001 DNV

Gent.le Cliente

mi permetto di presentarLe l'azienda.
Tecnoal è stata fondata nel 1985 da persone che operavano già da un ventennio nel settore della progettazione meccanica asservita all'elettronica e a quella di potenza in particolare.
L'azienda è specializzata nelle lavorazioni meccaniche sull'alluminio; attualmente vengono lavorate e gestite circa 1000 tonnellate annue.
L'attuale insediamento, ubicato nella zona industriale di Castel Maggiore, nell'immediata periferia di Bologna è costituito da circa 4500 mq coperti.
Il parco macchine di cui l'azienda dispone è composto da una decina di troncatrici veloci, specifiche per alluminio, altrettante presse di vario tonnellaggio, una decina di centri di lavoro verticali, da 4 fresatrici tradizionali di varie dimensioni, più svariati trapani e filettatrici di contorno.
La Tecnoal, nel 2002 ha conseguito la certificazione del sistema di qualità secondo le norme UNI EN ISO 9001:2008 e, conscia delle esigenze dei clienti e del mercato, ha pianificato ingenti investimenti in mezzi produttivi.
Di recente è stata destinata un'area considerevole alle lavorazioni di saldatura, implementando quella classica a TIG con una nuova linea completamente automatica e computerizzata. Questa importante scelta di investimento è finalizzata a garantire un processo più controllato, a ridurre i tempi di produzione e i relativi costi.
Si è proceduto alla razionalizzazione di tutto il settore delle lavorazioni a controllo numerico, inserendo nuove macchine interfacciandole con sistemi cad-cam e standardizzando l'intero settore al fine di accelerare i tempi produttivi e di prototipazione.
Nei programmi della direzione aziendale è ai primi posti l'estensione di tale politica innovativa anche a tutti gli altri settori produttivi.
In azienda operano circa 45 dipendenti e Tecnoal cura direttamente ed esegue tutte le fasi produttive dal ricevimento delle materie prime (barre estruse) fino alla spedizione al cliente finale.
Vengono quindi eseguite internamente operazioni quali il taglio del materiale, le varie lavorazioni meccaniche, sia quelle a controllo numerico che quelle tradizionali, come la foratura, filettatura, o fresatura, eventuali assemblaggi, il lavaggio e l'imballo.
Unica lavorazione che Tecnoal affida a partner esterni ma che gestisce e supervisiona accuratamente sono gli eventuali trattamenti superficiali dei materiali, quali anodizzazione anodica, verniciatura, alodyne, zincatura, argentatura ecc...
Tutti i nostri prodotti sono conformi alla normativa RoHs.
In attesa di poterLe presentare personalmente l'azienda ed i collaboratori che vi operano, Voglia gradire i più cordiali saluti.

Managing Director
Paolo Poppi

Dear Customer,

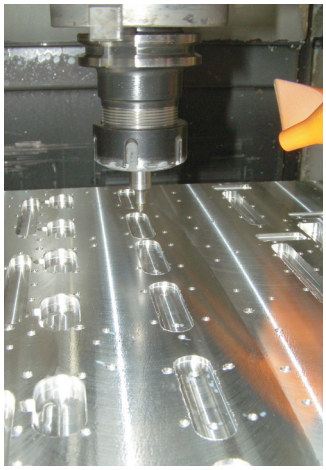
I'd like to introduce to You our company.
TECNOAL is a company established in 1985 by a team of specialists, who have been working in the field of mechanical design for electronic high power applications for over twenty years.
Tecnoal is skilled in aluminium mechanical machining; currently about 1000 tons per year are processed and managed.
The factory is located in Castel Maggiore near Bologna with a floor area of 4500 sqm.; Our machinery is composed of a dozen fast cutting off, suitable for aluminium, of many presses of various tonnage, of a dozen vertical cnc machining centres, of four traditional milling of various sizes, of various drills and threading machines.
Since 2002 TECNOAL is UNI EN ISO 9001:2008 certified and, conscious of the needs of customers and market, has planned substantial investments in production equipments.
Recently a large area of the factory has been dedicated to the welding adding to the traditional TIG line a new computerized welding line entirely automatic to grant a higher quality control to the manufacturing process, and to reduce production lead time and costs.
An important rationalization effort has been made in the CAM area with new machines directly interfaced with CAD and standardizing the CAD/CAM system to reduce the manufacturing and prototyping lead times.
Top priority is given by the TECNOAL management to the extend this policy to all other manufacturing areas.
The company employs 45 workers and technicians who follow all manufacturing activities from incoming row materials (extruded aluminium bars) to shipment of final products to final customers.
All metal workings are made in Tecnoal with traditional or CNC machines (cutting, welding, drilling, threading, milling, assembling and washing) while surface finishing like black or coloured anodizing, painting, alodine, galvanizing, silver plating, etc... are made by external partners carefully selected and thoroughly controlled by TECNOAL Quality Control.
All our items are RoHS compliant.
Waiting for the opportunity to welcome You to our company and to present You our staff
Best regards

Managing Director
Paolo Poppi

Tecnoal company

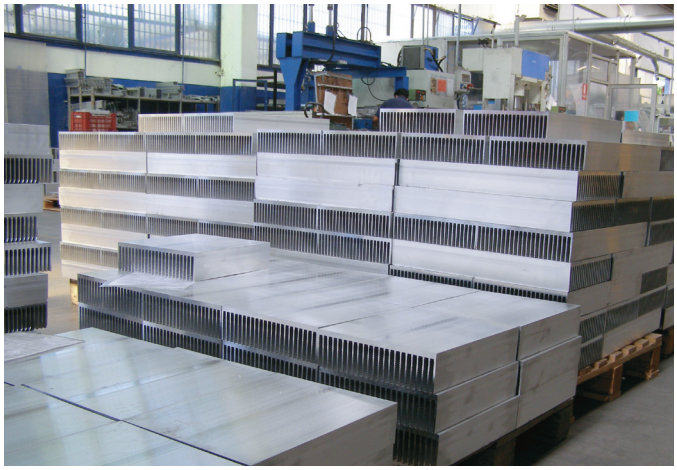
Raw materials area

CNC machining area

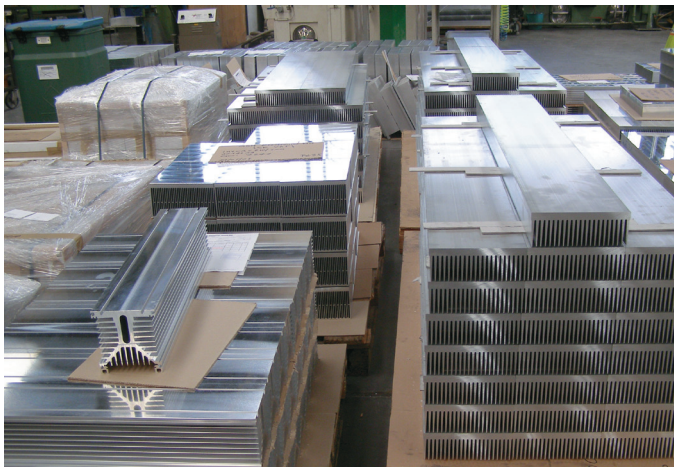


CNC machining

Items ready for working



Items ready for working



Packaging area

Shipment area

INDICE
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INDICE - PROFILI
INDEX - PROFILES

MATERIALI E DESIGNAZIONI
MATERIALS AND DESIGNATIONS

ALLUMINIO

CARATTERISTICHE MATERIALE
Tutti i profili presenti in questo catalogo, salvo diversa indicazione, sono estrusi in lega di alluminio EN AW-6060
Designazione numerica 6060 al Mg Si 0.5 (a richiesta su alcuni profili lega EN-AW 6063 Designazione numerica 6063)
Stato fisico T5
Peso specifico Kg/dm^3 2.7

TOLLERANZE DI ESTRUSIONE
Tutti i profili sono estrusi nel rispetto delle norme UNI EN 755/9. Per esigenze specifiche e per dissipatori realizzati su disegno si possono ottenere tolleranze di estrusione fino al 50% delle norme UNI EN 755/9.
Qualora vi siano delle dimensioni critiche, che devono essere rispettate, queste devono essere concordate preventivamente.

TRATTAMENTI E FINITURE SUPERFICIALI

TRATTAMENTI SUPERFICIALI
Anodizzazione (nera, naturale, oro e colorata)
Decapaggio (sgrassaggio - sbiancatura)
Cromatazione (alodyne 1000 bianco)
Nichelatura
Cromatura
Argentatura
Verniciatura
Serigrafia, ecc

FINITURE SUPERFICIALI
Burattatura
Sabbiatura - pallinatura
Satinatura
Spazzolatura meccanica, ecc.

Specificare chiaramente se sono richieste esigenze estetiche.

ALUMINTUM

MATERIAL CHARACTERISTICS
Unless otherwise specified, all profiles in this catalogue are extruded in aluminium alloy EN AW-6060
Numerical designation 6060 at Mg Si 0.5 (upon request on some alloy EN-AW 6063 Designazione numerica 6063)
Physical state T5
Specific weight Kg/dm^3 2.7

EXTRUSION TOLERANCE
All profiles are extruded in compliance with UNI EN 755/9 regulations. For specific needs and for heat sinks made to order it is possible to obtain extrusion tolerances up to 50% of the UNI EN 755/9 regulation.
Whenever there are critical dimensions that must be respected, they must be agreed in advance.

SURFACE TREATMENTS AND FINISHES

SURFACE TREATMENTS
Anodization (black, natural, gold and colored)
Pickling (degreasing – bleaching)
Chromatizing (Alodyne 1000 white)
Nickel-plating
Chromium plating
Silver-plating
Painting
Silk-screening, etc.

SURFACE FINISHES
Barrel finishing
Abrasive blasting – shot peening
Silking
Mechanical brushing, etc.

Clearly specify if there are esthetic requirements.

RAME

CARATTERISTICHE MATERIALE
Composizione materiale: secondo UNI 5649-71
Rame elettrolitico CU-ETP 99.9 %

TRATTAMENTI E FINITURE SUPERFICIALI

TRATTAMENTI SUPERFICIALI
Stagnatura
Argentatura
Nichelatura
Zincatura (nera)

FINITURE SUPERFICIALI
Satinatura
Spazzolatura meccanica

COPPER

MATERIAL CHARACTERISTICS
Material composition: according to UNI 5649-71
Electrolytic copper CU-ETP 99.9 %

SURFACE TREATMENTS AND FINISHES

SURFACE TREATMENTS
Tinning
Silver-plating
Nickel-plating
Galvanizing (black)

SURFACE FINISHES
Silking
Mechanical brushing

CARATTERISTICHE DEI MATERIALI
MATERIALS CHARACTERISTICS

LEGA 6060 - ALLOY 6060

LEGA ALLUMINIO - MAGNESIO - SILICIO PRIMARIA DA LAVORAZIONE
Designazione convenzionale della lega: EN AW - 6060 UNI 573-3
Designazione numerica: 6060
Applicazione tipiche: estrusi a disegno e sistemi

PRIMARY ALUMINIUM - MAGNESIUM - SILICON ALLOY FOR ALLOY FORGING
Conventional alloy designation: EN AW - 6060 UNI 573-3
Numerical designation: 6060
Typical applications: design and systems extrusion

COMPOSIZIONE CHIMICA IN PESO % — CHEMICAL COMPOSITION IN WEIGHT %

LEGA ALLOY	Cu	Fe	Mn	Mg	Zn	Si	Impurità Impurity	Al
6060	0,10	0,10 - 0,30	0,10	0,10 - 0,30	0,10	0,30 - 0,60	0,05 - 0,15	Resto Remaining

ESTRUSI PROPRIETA' FISICHE TIPICHE — TYPICAL PHYSICAL PROPERTIES OF EXTRUSION

LEGA ALLOY	Stato fisico Physical state *	Densità Density Kg/dm³	Resistenza elettrica Electrical resistance Ohm mm² mm	Conducibilità termica Thermal conductivity W/mk	intervallo di fusione Melting range °C	coeficiente dilatazionne termica Thermal expansion coefficient 20-100 °Cx10^{-6}/°C	Modulo elasticità Elasticy coefficient N/mm²
6060	T1 T5 T6	2,70	0,034 0,031 0,033	193 209 201	615 - 655	23	69000

ESTRUSI PROPRIETA' MECCANICHE TIPICHE — MECHANICAL PROPERTIES OF TYPICAL EXTRUSION

LEGA ALLOY	Stato fisico Physical state *	Carico unitario di rottura a trazioneStato fisico Tensile streght at break Rm N/mm²	Carico unitario si scostamento della proporzionalità Unit load of deviatium from proportionality $Rm_p0.2$ N/mm²	Allungamento Elongation A %	Durezza Brinnell Brinnell hardness HB
6060	0	140	80		
	F	100		22	40
	T1	125	70	18	45
	T5	185	145	16	60
	T6	205	165	15	70

CARATTERISTICHE TECNOLOGICHE (INDICATIVE) — TECHNOLOGICAL CHARACTERISTICS (INDICATIVE)

Stato fisico Physical state	Deformabilità plastica a freddo Plastic deformability cold	Lavorabilità all' utensile Tool machinability	Resistenza alla corrosione atmosferica Resistance to atmospheric corrosion	Resistenza alla corrosione marina Resistance to marine corrosion	Anodizzazione Anodization	Saldabilità Weldability
T1	Buona Good	Sconsigliabile Not advisable	Ottima Excellent	Buona Good	Ottima Excellent	Ottima Excellent
T5	Buona Good	Buona Good	Ottima Excellent	Buona Good	Ottima Excellent	Ottima Excellent
T6	Sufficiente Sufficient	Buona Good	Ottima Excellent	Buona Good	Ottima Excellent	Ottima Excellent

* STATO FISICO
0 Grezzo di estrusione
F Ricotto
T1 Raffreddato al termine di un processo di lavorazione plastica ad elevata temperatura ed invecchiamento naturale
T5 Raffreddato al termine di un processo di lavorazione plastica ad elevata temperatura ed invecchiamento artificiale
T6 Solubizzato, temperato e invecchiato artificialmente

* PHYSICAL STATE
0 Extrusion blank
F Annealed
T1 Cooled subsequent to hight temperature plastic forging and natural ageing
T5 Cooled subsequent to hight temperature plastic forging and artificial ageing
T6 Solubilized, tempered and artificially aged

TECNOAL BOLOGNA - ITALY

CARATTERISTICHE DEI MATERIALI
MATERIALS CHARACTERISTICS

LEGA 6063 - ALLOY 6063

LEGA ALLUMINIO - MAGNESIO - SILICIO PRIMARIA DA LAVORAZIONE
Designazione convenzionale della lega: EN AW - 6063 UNI 573-3
Designazione numerica: 6063
Applicazione tipiche: estrusi a disegno e sistemi

PRIMARY ALUMINIUM - MAGNESIUM - SILICON ALLOY FOR ALLOY FORGING
Conventional alloy designation: EN AW - 6063 UNI 573-3
Numerical designation: 6063
Typical applications: design and systems extrusion

COMPOSIZIONE CHIMICA IN PESO % — CHEMICAL COMPOSITION IN WEIGHT %

LEGA ALLOY	Cu	Fe	Mn	Mg	Zn	Si	Impurità Impurity	Al
6063	0,10	0,35	0,10	0,45 - 0,90	0,10	0,40 - 0,60	0,05 - 0,15	Resto Remaining

ESTRUSI PROPRIETA' FISICHE TIPICHE — TYPICAL PHYSICAL PROPERTIES OF EXTRUSION

LEGA ALLOY	Stato fisico Physical state *	Densità Density Kg/dm³	Resistenza elettrica Electrical resistance Ohm mm² mm	Conducibilità termica Thermal conductivity W/mk	intervallo di fusione Melting range °C	coeficiente dilatazione termica Thermal expansion coefficient 20-100 °Cx10⁻⁶/°C	Modulo elasticità Elasticy coefficient N/mm²
6063	T6	2,70	0,033	201	615 - 655	23	69000

ESTRUSI PROPRIETA' MECCANICHE TIPICHE — MECHANICAL PROPERTIES OF TYPICAL EXTRUSION

LEGA ALLOY	Stato fisico Physical state *	Carico unitario di rottura a trazioneStato fisico Tensile streght at break Rm N/mm²	Carico unitario si scostamento della proporzionalità Unit load of deviatium from proportionality $Rm_p0.2$ N/mm²	Allungamento Elongation A %	Durezza Brinnell Brinnell hardness HB
6063	T6	245	195	9	80

CARATTERISTICHE TECNOLOGICHE (INDICATIVE) — TECHNOLOGICAL CHARACTERISTICS (INDICATIVE)

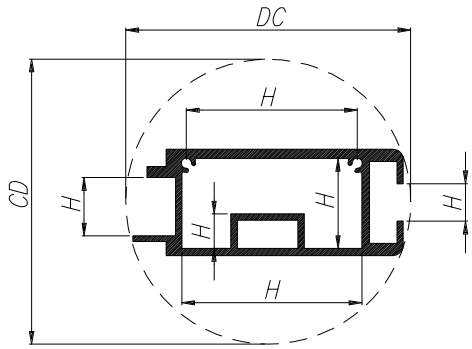
Stato fisico Physical state	Deformabilità plastica a freddo Plastic deformability cold	Lavorabilità all' utensile Tool machinability	Resistenza alla corrosione atmosferica Resistance to atmospheric corrosion	Resistenza alla corrosione marina Resistance to marine corrosion	Anodizzazione Anodization	Saldabilità Weldability
T6	Sufficiente Sufficient	Buona Good	Ottima Excellent	Buona Good	Ottima Excellent	Ottima Excellent

* STATO FISICO
T6 Tempra in acqua seguita da invecchiamento artificiale

* PHYSICAL STATE
T6 Tempered in water followed by artificial ageing

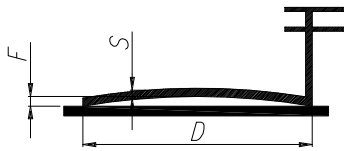
TECNOAL BOLOGNA - ITALY

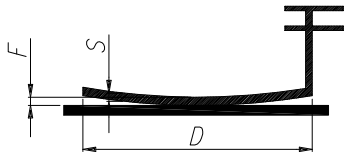
TOLLERANZE DI ESTRUSIONE ESTRATTE DA UNI EN 755/9
EXTRUSION TOLERANCES FROM UNI EN 755/9



TOLLERANZE DIMENSIONALI - DIMENSION TOLERANCE

Dimensione H (mm) Dimension		Tolleranza su H per diametro circoscritto DC (mm) H Tolerance by circumscribed diameter CD (mm)			
Maggiore di Greater of	Minore o uguale a Minor or equal to	≤ 100	> 100 ≤ 200	> 100 ≤ 300	> 100 ≤ 500
--	10	± 0.25	± 0.30	± 0.35	± 0.40
10	25	± 0.30	± 0.40	± 0.50	± 0.60
25	50	± 0.50	± 0.60	± 1.80	± 0.90
50	100	± 0.70	± 0.90	± 1.10	± 1.30
100	150	--	± 1.10	± 1.30	± 1.50
150	200	--	± 1.30	± 1.50	± 1.80
200	300	--	--	± 1.70	± 2.10
300	450	--	--	--	± 2.80



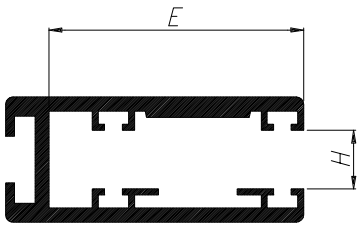


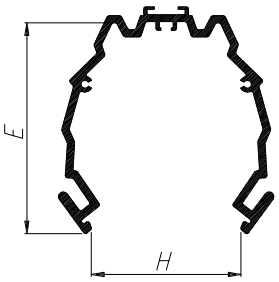
(*) Se il profilato ha spessore variabile nellagamma di misurazione,deve essere usato il più sottile

(*) Select minor thickness

TOLLERANZE DI CONVESSITA' E CONCAVITA' CONVEXITY AND CONCAVITY TOLERANCES

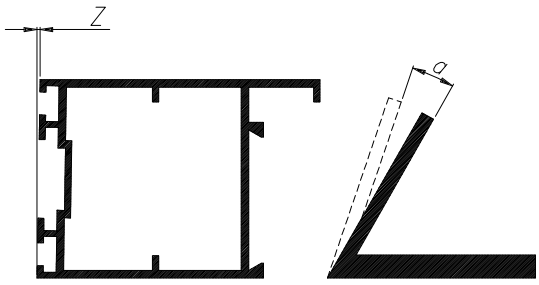
Larghezza D (mm) Width		Scostamento F (mm) Deviation F (mm)		
		Profilati cavi (*) - Hollow profile (*)		Profilati pieni Full profile
Maggiore di Greater of	Minore o uguale a Minor or equal to	Spessore Thickness S ≤ 5	Spessore Thickness S > 5	
--	30	0.30	0.20	0.20
30	60	0.40	0.30	0.30
60	100	0.60	0.40	0.40
100	150	0.90	0.60	0.60
150	200	1.20	0.80	0.80
200	300	1.80	1.20	1.20
300	400	2.40	1.60	1.60





TOLLERANZE DI APERTURA - APERTURE TOLERANCES

Dimensione E (mm) Dimension		Tolleranza su H in aggiunta a quella dimensionale per sezioni con estremità aperte For open ends to dimension H add this tolerance	Dimensione E (mm) Dimension		Tolleranza su H in aggiunta a quella dimensionale per sezioni con estremità aperte For open ends to dimension H add this tolerance
Maggiore di Greater of	Minore o uguale a Minor or equal to		Maggiore di Greater of	Minore o uguale a Minor or equal to	
--	20	--	100	125	± 0.80
20	30	± 0.15	125	150	± 1.00
30	40	± 0.25	150	180	± 1.20
40	60	± 0.40	180	210	± 1.40
60	80	± 0.50	210	250	± 1.60
80	100	± 0.60	250	--	± 1.80

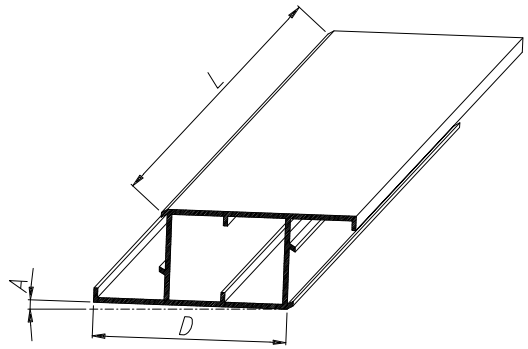


Lo scostamento massimo consentitoa per un angolo diverso dall' angolo retto deve essere ±1°

Maximum deviation allowed for not right angle must be ±1°

TOLLERANZE DI ANGOLARITA' - ANGULARITY TOLERANCE

Larghezza D (mm) Width		Scostamento massimo consentito Z dall' angolo retto Maximum deviation Z from right angle
Maggiore di Greater of	Minore o uguale a Minor or equal to	
--	30	0.40
30	50	0.70
50	80	1.00
80	120	1.40
120	180	2.00
180	240	2.60
240	300	3.10
300	400	3.50



TOLLERANZE DI TORSIONE - TORSION TOLERANCE

Larghezza D (mm) Width		Tolleranza di torsione A sulla lunghezza L Torsion tolerance A for length L		
Maggiore di Greater of	Minore o uguale a Minor or equal to	L=1000 (*)	1000 < L ≤ 6000	L ≥ 1000
--	20	1.20	2.50	3.00
30	50	1.50	3.00	4.00
50	100	2.00	3.50	5.00
100	200	2.50	5.00	7.00
200	300	2.50	6.00	8.00
300	450	3.00	8.00	1.5xL (L in metri)

(*) Per lunghezze inferiori a 1000mm tolleranze da concordare
(*) Tolerance to define for legth minor than 1000mm

TECNOAL BOLOGNA - ITALY

TOLLERANZE DI LAVORAZIONE
MACHINING TOLERANCE

Tecnoal ha adottato come tolleranze usuali per le lavorazioni meccaniche ove non diversamente specificato
- taglio + 0 - 0,5
- riferimenti ± 0,3
- interassi ± 0,2 (non cumulabile)
- profondità filettature 2 volte il diametro più un millimetro.

Altre lavorazioni ove non specificato grado di precisione medio secondo UNI 22768-1-m

Unless otherwise indicated, Tecnoal has machining tolerances as follows:
- cut + 0 - 0,5
- reference ± 0,3
- distances between centers ± 0,2 (non combinable)
- thread depths 2 times the diameter plus one millimeter.

Other machining where average degree of precision not specified according to UNI 22768–1-m

Classe di tolleranza applicata → Applied tolerance class

Classe di tolleranza/Tolerance class		(*) da/from 0.5 fino a/to 3	oltre/over 3 fino a/to 6	oltre/over 6 fino a/to 30	oltre/over 30 fino a/to 120	oltre/over 120 fino a/to 400	oltre/over 400 fino a/to 1000	oltre/over 1000 fino a/to 2000	oltre/over 2000 fino a/to 4000
Designazione Designation	Denominazione Denomination								
f	Fine/Thin	± 0.05	± 0.05	± 0.1	± 0.15	± 0.2	± 0.3	± 0.5	—
m	Media/Medium	± 0.1	± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2	± 2
c	Grossolana/Thick	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2	± 2	± 3	± 4
v	Molto grossolana/Very thick	—	± 0.5	± 1	± 1.5	± 2.5	± 4	± 6	± 8

(*) Per dimensioni nominali minori di 0,5 mm., gli scostamenti devono essere indicati vicino alla dimensione nominali relativa
(*) For nominal dimensions less than 0.5 mm, the deviation must be indicated near the relative nominal dimension.

CRITERI DI ACCETTAZIONE (UNI EN 22768-1)

Salvo indicazione contraria, i pezzi non conformi alle tolleranze generali prescritte non devono essere automaticamente rifiutati quando la funzionalità del pezzo non risulta compromessa.

ACCEPTANCE CRITERIA (UNI EN 22768-1)

Unless otherwise indicated, pieces not in compliance with the general prescribed tolerances should not automatically be refused when the functionality of the piece has not been compromised.

NOTE TECNICHE

Il presente catalogo è stato elaborato dal settore tecnico-commerciale della *TECNOAL* allo scopo di fornire al progettista elettronico un valido aiuto nella scelta del dissipatore più adatto ad uno specifico impiego. I dati di resistenza termica (RT) riferiti ad un provino di data lunghezza L riportati nella tabella di ogni profilo sono dati sperimentali riferiti a risultati di prove di laboratorio.

Le condizioni di prova sono quelle che garantiscono il massimo rendimento del dissipatore, ovvero:
1) ventilazione naturale;
2) carico termico applicato su tutta la superficie caricabile;
3) posizione "verticale" per sfruttare il massimo "dell'effetto camino" sul flusso dell'aria;
4) superficie opaca ossidata nera per favorire lo scambio termico anche per irraggiamento;
5) nessun corpo nelle vicinanze del dissipatore in prova per minimizzare le perturbazioni ambientali;
6) temperatura rilevata tramite termocoppia all'interno del dissipatore immediatamente sotto il carico in zona centrale del provino.

I valori riportati sul catalogo fanno riferimento ad un RT rilevata con una differenza di temperatura dissipatore-ambiente $\Delta T = 60$ °C.

Questo è in effetti il carico massimo di utilizzo per la maggioranza dei dispositivi a stato solido. La logica conseguenza di quanto sopra esposto è che per il progettista i valori della RT riportati in catalogo sono solo una buona base di partenza per scegliere il dissipatore più adatto al proprio impiego per arrivare al risultato definitivo occorre tenere conto che

TECHNICAL NOTES

This catalogue has been prepared by TECNOAL's design marketing department in order to provide electronic design engineers with the means to choose the most suitable heat sink for a given use.

The data regarding thermal resistance (TR) relative to a test piece of a given length L indicated in the table of each profile are experimental data gleaned from the results of laboratory experiments.

The test conditions are those which guarantee maximum performance by the heat sink, and include:
1) natural ventilation
2) thermal load applied to the entire load surface
3) vertical position to take maximum advantage of the chimney effect on airflow
4) anodized black opaque surface to enhance thermal exchange through heat radiation as well
5) absence of objects near the tested heat sink to minimize environmental disturbances
6) temperature measured by means of a thermocouple inside the heat sink immediately below the load in the center area of the test piece.

The values indicated in the catalogue refer to a TR detected with a heat sink-ambient temperature difference of $\Delta T = 60$°C. This is effectively the maximum load for usage of the majority of solid layer devices. The logical consequence of the above is that the designer should use the TR values reported in the catalogue only as a starting point in selecting the most suitable heat sink for a given use. In order to reach a definitive result it is necessary to be aware that in reality the heat sink

nella realtà il dissipatore andrà ad operare in condizioni sicuramente peggiori di quelle presenti al momento della prova di laboratorio. Un esempio molto semplice per chiarire il concetto se la potenza totale da dissipare è di 35W e imponiamo che il dispositivo possa arrivare alla temperatura massima di 80°C con una temperatura ambiente di 30°C utilizzeremo la semplice formula:

$$RT = \frac{\Delta T}{W}$$

Dove:

RT = resistenza termica del dissipatore
ΔT = temperatura massima del dissipatore meno temperatura ambiente
W = potenza massima dissipata

Sostituendo i valori del progetto nella formula abbiamo:

ΔT = 80 – 30 = 50 °C
W = 35 W

Questo dato, ancora teorico, andrà diminuito leggermente per renderlo realmente applicabile al progetto. Si può partire da 1,1 ÷ 1,3 °C/W.
A questo punto i dati riportati sul catalogo ci consentono ampi margini di scelta trattandosi di individuare fra tanti profili di media potenza il più adatto per dimensioni e facilità di montaggio al nostro utilizzo.
Difficilmente si troverà il valore della RT cercata direttamente sulle tabelle, essendo i valori riportati relativi a lunghezze predeterminate; come è intuitivo occorrerà allungare o accorciare il profilo per diminuire o aumentare la RT.

ATTENZIONE!
Trattandosi di conduzione termica il valore della RT non cambia con legge lineare, ovvero: raddoppiando la lunghezza di un dissipatore non si dimezza la sua resistenza termica! Va inoltre tenuto conto che la disposizione del carico termico influenza in modo determinante l'efficienza del dissipatore.

VENTILAZIONE FORZATA
Nel caso che il dispositivo da progettare preveda la ventilazione forzata, è ancora possibile utilizzare i dati del catalogo tenendo presente che la RT rilevata in ventilazione naturale diminuisce proporzionalmente all'aumento della velocità dell'aria. In tabella 1 è riportato l'andamento puramente teorico di tale diminuzione.
È pure possibile valutare in modo molto approssimato come diminuisce la RT all'aumentare della lunghezza del dissipatore. Riportiamo in tabella 2 un tipico andamento.

will be subject to worse conditions than those used in laboratory testing. A very simple example to clarify the concept: if the total power to dissipate is 35W and we determine that the device can reach a maximum temperature of 80°C with an ambient temperature of 30°C, we can use the following formula:

$$TR = \frac{\Delta T}{W}$$

Where:

TR = thermal resistance of the heat sink
ΔT = maximum temperature of the heat sink minus ambient temperature
W = maximum dissipated power

Substituting the project values in the formula we have:

ΔT = 80 - 30 = 50 °C
W = 35 W

This theoretical result will be slightly reduced to make it more realistically applicable to the project. A starting point would be from 1.1 – 1.3 °C/W.
At this point the data indicated in the catalogue allow us a wide range of choice in identifying among many profiles of medium power the most suitable in terms of dimensions and ease of installation for our use.
It is unlikely to find the desired TR value directly in the tables as these indicated values regard predetermined lengths. As is evident, it is necessary to lengthen or shorten the profile to decrease or increase the TR.

CAUTION!
Since thermal conduction is involved the TR value does not change on a linear basis. For example, doubling the length of the heat sink will not reduce its thermal resistance by one half! It is also important to bear in mind that the thermal load disposition has a determining effect on the effectiveness of the heat sink.

FORCED VENTILATION
When the design involves the use of forced ventilation it is still possible to use the catalogue data, bearing in mind that the TR measured in natural ventilation decreases proportionally with the air velocity. Table 1 shows the purely theoretical trend of this decrease.
It is possible to approximately evaluate the decrease in TR with the increase in heat sink length. Table 2 shows a typical trend.

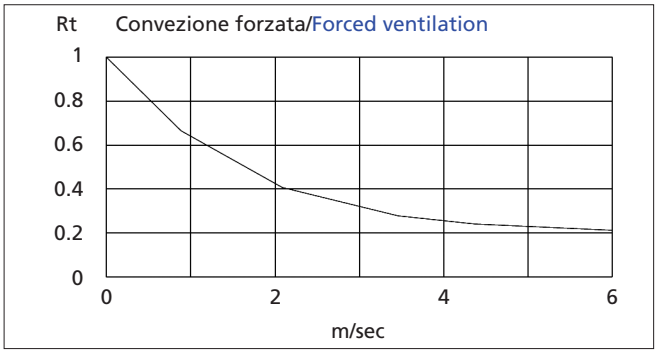


tabella 1 / table 1

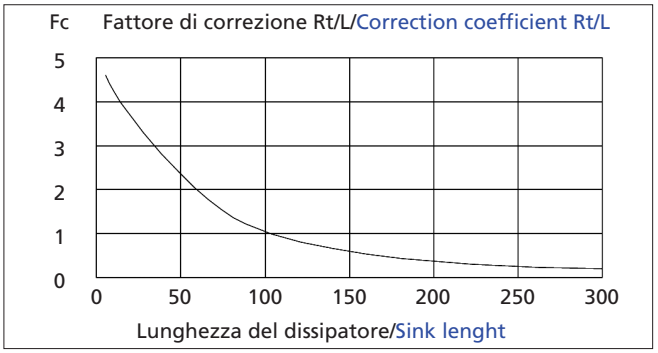


tabella 2 / table 2

ATTENZIONE!

Tutti i fattori di non linearità che caratterizzano la conduzione termica sono enormemente amplificati in caso di ventilazione forzata. Bisogna infatti mettere in conto che la geometria del profilo, il tipo di ventilatore, la presenza o meno di un convogliatore, l'insorgenza o meno di vortici, la disposizione dei carichi termici, ecc. interagiscono contemporaneamente in modo talmente imprevedibile da rendere praticamente improgettabile un dispositivo.
In questi casi solo la conoscenza, l'esperienza e le prove di laboratorio possono aiutare il progettista.
E' in effetti in questo contesto che la *TECNOAL* mette a completa disposizione il proprio laboratorio per risolvere rapidamente e nel modo migliore i problemi dei clienti.

IMPORTANTE

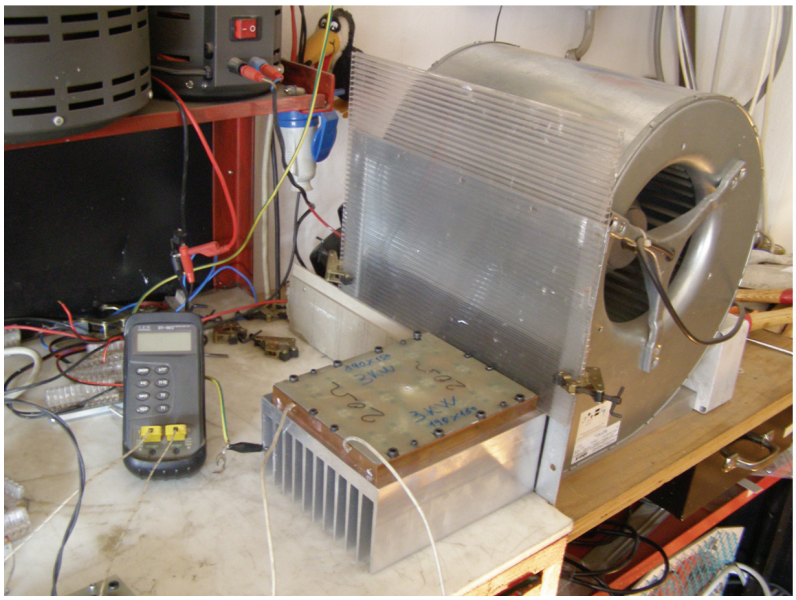
I dati e le informazioni riportate sul presente catalogo sono stati rilevati in modo accurato e pertanto affidabili. Al cliente rimane comunque la responsabilità di verificare la correttezza dell'uso finale dei dispositivi.
La *TECNOAL* non potendo essere a conoscenza dell'uso specifico che ne sarà fatto non può essere ritenuta responsabile in alcun modo per eventuali incidenti o danni provocati durante l'impiego dei suoi prodotti.
Si riserva altresì il diritto di apportare senza preavviso qualsiasi variazione ai propri prodotti, allo scopo di migliorarne la qualità e l'efficienza.
Tutti i profili estrusi in alluminio sono soggetti alle norme di tolleranza sull'estrusione UNI EN 755/9; di conseguenza i pesi riportati sono valori medi teorici e oscillano all'interno dei campi di tolleranze dimensionali.

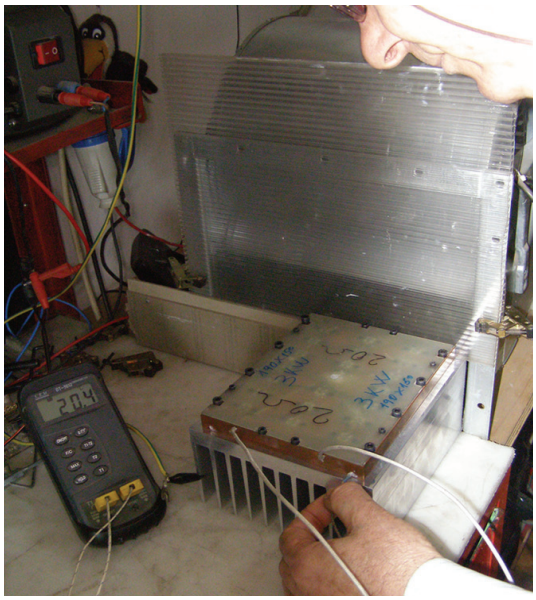
CAUTION!

All non-linear factors that characterize thermal conduction are greatly amplified with forced ventilation. It is necessary to consider that geometric properties of the profile, the type of fan, the presence (or lack) of a conveyor, the possibility of vortexes, the disposition of thermal loads, etc. simultaneously interact in such an unpredictable way that make device design nearly impossible. In these cases only knowledge, experience and laboratory testing can help the designer. It is exactly in these situations that TECNOAL makes it laboratory available to quickly resolve client problems with the best solutions.

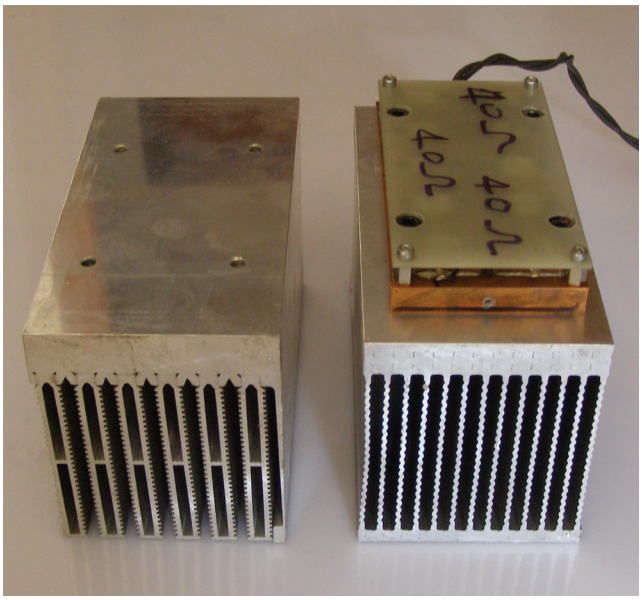
IMPORTANT

The data and information contained in this catalogue have been carefully compiled and are therefore reliable. However, the client still has the responsibility of ensuring the correct use of the devices. TECNOAL cannot know the specific use of its products and therefore cannot be held responsible in any way for any incidents or damage caused during the use of such products. The company also reserves the right to modify its products without prior notice in order to improve their quality and efficiency. All extruded aluminium profiles are subject to UNI EN 755/9 regulations regarding extrusion tolerance. Consequently, the indicated weights are theoretical average values and vary within the range of dimension tolerances.



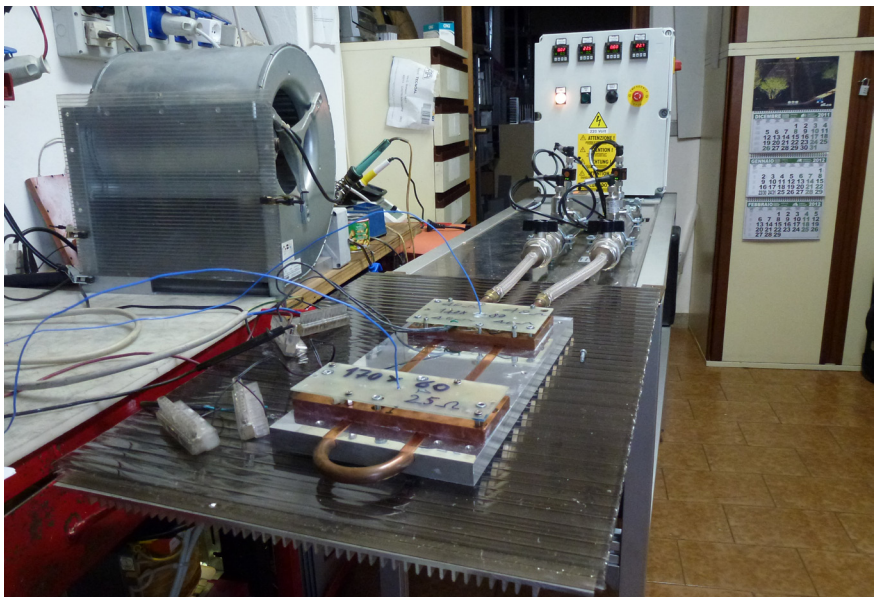


Prova di laboratorio/Laboratory: test heatsink



Test di comparazione/Laboratory comparison test

Strumentazione di laboratorio/Laboratory equipement



Banco di prova per dissipatori ad acqua
Equipement test for fluid cooler heatsinks

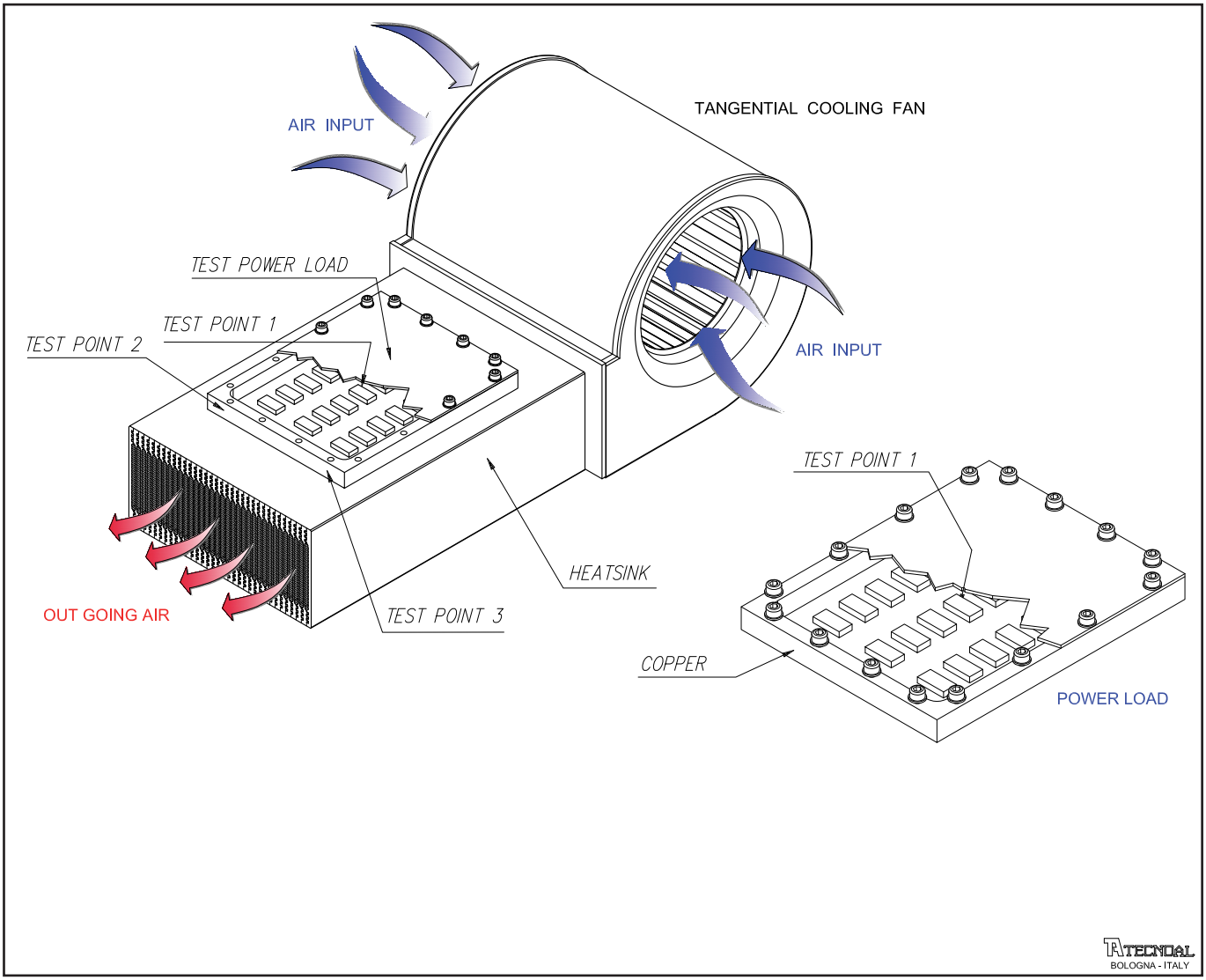
CONDIZIONI DI PROVA DEL LABORATORIO
LABORATORY TEST CONDITIONS

La scelta del profilo più adatto ad uno specifico progetto è quasi sempre un'impresa molto ardua perché i dati del dissipatore che vengono riportati sui cataloghi sono solo teorici.
Pertanto soprattutto nel caso della ventilazione forzata sono di difficile utilizzo a causa della complessa interdipendenza fra le reali condizioni di ventilazione, la disposizione dei carichi e la esigenza sempre più pressante di miniaturizzazione e di bassi costi.
Partendo da queste considerazioni TECNOAL ha messo a punto un nuovo tipo di carico termico che simula perfettamente l' architettura e le dimensioni dei nuovi moduli di potenza IGBT.
In questa maniera durante le prove di laboratorio è possibile rilevare con grande precisione la reale temperature di lavoro a cui sono sottoposte le varie zone del modulo in prova e i relativi gradienti.
Naturalmente sarà compito del cliente fornire ai tecnici del laboratorio della Tecnoal i dati più esatti possibili sulle esigenze del progetto (dimensioni del profilo, carico termico, condizioni di ventilazione, carico continuo o variabile ecc...).

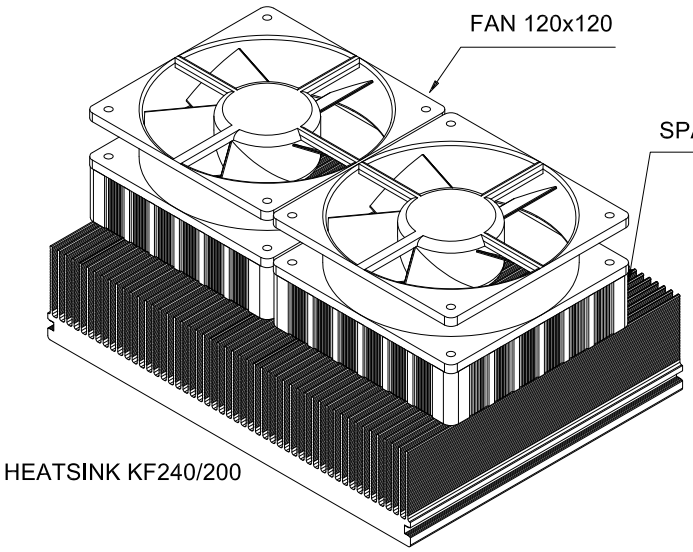
I dati rilevati da Tecnoal nelle prove di laboratorio sono affidabili ed esatti.
Il grado di precisione lo possiamo collocare in un campo di tolleranza di ±5%
È opportuno comunque che il cliente ne verifichi l'applicabilità al suo progetto che può differire in modo sostanziale dalle condizioni di prova.
Precisiamo inoltre che Tecnoal non può quindi essere ritenuta responsabile per incidenti o danni che si dovessero verificare durante l'uso dei suoi prodotti.

Choosing the most appropriate profile for a specific project can be a very difficult undertaking because the heatsinks data reported in the catalogues are only theoretical.
Therefore especially in case of forced ventilation it' very difficult to use them due to the complex interdependence between the real condition of ventilation, the layout of loads and the more strong need of miniaturization and low costs.
From these considerations TECNOAL has developed a new type of thermal load that perfectly simulates the architecture and the size of the new IGBT power modules.
In this way during the laboratory tests it is possible to detect with great accuracy the real working temperature of the different parts of the module under test and their gradients.
Of course the costumers should provide Tecnoal labs with the most accurate data regarding the project requirements (profile size, thermal load, ventilation conditions, continues or variable load etc...)

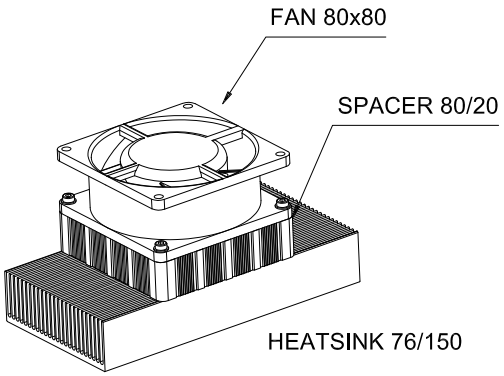
The data obtained in laboratory tests are reliable and exacts. The precision grade we can place in a field of ±5%.
Customer need to verify if condition test are similar to his project.
So Tecnoal has no responsibility during the use of his items.



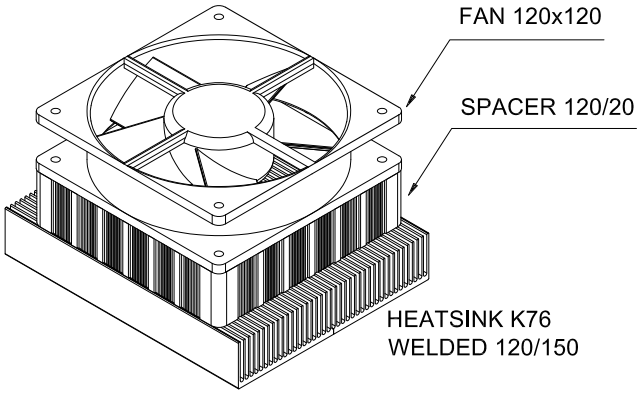
SPECIAL COOL PLATES



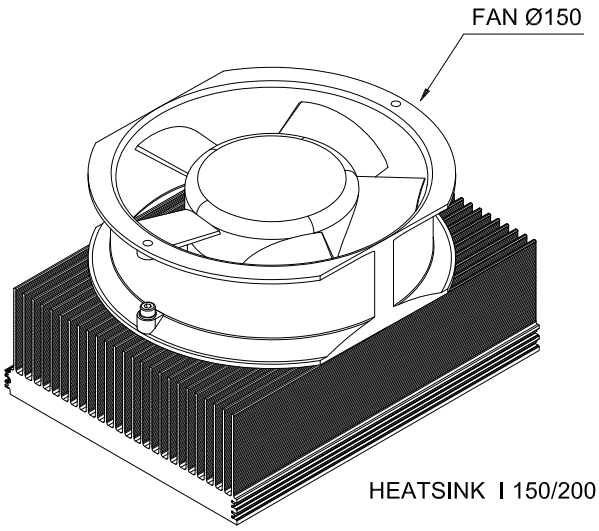
Articolo Item	KF240/200	Ventilazione forzata Forced ventilation	2 FANS 120x120x38 D.C. 24V	Rt °C/W	0,042



Articolo Item	K76/150	Ventilazione forzata Forced ventilation	1 FAN 80x80x20 D.C. 24V	Rt °C/W	0,156



Articolo Item	2xK76/120 CUT 120	Ventilazione forzata Forced ventilation	1 FAN 120x120x38 D.C. 24V	Rt °C/W	0,11

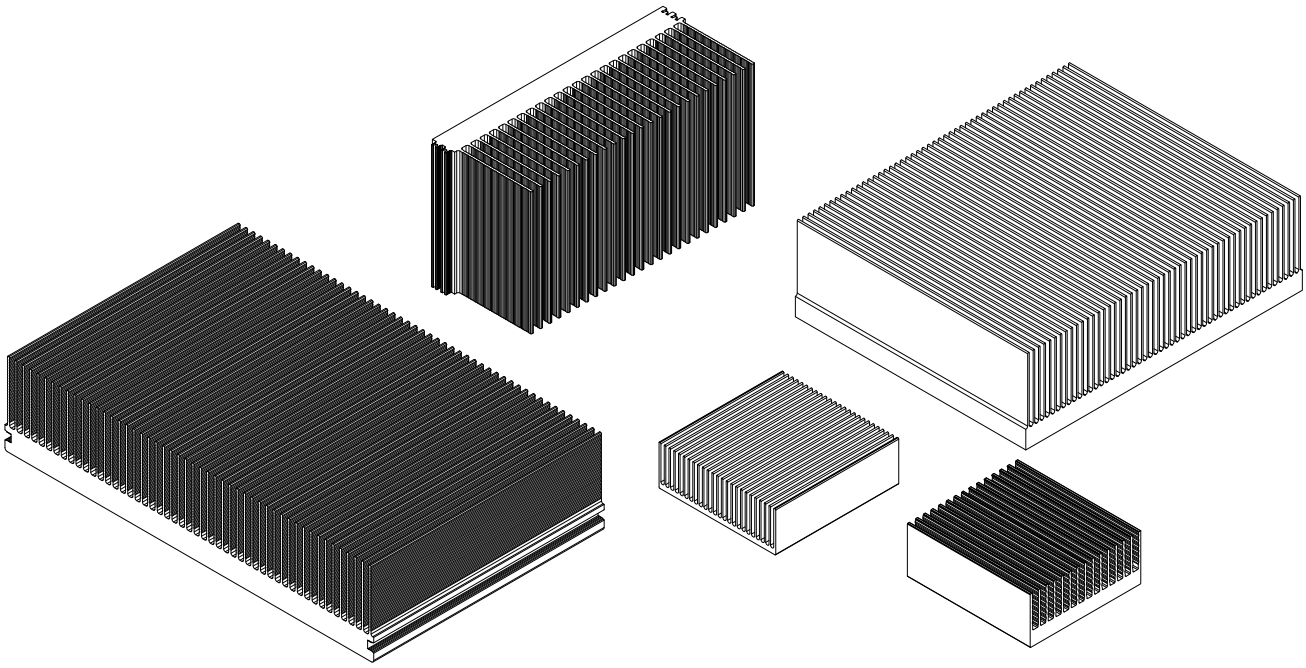


Articolo Item	I 150/200	Ventilazione forzata Forced ventilation	1 FAN Ø 150 D.C. 24V	Rt °C/W	0,059

Utilizzando profili speciali con il sistema della ventilazione impinge si possono ottenere delle cool plates veramente molto interessanti dal momento che uniscono una grandissima efficienza ad un costo ottimizzato.
Le dimensioni testate in laboratorio e riportate nel presente catalogo sono comunque da considerarsi solo come ottimi esempi di impiego.
Poiché i profili sono integrali e non hanno le limitazioni dei modulari, questi articoli possono essere ottimamente impiegati anche per carichi molto concentrati.

Using special profiles with impinge ventilation can obtain very good cool plates with a ratio cost/efficiency very interesting. In the catalog can be found some tested examples, but customer can request any other dimension.
Those profiles are integral profiles and are better than modular profiles.

PROFILI INTEGRALI AD ALTA EFFICIENZA IN VENTILAZIONE FORZATA
HIGH EFFICIENCY INTEGRAL PROFILES IN FORCED VENTILATION



La nascita dei profili modulari ad alta efficienza in ventilazione forzata, ha aperto la strada al progettista elettronico all'impiego nelle migliori condizioni possibili della nuova componentistica basata su moduli ad altissima concentrazione di iniezione di calore sul dissipatore. Purtroppo il profilo modulare non è esente da tutta una serie di problemi dal punto di vista meccanico perché se viene assemblato con colla non può essere evitato un sensibile aumento della resistenza termica trasversale fra modulo e modulo, mentre se viene utilizzato un sistema puramente meccanico a deformazione, quando si raggiungono certe dimensioni il rischio di collasso del pezzo assemblato è molto alto

Per questi motivi la Tecnoal ha progettato e implementato una tecnologia particolare per garantire che i prodotti finali siano perfettamente sicuri e ripetibili sia dal punto di vista meccanico che termico.

Dal momento che con l'estrusione integrale non si può andare oltre certi limiti sia dimensionali che di rapporti, viene utilizzata una soluzione ibrida che permette di impiegare il sistema ad incastro rinforzato ove sia necessario con la saldatura.

Con questo sistema che l'azienda gestisce integralmente all' interno della propria struttura si possono ottenere profili di grandi dimensioni, ma con rapporti alettali veramente efficienti, tali da consentire una continuità di prestazioni e qualità non ottenibili per altre vie.

Tutti i profili di questa serie sono gestiti a magazzino in barre di lunghezza compresa tra i 3 e i 5m a seconda dei modelli e del relativo peso al metro lineare.

Tecnoal è in grado di fornire il particolare comprensivo di tutte le lavorazioni e di eventuali trattamenti superficiali.

Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1 - Profilo e relativa lunghezza di taglio (Esempio: KF240/350 – viene così indicato il profilo KF240 tagliato a 350mm.
2 - Quantitativo del lotto di produzione.
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali anodizzazione (indicare il colore), alodyne, ecc....

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

The birth of high efficiency modular profiles in forced ventilation opened the way to electronic designer the employ in the best possible condition new components based on modules with very high concentration of heat injection on the heatsink.

Unfortunately modular profile can be affected by mechanical problems, because if assembled with glue there is a significant increase in cross thermal resistance between module and module while if assembled with purely mechanical deformation, when we reach certain size the risk of collapse of assembled piece is very high. For these reasons Tecnoal has designed and implemented a technology to ensure that final product are perfectly safe and with reliable mechanical and thermal characteristics.

While with integral extrusion cannot be exceeded the ratio between step and height of fins, a hybrid solution using press system reinforced where necessary by welding, is the right technical approach.

With this system fully available in Tecnoal large profiles can be obtained but with fins ratio truly efficient, which would allow a continuity of performance and quality that cannot be obtained by other means.

All profiles in this series are stored in bars 3 to 5 meters long depending on the models and relative weight per mt.

Tecnoal is able to provide these items including all machining and any surface treatments.

For quotations please provide the following informations:

1 - Profile and relevant length (Example: KF240/350 – specifies the profile KF240 cut to 350mm
2 - Quantity of batch production.
3 - Any machining, preferably accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne etc...

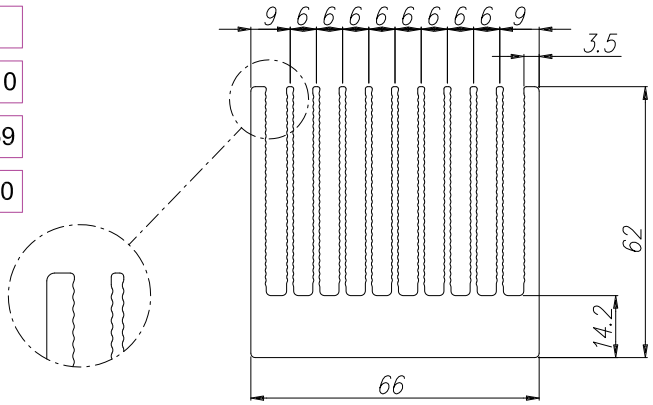
Our commercial and technical office is at your disposal for any clarification.

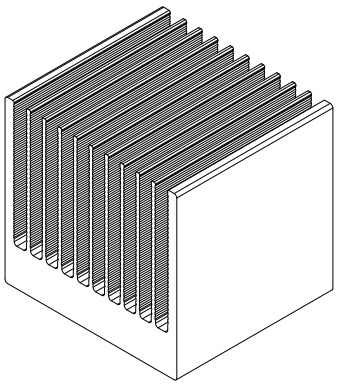
TECNOAL
BOLOGNA - ITALY

A

KA66

Peso Kg/m Weight Kg/m	5.10
Rt °C/W	1.59
Lung. campione mm Sample length mm	100



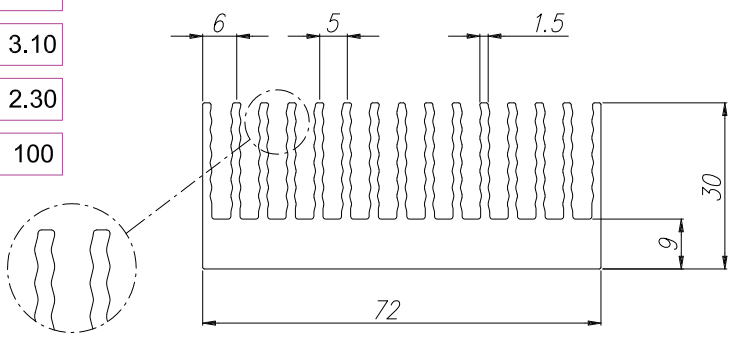


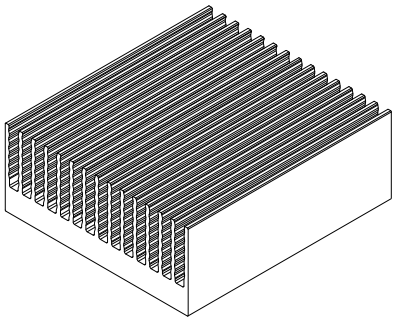
Ventilazione forzata Forced ventilation	Rt °C/W	0.22	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100	TECNOAL BOLOGNA - ITALY

B

K72

Peso Kg/m Weight Kg/m	3.10
Rt °C/W	2.30
Lung. campione mm Sample length mm	100



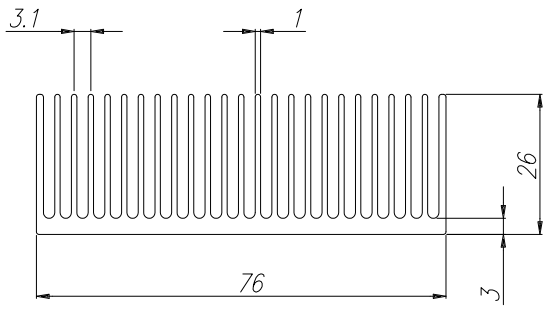


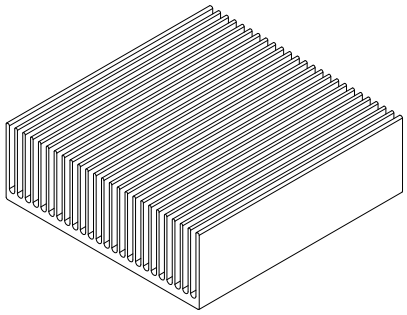
Ventilazione forzata Forced ventilation	Rt °C/W	0.32	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100	TECNOAL BOLOGNA - ITALY

C

K76

Peso Kg/m Weight Kg/m	2.30
Rt °C/W	1.75
Lung. campione mm Sample length mm	150

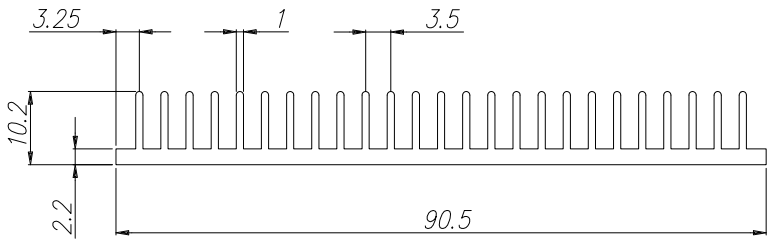


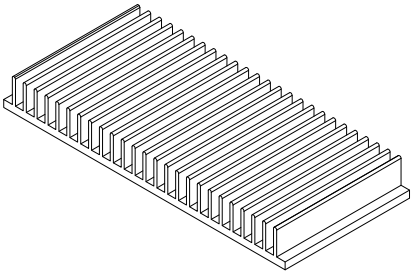


Ventilazione forzata Forced ventilation	Rt °C/W	0.21	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	150	TECNOAL BOLOGNA - ITALY

D

K91	Peso Kg/m Weight Kg/m	1.07	Rt °C/W	3.35	Lung. campione mm Sample length mm	100	

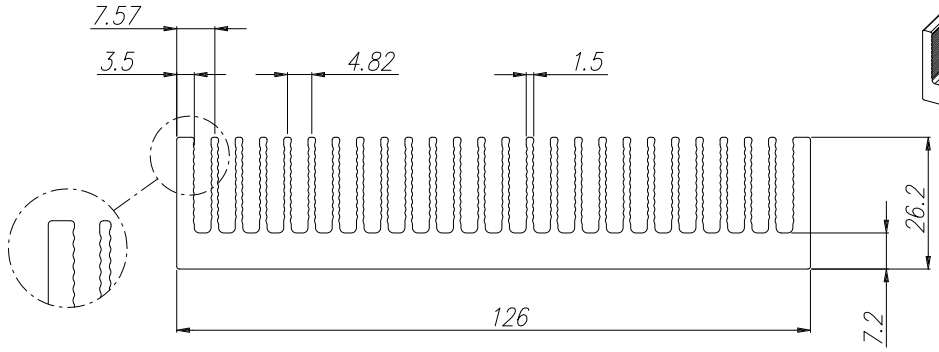


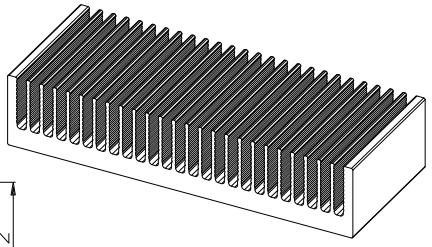


Ventilazione forzata Forced ventilation	Rt °C/W	0.325	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100	TECNOAL BOLOGNA - ITALY

KF126

Peso Kg/m Weight Kg/m	Rt °C/W	Lung. campione mm Sample length mm
4.38	0.5	100





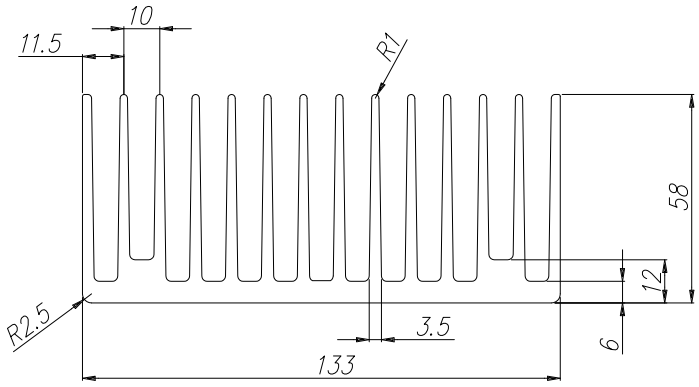
A

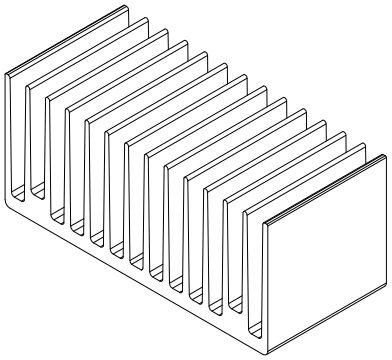
Ventilazione forzata Forced ventilation	Rt °C/W	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	Lung. campione mm Sample length mm
	0.147	5.0	100

TECNOAL BOLOGNA - ITALY

K133

Peso Kg/m Weight Kg/m	Rt °C/W	Lung. campione mm Sample length mm
7.53	0.78	100



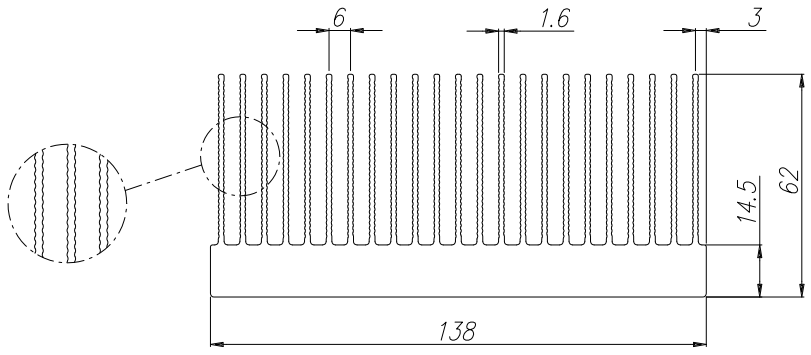


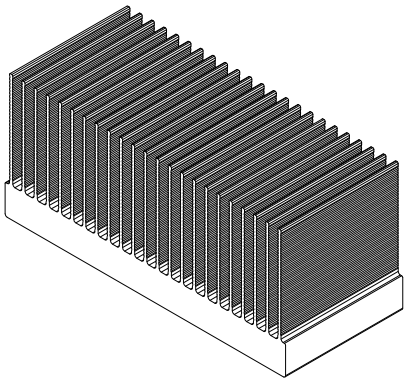
B

TECNOAL BOLOGNA - ITALY

K138

Peso Kg/m Weight Kg/m	Rt °C/W	Lung. campione mm Sample length mm
9.60	0.80	200





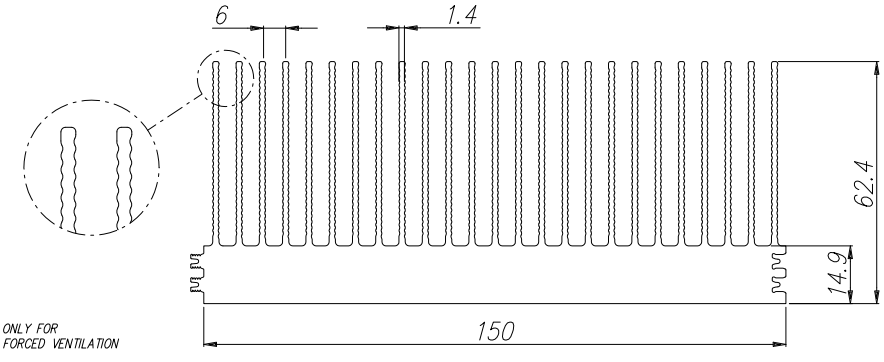
C

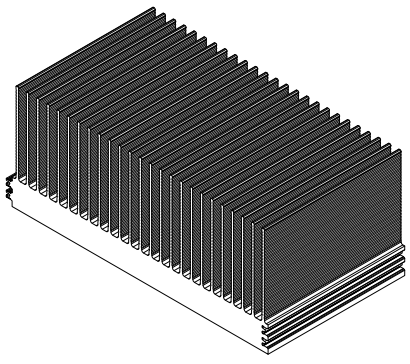
Ventilazione forzata Forced ventilation	Rt °C/W	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	Lung. campione mm Sample length mm
	0.079	5.0	200

TECNOAL BOLOGNA - ITALY

I 150

Peso Kg/m Weight Kg/m	Rt °C/W	Lung. campione mm Sample length mm
10.5	0.56	200





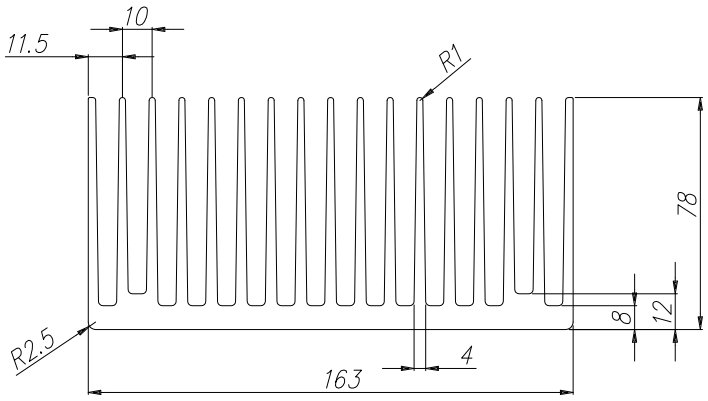
D

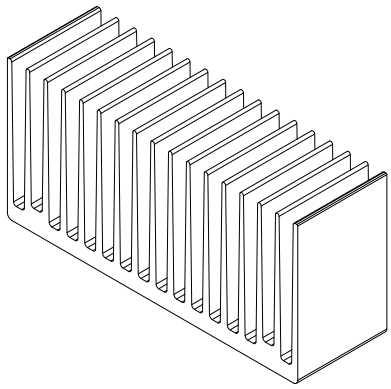
Ventilazione forzata Forced ventilation	Rt °C/W	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	Lung. campione mm Sample length mm
	0.075	5.0	200

TECNOAL BOLOGNA - ITALY

A

KF163	Peso Kg/m / Weight Kg/m 12.90	Rt °C/W 0.56	Lung. campione mm / Sample length mm 150

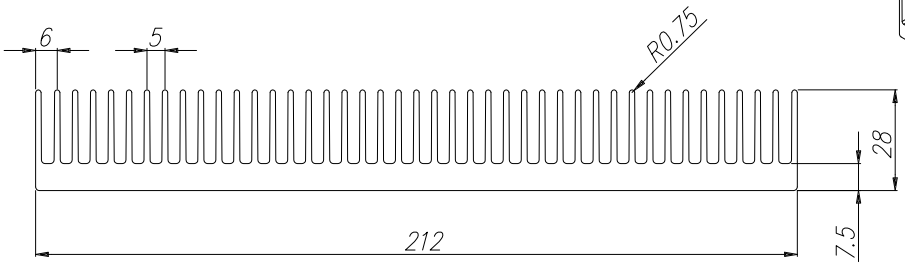


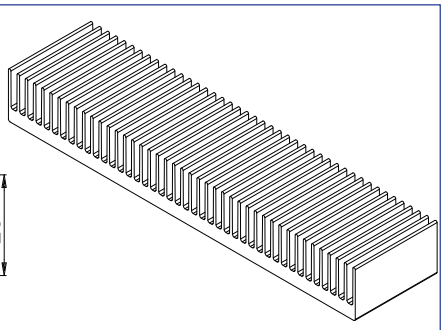


TECNOAL BOLOGNA - ITALY

B

KF212	Peso Kg/m / Weight Kg/m 8.20	Rt °C/W 0.85	Lung. campione mm / Sample length mm 150



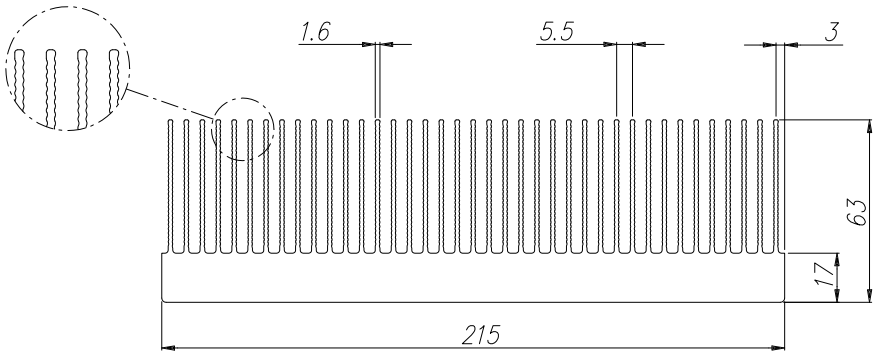


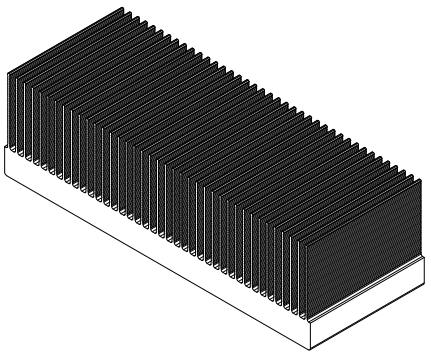
Ventilazione forzata / Forced ventilation	Rt °C/W 0.074	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 3.0	Lung. campione mm / Sample length mm 150
Ventilazione forzata / Forced ventilation	Rt °C/W 0.062	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 5.0	Lung. campione mm / Sample length mm 150

TECNOAL BOLOGNA - ITALY

C

KF215	Peso Kg/m / Weight Kg/m 16.75	Rt °C/W 0.637	Lung. campione mm / Sample length mm 150



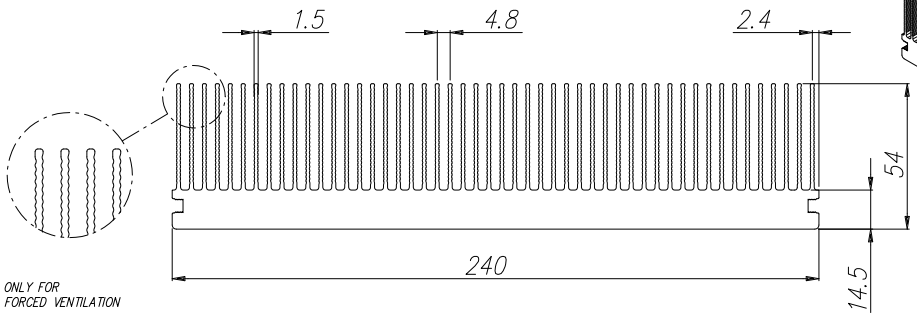


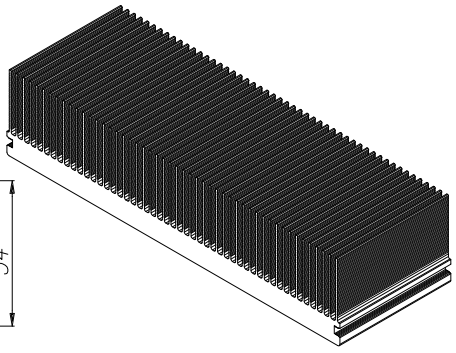
Ventilazione forzata / Forced ventilation	Rt °C/W 0.043	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 5.0	Lung. campione mm / Sample length mm 150

TECNOAL BOLOGNA - ITALY

D

KF240	Peso Kg/m / Weight Kg/m 16.50	Rt °C/W 0.54	Lung. campione mm / Sample length mm 150

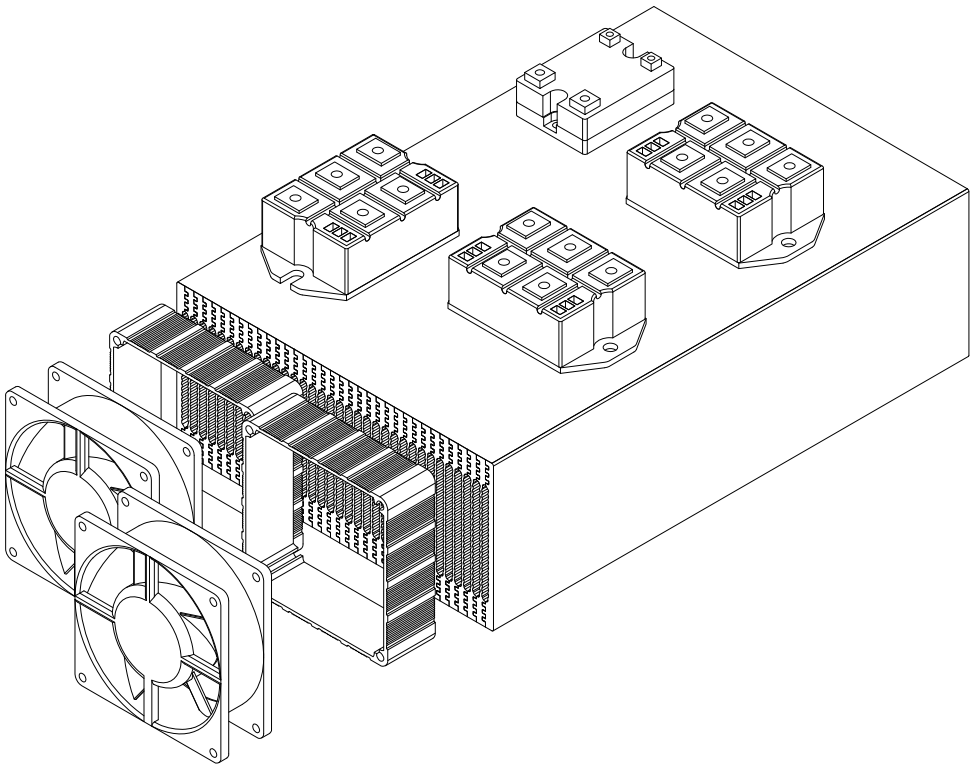




Ventilazione forzata / Forced ventilation	Rt °C/W 0.043	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 6.0	Lung. campione mm / Sample length mm 200

TECNOAL BOLOGNA - ITALY

PROFILI MODULARI SERIE "I"
SERIES "I" MODULAR PROFILES



I profili della serie “I” formano la linea dei dissipatori a moduli incastrati denominata “Tecnopower”.
I dissipatori appartenenti a questa serie offrono una grandissima efficienza in ventilazione forzata in quanto la superficie alettata a contatto con l’ aria è estremamente elevata.
Le dimensioni sono molto flessibili essendo fissa solo l’altezza dell’elemento.
Tecnoal è in grado di fornire i pezzi comprensivi di tutte le lavorazioni meccaniche.
Possono essere realizzati nuovi profili su specifiche esigenze del cliente.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1- Profilo assemblato alla larghezza richiesta e relativa lunghezza di taglio (Esempio: I75Ax300/400 – viene così indicato il profilo I75A assemblato alla larghezza di 300mm e tagliato alla lunghezza di 400mm).
2- Quantitativo del lotto di produzione
3- Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.

Qualora non vengano espressamente richieste le chiusure laterali, sarà a nostra discrezionalità stabilirne l’eventuale impiego al fine di ottimizzare le dimensioni del pezzo finito.

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

Series “I” profiles form the line of press fit heatsink pressed modules called “Tecnopower.”
The heatsinks belonging to this series offer a great efficiency in forced ventilation because the fins surface in contact with the air is extremely high.
The dimensions are very flexible being fixed only the height of the module.
Tecnoal is able to provide the pieces with full machining and new profiles can be made on specific customer requirement.
For quotations please provide the following informations:

1 - Profile assembled at width and length requested (Example: I75Ax300/400 specifies the profile I 75A assembled at width 300mm and cut to 400mm).
2 - Quantity of batch production.
3 - Any machining, preferably accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.

When side closures are not expressly required, will be at our discretion to determine their possible use in order to optimize the size of the finished piece.

Our commercial and technical office is at your disposal for any clarification.

TECNOAL
BOLOGNA - ITALY

La nascita dei profili modulari ad alta efficienza in ventilazione forzata ha aperto la strada al progettista elettronico all'impiego nelle migliori condizioni possibili della nuova componentistica basata su moduli ad altissima concentrazione di iniezione di calore sul dissipatore . Inoltre una nuova famiglia di ventole ad altissima efficienza è stata lanciata sul mercato negli ultimi tempi provocando una grande rivoluzione sui parametri dei nuovi progetti sempre rivolti ad ottenere il massimo risultato con il minimo dei costi.
Tecnoal in virtù della vasta esperienza nel settore della ventilazione forzata, ha ampliato la gamma delle più importanti famiglie dei profili modulari specialmente quella del I84 e del I125 per ottenere il miglior risultato per tutti i nuovi progetti.

APPLICAZIONI

Tutti i profili della serie TECNOPOWER sono progettati per ottenere le migliori prestazioni in ventilazione forzata. Si può operare in due modi ovvero:
- Ventilazione longitudinale
- Ventilazione radiale o impinge.

Maggiore efficienza si ottiene in compressione, per operare in aspirazione scegliere possibilmente alette lisce.

NOTE TECNICHE (INDICAZIONI GENERALI)

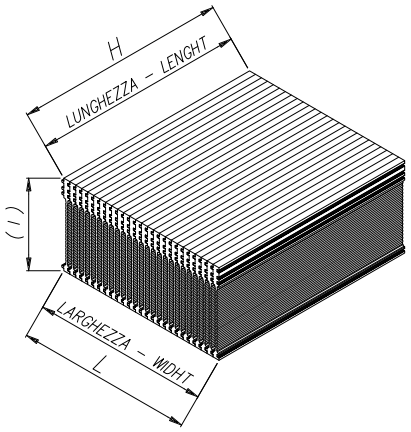
Tutti modelli della serie TECNOPOWER sono in lega di alluminio EN AW-6060 o 6063.
Le superfici sulle quali vengono montati i componenti elettronici sono spianate con una planarità di 0,02 mm/150 mm. e la rugosità massima è di Ra = 1,2 micron.
La finitura standard è il lavaggio (sgrassaggio).

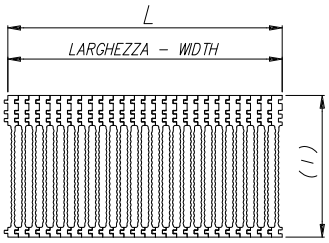
DISSIPATORI MODULARI DI GRANDI DIMENSIONI

Con il sistema di assemblaggio Tecnoal si possono ricavare particolari di notevoli dimensioni, sia in larghezza che in lunghezza. La dimensione più critica è senz'altro la larghezza soprattutto perché al di sopra di una certa dimensione il peso relativo contribuisce a complicare enormemente tutte le lavorazioni, le movimentazioni e, di conseguenza, la qualità totale.
Per garantire la costanza e la sicurezza delle caratteristiche meccaniche su particolari con pesi superiori ai 50 Kg. e dimensioni superiori ai 500 mm., Tecnoal ha integrato nelle normali procedure di costruzione l'aggiunta di un cordolo di saldatura da applicare nelle posizioni più opportune. I parametri possono cambiare a seconda della geometria del profilo e delle particolari caratteristiche di rigidità e resistenza.
Per quello che riguarda tutte le tolleranze sulle dimensioni finali è stata elaborata sulla dimensione larghezza la seguente tabella valida in base ai campi di misura.

TABLE FOR TOLLERANCES FOR MODULAR PROFILE

WHIDTH MEASURES	TOLERANCE IN mm.	ALTERNATIVE TOLERANCE IN mm.	ALTERNATIVE TOLERANCE IN mm.
UNTILLL TO 100 mm.	± 0.5	+ 1 0	0 - 1
FROM 100mm. TO 150mm.	± 0.7	+ 1.5 0	0 - 1.5
FROM 150mm. TO 250mm.	± 1	+ 2 0	0 - 2
FROM 250mm. TO 400mm.	± 1.5	+ 3 0	0 - 3
FROM 400mm. TO 700mm.	± 2	+ 4 0	0 - 4
FROM 700mm. TO 1000mm.	± 2.5	+ 5 0	0 - 5





Tolleranze di lunghezza ± 0,5 mm. da 0 a 400 mm.
Tolleranze di lunghezza ± 1 mm. da 400 a 1000 mm.
Tolleranze di lunghezza oltre i 1000 mm. +/- 2 mm.
Tolleranze di ortogonalità ± 1°
Tolleranze di planarità ± 0,03 mm./100 mm. nelle zone di appoggio dei componenti.
Tolleranze di rugosità Ra= 1,6 medio nelle zone di appoggio dei componenti. Sono escluse le zone di giunzione dei moduli dove è ammessa una distanza massima di 0,15 mm.

Poiché al termine di tutte le lavorazioni i particolari subiscono al momento dell'imballo un controllo finale, tutte le difettosità visive che possono evidenziarsi che non vanno però ad interferire sul buon funzionamento del pezzo, devono essere accettate perché è particolarmente difficile preservare pezzi di grande peso e dimensione da piccole imperfezioni causate dalle lavorazioni e dalle successive movimentazioni. Ricordiamo inoltre come già riportato all'inizio del catalogo che le caratteristiche generali fanno riferimento alle norme UNI EN 755/9 riguardanti i profili estrusi.
Precisiamo altresì che salvo indicazione contraria i pezzi non conformi alle tolleranze generali non possono essere automaticamente rifiutati quando la loro funzionalità non risulti compromessa.

Tecnoal si riserva il diritto di apportare modifiche e migliorie ai prodotti senza obbligo di preavviso con l'unica condizione che questa operazione non comprometta la funzionalità del pezzo.

The birth of high efficiency modular profiles in forced ventilation opened the way to electronic designer for employ in the best possible condition new components based on modules with very high concentration of heat injection on the heatsink.
More-over a new family of high efficiency fans born on last time has changed all parameters on electronic projects and for reach maximum result with minimum cost is very hard. Tecnoal using his big experience on forced ventilation field has increased all type of the most important family of modular profiles and especially I84 and I125 family for have the best result in all type of new projects.

APPLICATIONS

All modular profiles TECNOPOWER are optimized for forced ventilation. We can work in two systems:
- Longitudinal ventilation
- Radial or impinge ventilation.

More efficiency can be obtained in pumping use, in sucking use is better smoothed fins.

TECHNICAL NOTE (GENERAL INDICATION)

All modular profiles TECNOPOWER are in aluminum alloy EN AW-6060 or 6063.
The components assembly surfaces are milled as following data:
Planarity 0,02mm/150 mm.
Maximum Roughness = Ra 1,2 Microns.

LARGE TECNOPOWER ASSEMBLED HEATSINKS

Through Tecnoal assembly process heatsinks of large dimensions can be obtained.
Surely the most critical dimension is width. However when the length is very high the relative weight contribute to make all process and handling much more consequent unpleasant impact on the total quality. For guarantee the constancy of quality and mechanical characteristic on pieces with weight superior to 50 Kg. and dimension over 500 mm., Tecnoal has added a welding strip where most needed to the regular manufacturing procedures. The parameters can be change based on profile geometry, on rigidity and strength characteristics. About dimension tolerances for width standard measures are in the following table.

Length tolerance +/- 0,5 mm. from 0 to 400 mm.
Length tolerance +/- 1 mm. from 400 to 1.000 mm.
Length tolerance up to 1.000 mm. +/- 2 mm.
Orthogonality tolerance +/- 1°
Planarity tolerance +/- 0,03 mm./100 mm. on components apply zone
Roughness tolerance Ra= 1,6 microns medium on components apply zone. Maximum distance of 0,15 mm. is admitted on ribs joint zone.

Since all these characteristics are subject to final control, all visible defects not impacting on product functionality need to be accepted because is very difficult to preserve large size products from light imperfection caused by manufacturing and handling.
As already underlined in the beginning of our catalogue, we remind besides general characteristics are referred to UNI EN 755/9 rules for extruded profiles.

Unless otherwise stated the products that do not comply with general tolerances cannot be automatically rejected when their functionality is not compromised.

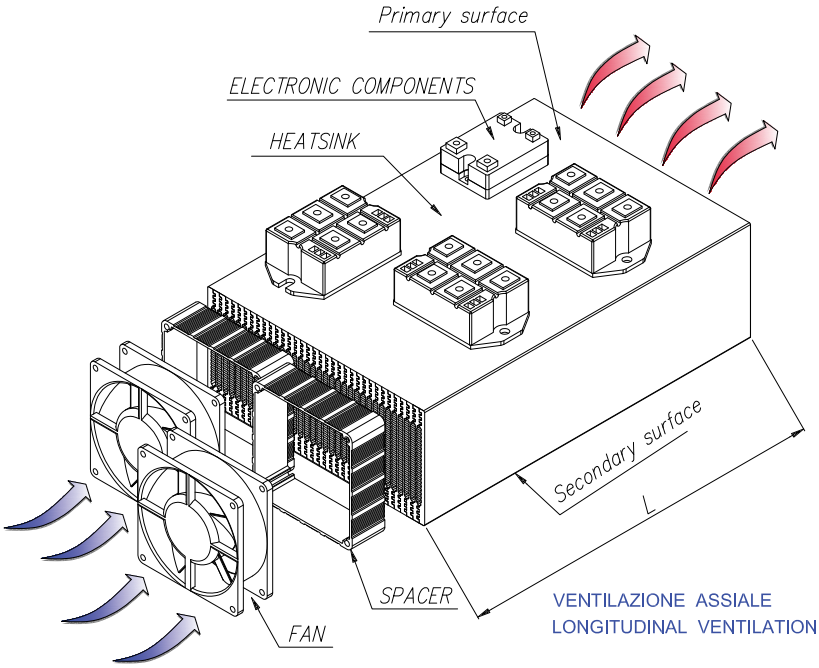
SISTEMA DI VENTILAZIONE — VENTILATION SYSTEM

VENTILAZIONE ASSIALE O LONGITUDINALE

Nella ventilazione longitudinale il flusso dell'aria generato dalle ventole attraversa tutta la lunghezza del dissipatore.
Si avrà perciò il massimo delle perdite di carico del flusso dell'aria insieme con la formazione di forti gradienti termici.
Evidenziamo altresì che, qualora le dimensioni del progetto lo consentano, è importante inserire fra la ventola e il dissipatore uno spacer per ottimizzare il flusso dell'aria.
Facciamo notare infine che con questo tipo di ventilazione è possibile caricare entrambe le facce del dissipatore se non è a pettine.

LONGITUDINAL VENTILATION

In longitudinal ventilation the air flow generated by the cooling fans flows through the whole lenght of the heat sink.
This implies the maximum pressure drop in airflow with high thermal gradients.
In this case if allowed by the size of the project, it is very important to install between the fan and the heat sink a spacer to optimize the airflow.
With this type of ventilation it is possible to put the thermal load on both sides of the heat sink if the heat sink is not comb shaped.



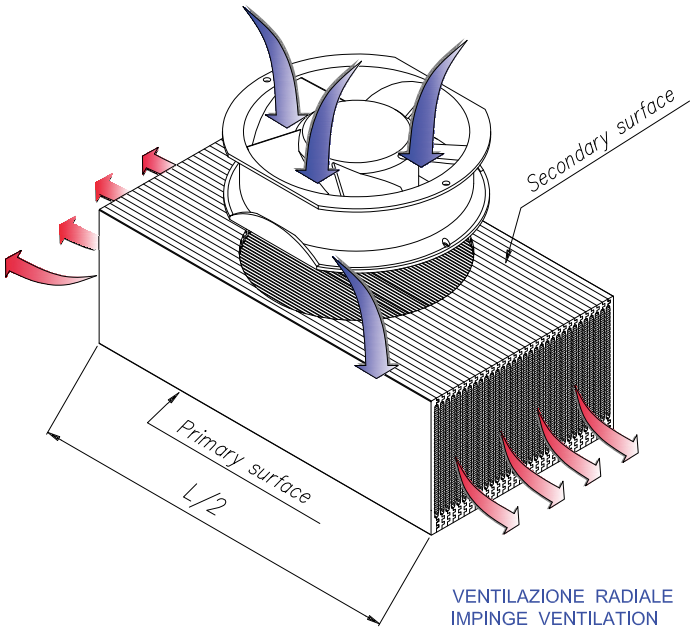
VENTILAZIONE ASSIALE
LONGITUDINAL VENTILATION

VENTILAZIONE RADIALE

Nella ventilazione impinge o radiale abbiamo contemporaneamente due notevoli vantaggi: il dimezzamento del percorso dell'aria con conseguenti minor perdite di carico e la forte diminuzione dei gradienti termici, il che consente di portare il rendimento del dissipatore al massimo.
Si può operare sia in aspirazione che in compressione, ma è assolutamente preferibile lavorare in compressione; ciò consente l'ottimizzazione dei percorsi dell'aria.
Operando tagli trasversali delle alette si può ottenere l'uscita dell'aria su tutti e quattro i lati del dissipatore, ma non si ottengono particolari vantaggi di efficienza.
Anche in questa configurazione se il dissipatore è chiuso è consigliabile montare la ventola interponendo uno spacer.

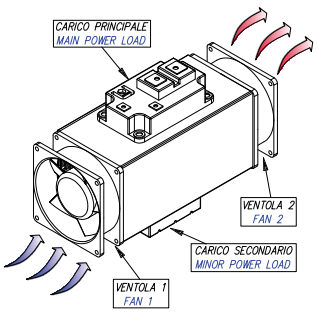
IMPINGE VENTILATION

Impinge or radial ventilation grants two important features: half flow path lenght, with consequest lower "pressure drop", and high thermal gradients reduction, with maximization of heat sink efficiency.
Both suction or compression operation modes are possible but compression mode is preferred because enables the optimization of air run.
It is also possible to get the exit of the air flow from the four sides of the heat sink by means of cross-cut fins, but without obtaining improvements in efficiency.
Also in this configuration, if the heat sink is closed, it is convenient to install the cooling fan inserting a spacer.

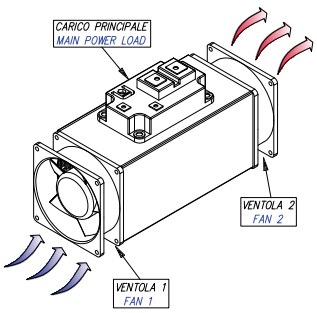


VENTILAZIONE RADIALE
IMPINGE VENTILATION

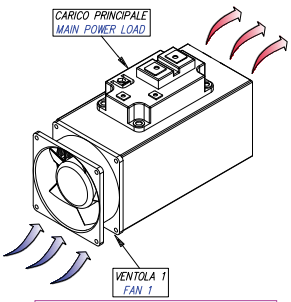
CONDIZIONI DI PROVA - TEST' S STATE



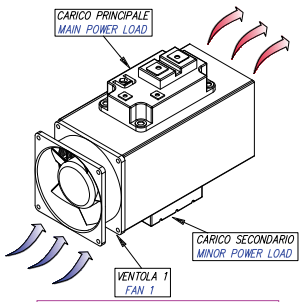
PROVA TEST 1	
CARICO MASSIMO MAXIMUM LOAD	MASSIMA VENTILAZIONE MAXIMUM VENTILATION



PROVA TEST 2	
SOLO CARICO PRINCIPALE ONLY MAIN LOAD	MASSIMA VENTILAZIONE MAXIMUM VENTILATION



PROVA TEST 3	
SOLO CARICO PRINCIPALE ONLY MAIN LOAD	1 VENTOLA IN COMPRESSIONE 1 BLOWING FAN



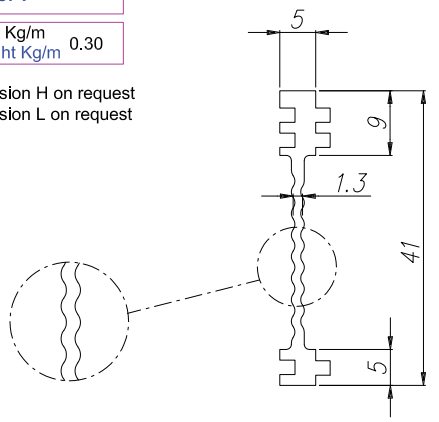
PROVA TEST 4	
CARICO MASSIMO MAXIMUM LOAD	1 VENTOLA IN COMPRESSIONE 1 BLOWING FAN

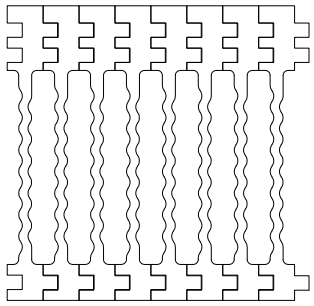
A

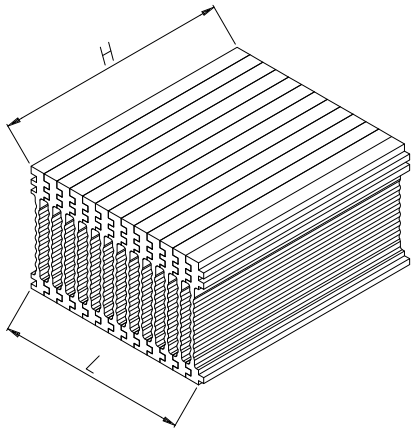
I 40A

Peso Kg/m
Weight Kg/m 0.30

Dimension H on request
Dimension L on request

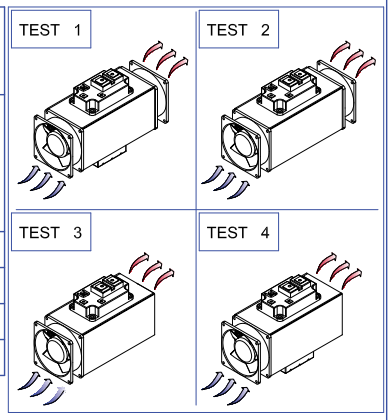






DATA SHEET	PART NUMBER	I 40x80/150	I	L	H
			40	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x20 DC	VENTOLA 2 FAN 2 TYPE 40x40x20 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	200	50	*	*	70.5	0.2820	2.5	
2	242		*	*	73.0	0.3016	2.5	
3	200		*		63.5	0.3175	1.5	1.8
4	200	50	*		74.0	0.2960	1.5	1.8



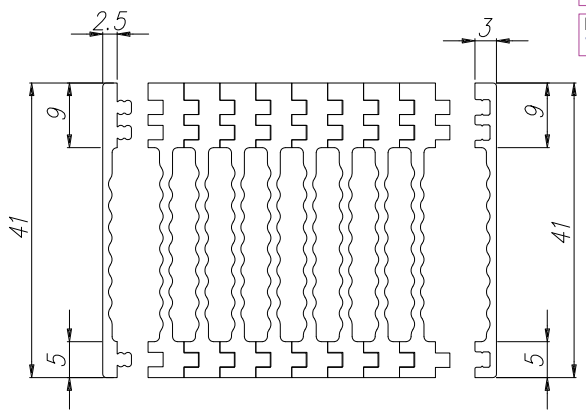
TECNOAL
BOLOGNA - ITALY

B

I 40M

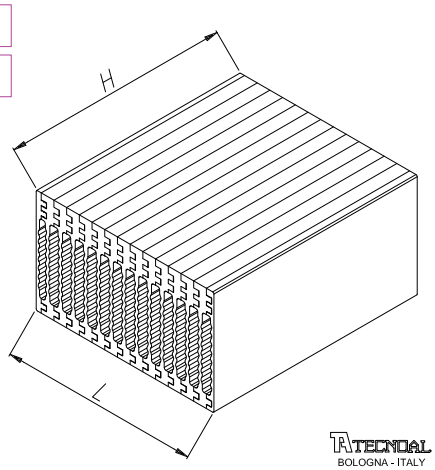
Peso Kg/m
Weight Kg/m 0.25

Dimension H on request
Dimension L on request



I 40F

Peso Kg/m
Weight Kg/m 0.21

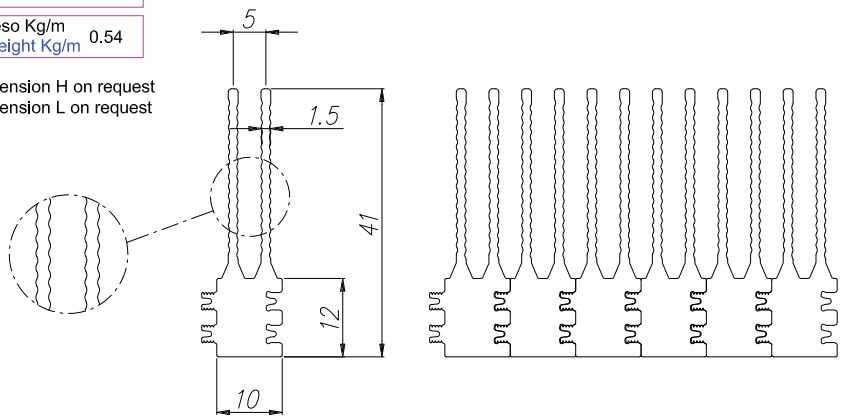


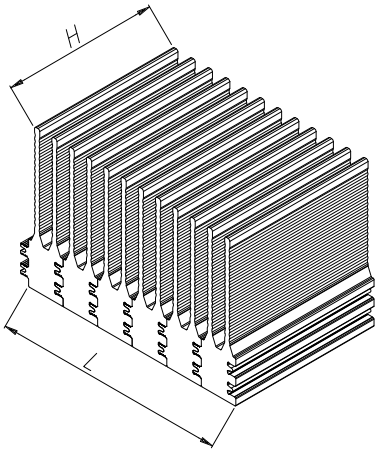
TECNOAL
BOLOGNA - ITALY

I 40B

Peso Kg/m
Weight Kg/m 0.54

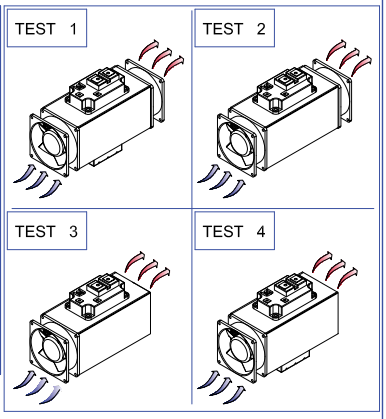
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 40Bx80/150	I	L	H
			40	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x20 DC	VENTOLA 2 FAN 2 TYPE 40x40x20 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	250		*	*	57	0.228	2.5	
3	250		*		48	0.192	3.8	1.7



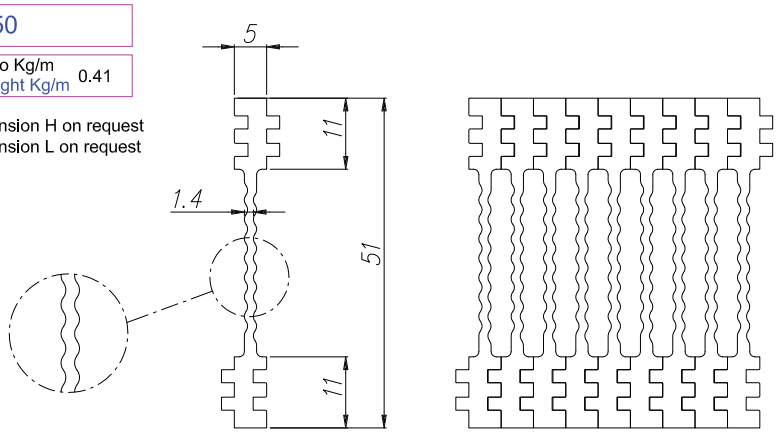
A

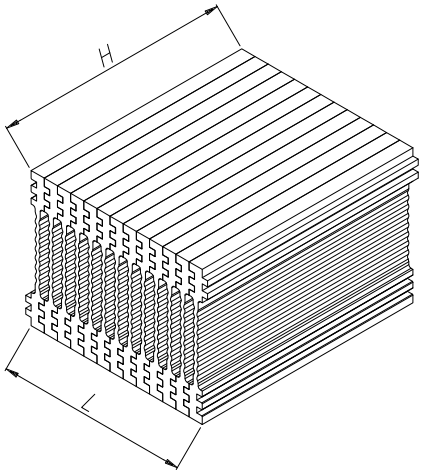
TECNOAL
BOLOGNA - ITALY

I 50

Peso Kg/m
Weight Kg/m 0.41

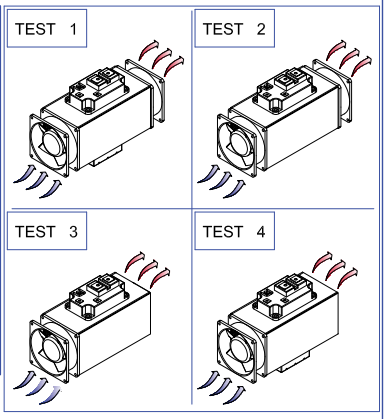
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 50x80/150	I	L	H
			50	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x20 DC	VENTOLA 2 FAN 2 TYPE 40x40x20 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	200	200	*	*	59	0.147	3.5	
2	250		*	*	53	0.212	3.5	
3	250		*		56	0.224	2.5	2.8
4	200	200	*		62	0.155	2.5	2.8



B

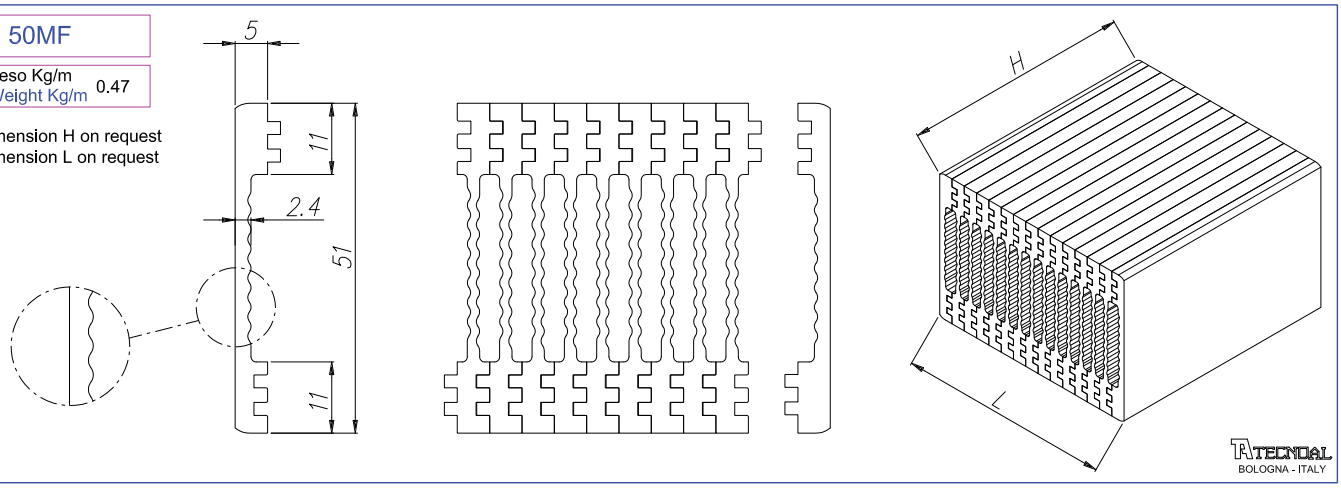
TECNOAL
BOLOGNA - ITALY

A

I 50MF

Peso Kg/m
Weight Kg/m 0.47

Dimension H on request
Dimension L on request



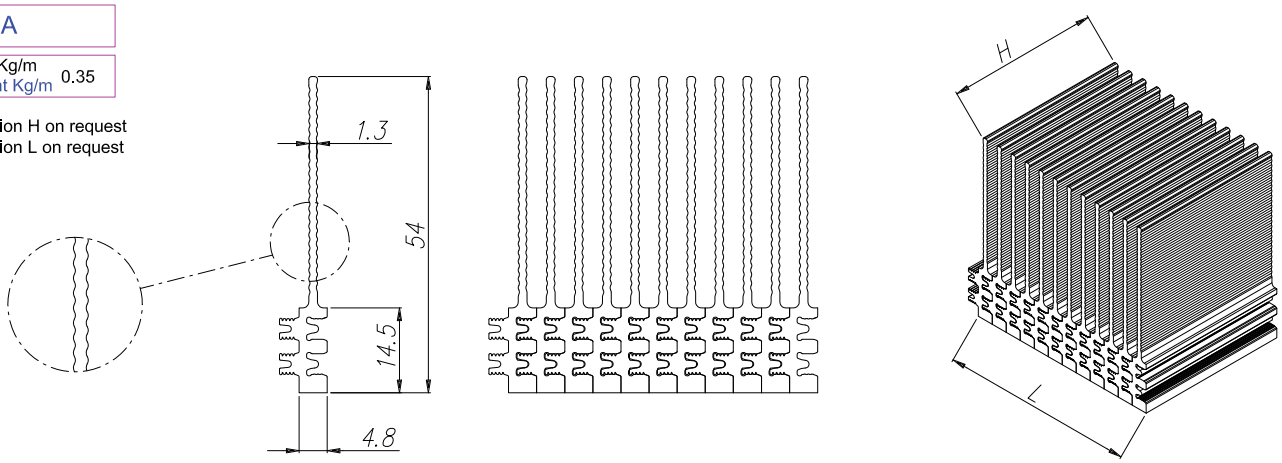
TECNOAL
BOLOGNA - ITALY

B

I 54A

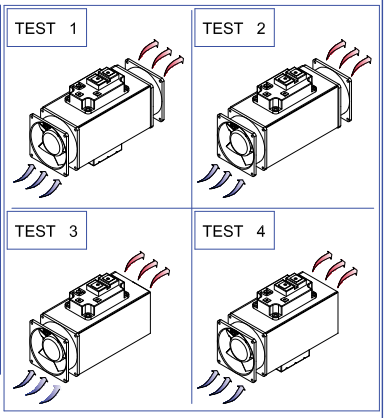
Peso Kg/m
Weight Kg/m 0.35

Dimension H on request
Dimension L on request



DATA SHEET	PART NUMBER	I 54Ax80/150	I	L	H
			54	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	360		*	*	45.4	0.1261	6.0	
3	360		*		49.7	0.1381	3.5	2.0

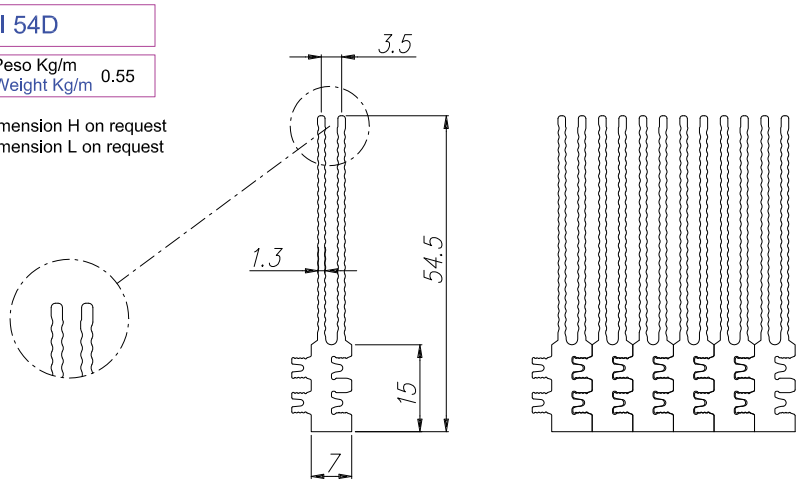


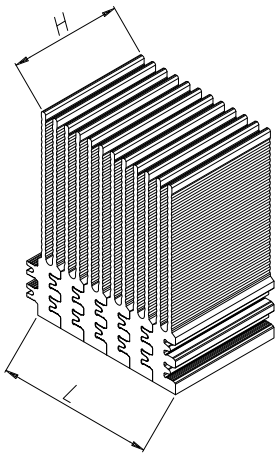
TECNOAL
BOLOGNA - ITALY

I 54D

Peso Kg/m
Weight Kg/m 0.55

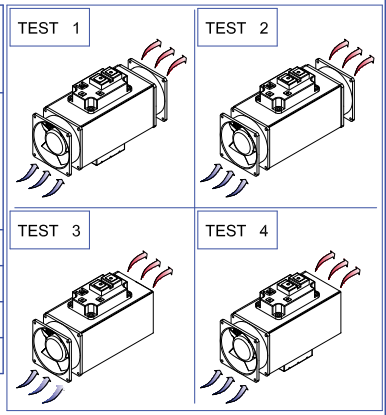
Dimension H on request
Dimension L on request





	DATA SHEET	PART NUMBER	I 54Dx80/150	I	L	H
				54	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	250		*	*	27	0.108	4.5	
3	250		*		32	0.128	3.0	1.8



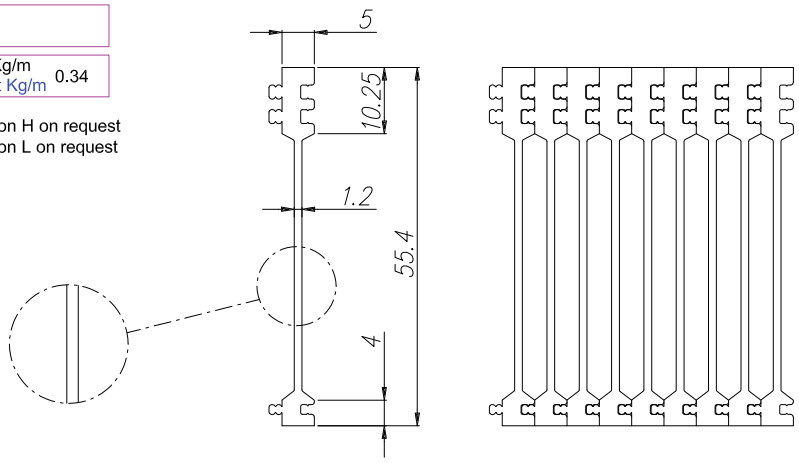
A

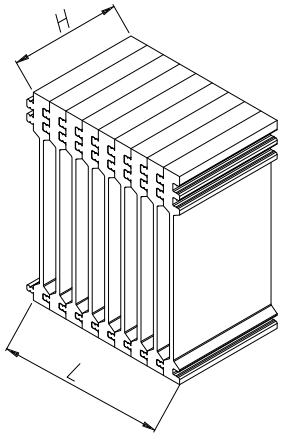
TECNOAL BOLOGNA - ITALY

I 55

Peso Kg/m
Weight Kg/m 0.34

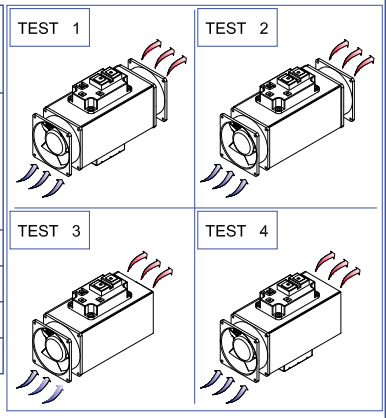
Dimension H on request
Dimension L on request





	DATA SHEET	PART NUMBER	I 55x80/150	I	L	H
				55	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	112	*	*	42.5	0.1174	7.0	
2	250		*	*	32.5	0.1300	7.0	
3	250		*		35	0.1400	4.6	1.9
4	250	112	*		45.4	0.1260	4.6	1.9



B

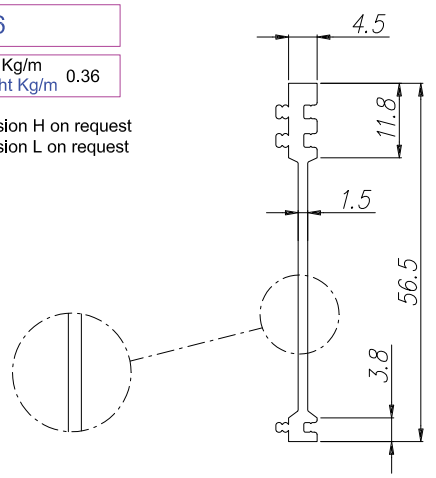
TECNOAL BOLOGNA - ITALY

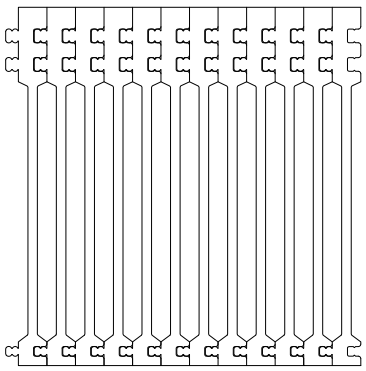
A

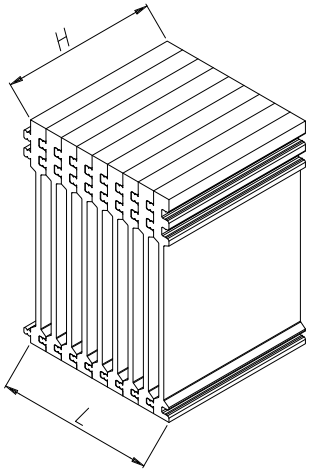
I 56

Peso Kg/m
Weight Kg/m 0.36

Dimension H on request
Dimension L on request

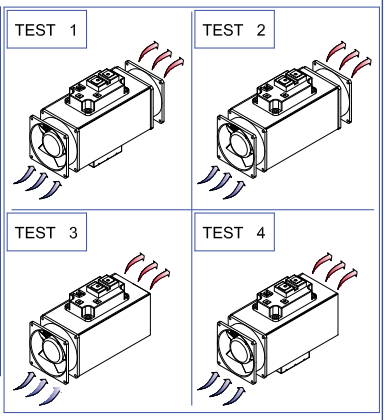






DATA SHEET	PART NUMBER	I 56x80/150	I	L	H
			56	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	112	*	*	41	0.1133	6.5	
2	250		*	*	32	0.1280	6.5	
3	250		*		35	0.1400	4.0	1.8
4	250	112	*		46	0.1271	4.0	1.8



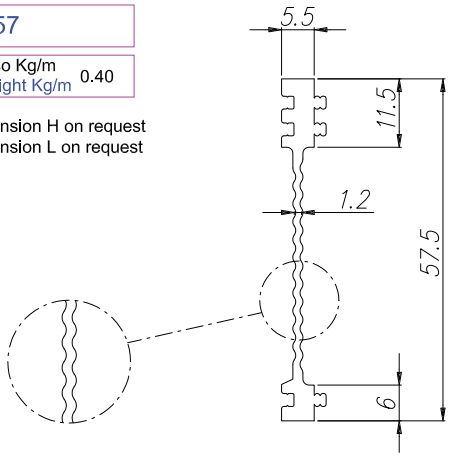
TECNOAL BOLOGNA - ITALY

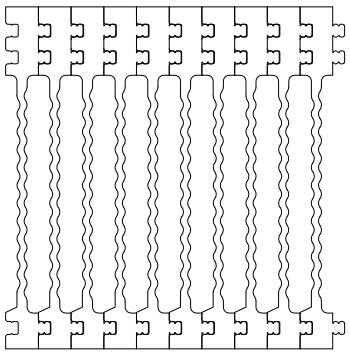
B

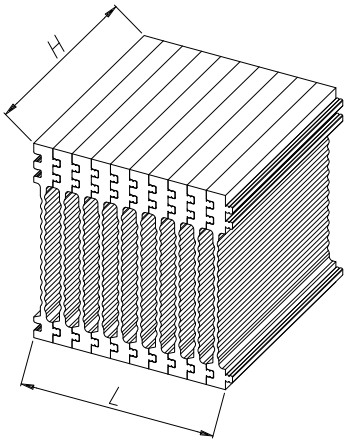
I 57

Peso Kg/m
Weight Kg/m 0.40

Dimension H on request
Dimension L on request

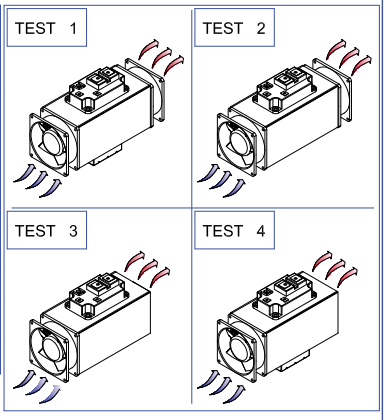






DATA SHEET	PART NUMBER	I 57x80/150	I	L	H
			57	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	112	*	*	44	0.1215	6.3	
2	250		*	*	34.5	0.1380	6.3	
3	250		*		36.5	0.1460	5.0	2.0
4	250	112	*		47	0.1298	5.0	2.0

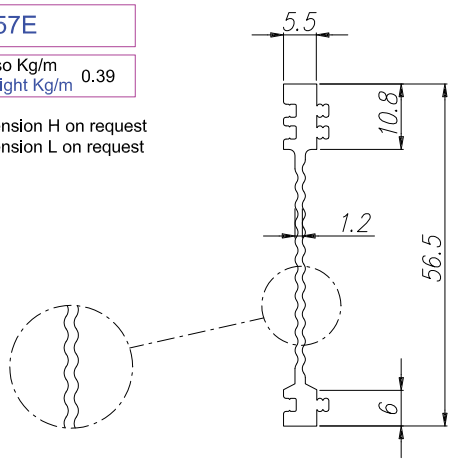


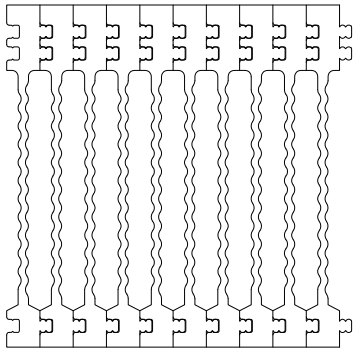
TECNOAL BOLOGNA - ITALY

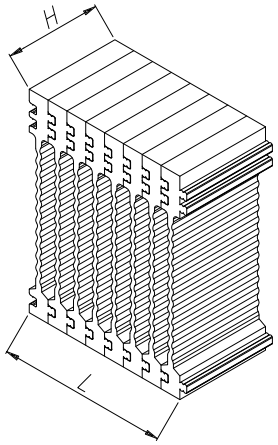
I 57E

Peso Kg/m
Weight Kg/m 0.39

Dimension H on request
Dimension L on request

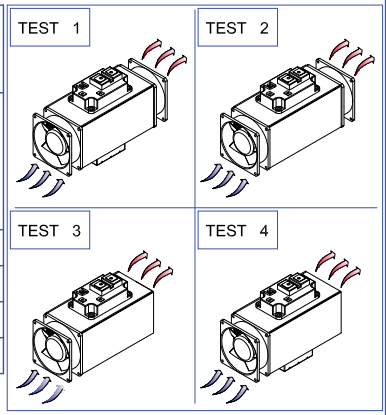






DATA SHEET	PART NUMBER	I 57Ex80/150	I	L	H
			57	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 40x40x28 DC	VENTOLA 2 FAN 2 TYPE 40x40x28 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	112	*	*	44.0	0.1215	6.5	
2	250		*	*	34.5	0.1380	6.5	
3	250		*		36.5	0.1460	5.0	2.0
4	250	112	*		47.0	0.1293	5.0	2.0

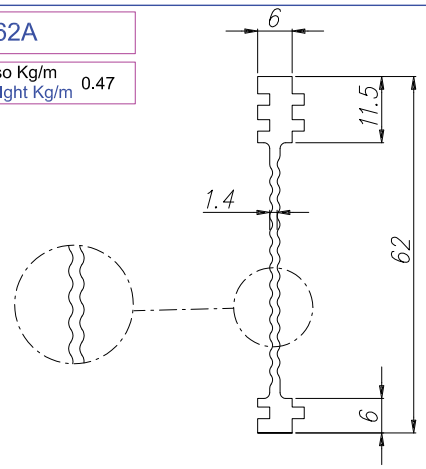


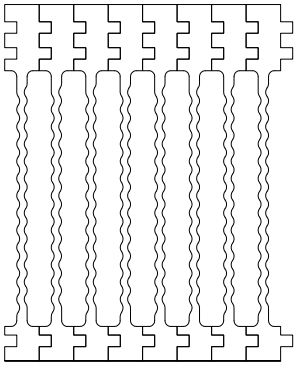
TECNOAL BOLOGNA - ITALY

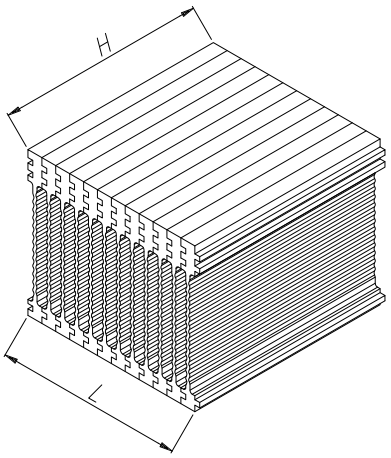
A

I 62A

Peso Kg/m
Weight Kg/m 0.47

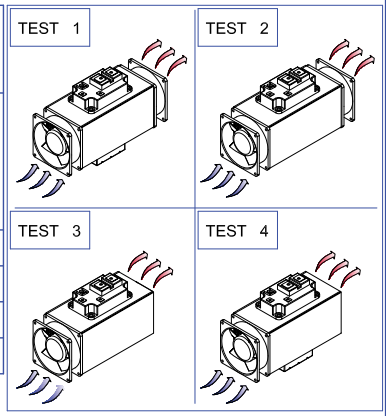






DATA SHEET	PART NUMBER	I 62Ax60/180	I	L	H
			62	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	215	72	*	*	60	0.2090	3.0	
2	270		*	*	61	0.2259	3.0	
3	270		*		73.5	0.2722	2.5	2.1
4	215	72	*		72	0.2508	2.5	2.1



TECNOAL BOLOGNA - ITALY

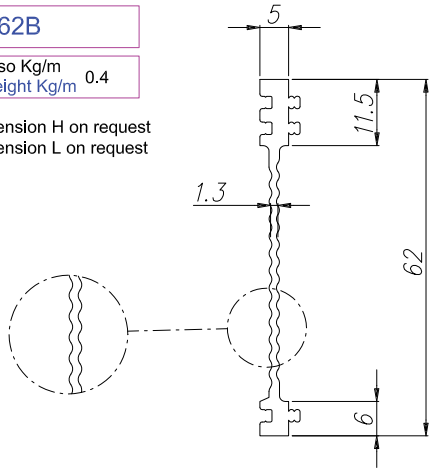
B

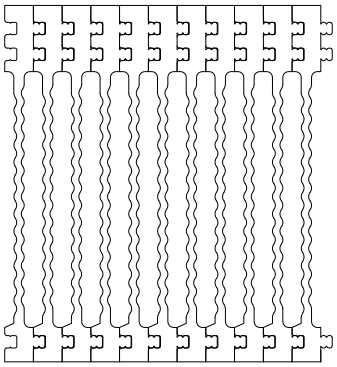
A

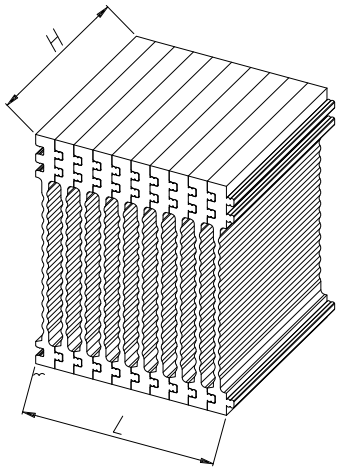
I 62B

Peso Kg/m
Weight Kg/m 0.4

Dimension H on request
Dimension L on request

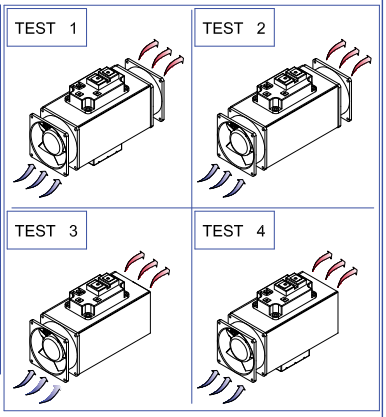






DATA SHEET	PART NUMBER	I 62Bx60/180	I	L	H
			62	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	225	167	*	*	33.0	0.0842	7.5	
2	225		*	*	23.5	0.1044	7.5	
3	225		*		27.0	0.1200	5.0	3.0
4	225	167	*		38.5	0.098	5.0	3.0



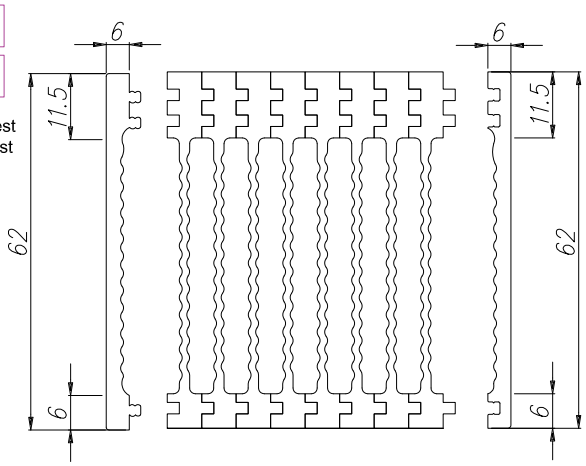
TECNOAL
BOLOGNA - ITALY

B

I 62M

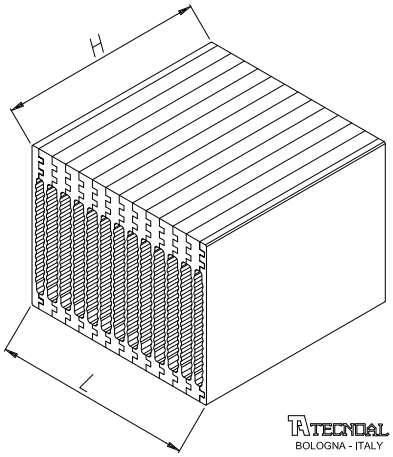
Peso Kg/m
Weight Kg/m 0.76

Dimension H on request
Dimension L on request



I 62F

Peso Kg/m
Weight Kg/m 0.70



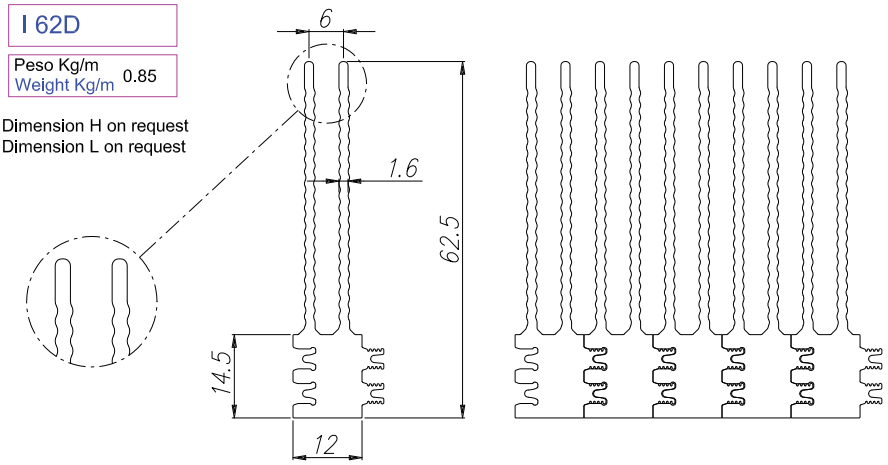
TECNOAL
BOLOGNA - ITALY

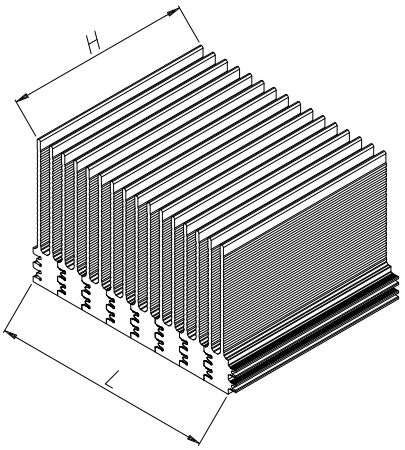
TECNOAL
BOLOGNA - ITALY

I 62D

Peso Kg/m
Weight Kg/m 0.85

Dimension H on request
Dimension L on request

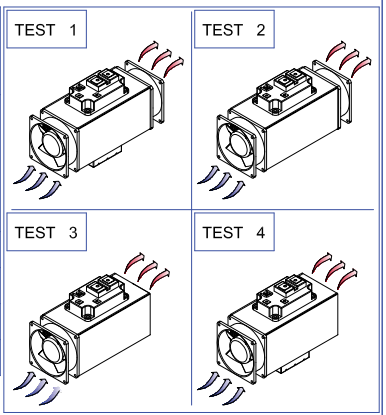




A

DATA SHEET	PART NUMBER	I 62Dx60/180	I	L	H
			62	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	250		*	*	47.8	0.1912	3.0	
3	250		*		50.2	0.2008	2.5	1.6

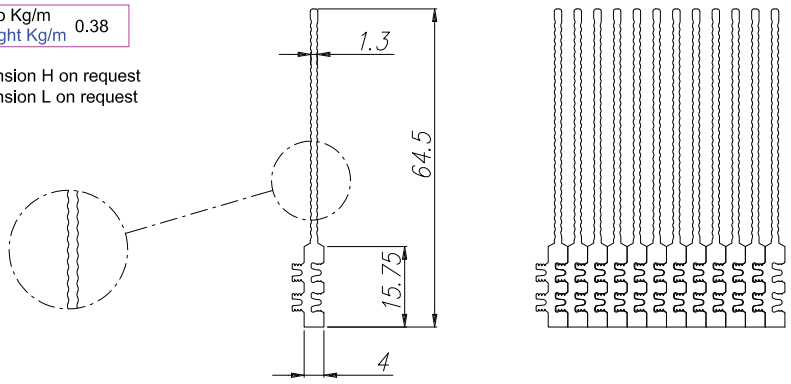


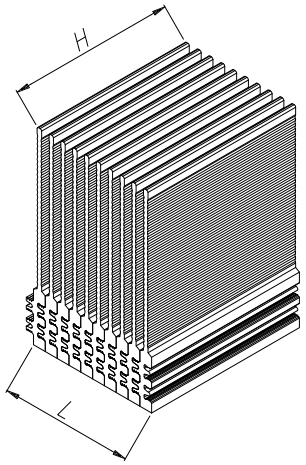
TECNOAL
BOLOGNA - ITALY

I 64

Peso Kg/m
Weight Kg/m 0.38

Dimension H on request
Dimension L on request

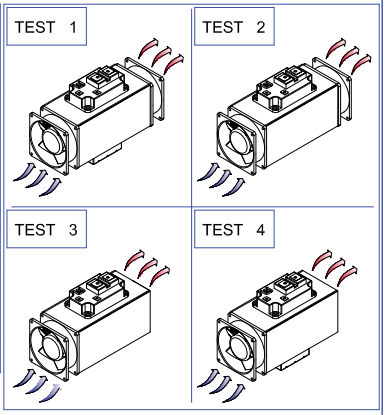




B

DATA SHEET	PART NUMBER	I 64x60/180	I	L	H
			64	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	225		*	*	30.2	0.1342	6.5	
3	225		*		35.3	0.1569	4.5	1.9



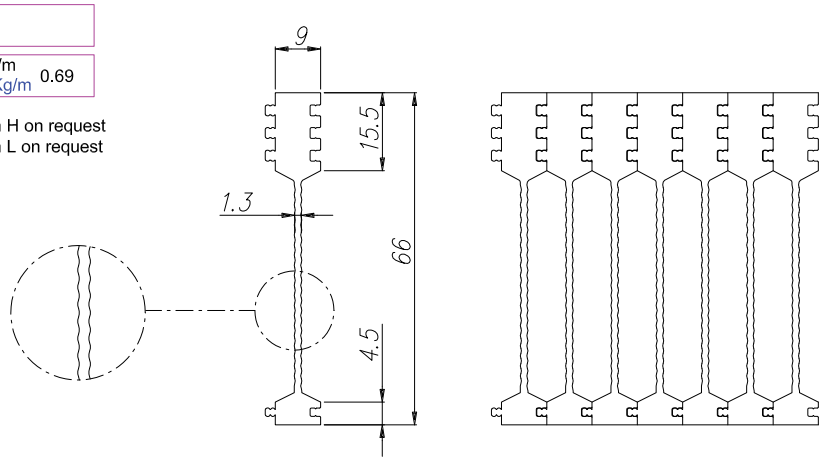
TECNOAL
BOLOGNA - ITALY

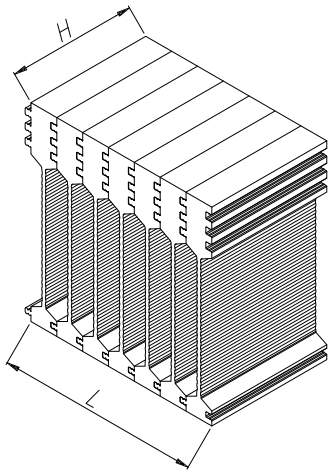
A

I 66

Peso Kg/m
Weight Kg/m 0.69

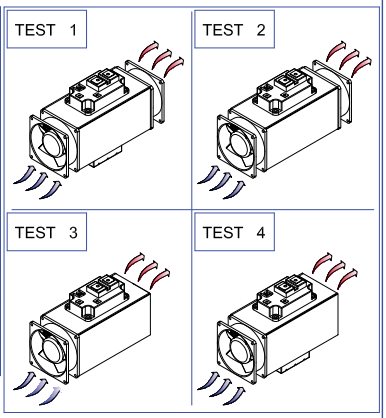
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 66x60/180	I	L	H
			66	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	225	85	*	*	44.5	0.144	7.0	
2	225		*	*	36.6	0.163	7.0	
3	225		*		45.2	0.201	5.0	0.3
4	225	85	*		53.5	0.173	5.0	0.3



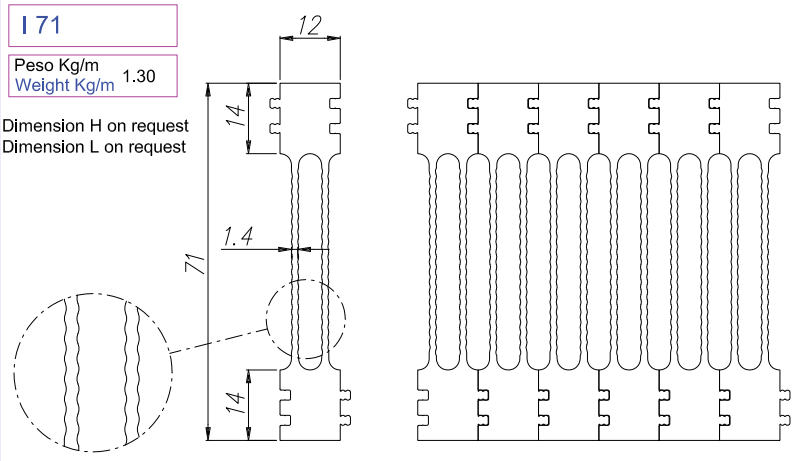
TECNOAL
BOLOGNA - ITALY

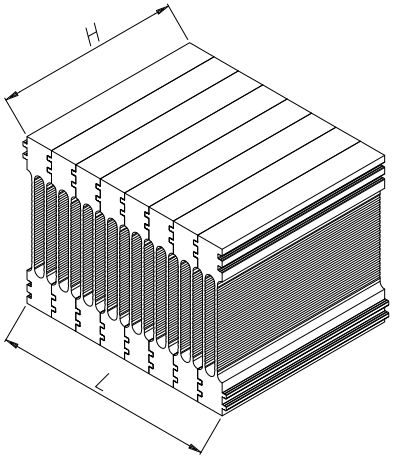
B

I 71

Peso Kg/m
Weight Kg/m 1.30

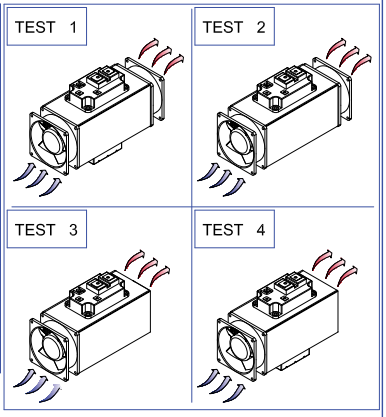
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 71x60/180	I	L	H
			71	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	250	*	*	80.5	0.1610	5.0	
2	360		*	*	71	0.1972	5.0	
3	360		*		73	0.2028	4.5	0.8
4	250	250	*		82	0.1640	4.5	0.8

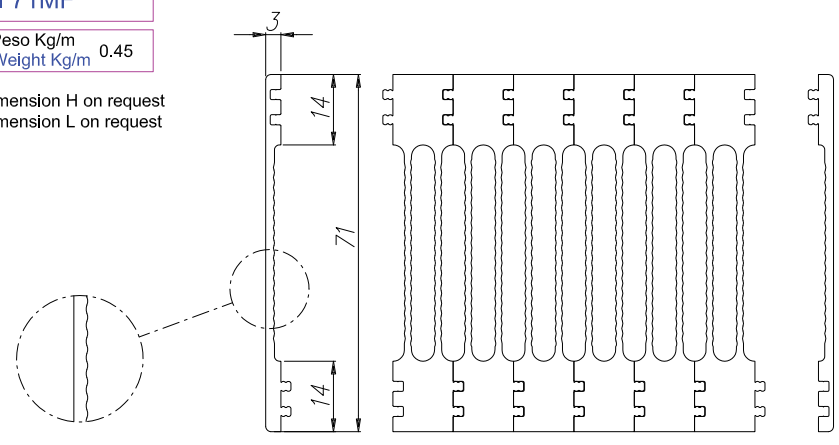


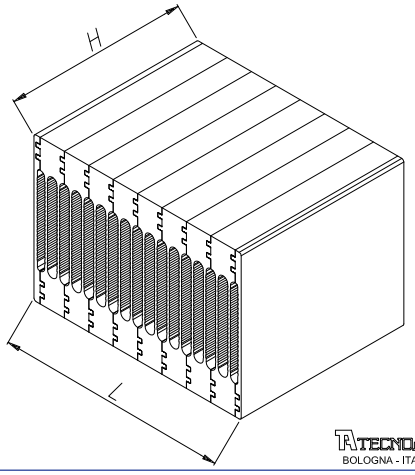
TECNOAL
BOLOGNA - ITALY

I 71MF

Peso Kg/m
Weight Kg/m 0.45

Dimension H on request
Dimension L on request





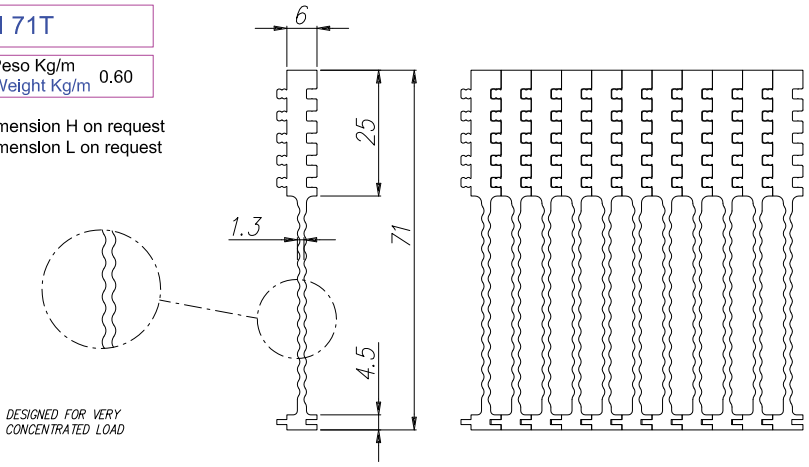
TECNOAL
BOLOGNA - ITALY

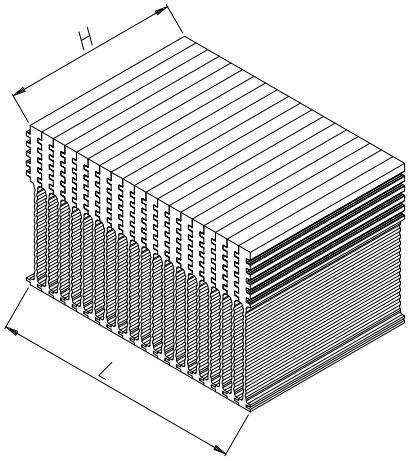
A

I 71T

Peso Kg/m
Weight Kg/m 0.60

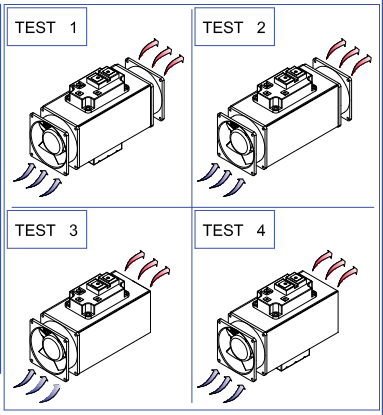
Dimension H on request
DImension L on request





DATA SHEET	PART NUMBER	I 71Tx60/180	I	L	H
			71	60	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 60x60x25 DC	VENTOLA 2 FAN 2 TYPE 60x60x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	250	160	*	*	63.5	0.1549	4.5	
2	250		*	*	45	0.1800	4.5	
3	250		*		51	0.2040	4.0	1.55
4	250	160	*		67	0.1634	4.0	1.55



TECNOAL
BOLOGNA - ITALY

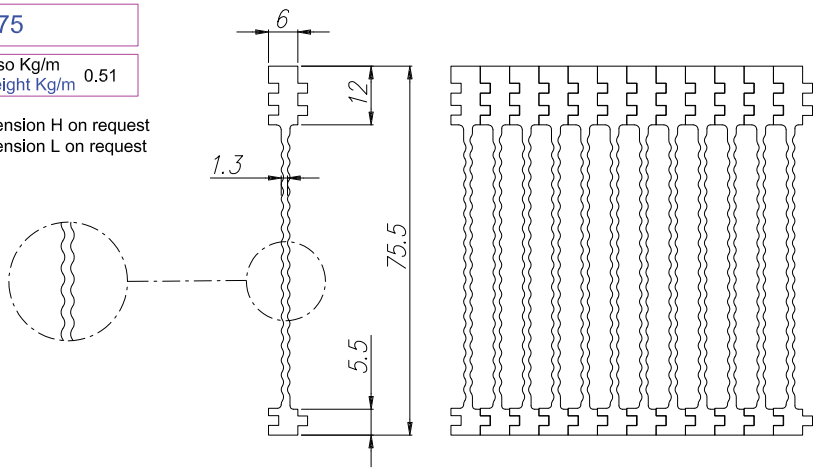
B

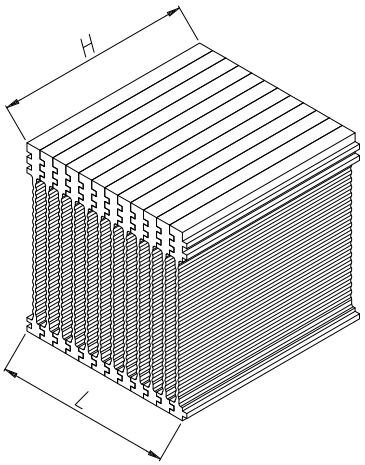
A

I 75

Peso Kg/m
Weight Kg/m 0.51

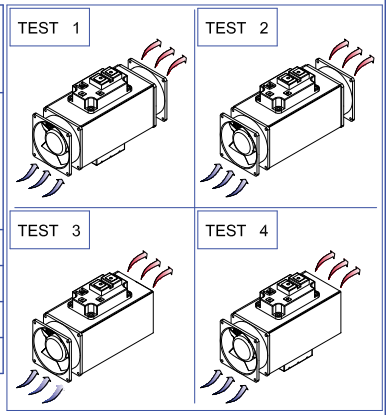
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 75x84/170	I	L	H
			75	84	170

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	450	100	*	*	63.5	0.1154	5.0	
2	450		*	*	55.5	0.1233	5.0	
3	450		*		67	0.1488	3.5	1.2
4	450	64	*		73	0.1420	3.5	1.2



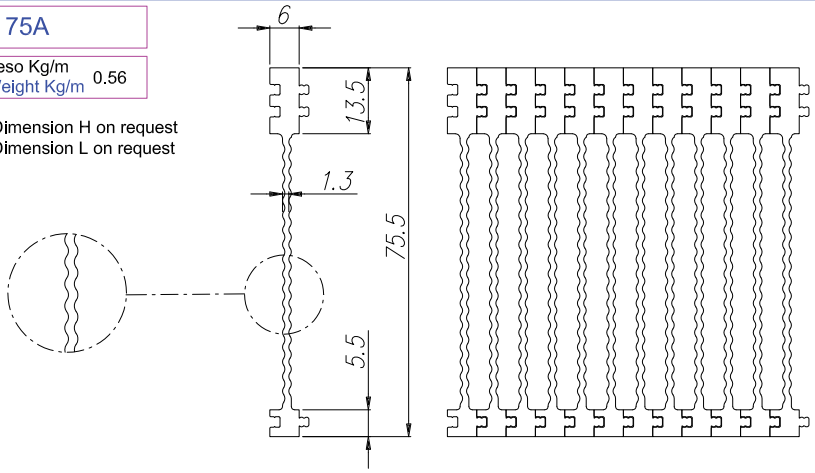
TECNOAL BOLOGNA - ITALY

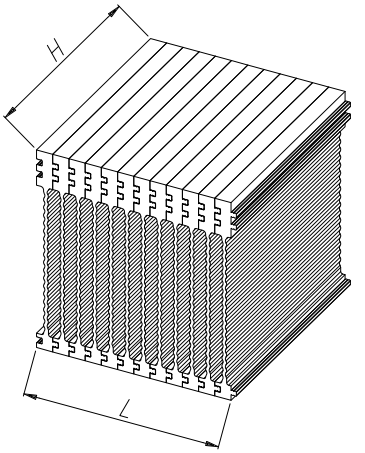
B

I 75A

Peso Kg/m
Weight Kg/m 0.56

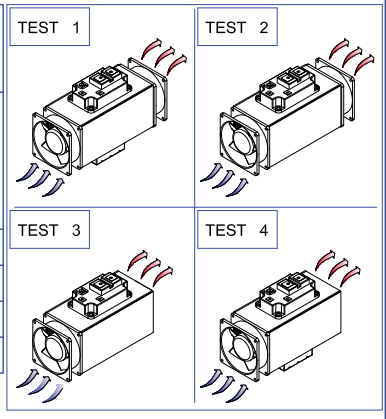
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 75Ax84/170	I	L	H
			75	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	450	100	*	*	65.5	0.119	5.0	
2	450		*	*	57	0.126	5.0	
3	450		*		68	0.151	3.5	1.4
4	450	64	*		74.5	0.144	3.5	1.4

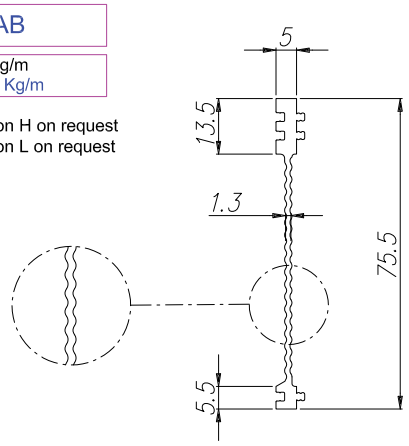


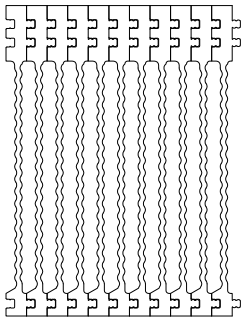
TECNOAL BOLOGNA - ITALY

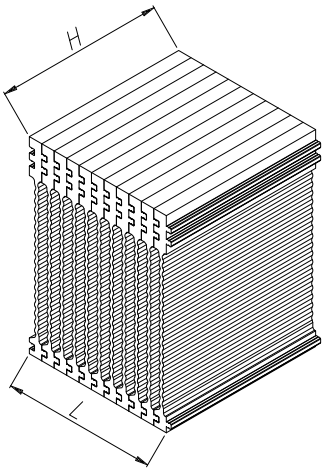
I 75AB

Peso Kg/m
Weight Kg/m

Dimension H on request
Dimension L on request

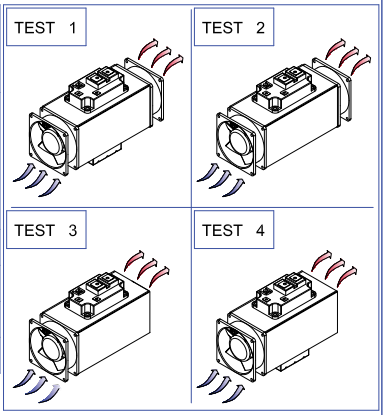






DATA SHEET	PART NUMBER	I 75ABx84/180	I	L	H
			75	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	38.0	0.0731	7.5	
2	360		*	*	30.2	0.083	7.5	
3	360		*		36.1	0.10	5.0	1.5
4	360	160	*		45.8	0.088	5.0	1.5



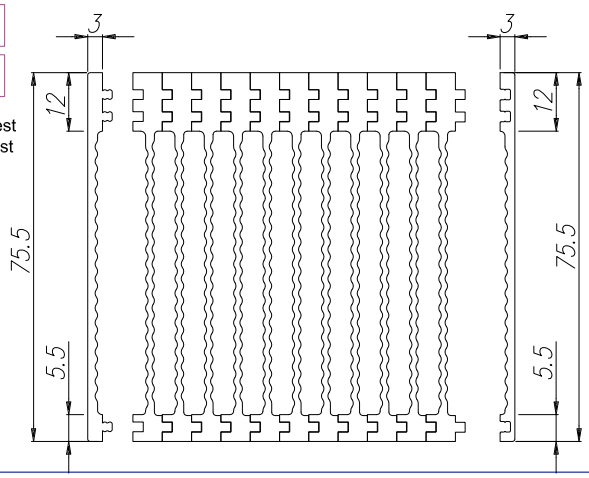
TECNOAL BOLOGNA - ITALY

A

I 75M

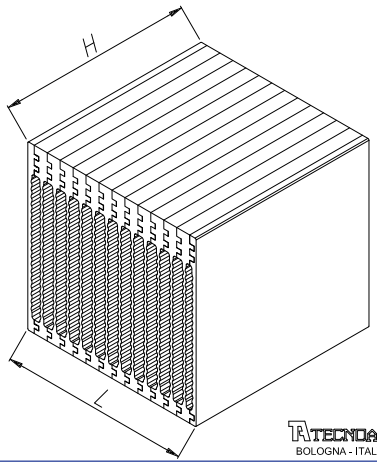
Peso Kg/m
Weight Kg/m 0.45

Dimension H on request
Dimension L on request



I 75F

Peso Kg/m
Weight Kg/m 0.47



TECNOAL BOLOGNA - ITALY

B

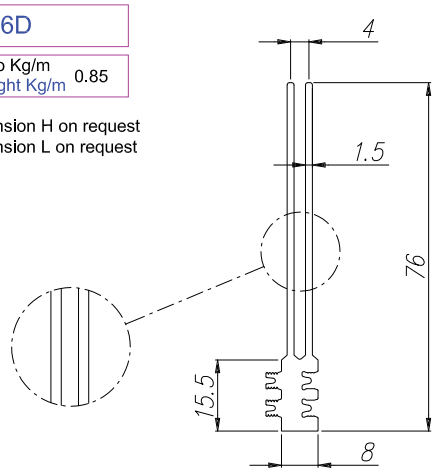
TECNOAL BOLOGNA - ITALY

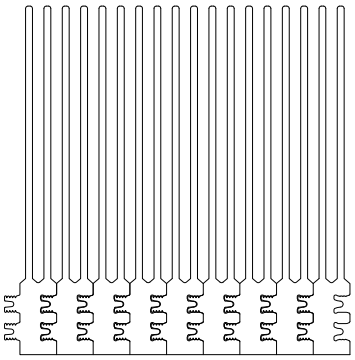
A

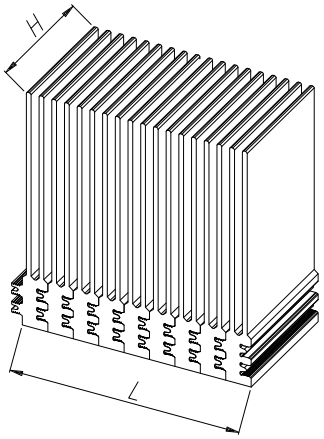
I 76D

Peso Kg/m
Weight Kg/m 0.85

Dimension H on request
Dimension L on request

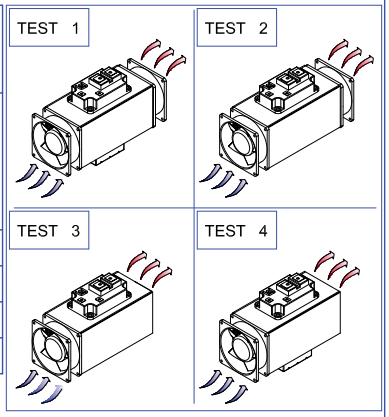






DATA SHEET	PART NUMBER	I 76Dx80/180	I	L	H
			76	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	360		*	*	27	0.0750	7.5	
3	360		*		31	0.0861	5.0	2.5



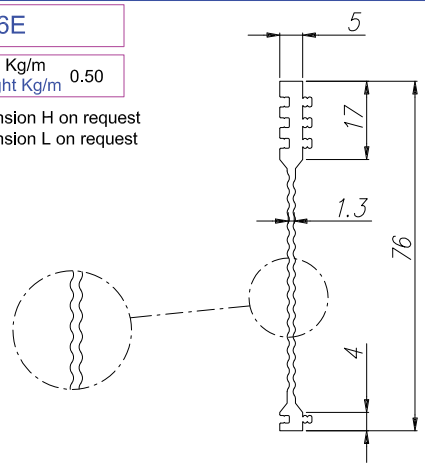
TECNOAL
BOLOGNA - ITALY

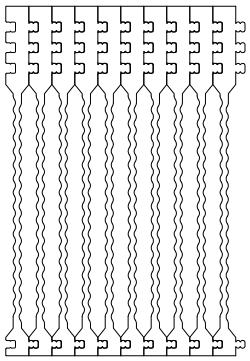
B

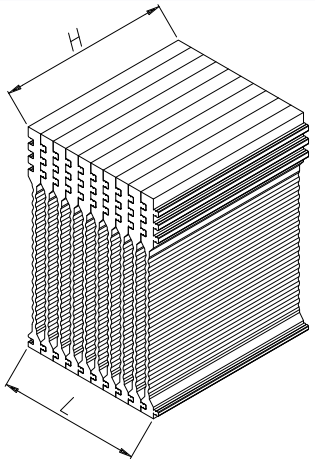
I 76E

Peso Kg/m
Weight Kg/m 0.50

Dimension H on request
Dimension L on request

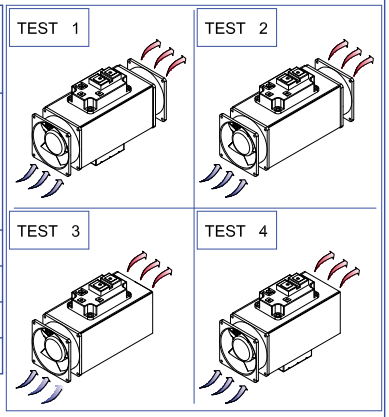






DATA SHEET	PART NUMBER	I 76Ex8/180	I	L	H
			76	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	41.0	0.0788	7.5	
2	360		*	*	33.0	0.0917	7.5	
3	360		*		39.0	0.1083	5.0	1.9
4	360	160	*		48.5	0.0933	5.0	1.9



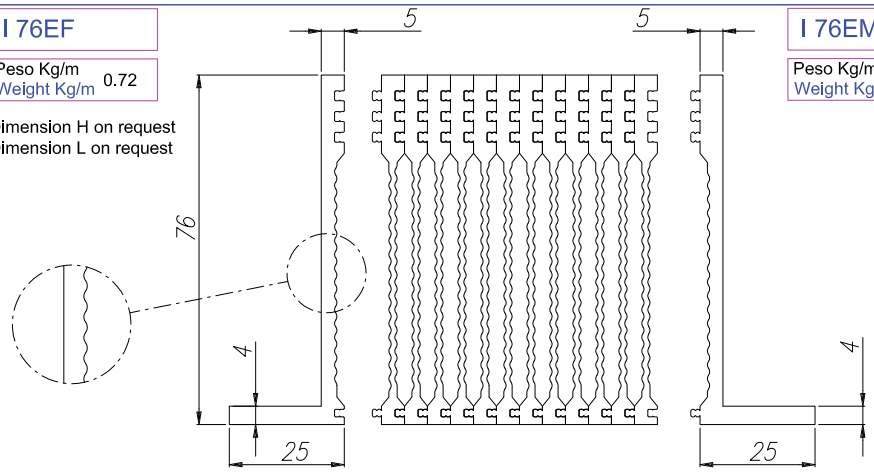
TECNOAL
BOLOGNA - ITALY

A

I 76EF

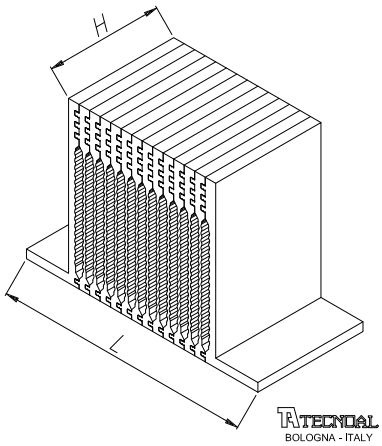
Peso Kg/m
Weight Kg/m 0.72

Dimension H on request
Dimension L on request



I 76EM

Peso Kg/m
Weight Kg/m 0.81



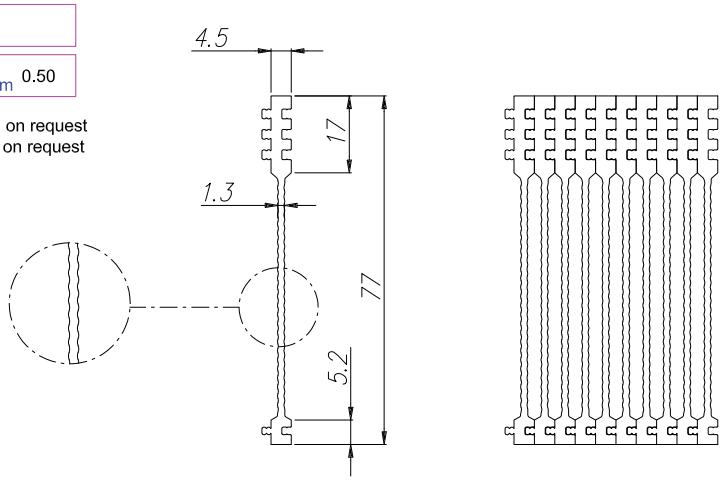
TECNOAL
BOLOGNA - ITALY

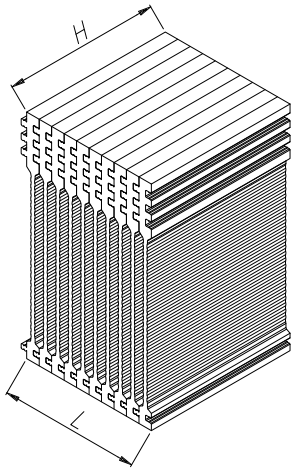
B

I 77

Peso Kg/m
Weight Kg/m 0.50

Dimension H on request
Dimension L on request

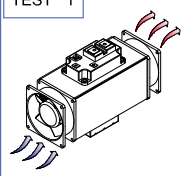




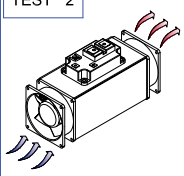
DATA SHEET	PART NUMBER	I 77x80/180	I	L	H
			77	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	140	*	*	43.5	0.0870	7.0	
2	360		*	*	36.8	0.1022	7.0	
3	360		*		41.3	0.1147	5.0	2.0
4	360	140	*		51.2	0.1024	5.0	2.0

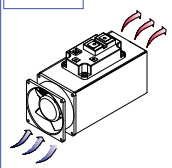
TEST 1



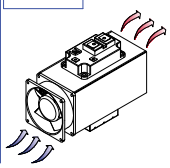
TEST 2



TEST 3



TEST 4



TECNOAL
BOLOGNA - ITALY

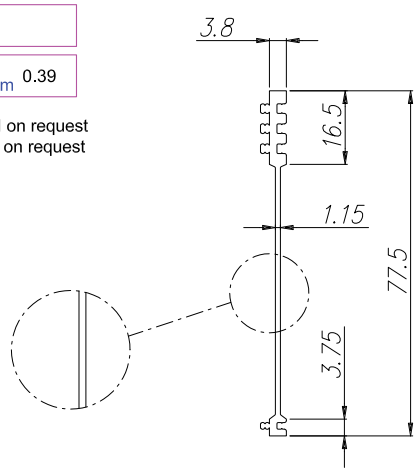
TECNOAL
BOLOGNA - ITALY

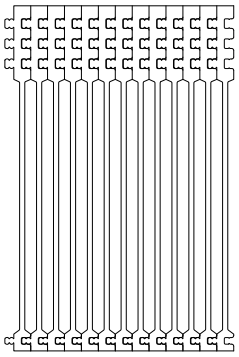
A

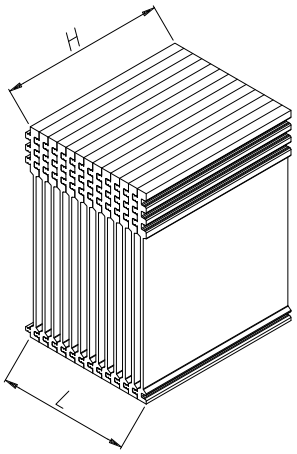
I 78

Peso Kg/m
Weight Kg/m 0.39

Dimension H on request
Dimension L on request

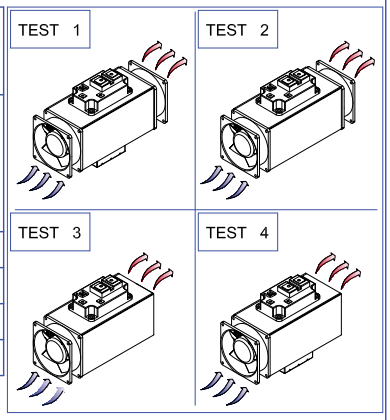






DATA SHEET	PART NUMBER	I 78x80/180	I	L	H
			77	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	34.5	0.0663	7.5	
2	360		*	*	27.0	0.0750	7.5	
3	360		*		32.0	0.0889	5.0	0.8
4	360	160	*		41.3	0.0794	5.0	0.8



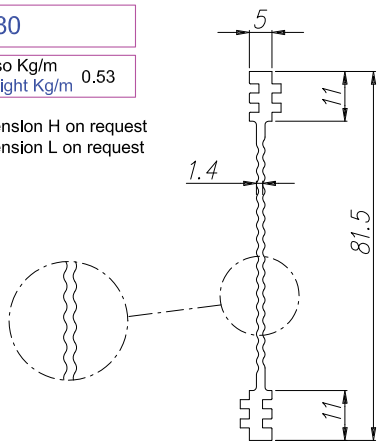
TECNOAL BOLOGNA - ITALY

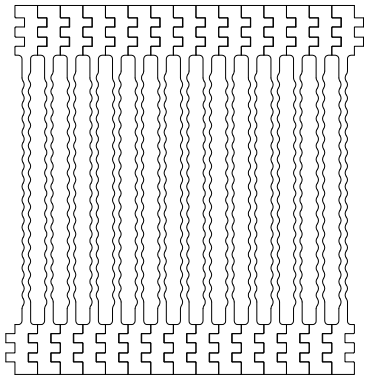
B

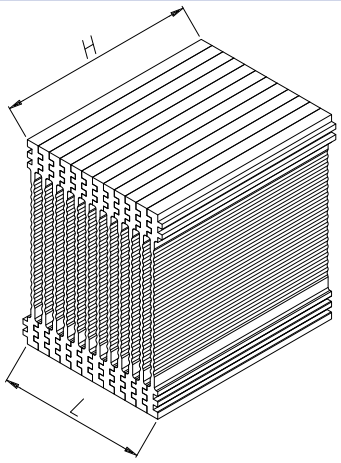
I 80

Peso Kg/m
Weight Kg/m 0.53

DImension H on request
Dimension L on request

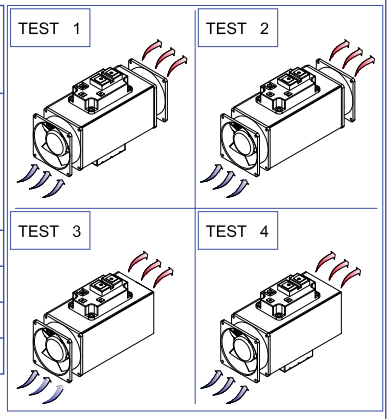






DATA SHEET	PART NUMBER	I 80x80/180	I	L	H
			80	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	360	*	*	63.0	0.0875	8.5	
2	360		*	*	45.0	0.1250	8.5	
3	360		*		50.0	0.1389	7.0	5.5
4	360	360	*		71.0	0.0986	7.0	5.5

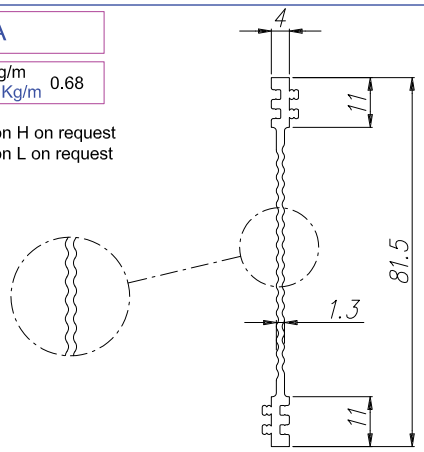


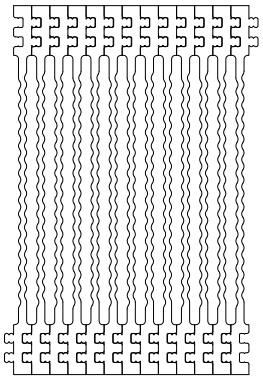
TECNOAL BOLOGNA - ITALY

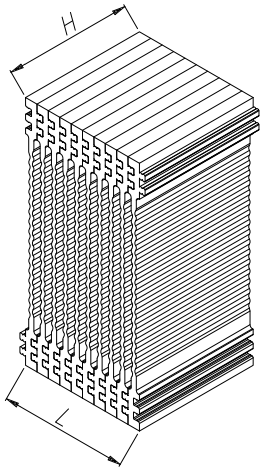
I 80A

Peso Kg/m
Weight Kg/m 0.68

Dimension H on request
Dimension L on request

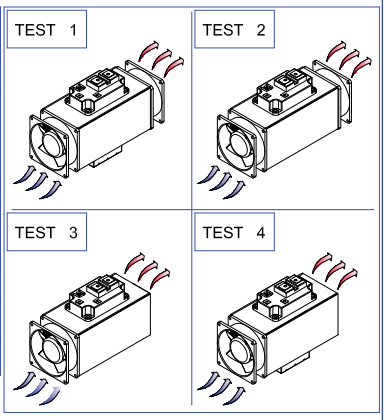






DATA SHEET	PART NUMBER	I 80Ax80/180	I	L	H
			80	80	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	225	225	*	*	26.5	0.0589	7.5	
2	225		*	*	17.0	0.0756	7.5	
3	225		*		20.0	0.0889	5.0	2.8
4	225	225	*		33.0	0.0733	5.0	2.8



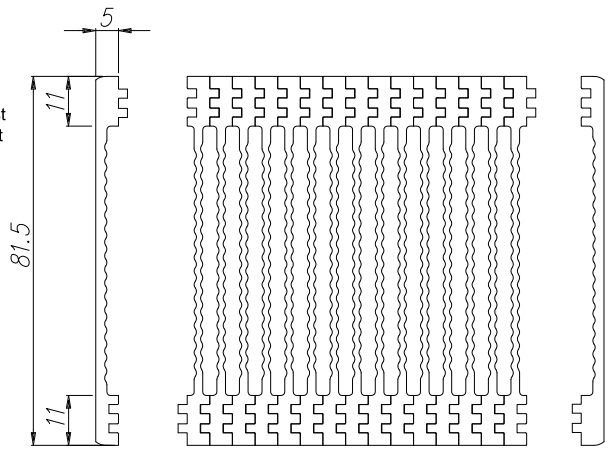
TECNOAL
BOLOGNA - ITALY

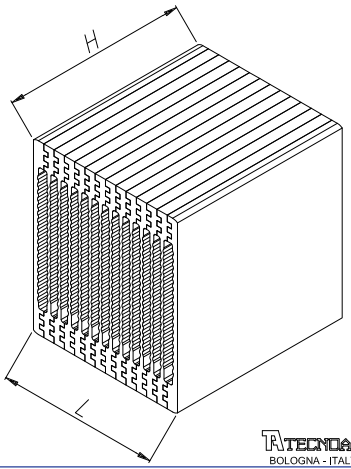
A

I 80MF

Peso Kg/m
Weight Kg/m 0.65

Dimension H on request
Dimension L on request





TECNOAL
BOLOGNA - ITALY

B

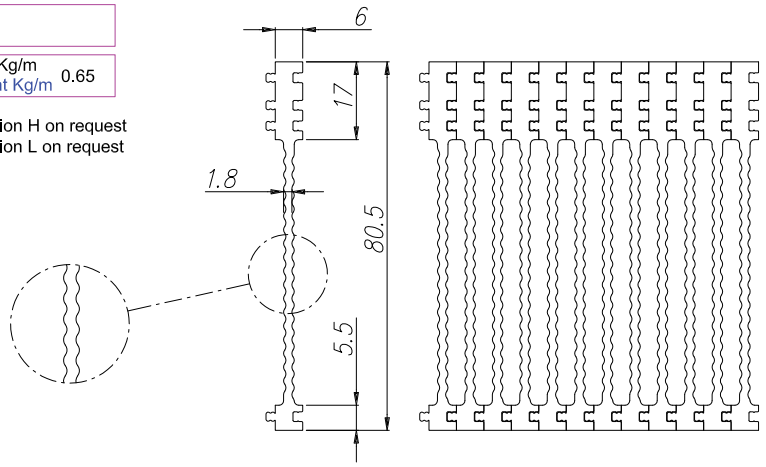
TECNOAL
BOLOGNA - ITALY

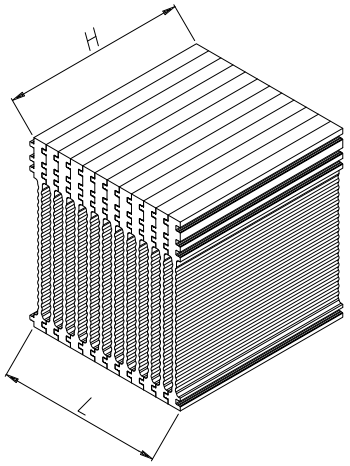
A

I 81

Peso Kg/m
Weight Kg/m 0.65

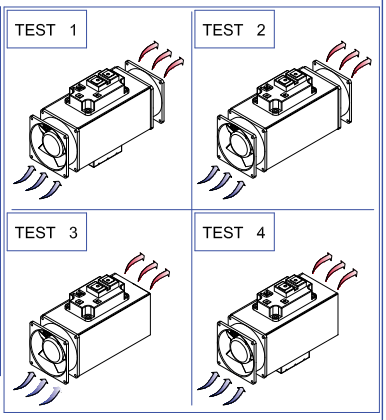
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 81x80/180	I	L	H
			81	80	150

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	51.5	0.0990	7.0	
2	360		*	*	42.5	0.1181	7.0	
3	360		*		48.5	0.1347	5.0	2.5
4	360	160	*		59.0	0.1135	5.0	2.5



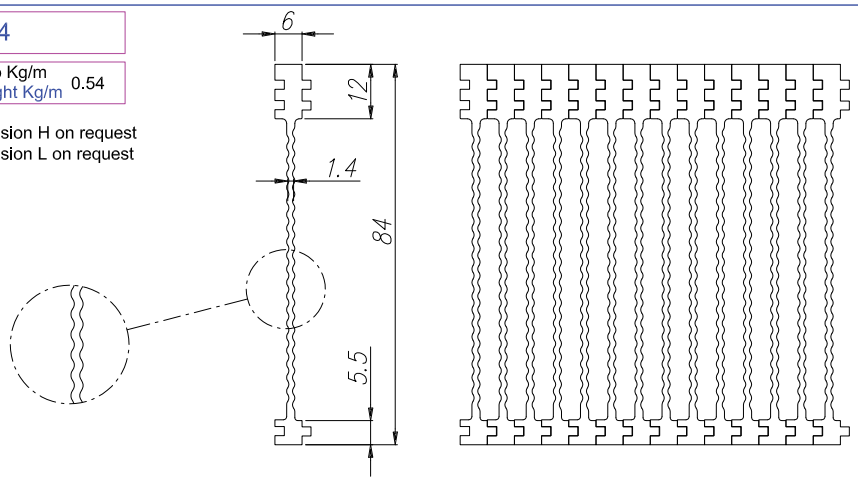
TECNOAL BOLOGNA - ITALY

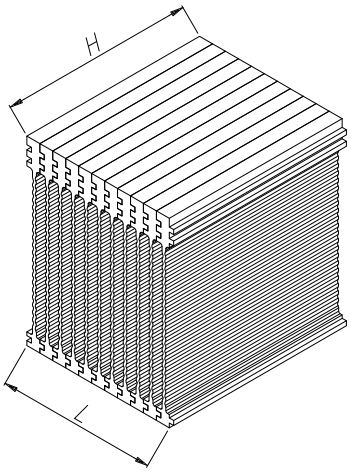
B

I 84

Peso Kg/m
Weight Kg/m 0.54

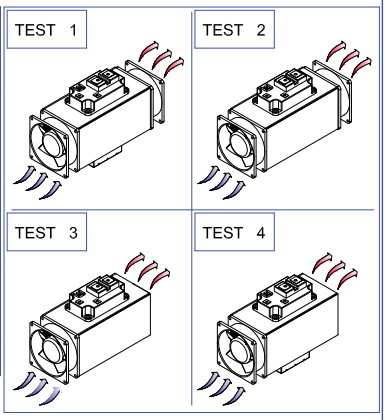
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 84x84/170	I	L	H
			84	84	170

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	312	144	*	*	46	0.1008	4.5	
2	450		*	*	51.5	0.1144	4.5	
3	450		*		57	0.1266	3.5	1.2
4	312	144	*		54	0.1184	3.5	1.2

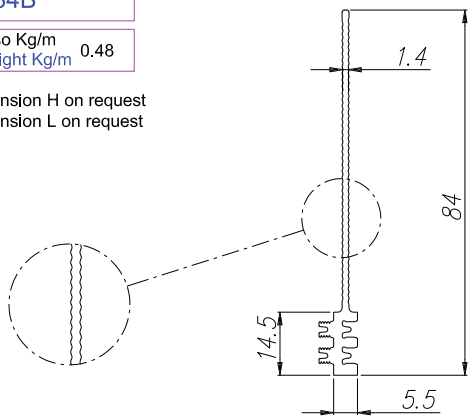


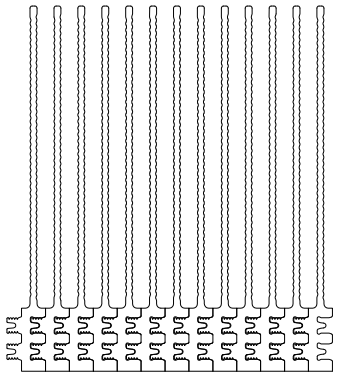
TECNOAL BOLOGNA - ITALY

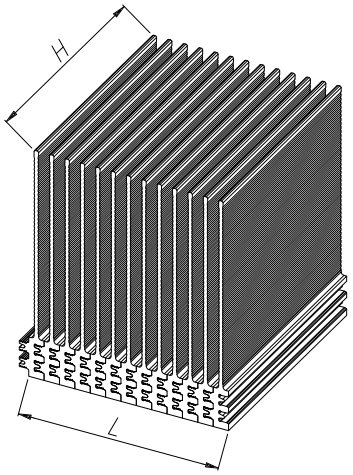
I 84B

Peso Kg/m
Weight Kg/m 0.48

Dimension H on request
Dimension L on request

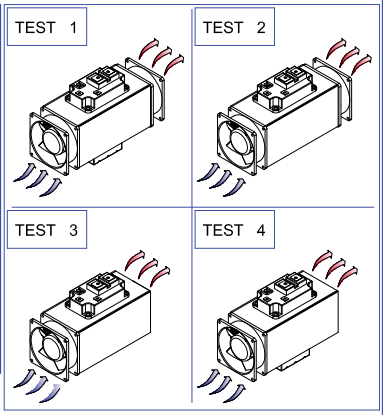






DATA SHEET	PART NUMBER	I 84Bx84/180	I	L	H
			84	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
2	420		*	*	41	0.0976	7.5	
3	420		*		47	0.1119	5.0	2.2



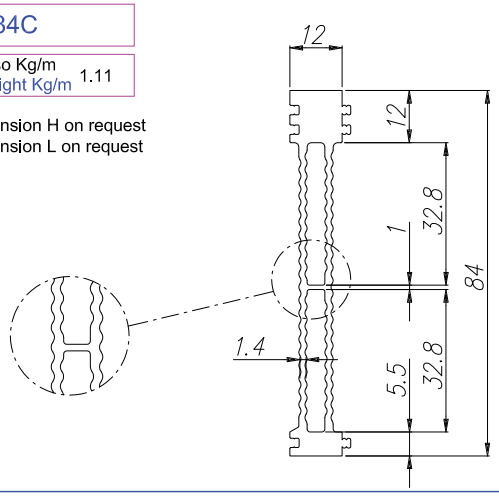
A

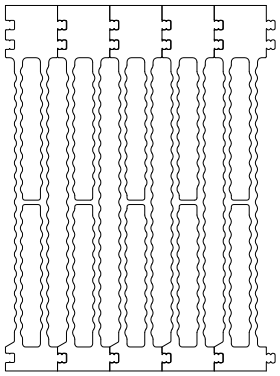
TECNOAL BOLOGNA - ITALY

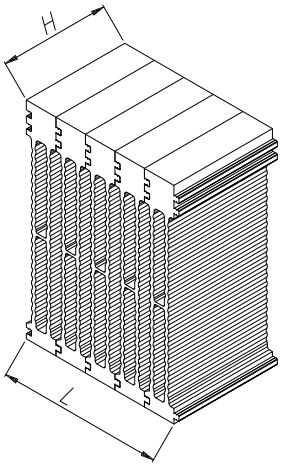
I 84C

Peso Kg/m
Weight Kg/m 1.11

Dimension H on request
Dimension L on request

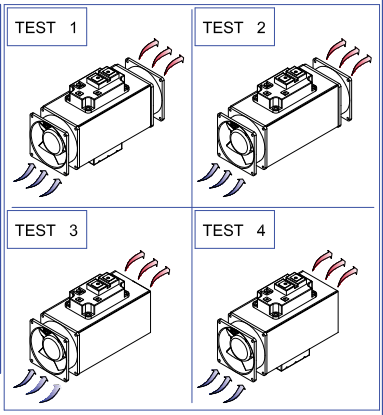






DATA SHEET	PART NUMBER	I 84Cx84/180	I	L	H
			84	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	140	*	*	40.5	0.081	7.0	
2	360		*	*	34.2	0.095	7.0	
3	360		*		41.0	0.114	5.0	1.6
4	360	140	*		50.0	0.100	5.0	1.6



B

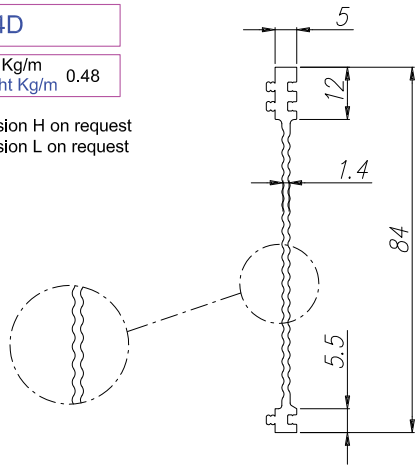
TECNOAL BOLOGNA - ITALY

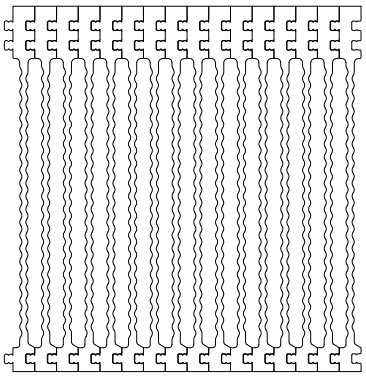
A

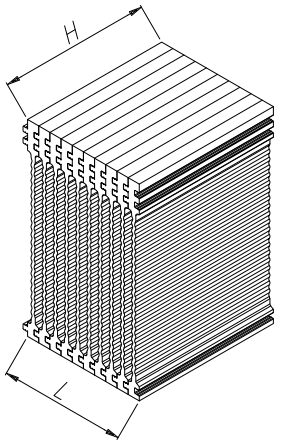
I 84D

Peso Kg/m
Weight Kg/m 0.48

Dimension H on request
Dimension L on request

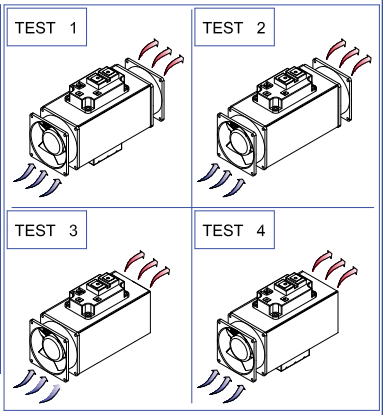






DATA SHEET	PART NUMBER	I 84Dx84/180	I	L	H
			84	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	140	*	*	41.5	0.083	7.0	
2	360		*	*	35.0	0.097	7.0	
3	360		*		39.7	0.110	5.0	2.8
4	360	140	*		47.0	0.094	5.0	2.8



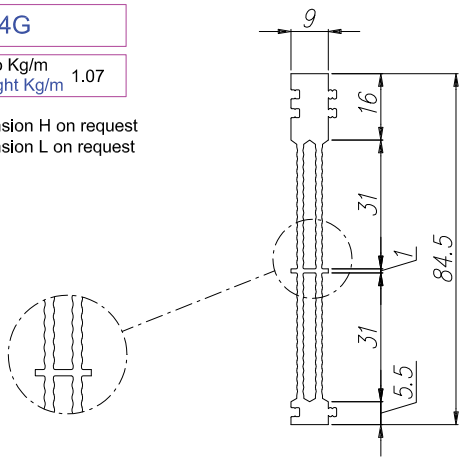
TECNOAL BOLOGNA - ITALY

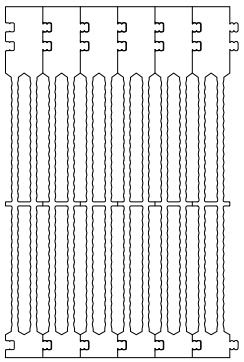
B

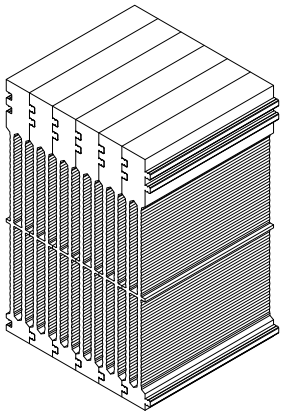
I 84G

Peso Kg/m
Weight Kg/m 1.07

Dimension H on request
Dimension L on request

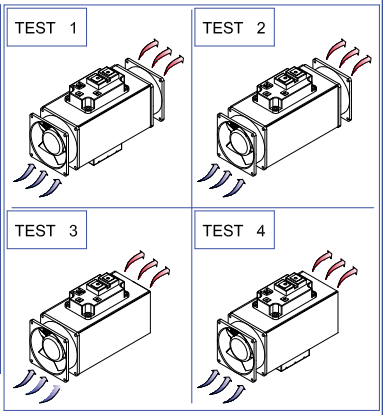






DATA SHEET	PART NUMBER	I 84Gx84/170	I	L	H
			84	84	170

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	140	*	*	38.0	0.076	7.0	
2	360		*	*	33.0	0.092	7.0	
3	360		*		39.5	0.110	5.0	2.7
4	360	140	*		44.1	0.088	5.0	2.7

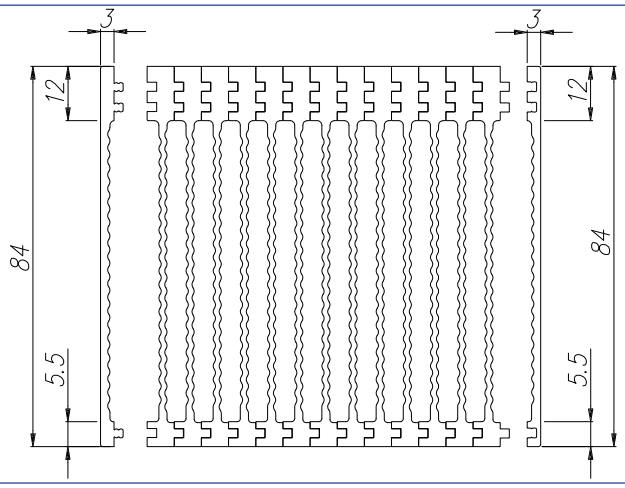


TECNOAL BOLOGNA - ITALY

I 84M

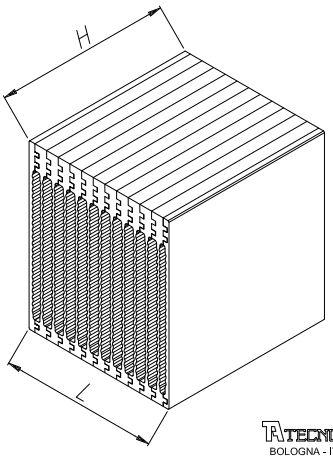
Peso Kg/m
Weight Kg/m 0.51

Dimension H on request
Dimension L on request



I 84F

Peso Kg/m
Weight Kg/m 0.53



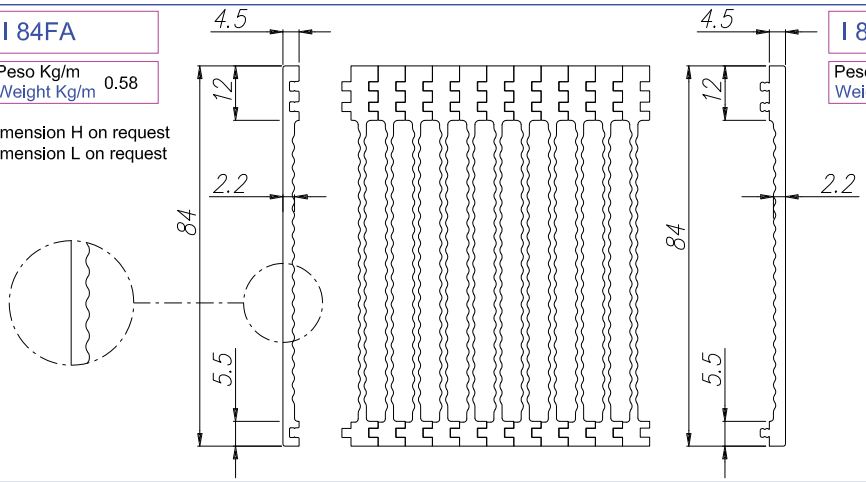
TECNOAL BOLOGNA - ITALY

A

I 84FA

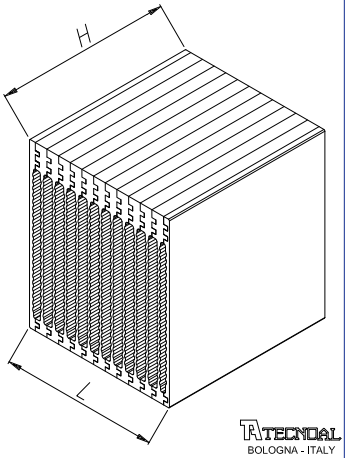
Peso Kg/m
Weight Kg/m 0.58

Dimension H on request
Dimension L on request



I 84MA

Peso Kg/m
Weight Kg/m 0.58



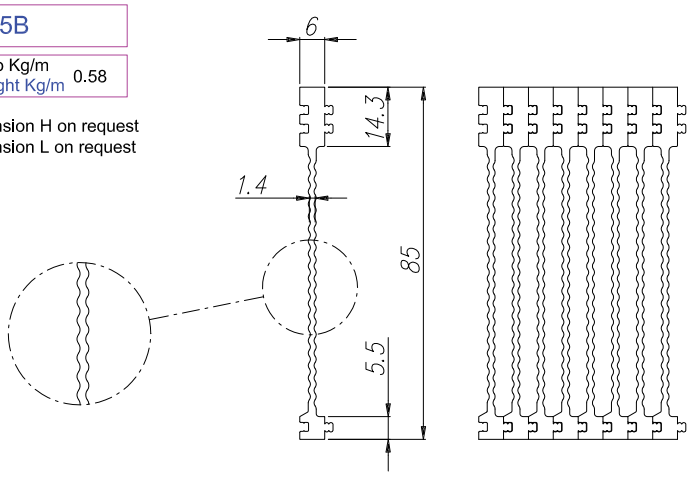
TECNOAL BOLOGNA - ITALY

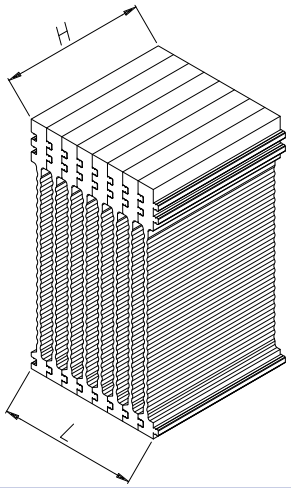
B

I 85B

Peso Kg/m
Weight Kg/m 0.58

Dimension H on request
Dimension L on request



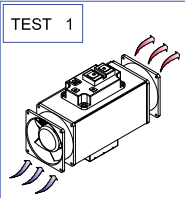


C

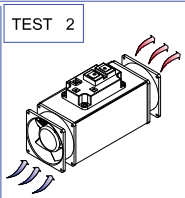
DATA SHEET	PART NUMBER	I 85Bx84/180	I	L	H
			85	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	40.5	0.0779	7.5	
2	360		*	*	34.7	0.0964	7.5	
3	360		*		43.0	0.1194	5.0	1.5
4	360	160	*		47.0	0.1306	5.0	1.5

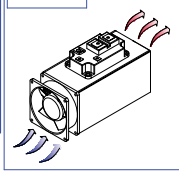
TEST 1



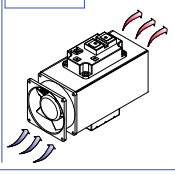
TEST 2



TEST 3



TEST 4



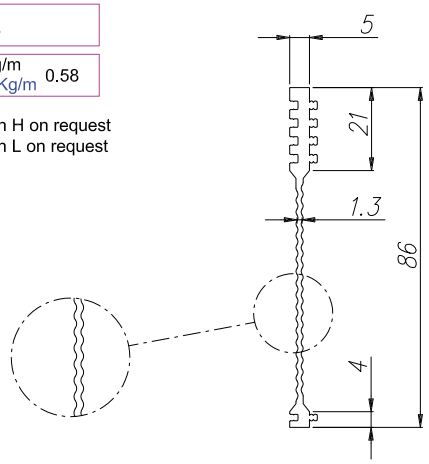
TECNOAL BOLOGNA - ITALY

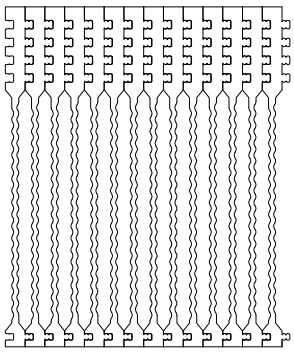
A

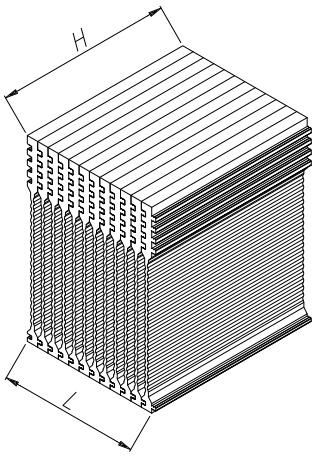
I 86E

Peso Kg/m
Weight Kg/m 0.58

Dimension H on request
Dimension L on request

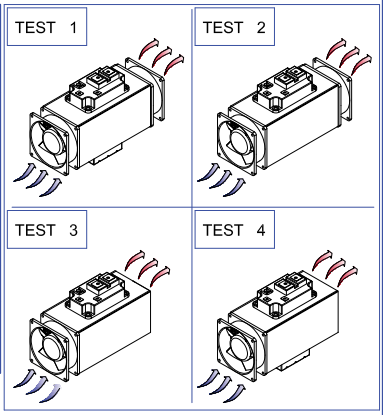






DATA SHEET	PART NUMBER	I 86Ex84/180	I	L	H
			86	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	41.2	0.0792	7.5	
2	360		*	*	33.7	0.0936	7.5	
3	360		*		39.0	0.1083	5.0	3.2
4	360	160	*		48.0	0.0923	5.0	3.2



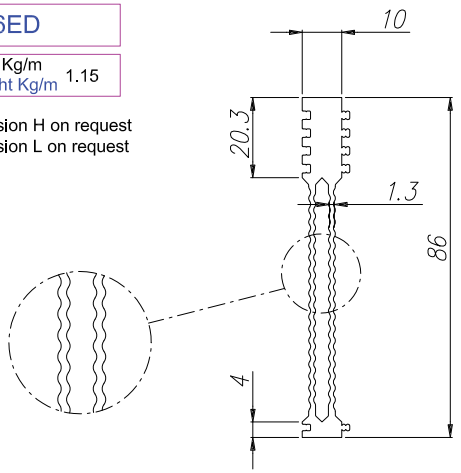
TECNOAL
BOLOGNA - ITALY

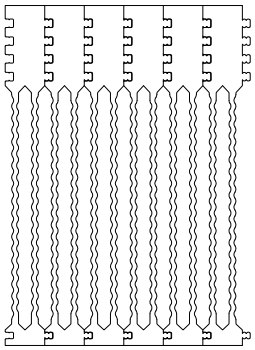
B

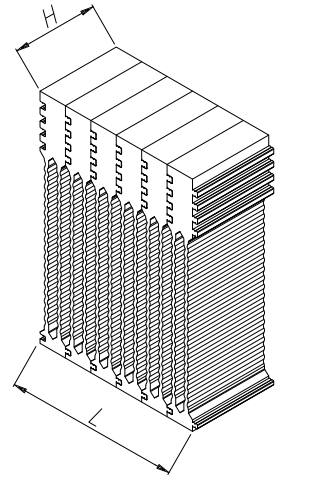
I 86ED

Peso Kg/m
Weight Kg/m 1.15

Dimension H on request
Dimension L on request

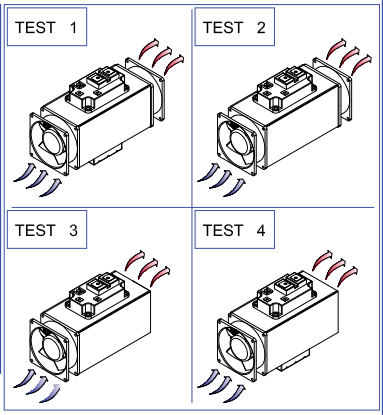






DATA SHEET	PART NUMBER	I 86EDx84/180	I	L	H
			86	84	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	160	*	*	41.2	0.0792	7.5	
2	360		*	*	33.7	0.0936	7.5	
3	360		*		39.0	0.1083	5.0	3.2
4	360	160	*		48.0	0.0923	5.0	3.2

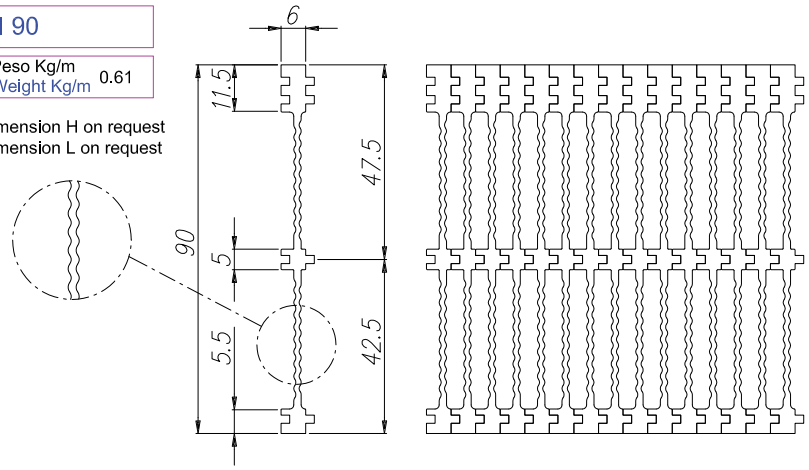


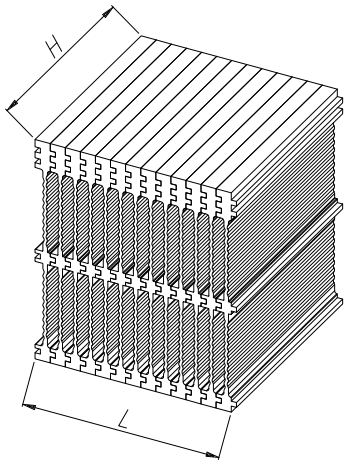
TECNOAL
BOLOGNA - ITALY

I 90

Peso Kg/m
Weight Kg/m 0.61

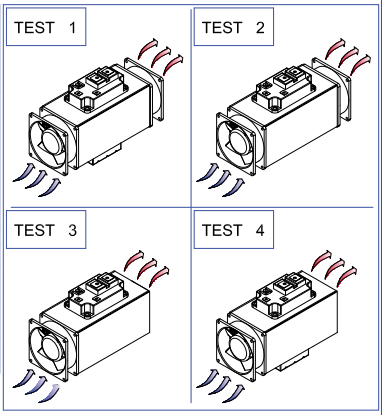
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 90x90/170	I	L	H
			90	90	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	450	200	*	*	42	0.0646	6.0	
2	612		*	*	48	0.0784	6.0	
3	612		*		56.7	0.0926	4.0	3.0
4	450	200	*		50	0.0796	4.0	3.0



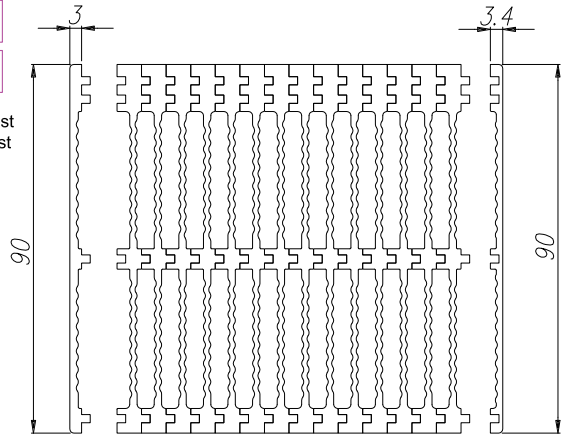
A

TECNOAL BOLOGNA - ITALY

I 90M

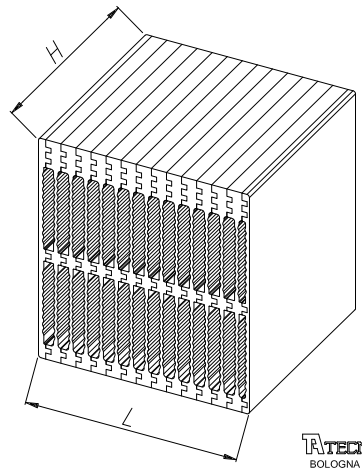
Peso Kg/m
Weight Kg/m 0.57

Dimension H on request
Dimension L on request



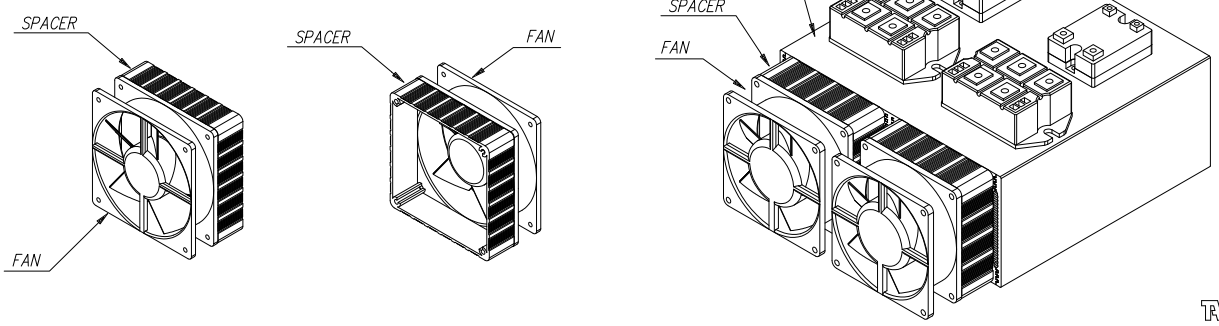
I 90F

Peso Kg/m
Weight Kg/m 0.44



B

TECNOAL BOLOGNA - ITALY



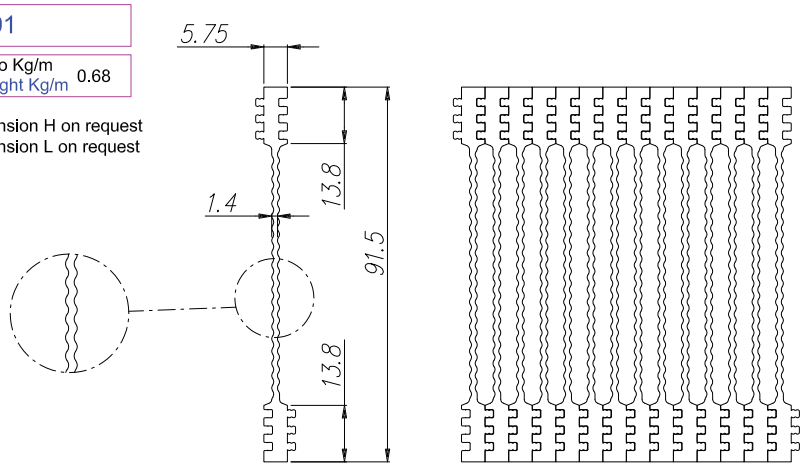
TECNOAL BOLOGNA - ITALY

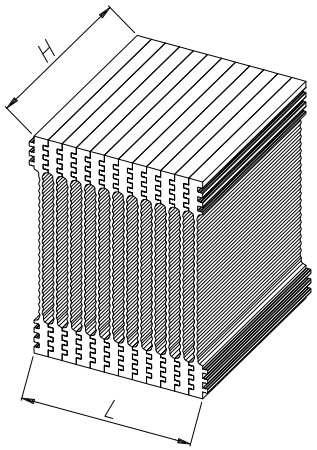
A

I 91

Peso Kg/m
Weight Kg/m 0.68

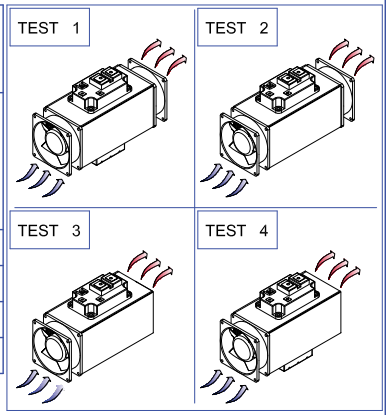
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 91x98/180	I	L	H
			91	98	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 80x80x25 DC	VENTOLA 2 FAN 2 TYPE 80x80x25 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	360	*	*	49	0.0681	7.0	
2	490		*	*	50	0.102	7.0	
3	490		*		58	0.118	5.0	1.5
4	360	360	*		60	0.0833	5.0	1.5



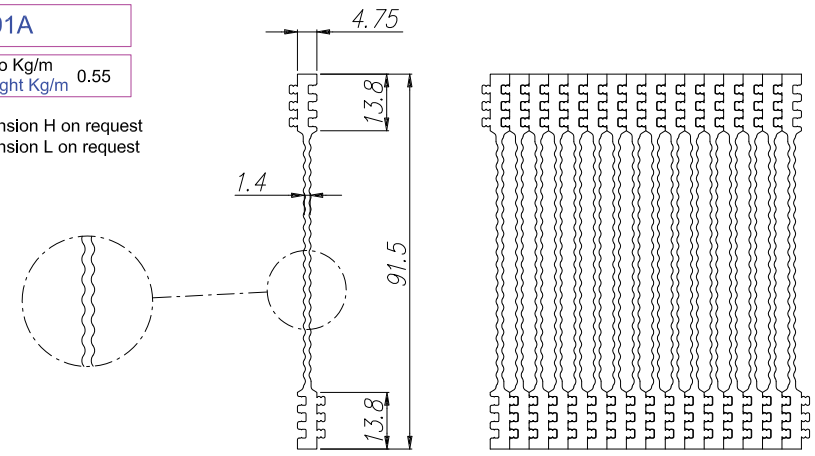
TECNOAL BOLOGNA - ITALY

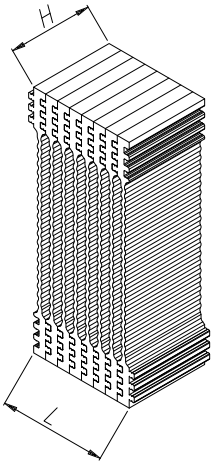
B

I 91A

Peso Kg/m
Weight Kg/m 0.55

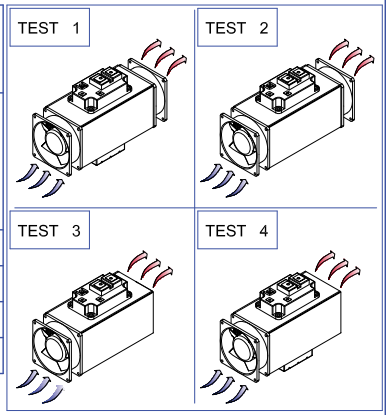
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 91Ax98/180	I	L	H
			91	98	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	324	*	*	31.5	0.045	10	
2	360		*	*	23.5	0.065	10	
3	360		*		28.5	0.079	6.0	2.5
4	360	324	*		42.0	0.061	6.0	2.5

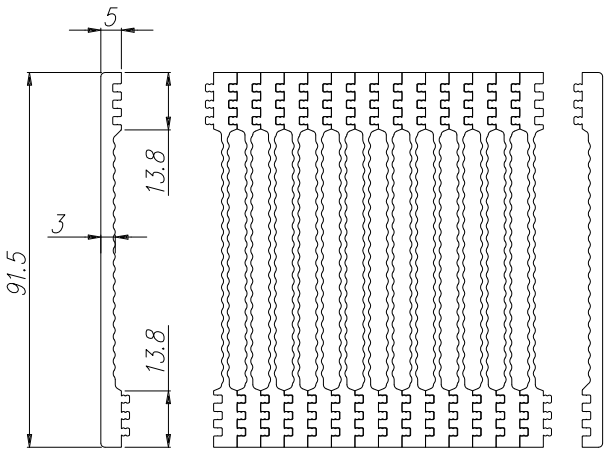


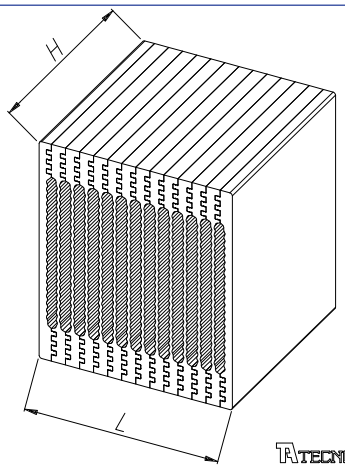
TECNOAL BOLOGNA - ITALY

I 91MF

Peso Kg/m
Weight Kg/m 0.94

Dimension H on request
Dimension L on request





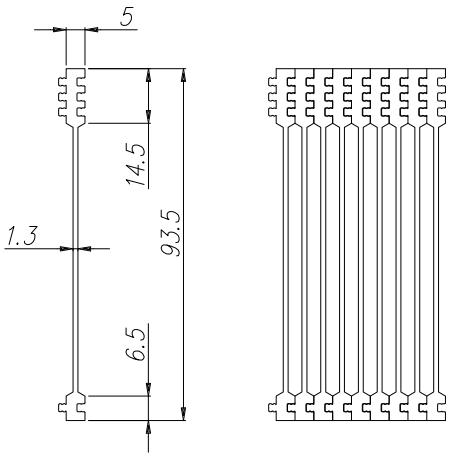
TECNOAL BOLOGNA - ITALY

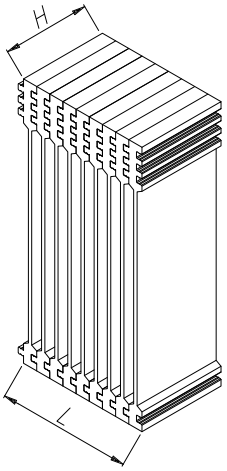
A

I 93

Peso Kg/m
Weight Kg/m 0.55

Dimension H on request
Dimension L on request

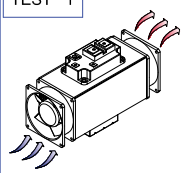




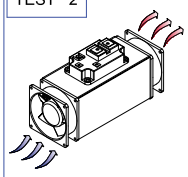
DATA SHEET	PART NUMBER	I 93x92/180	I	L	H
			93	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	360	*	*	41	0.057	7.0	
2	490		*	*	39	0.08	7.0	
3	490		*		44	0.09	5.0	2.2
4	360	360	*		51	0.07	5.0	2.2

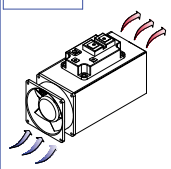
TEST 1



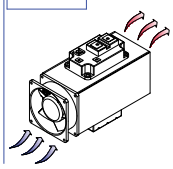
TEST 2



TEST 3



TEST 4



TECNOAL BOLOGNA - ITALY

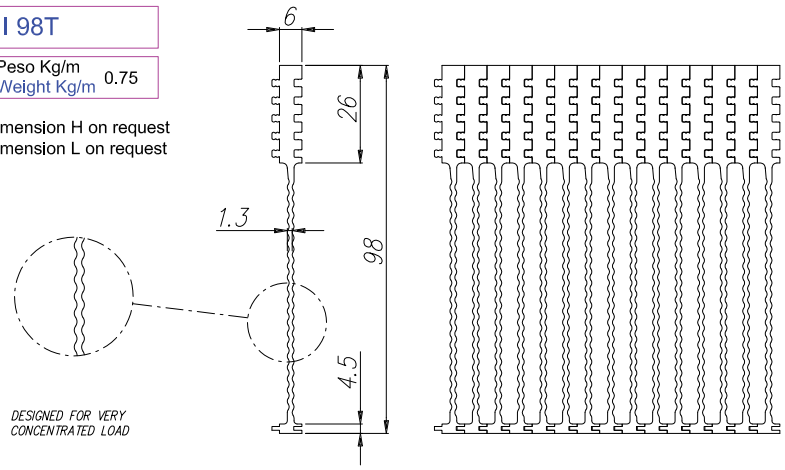
B

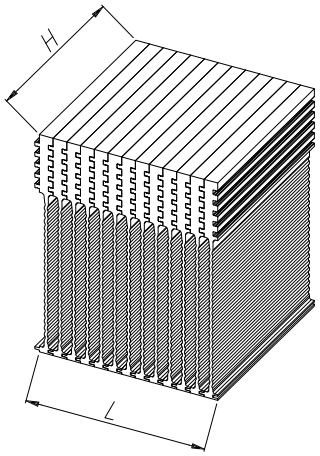
TECNOAL BOLOGNA - ITALY

I 98T

Peso Kg/m
Weight Kg/m 0.75

Dimension H on request
Dimension L on request

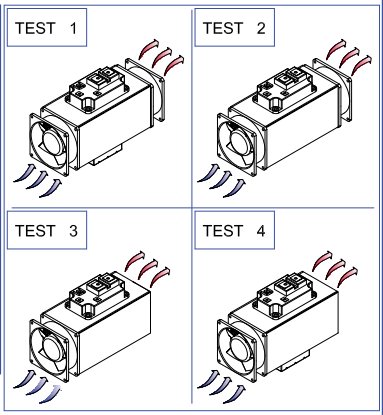




A

DATA SHEET	PART NUMBER	I	L	H
	I 98x92/180	98	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	360	250	*	*	49	0.0803	6.0	
2	360		*	*	37	0.1028	6.0	
3	360		*		45	0.1250	4.5	2.2
4	360	250	*		55.5	0.0910	4.5	2.2

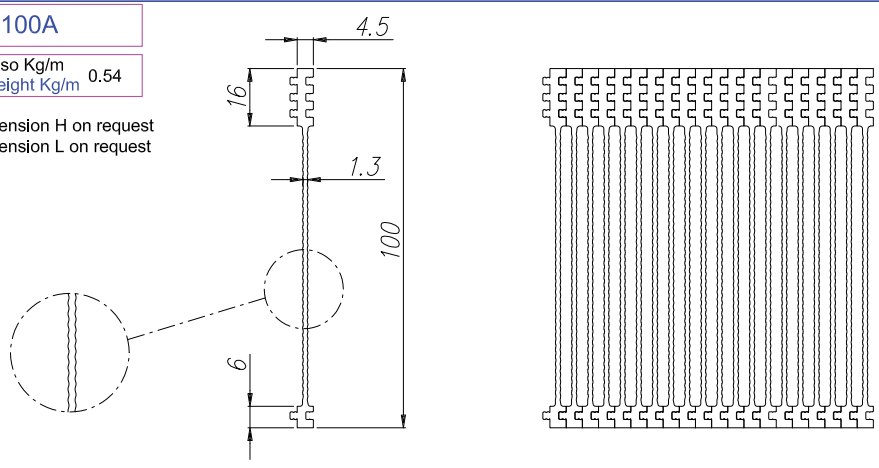


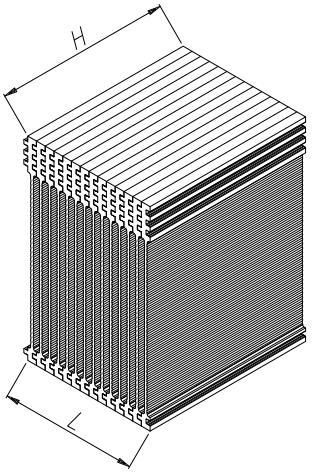
TECNOAL
BOLOGNA - ITALY

I 100A

Peso Kg/m
Weight Kg/m 0.54

Dimension H on request
Dimension L on request

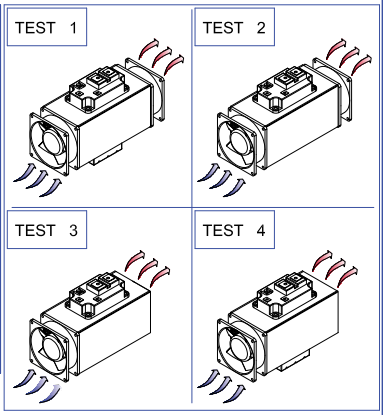




B

DATA SHEET	PART NUMBER	I	L	H
	I 100Ax92/180	100	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	490	160	*	*	36.5	0.0562	7.5	
2	490		*	*	30.5	0.0622	7.5	
3	490		*		35.5	0.0724	5.0	1.2
4	490	160	*		42.5	0.0654	5.0	1.2

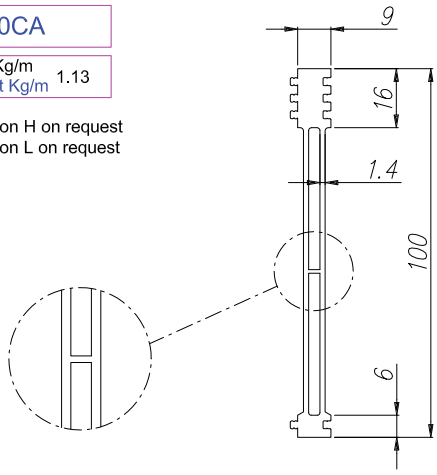


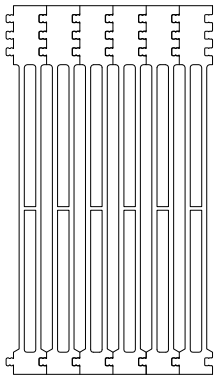
TECNOAL
BOLOGNA - ITALY

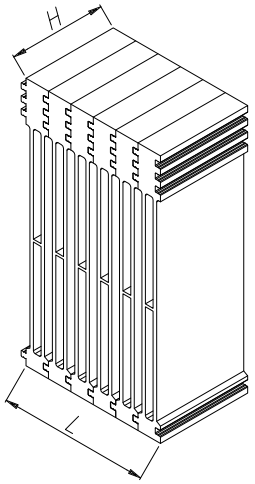
I 100CA

Peso Kg/m
Weight Kg/m 1.13

Dimension H on request
Dimension L on request

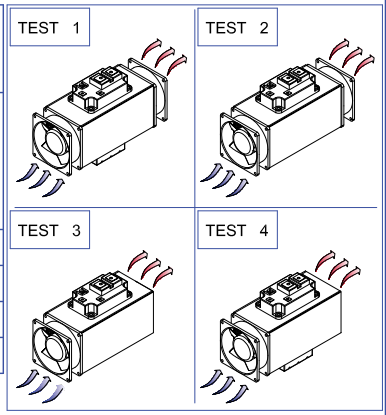






DATA SHEET	PART NUMBER	I 100CAx92/180	I	L	H
			100	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	490	160	*	*	36.5	0.0562	7.5	
2	490		*	*	30.5	0.0622	7.5	
3	490		*		35.5	0.0724	5.0	1.2
4	490	160	*		42.5	0.0654	5.0	1.2



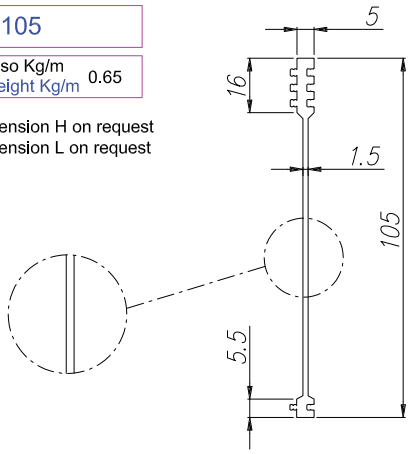
A

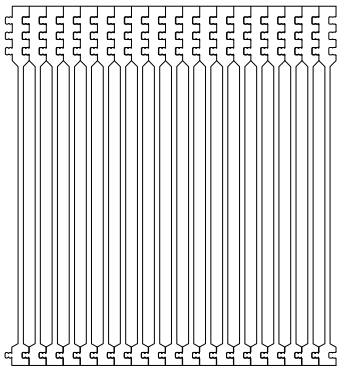
TECNOAL
BOLOGNA - ITALY

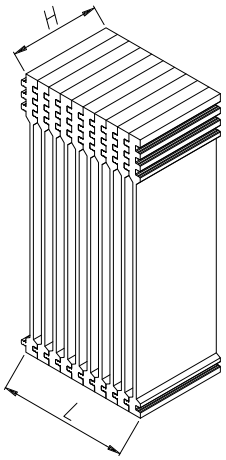
I 105

Peso Kg/m
Weight Kg/m 0.65

Dimension H on request
Dimension L on request

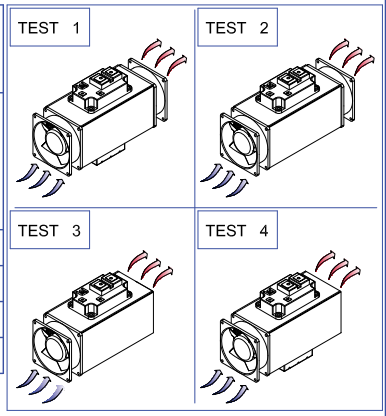






DATA SHEET	PART NUMBER	I 105x92/180	I	L	H
			105	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	490	360	*	*	55	0.0647	7.1	
2	490		*	*	44	0.089	7.1	
3	490		*		49	0.1000	5.2	1.0
4	490	360	*		62	0.0729	5.2	1.0



B

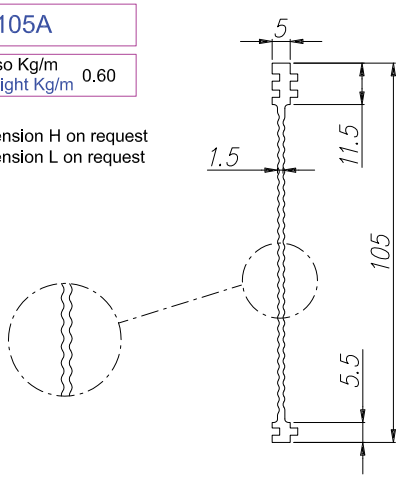
TECNOAL
BOLOGNA - ITALY

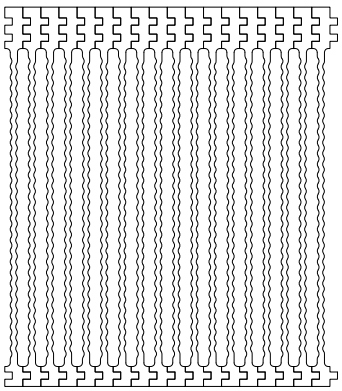
A

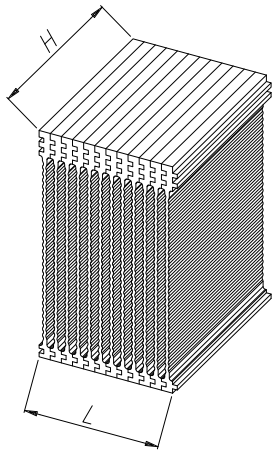
I 105A

Peso Kg/m
Weight Kg/m 0.60

Dimension H on request
Dimension L on request

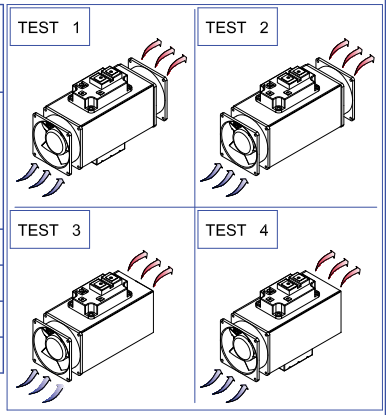






DATA SHEET	PART NUMBER	I 105Ax92/180	I	L	H
			105	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	612	225	*	*	46.5	0.0555	6.0	
2	685		*	*	43.8	0.0639	6.0	
3	685		*		51	0.0744	4.0	1.2
4	612	225	*		55	0.0657	4.0	1.2



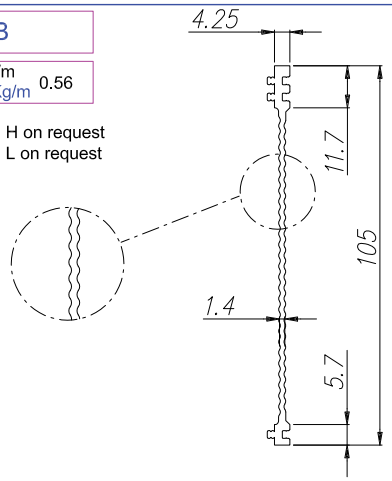
TECNOAL BOLOGNA - ITALY

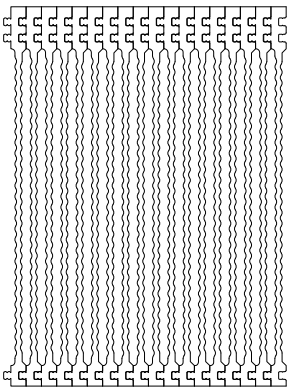
B

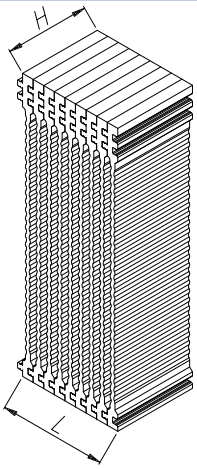
I 105B

Peso Kg/m
Weight Kg/m 0.56

Dimension H on request
Dimension L on request

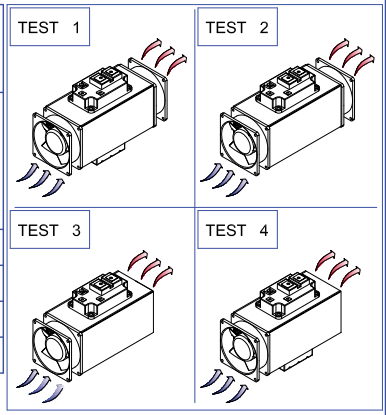






DATA SHEET	PART NUMBER	I 105Bx140/300	I	L	H
			105	140	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	685	490	*	*	27.5	0.0234	7.0	
2	685		*	*	21	0.0307	7.0	
3	685		*		24	0.0350	5.0	9
4	685	490	*		35	0.0297	5.0	9

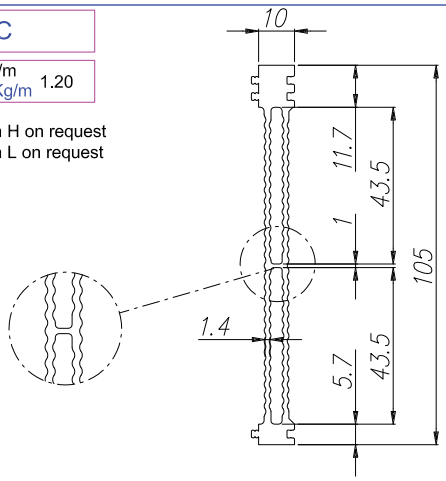


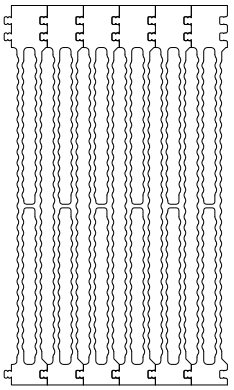
TECNOAL BOLOGNA - ITALY

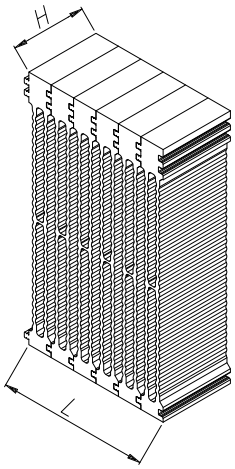
I 105C

Peso Kg/m
Weight Kg/m 1.20

Dimension H on request
Dimension L on request

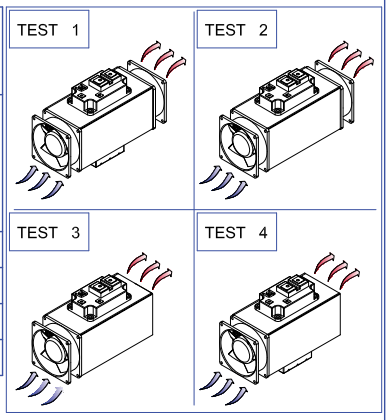






DATA SHEET	PART NUMBER	I 105Cx92/180	I	L	H
			105	92	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 92x92x38 DC	VENTOLA 2 FAN 2 TYPE 92x92x38 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	612	225	*	*	46.5	0.0555	6.0	
2	685		*	*	43.8	0.0639	6.0	
3	685		*		51	0.0744	4.0	1.2
4	612	225	*		55	0.0657	4.0	1.2



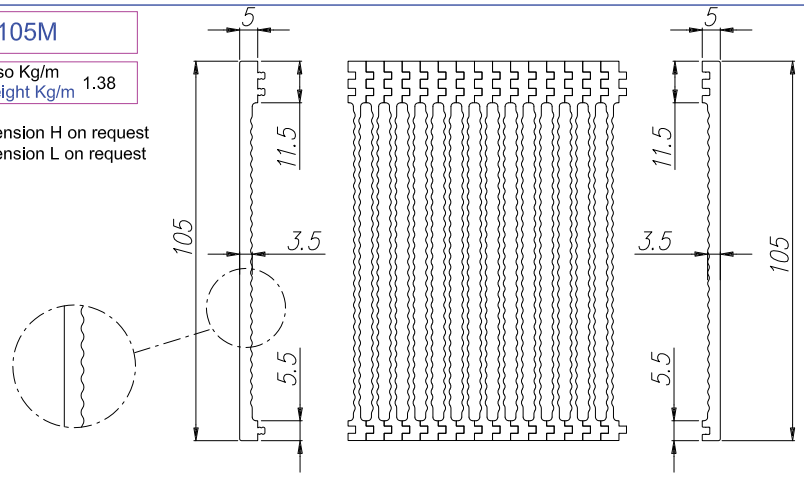
TECNOAL BOLOGNA - ITALY

A

I 105M

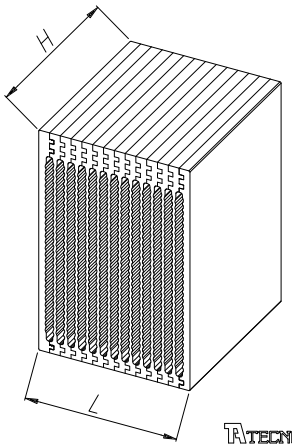
Peso Kg/m
Weight Kg/m 1.38

Dimension H on request
Dimension L on request



I 105F

Peso Kg/m
Weight Kg/m 1.00



TECNOAL BOLOGNA - ITALY

B

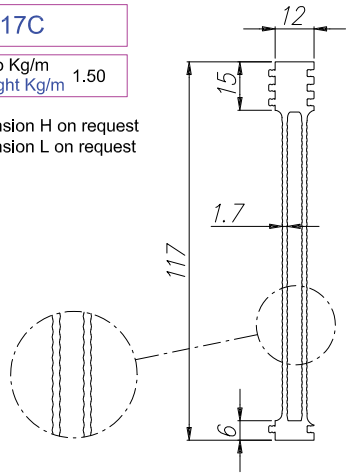
TECNOAL BOLOGNA - ITALY

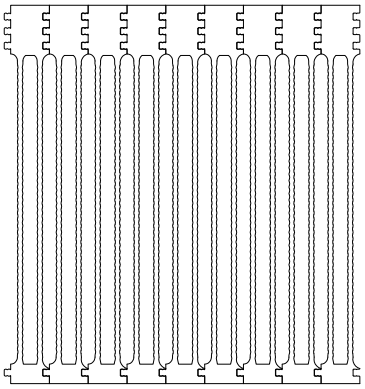
A

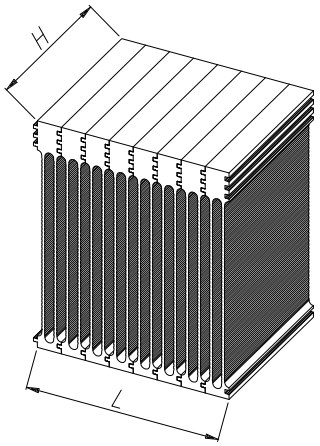
I 117C

Peso Kg/m
Weight Kg/m 1.50

Dimension H on request
Dimension L on request

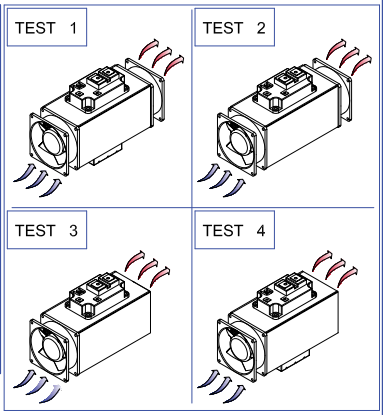






DATA SHEET	PART NUMBER	I 117x120/200	I	L	H
			117	120	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	612	200	*	*	40.5	0.0498	6.0	
2	722		*	*	42	0.0581	6.0	
3	722		*		48	0.0664	4.0	1.5
4	612	200	*		47	0.0578	4.0	1.5



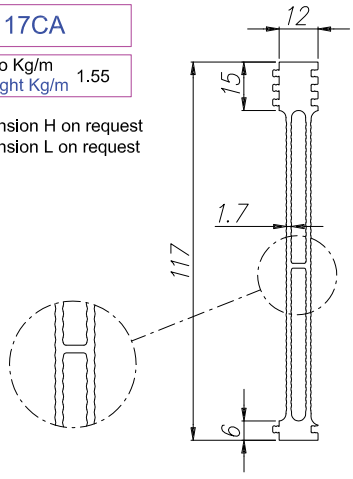
TECNOAL
BOLOGNA - ITALY

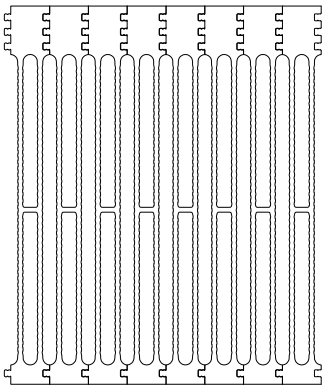
B

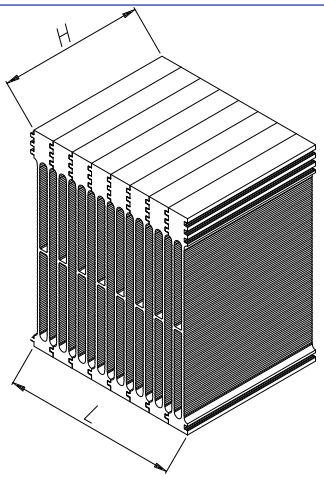
I 117CA

Peso Kg/m
Weight Kg/m 1.55

Dimension H on request
Dimension L on request

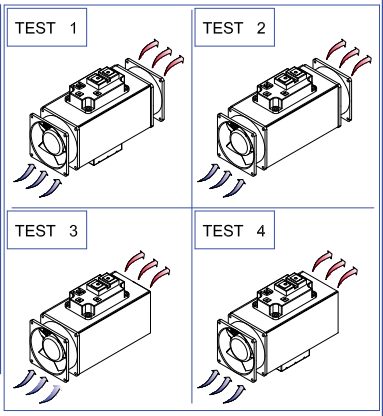






DATA SHEET	PART NUMBER	I 117CAx120/200	I	L	H
			117	120	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	612	200	*	*	40.5	0.0498	6.0	
2	722		*	*	42	0.0581	6.0	
3	722		*		48	0.0664	4.0	1.5
4	612	200	*		47	0.0578	4.0	1.5

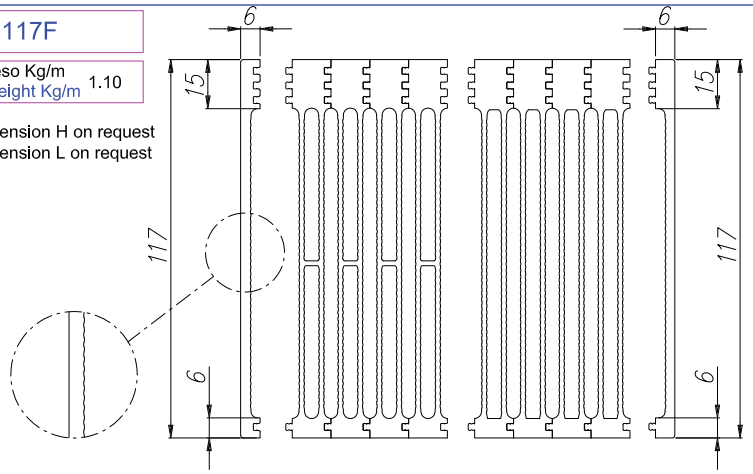


TECNOAL
BOLOGNA - ITALY

I 117F

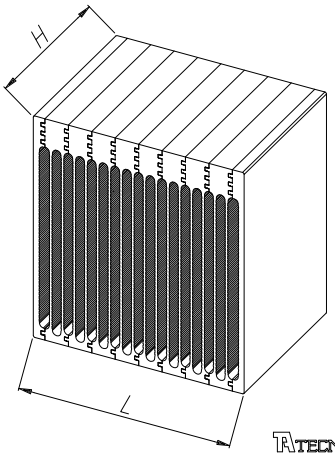
Peso Kg/m
Weight Kg/m 1.10

Dimension H on request
Dimension L on request



I 117M

Peso Kg/m
Weight Kg/m 1.14



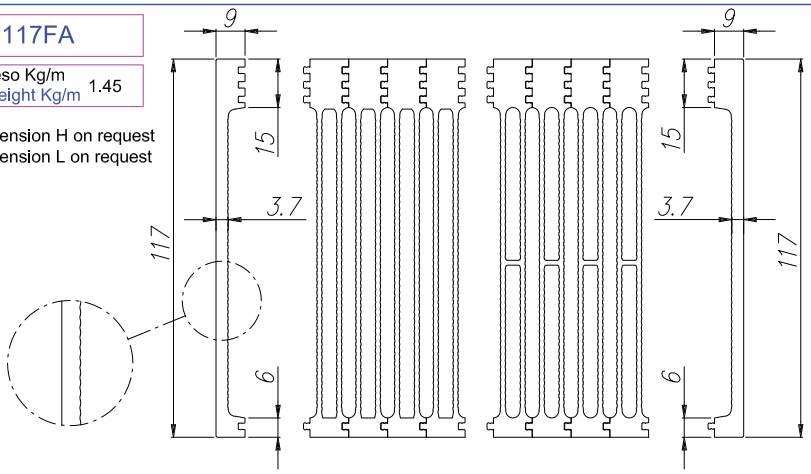
TECNOAL BOLOGNA - ITALY

A

I 117FA

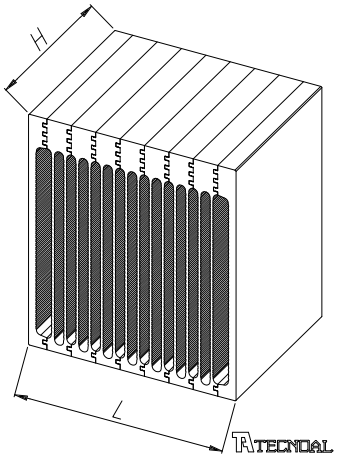
Peso Kg/m
Weight Kg/m 1.45

Dimension H on request
Dimension L on request



I 117MA

Peso Kg/m
Weight Kg/m 1.53



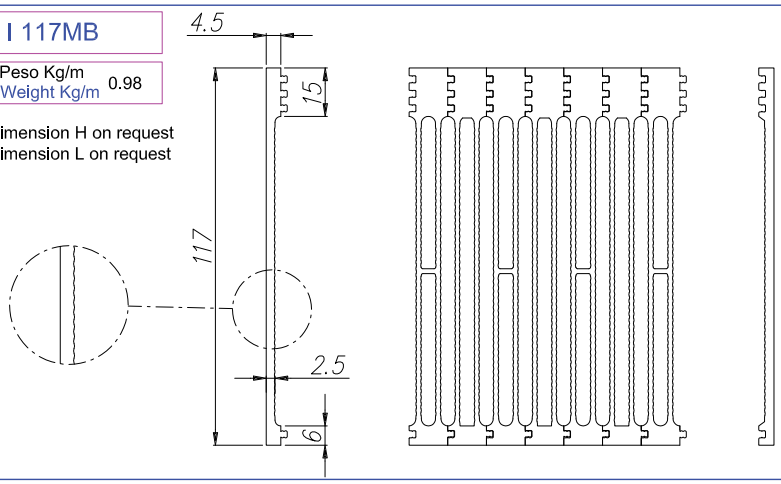
TECNOAL BOLOGNA - ITALY

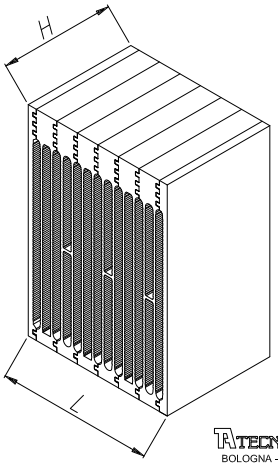
B

I 117MB

Peso Kg/m
Weight Kg/m 0.98

Dimension H on request
Dimension L on request





TECNOAL BOLOGNA - ITALY

C

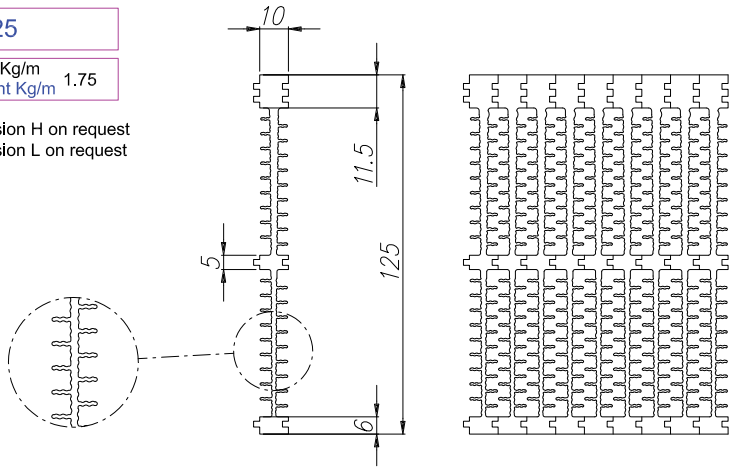
TECNOAL BOLOGNA - ITALY

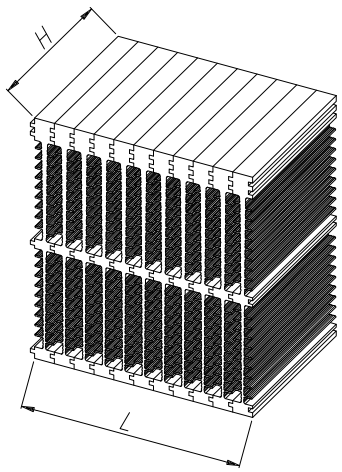
A

I 125

Peso Kg/m
Weight Kg/m 1.75

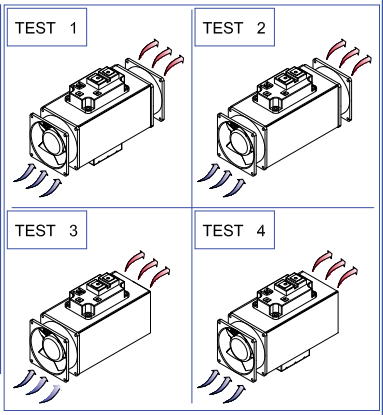
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 125x150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	600	215	*	*	33	0.0404	5.0	
2	1350		*	*	62	0.0459	5.0	
3	940		*		52.4	0.0557	3.0	3.5
4	940	215	*		59.5	0.0515	3.0	3.5



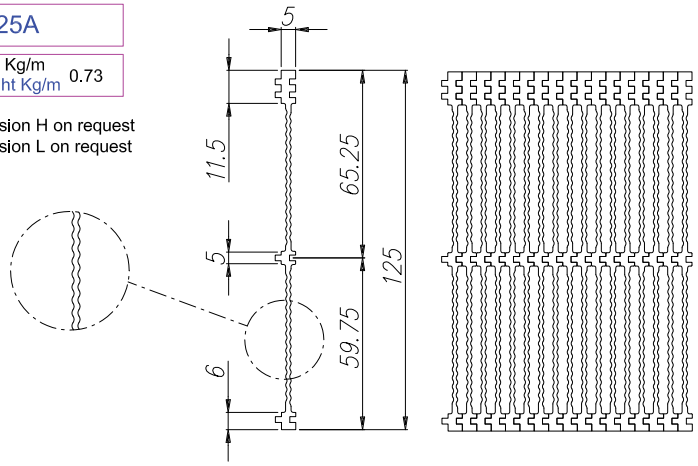
TECNOAL
BOLOGNA - ITALY

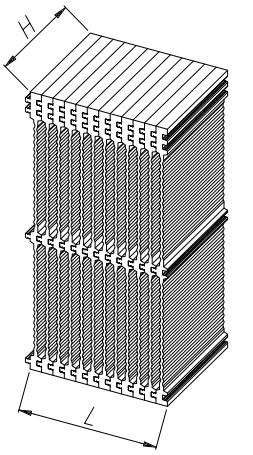
B

I 125A

Peso Kg/m
Weight Kg/m 0.73

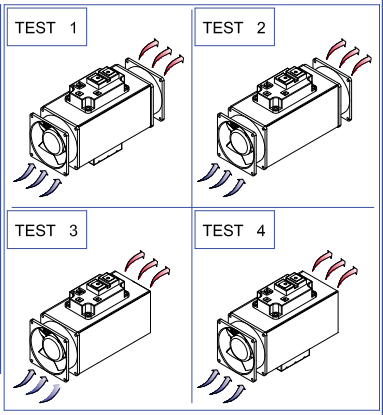
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 125Ax150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	940	215	*	*	45	0.0389	5.5	
2	1350		*	*	57.5	0.0425	5.5	
3	940		*		47	0.0500	3.5	3.0
4	940	215	*		52.5	0.0454	3.5	3.0

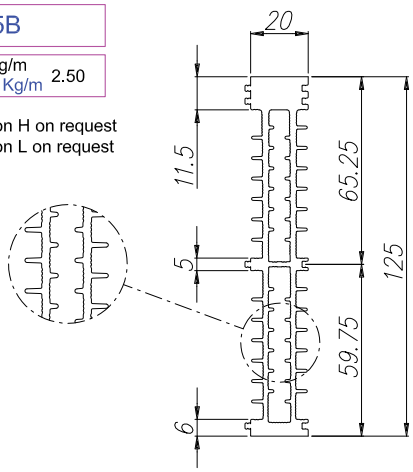


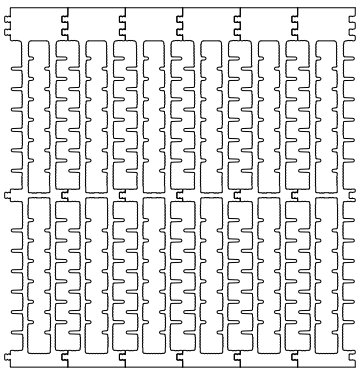
TECNOAL
BOLOGNA - ITALY

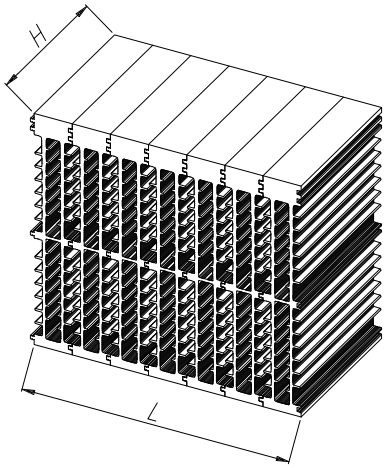
I 125B

Peso Kg/m
Weight Kg/m 2.50

Dimension H on request
Dimension L on request



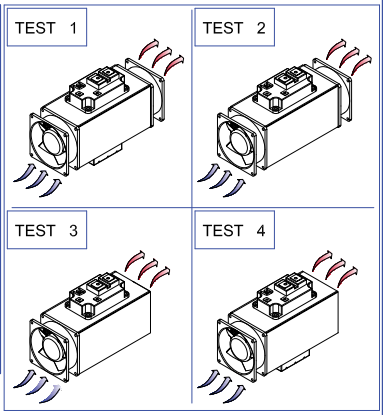




A

DATA SHEET	PART NUMBER	I 125Bx150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	600	215	*	*	32.5	0.0389	6.0	
2	1350		*	*	62.3	0.0461	6.0	
3	940		*		50.5	0.0537	4.0	2.5
4	940	215	*		56	0.0484	4.0	2.5

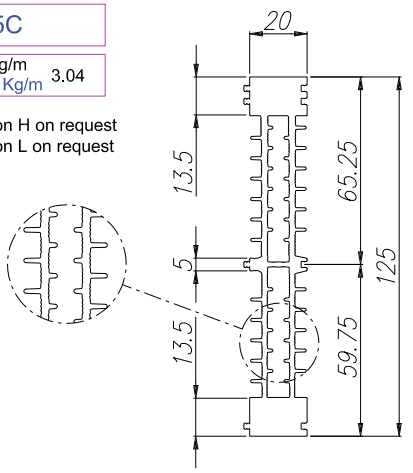


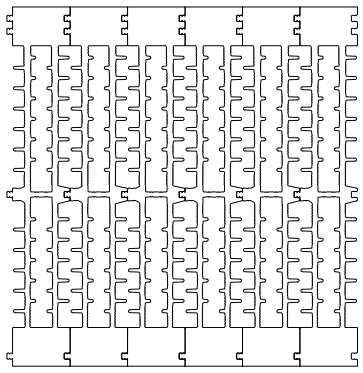
TECNOAL BOLOGNA - ITALY

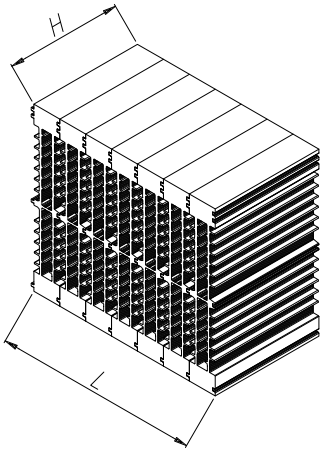
I 125C

Peso Kg/m
Weight Kg/m 3.04

Dimension H on request
Dimension L on request



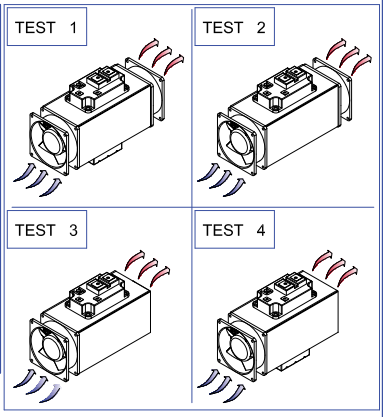




B

DATA SHEET	PART NUMBER	I 125Cx150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	600	600	*	*	29	0.0242	10.5	
2	600		*	*	26	0.0433	10.5	
3	600		*		28	0.0466	7.0	3.5
4	600	600	*		32	0.0267	7.0	3.5



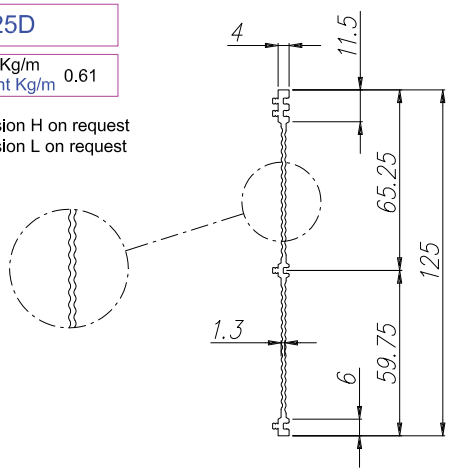
TECNOAL BOLOGNA - ITALY

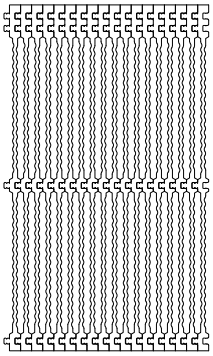
A

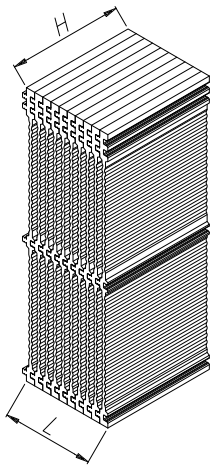
I 125D

Peso Kg/m
Weight Kg/m 0.61

Dimension H on request
Dimension L on request

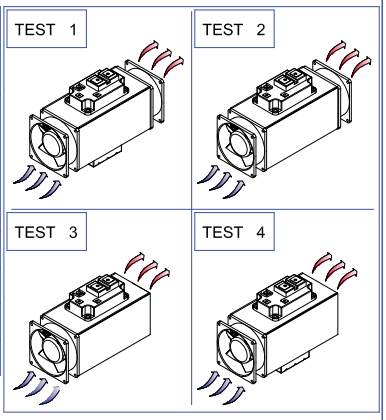






DATA SHEET	PART NUMBER	I 125Dx150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	720	503	*	*	26.0	0.0213	10.0	
2	720		*	*	19.0	0.0264	10.5	
3	720		*		22.0	0.0306	4.5	6.5
4	720	503	*		29.5	0.0241	4.5	6.5



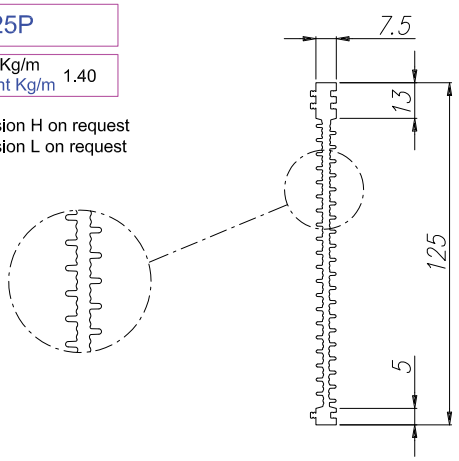
TECNOAL BOLOGNA - ITALY

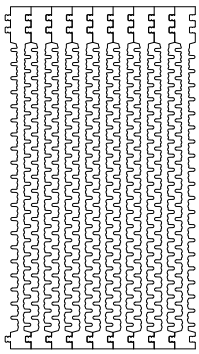
B

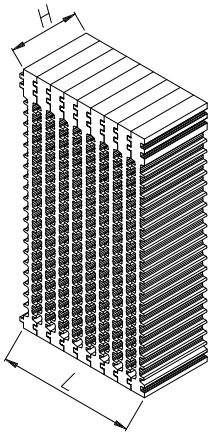
I 125P

Peso Kg/m
Weight Kg/m 1.40

Dimension H on request
Dimension L on request

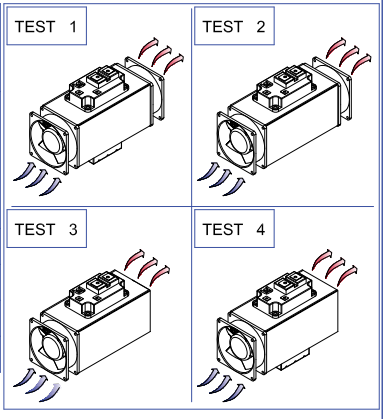






DATA SHEET	PART NUMBER	I 125Px150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	720	360	*	*	25	0.0231	10.5	
2	980		*	*	28.5	0.0291	10.5	
3	980		*		34.5	0.0352	4.5	5.0
4	720	360	*		35	0.0324	4.5	5.0

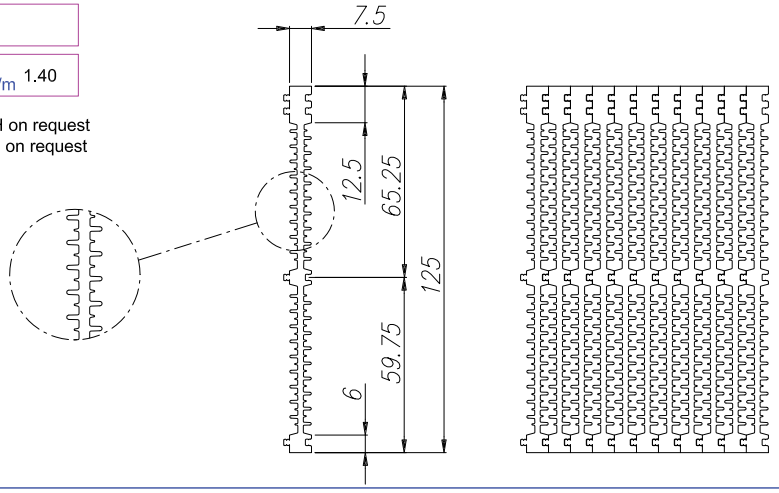


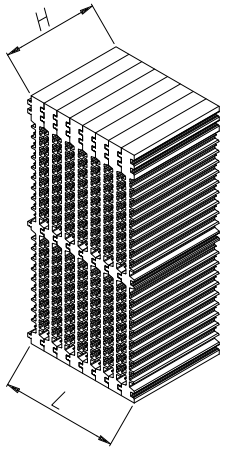
TECNOAL BOLOGNA - ITALY

I 125Q

Peso Kg/m
Weight Kg/m 1.40

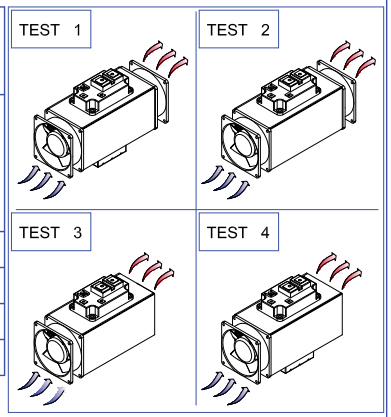
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 125Qx150/300	I	L	H
			125	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	720	503	*	*	30	0.024	8.0	
2	720		*	*	25	0.034	8.0	
3	720		*		28	0.038	5.5	17
4	720	503	*		32	0.026	5.5	17



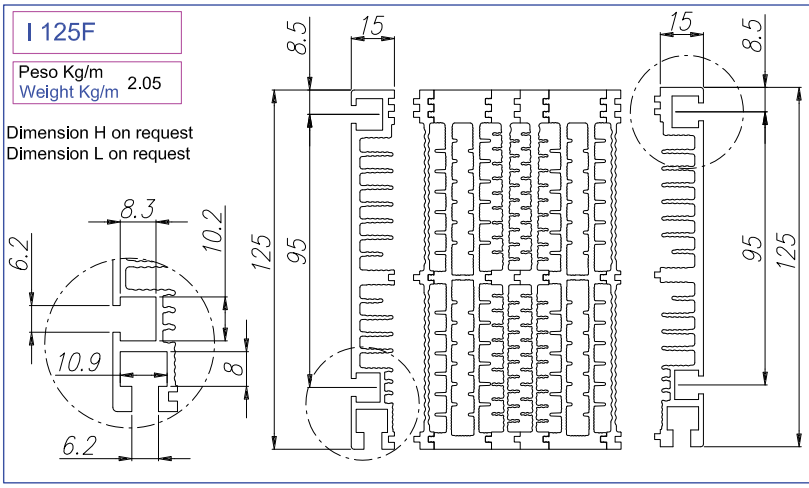
TECNOAL BOLOGNA - ITALY

A

I 125F

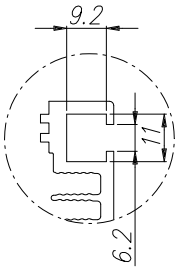
Peso Kg/m
Weight Kg/m 2.05

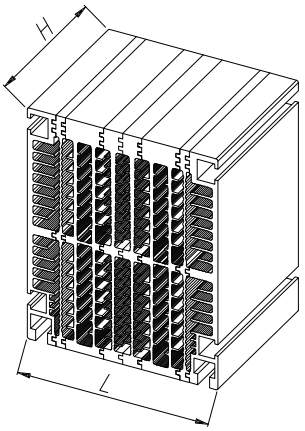
Dimension H on request
Dimension L on request



I 125M

Peso Kg/m
Weight Kg/m 2.10





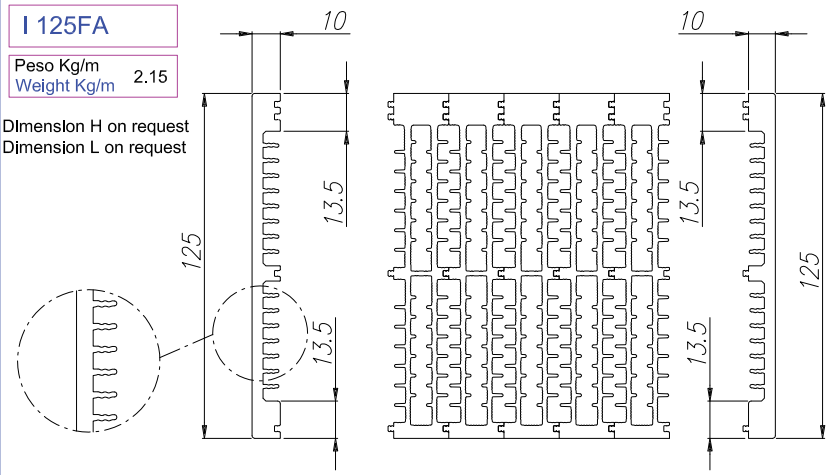
TECNOAL BOLOGNA - ITALY

B

I 125FA

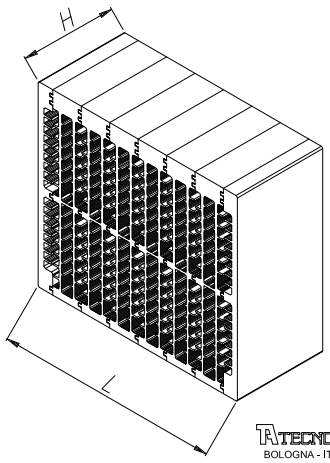
Peso Kg/m
Weight Kg/m 2.15

Dimension H on request
Dimension L on request



I 125MA

Peso Kg/m
Weight Kg/m 2.17



TECNOAL BOLOGNA - ITALY

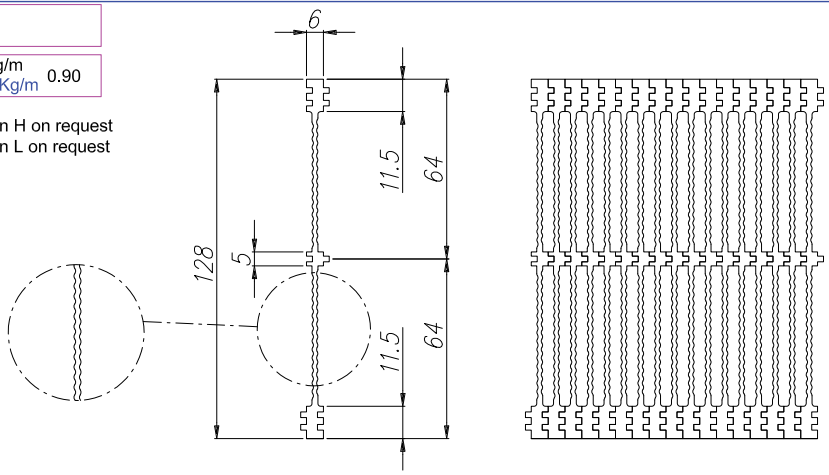
C

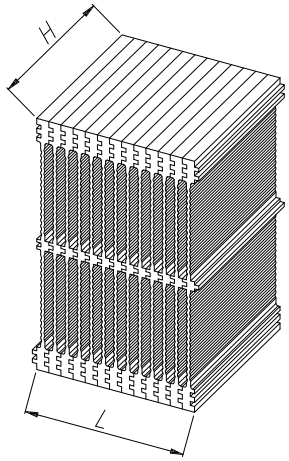
A

I 128

Peso Kg/m
Weight Kg/m 0.90

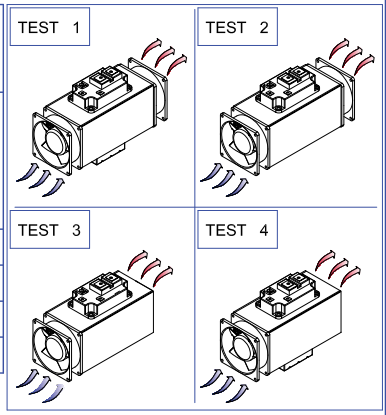
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 128x120/200	I	L	H
			128	120	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	450	450	*	*	36	0.0400	6.0	
2	612		*	*	36	0.0588	6.0	
3	612		*		40	0.0653	4.3	1.5
4	450	450	*		42.5	0.0472	4.3	1.5



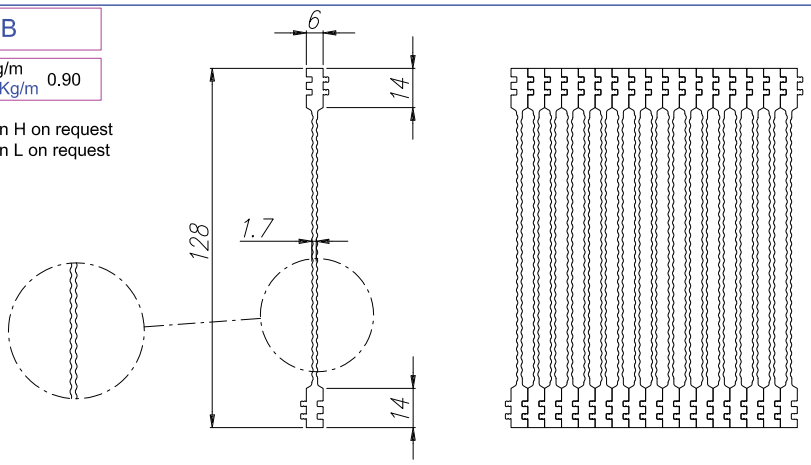
TECNOAL
BOLOGNA - ITALY

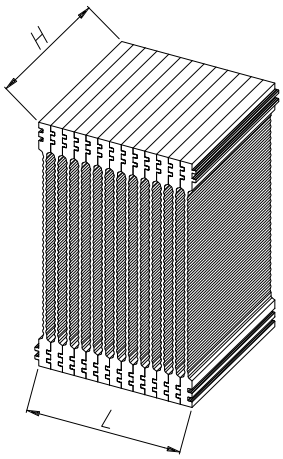
B

I 128B

Peso Kg/m
Weight Kg/m 0.90

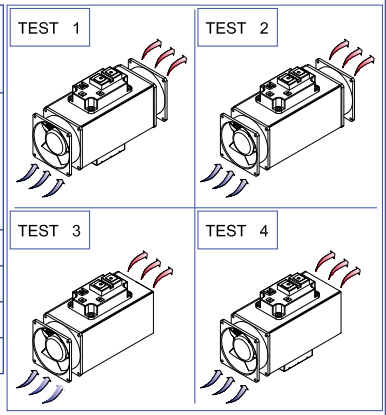
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 128Bx120/200	I	L	H
			128	120	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	450	450	*	*	35	0.0390	6.0	
2	612		*	*	35	0.0570	6.0	
3	612		*		39.5	0.0640	4.3	1.5
4	450	450	*		42.0	0.0460	4.3	1.5

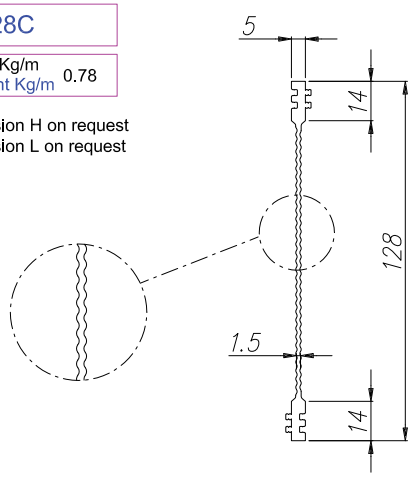


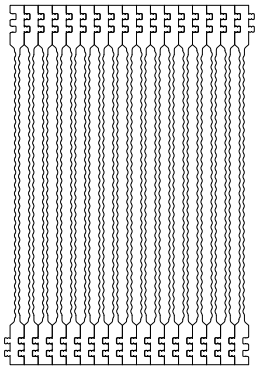
TECNOAL
BOLOGNA - ITALY

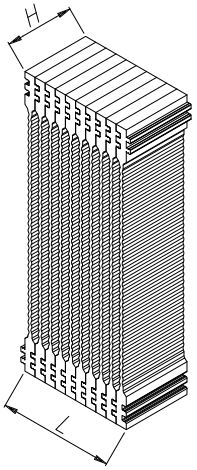
I 128C

Peso Kg/m
Weight Kg/m 0.78

Dimension H on request
Dimension L on request

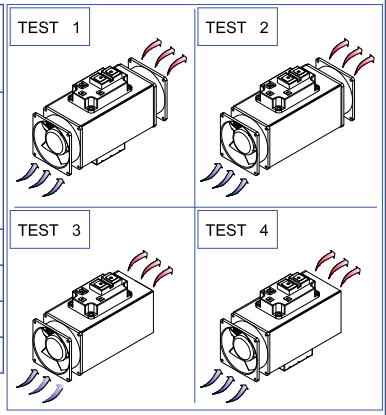






DATA SHEET	PART NUMBER	I 128Cx120/200	I	L	H
			128	120	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	400	400	*	*	31	0.0389	7.0	
2	400		*	*	32.7	0.0818	7.0	
3	400		*		36.3	0.0908	5.0	4.0
4	400	400	*		36	0.0450	5.0	4.0



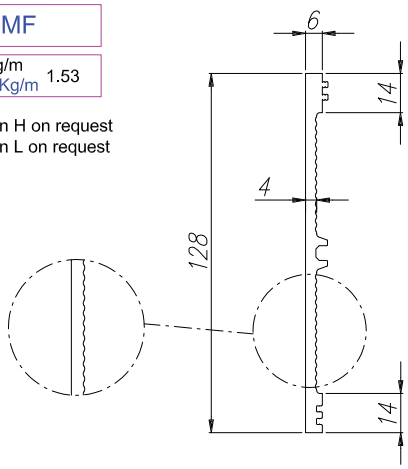
TECNOAL
BOLOGNA - ITALY

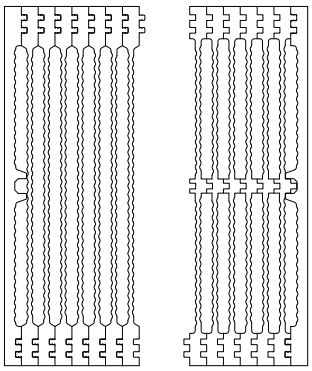
A

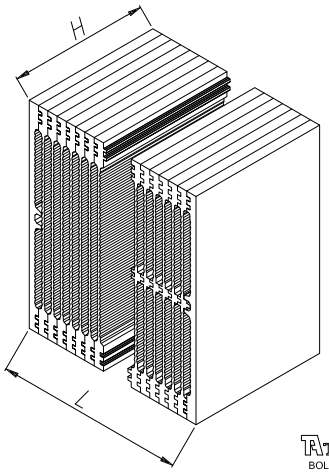
I 128MF

Peso Kg/m
Weight Kg/m 1.53

Dimension H on request
Dimension L on request







TECNOAL
BOLOGNA - ITALY

B

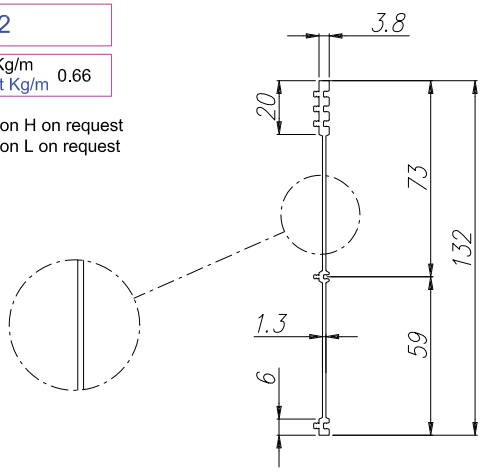
TECNOAL
BOLOGNA - ITALY

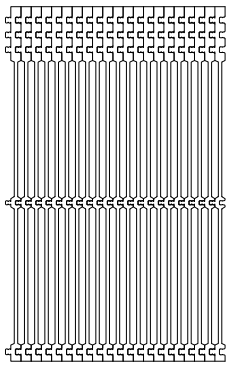
A

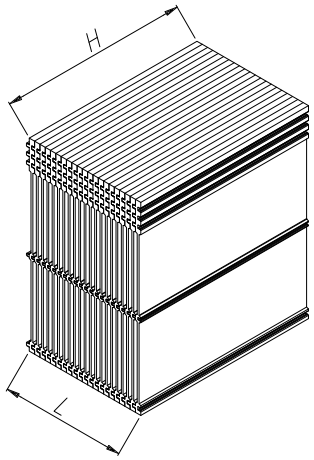
I 132

Peso Kg/m
Weight Kg/m 0.66

Dimension H on request
Dimension L on request

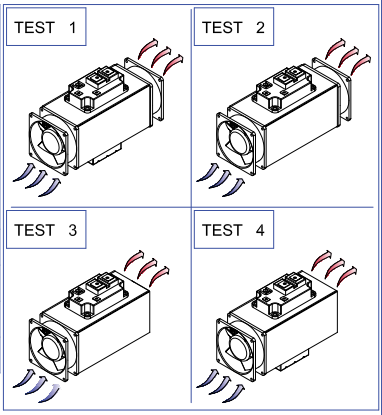






DATA SHEET	PART NUMBER	I 132x150/290	I	L	H
			132	150	290

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	600	300	*	*	27.8	0.0309	10.0	
2	720		*	*	22.2	0.0308	10.0	
3	720		*		24.2	0.0336	6.5	12
4	600	300	*		24.8	0.0276	6.5	12



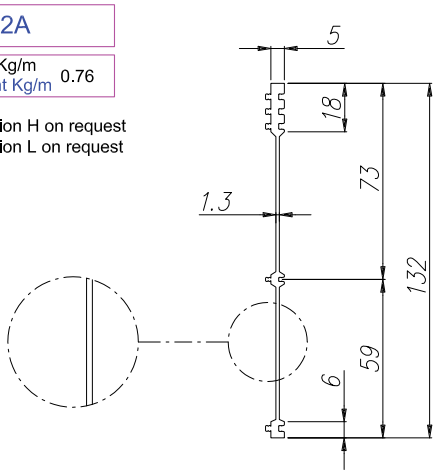
TECNOAL BOLOGNA - ITALY

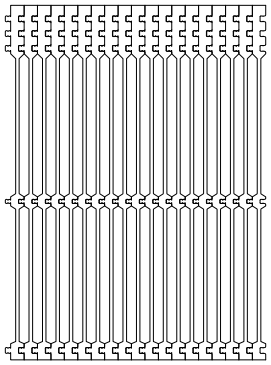
B

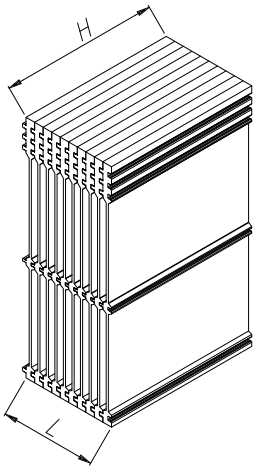
I 132A

Peso Kg/m
Weight Kg/m 0.76

Dimension H on request
Dimension L on request

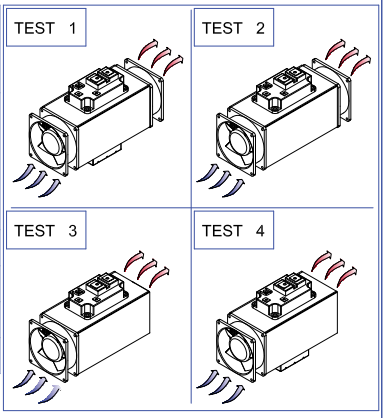






DATA SHEET	PART NUMBER	I 132Ax150/290	I	L	H
			132	150	290

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	600	300	*	*	24.7	0.0274	10.0	
2	720		*	*	24.5	0.0340	10.0	
3	720		*		25.6	0.0355	6.5	8.0
4	600	300	*		26.2	0.0291	6.5	8.0

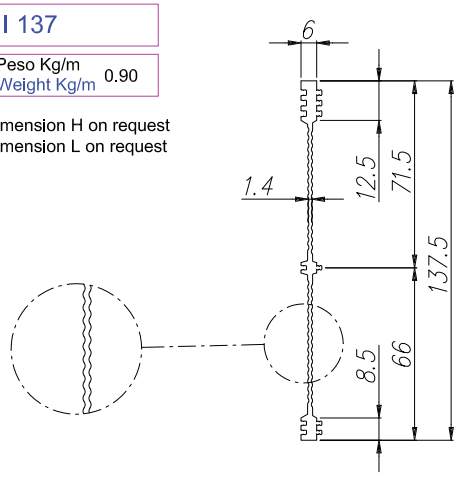


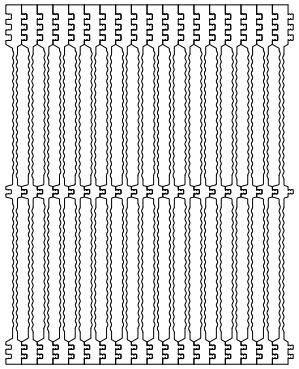
TECNOAL BOLOGNA - ITALY

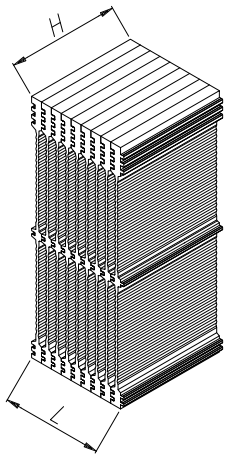
I 137

Peso Kg/m
Weight Kg/m 0.90

Dimension H on request
Dimension L on request

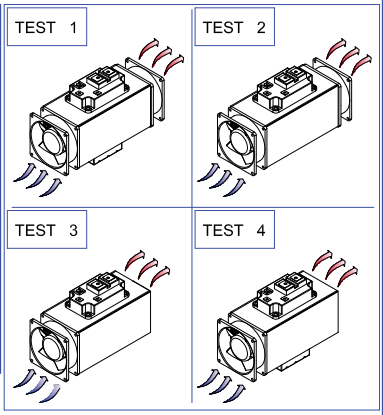






DATA SHEET	PART NUMBER	I	L	H
	I 137x150/300	137	150	300

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 120x120x40 DC	VENTOLA 2 FAN 2 TYPE 120x120x40 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	720	503	*	*	29.0	0.0237	10.0	
2	720		*	*	24.3	0.0338	10.0	
3	720		*		25.2	0.0350	5.5	3.5
4	720	503	*		34.0	0.0303	5.5	3.5



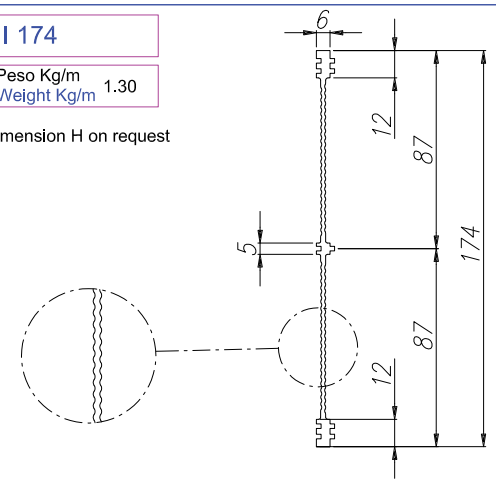
TECNOAL
BOLOGNA - ITALY

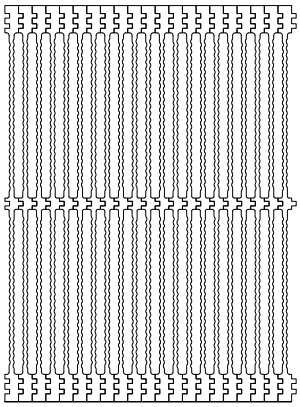
A

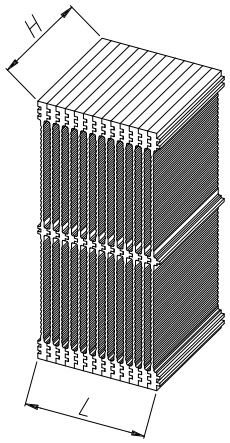
I 174

Peso Kg/m
Weight Kg/m 1.30

Dimension H on request

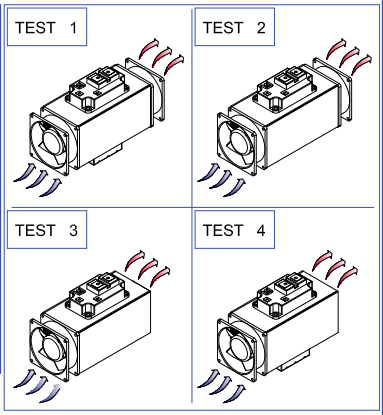






DATA SHEET	PART NUMBER	I	L	H
	I 174x170/180	174	170	180

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE 150x150x50 DC	VENTOLA 2 FAN 2 TYPE 150x150x50 DC	ΔT °C	RT °C/W	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	900	900	*	*	30.7	0.0170	5.5	
2	1225		*	*	35	0.0285	5.5	
3	1225		*		43.7	0.0356	3.5	3.0
4	900	900	*		43.3	0.0240	3.5	3.0



TECNOAL
BOLOGNA - ITALY

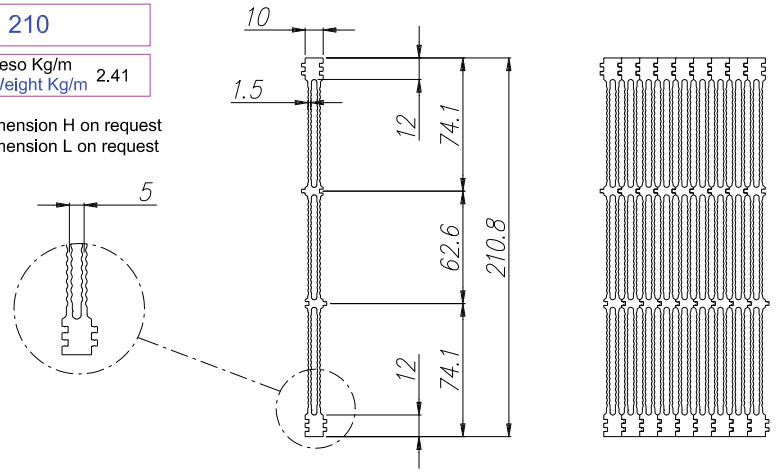
B

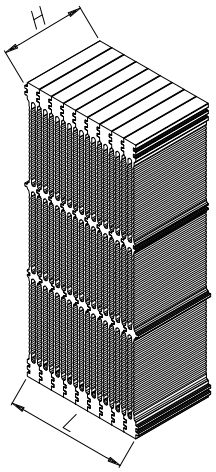
A

I 210

Peso Kg/m
Weight Kg/m 2.41

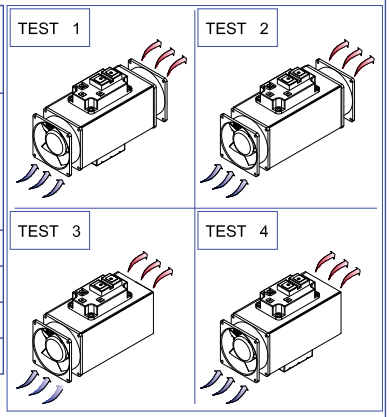
Dimension H on request
Dimension L on request





DATA SHEET	PART NUMBER	I 210x80/210	I	L	H
			210	80	200

PROVA TEST	CARICO PRINCIPALE MAIN POWER LOAD W	CARICO SECONDARIO MINOR POWER LOAD W	VENTOLA 1 FAN 1 TYPE	VENTOLA 2 FAN 2 TYPE	ΔT °C	RT	VELOCITA' USCITA ARIA OUTGOING AIR SPEED m/sec	D.D.P. mm H_2O
1	400	400	*	*	26.0	0.0325	7.5	
2	400		*	*	23.5	0.0587	7.5	
3	400		*		27.0	0.0675	5.0	5.0
4	400	400	*		30.0	0.0375	5.0	5.0



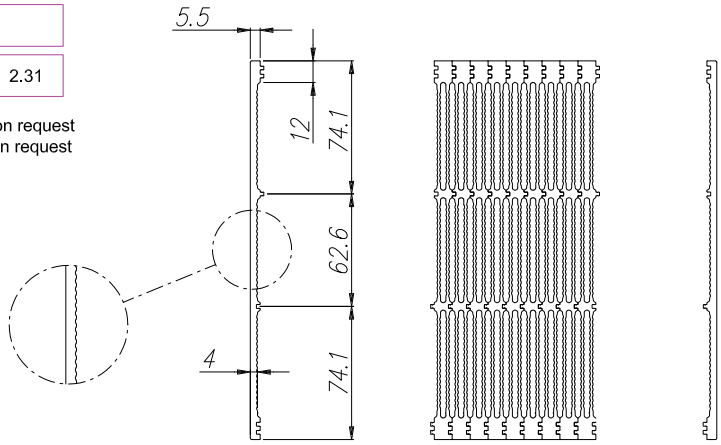
TECNOAL
BOLOGNA - ITALY

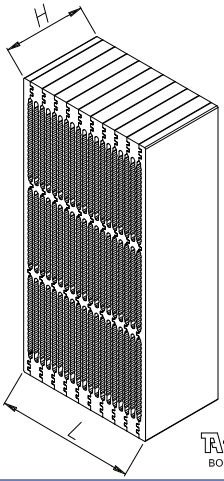
B

I 210MF

Peso Kg/m
Weight Kg/m 2.31

Dimension H on request
Dimension L on request





TECNOAL
BOLOGNA - ITALY

TECNOAL
BOLOGNA - ITALY

I 125W1A

Peso Kg/m
Weight Kg/m 16.00

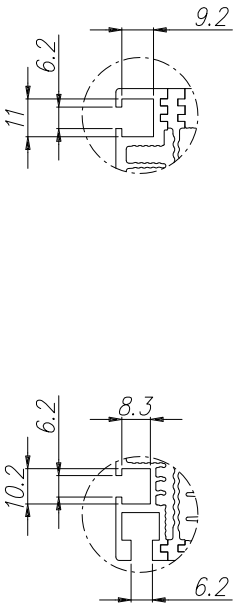
Ventilazione forzata
Forced ventilation

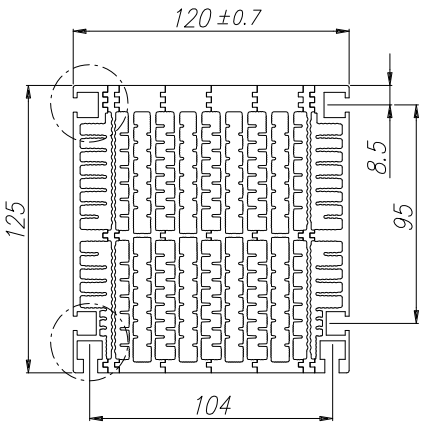
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6

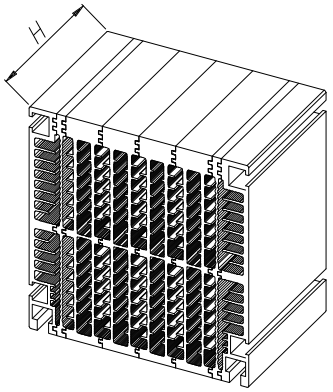
Rt °C/W 0.048

Dimension H on request





I 125V2 (CODE OLD)



A

TECNOAL BOLOGNA - ITALY

I 125W2A

Peso Kg/m
Weight Kg/m 16.40

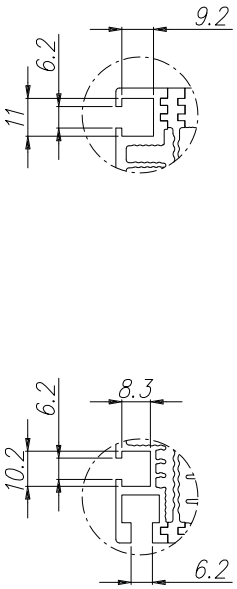
Ventilazione forzata
Forced ventilation

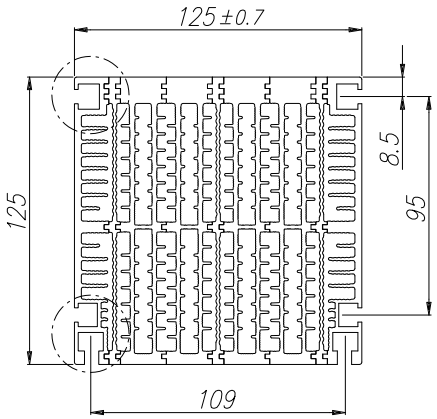
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6

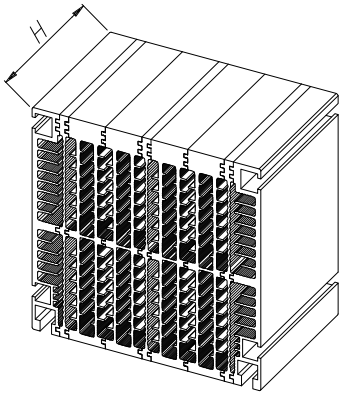
Rt °C/W 0.047

Dimension H on request





I 125Y (CODE OLD)



B

TECNOAL BOLOGNA - ITALY

I 125W3A

Peso Kg/m
Weight Kg/m 16.70

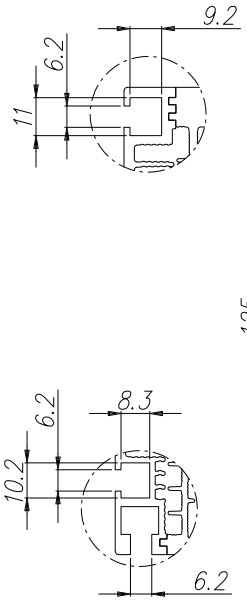
Ventilazione forzata
Forced ventilation

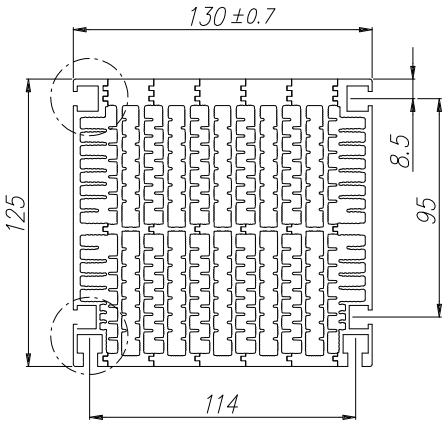
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6

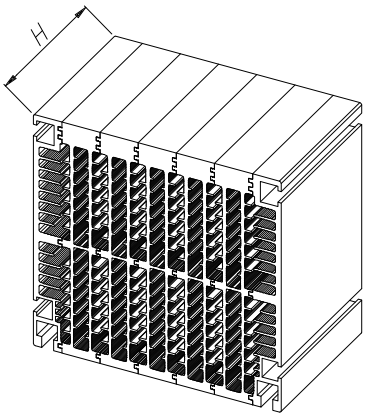
Rt °C/W 0.045

Dimension H on request





I 125H (CODE OLD)



C

TECNOAL BOLOGNA - ITALY

A

I 125W4A

Peso Kg/m
Weight Kg/m 17.90

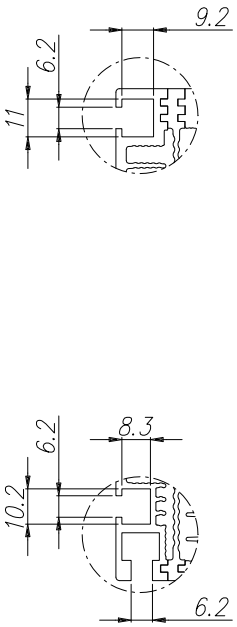
Ventilazione forzata
Forced ventilation

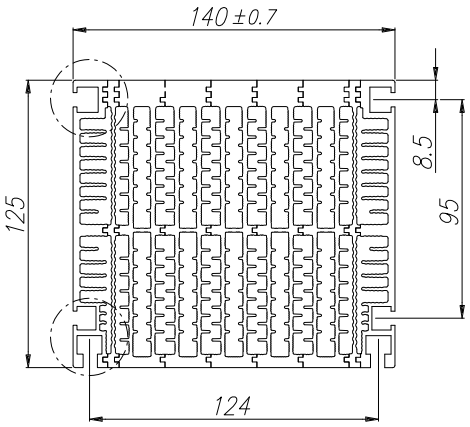
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec) 6

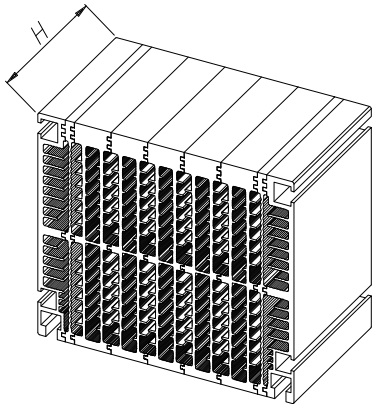
Rt °C/W 0.041

Dimension H on request





I 125X (CODE OLD)



TECNOAL BOLOGNA - ITALY

B

I 125W5A

Peso Kg/m
Weight Kg/m 19.20

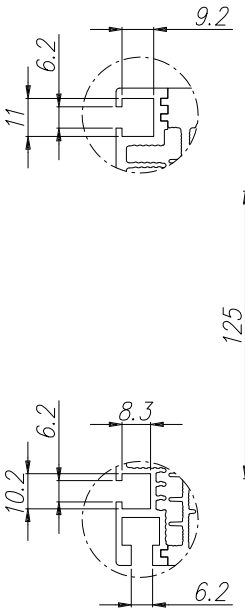
Ventilazione forzata
Forced ventilation

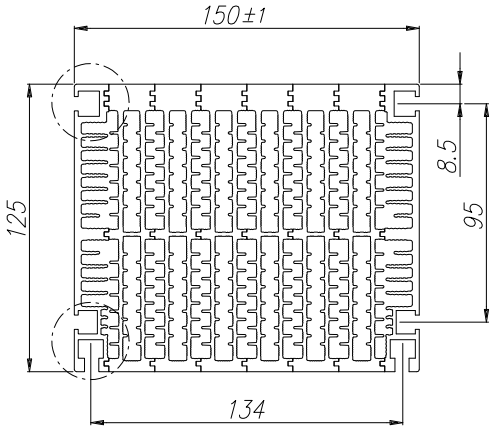
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec) 6

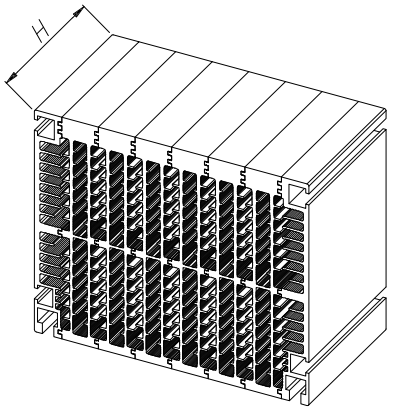
Rt °C/W 0.039

Dimension H on request





I 125R (CODE OLD)



TECNOAL BOLOGNA - ITALY

C

I 125W6A

Peso Kg/m
Weight Kg/m 25.60

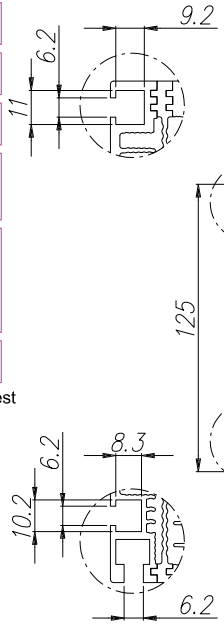
Ventilazione forzata
Forced ventilation

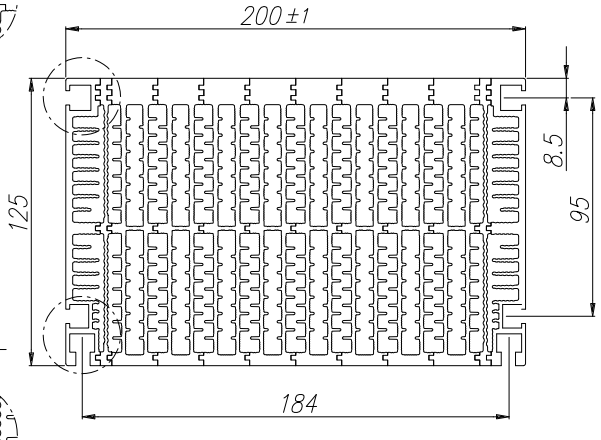
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec) 6

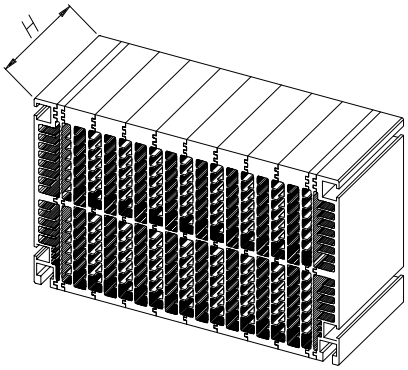
Rt °C/W 0.029

Dimension H on request





I 125W (CODE OLD)



TECNOAL BOLOGNA - ITALY

I 125W7A

Peso Kg/m
Weight Kg/m 31.70

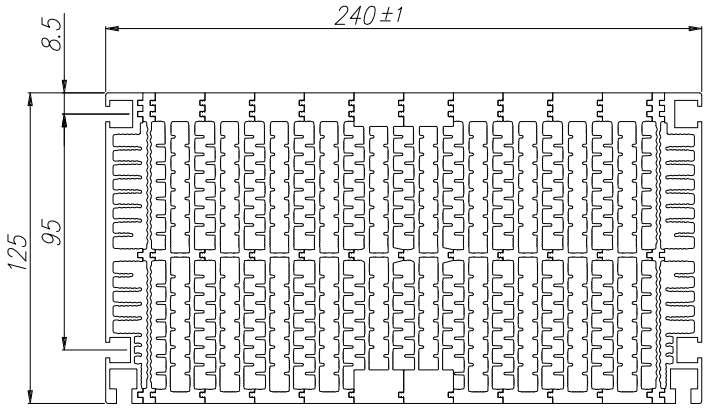
Ventilazione forzata
Forced ventilation

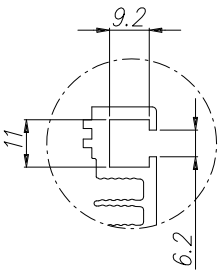
Lung. campione mm
Sample length mm
300

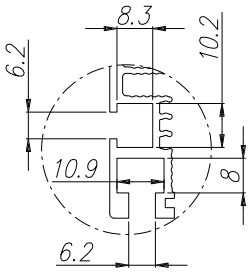
Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec) 6

Rt °C/W 0.024

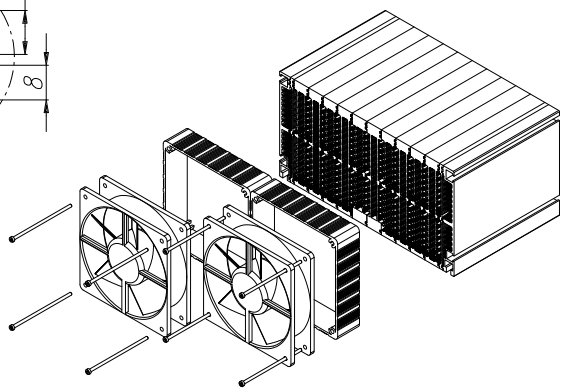
Dimension H on request

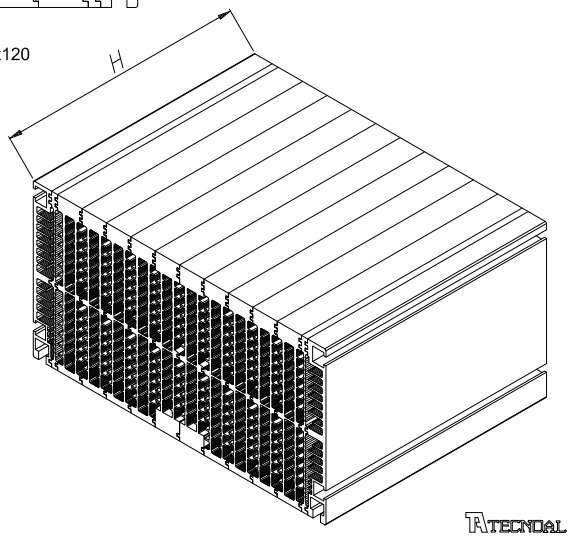






Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120





A

TECNOAL BOLOGNA - ITALY

I 125W8A

Peso Kg/m
Weight Kg/m 38.10

Ventilazione forzata
Forced ventilation

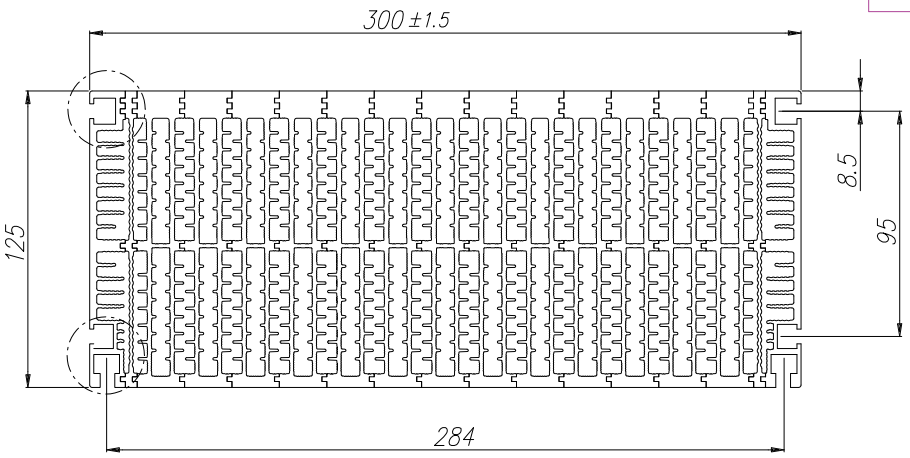
Lung. campione mm
Sample length mm
300

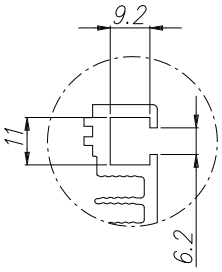
Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec) 6

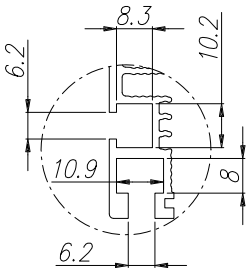
Rt °C/W 0.0195

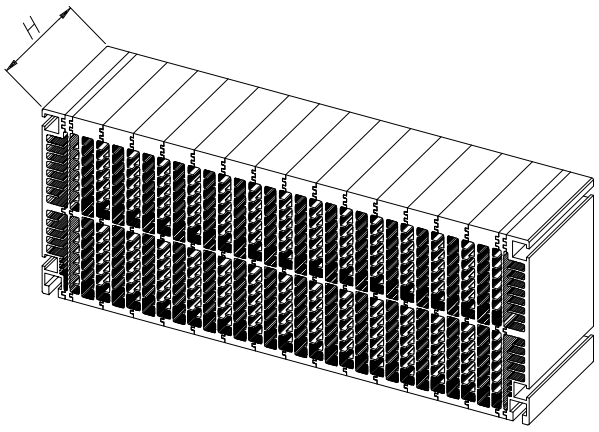
Dimension H on request

I 125Z (CODE OLD)









B

TECNOAL BOLOGNA - ITALY

A

I 125W9A

Peso Kg/m
Weight Kg/m 47.80

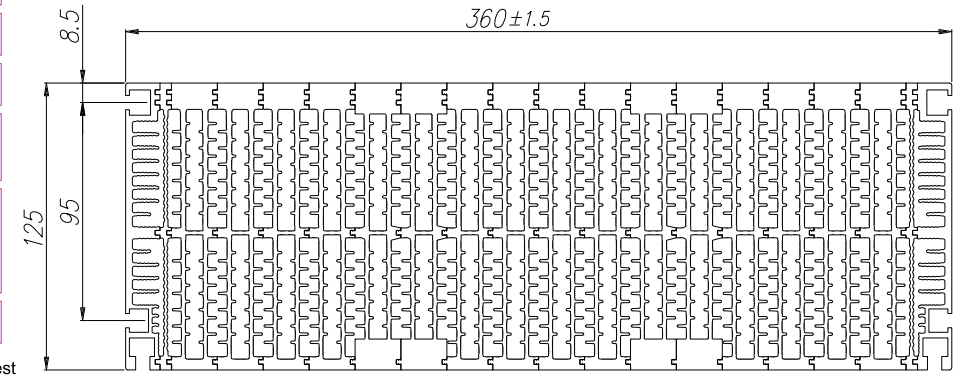
Ventilazione forzata
Forced ventilation

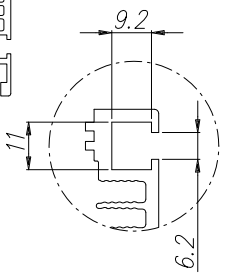
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6

Rt °C/W 0.016

DImenslon H on request





Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

TECNOAL BOLOGNA - ITALY

B

I 125W10A

Peso Kg/m
Weight Kg/m 53.10

Ventilazione forzata
Forced ventilation

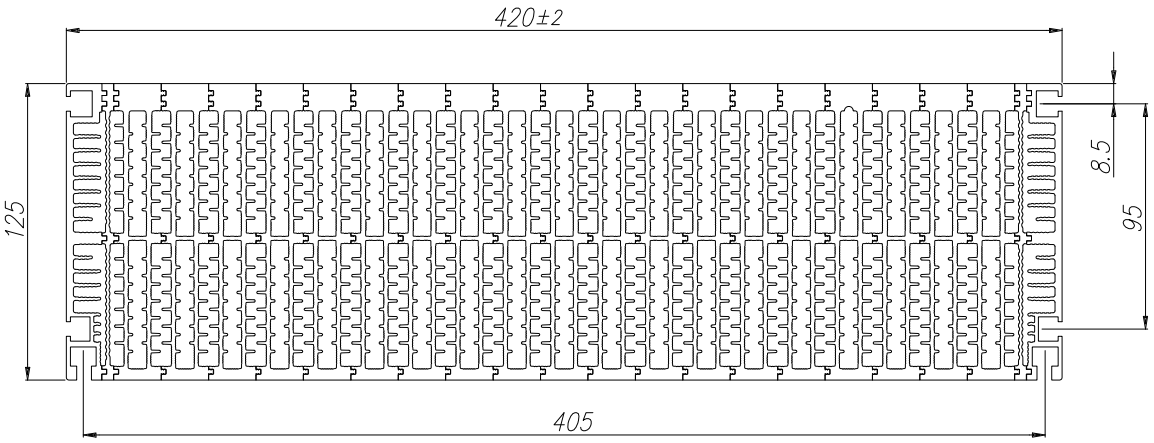
Lung. campione mm
Sample length mm
300

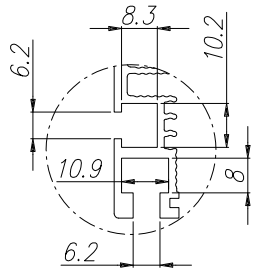
Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6

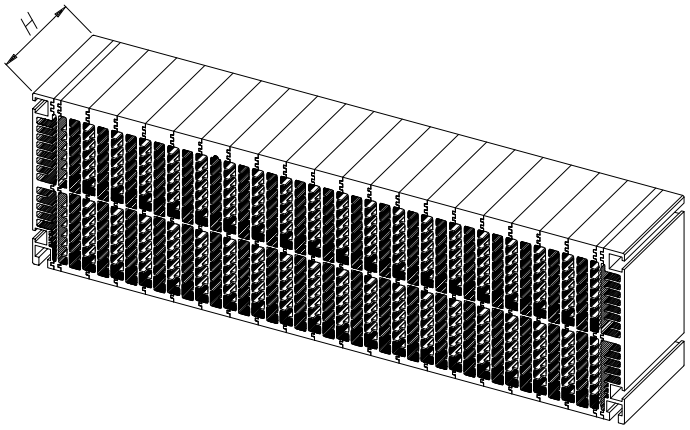
Rt °C/W 0.014

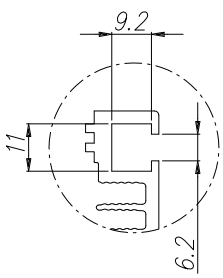
Dimension H on request

I 125S (CODE OLD)





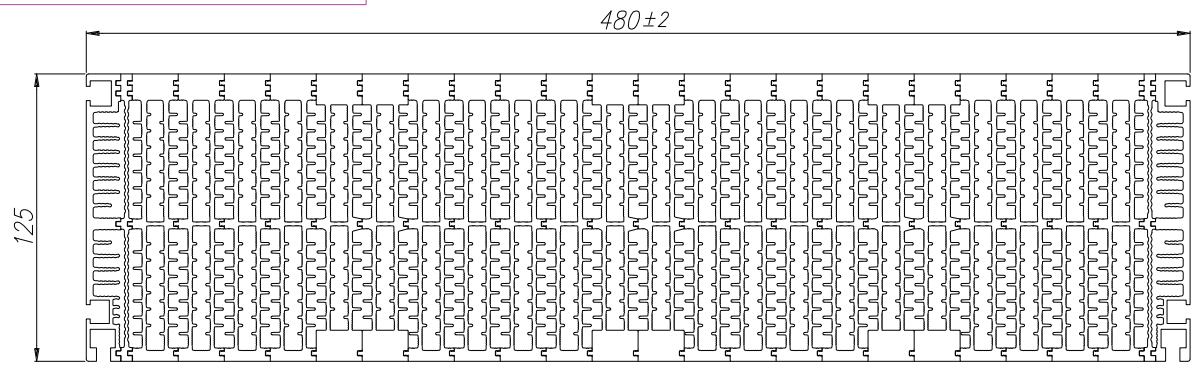




TECNOAL BOLOGNA - ITALY

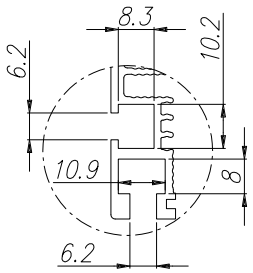
I 125W11A	Peso Kg/m Weight Kg/m 63.85	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6	Rt °C/W 0.012

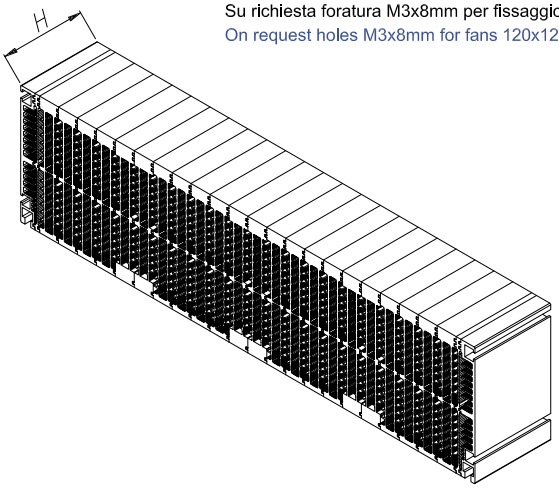
I 125T (CODE OLD)

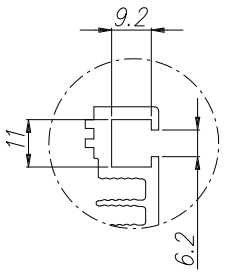


A

Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

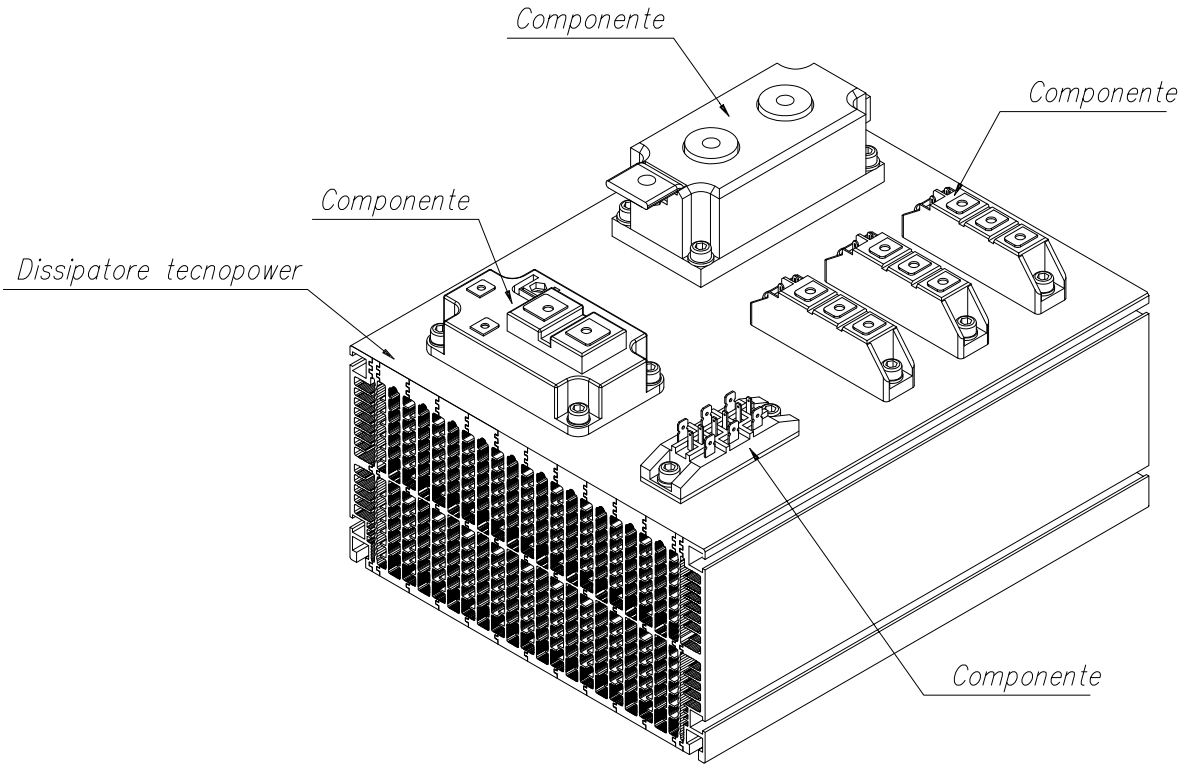






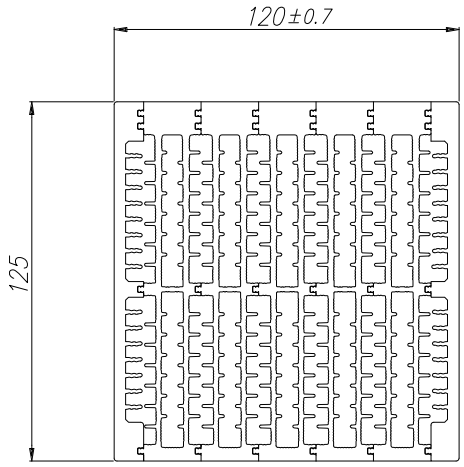
Dimension H on request

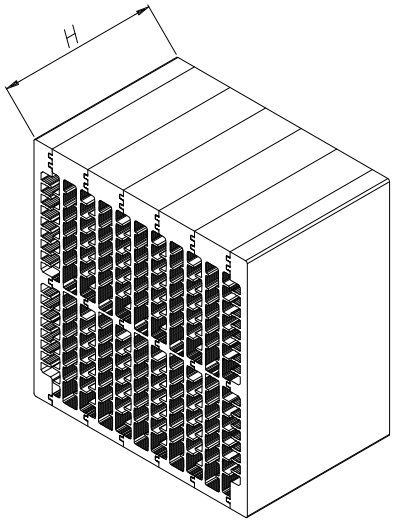
TECNOAL BOLOGNA - ITALY

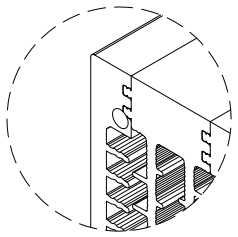


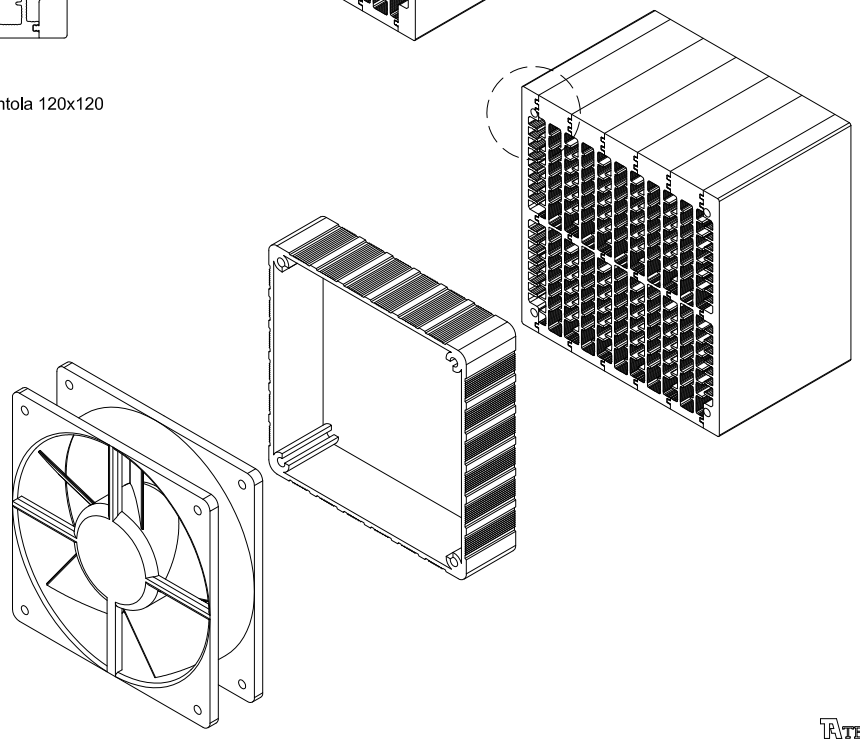
A

I 125W1B	Peso Kg/m Weight Kg/m 16.80	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.047









Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

TECNOAL BOLOGNA - ITALY

B

I 125W3B

Peso Kg/m
Weight Kg/m 17.55

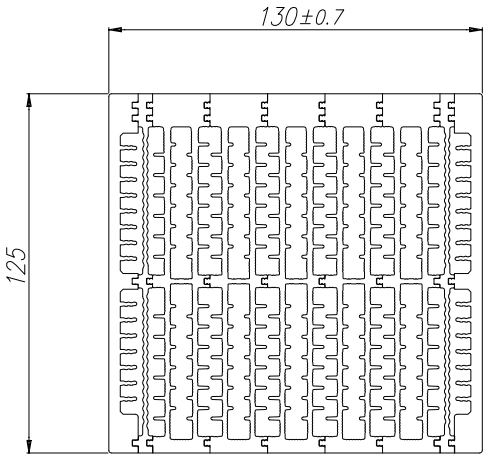
Ventilazione forzata
Forced ventilation

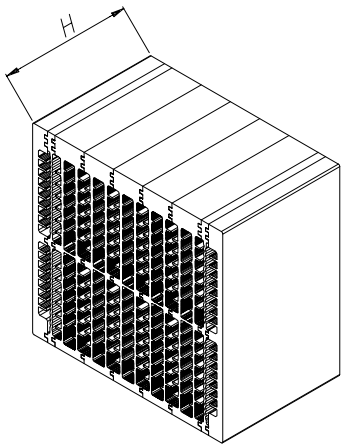
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6.0

Rt °C/W 0.046

Dimension H on request





Dimension H on request

TECNOAL BOLOGNA - ITALY

I 125W3BA

Peso Kg/m
Weight Kg/m 18.30

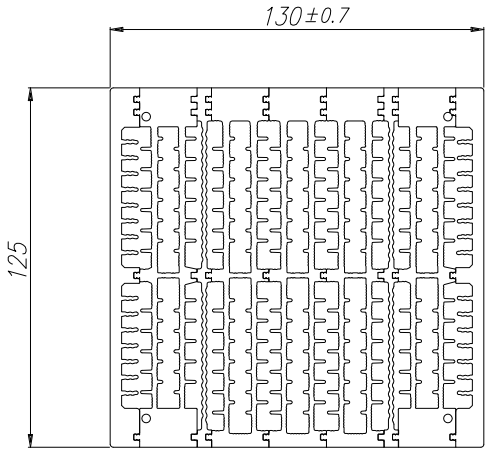
Ventilazione forzata
Forced ventilation

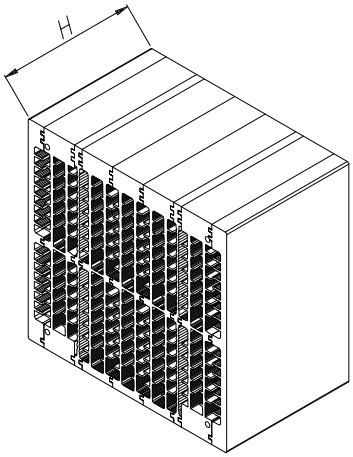
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6.0

Rt °C/W 0.044

Dimension H on request





A

Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

TECNOAL BOLOGNA - ITALY

I 125W4B

Peso Kg/m
Weight Kg/m 20.40

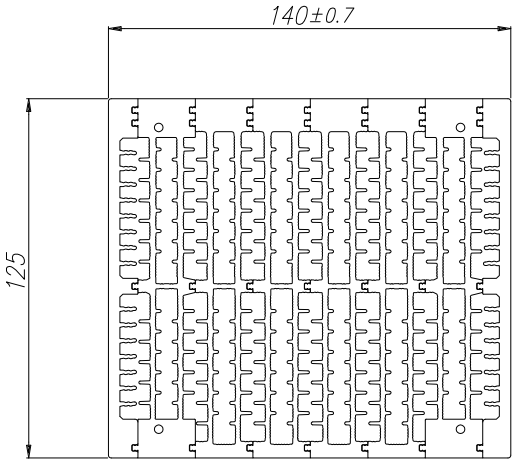
Ventilazione forzata
Forced ventilation

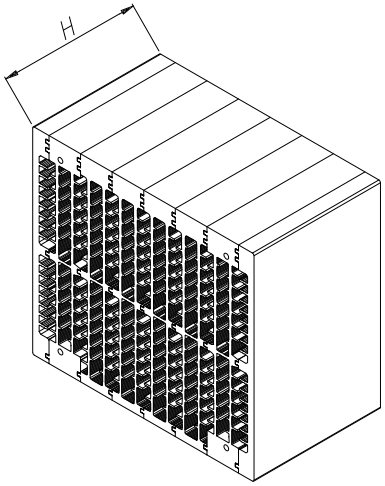
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6.0

Rt °C/W 0.040

Dimension H on request





B

Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

TECNOAL BOLOGNA - ITALY

I 125W5B

Peso Kg/m
Weight Kg/m 20.80

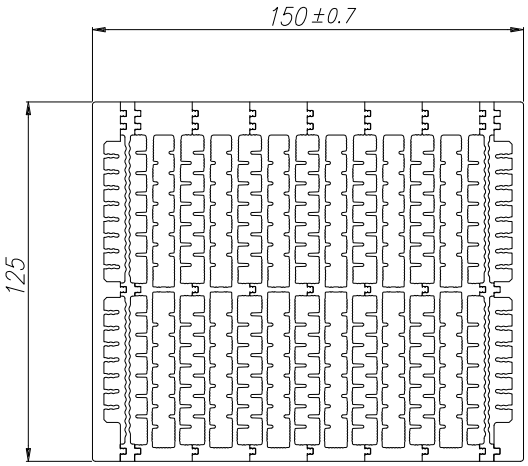
Ventilazione forzata
Forced ventilation

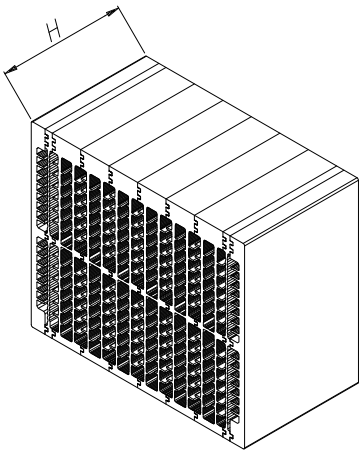
Lung. campione mm
Sample length mm
300

Velocità dell'aria in uscita (m/sec)
Outgoing air speed (m/sec)
6.0

Rt °C/W 0.038

Dimension H on request



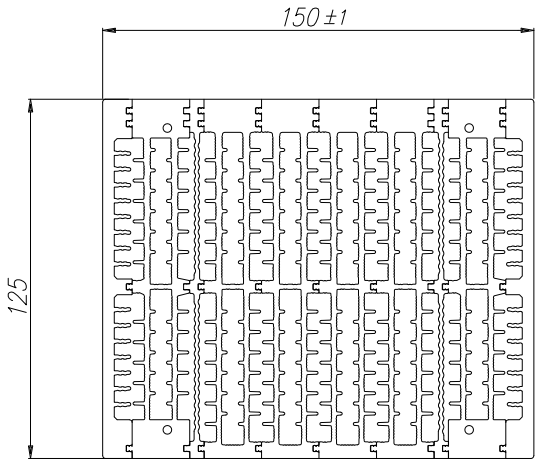


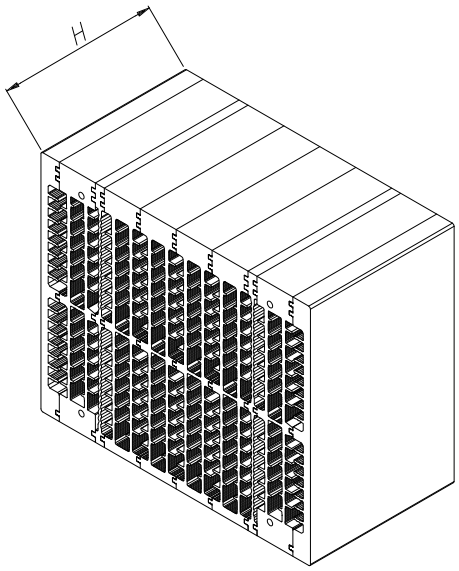
C

TECNOAL BOLOGNA - ITALY

I 125W5BA	Peso Kg/m Weight Kg/m 21.90	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.039

A





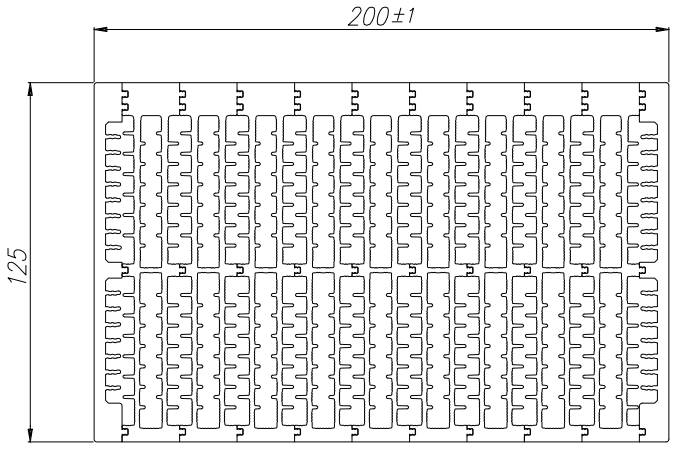
Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

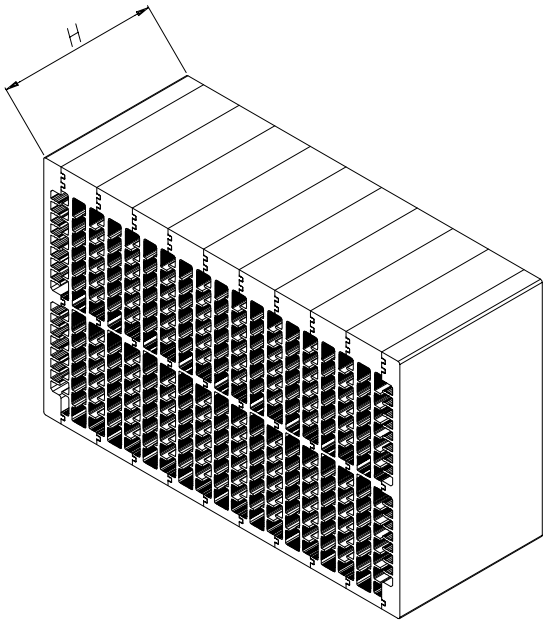
Dimension H on request

TECNOAL BOLOGNA - ITALY

I 125W6B	Peso Kg/m Weight Kg/m 26.90	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.028

B

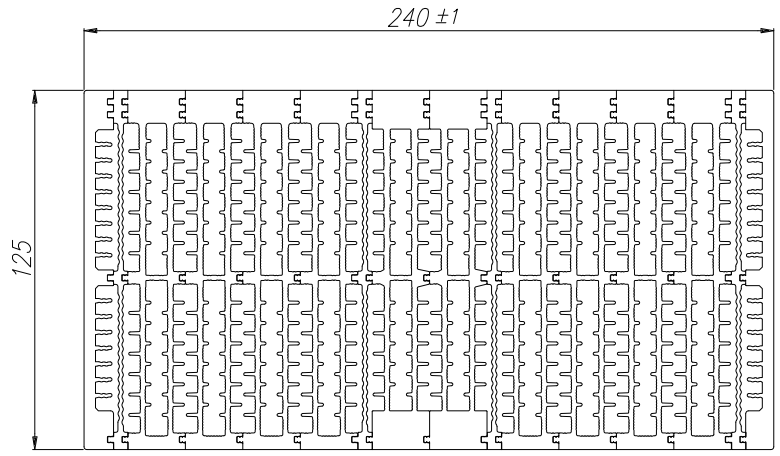


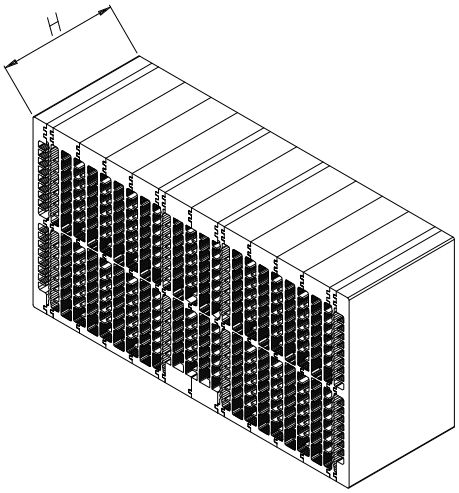


Dimension H on request

TECNOAL BOLOGNA - ITALY

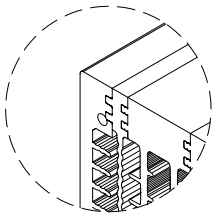
I 125W7B	Peso Kg/m Weight Kg/m 31.90	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.023

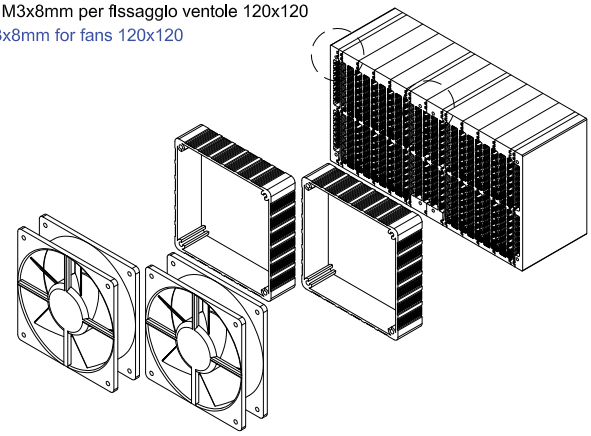


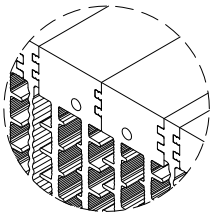


A

Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

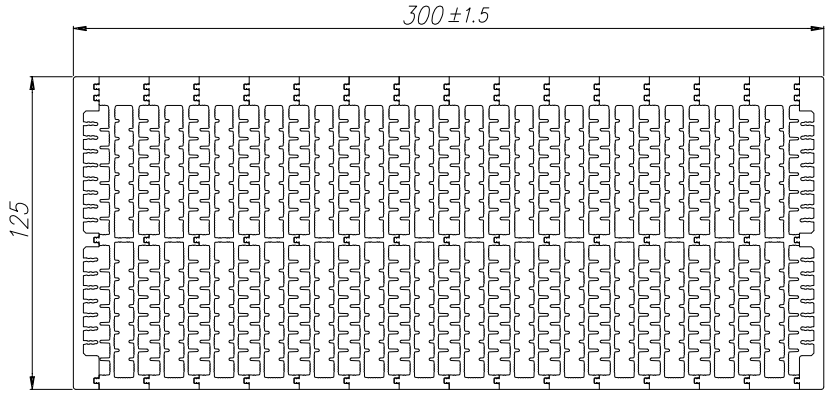


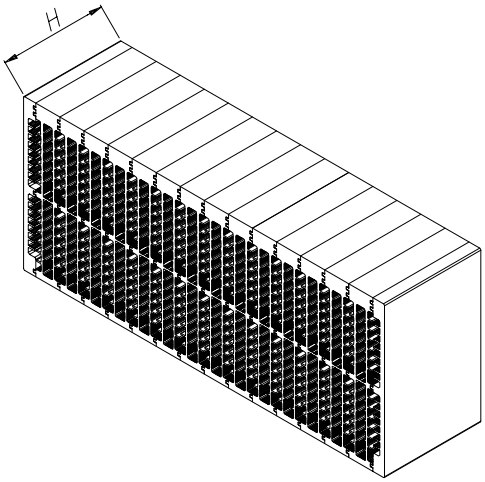




Dimension H on request

I 125W8B	Peso Kg/m Weight Kg/m 39.40	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0193





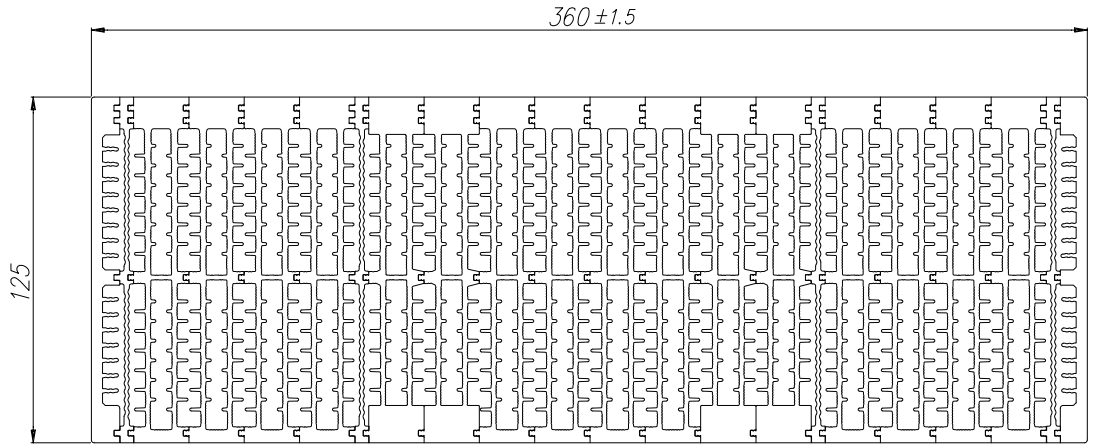
B

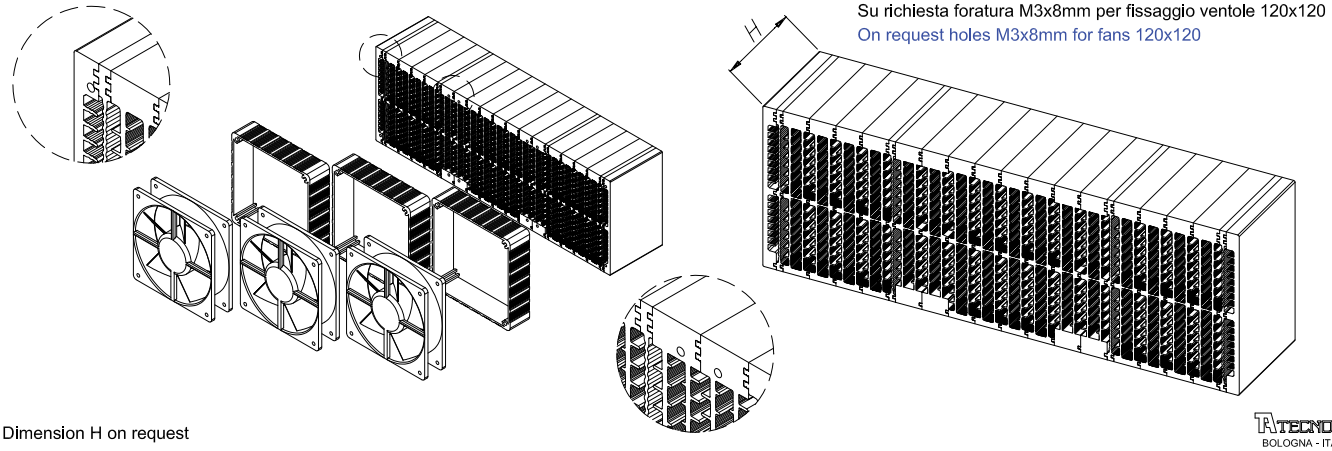
Dimension H on request

TECNOAL BOLOGNA - ITALY

A

I 125W9B	Peso Kg/m Weight Kg/m 49.50	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0153





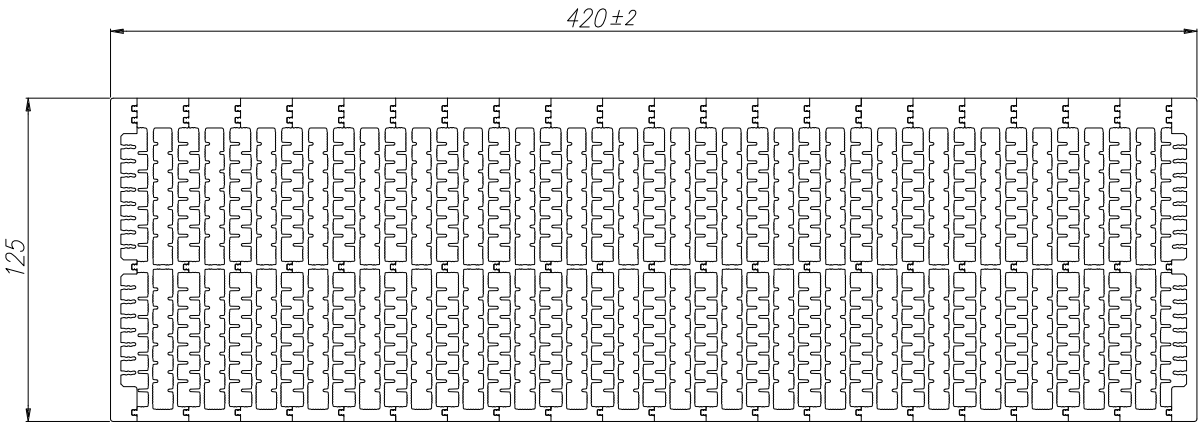
Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

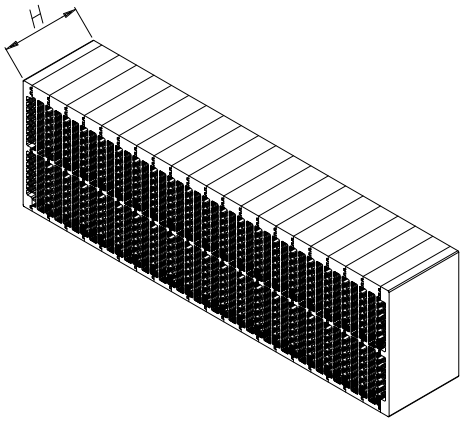
Dimension H on request

TECNOAL BOLOGNA - ITALY

B

I 125W10B	Peso Kg/m Weight Kg/m 54.35	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0135



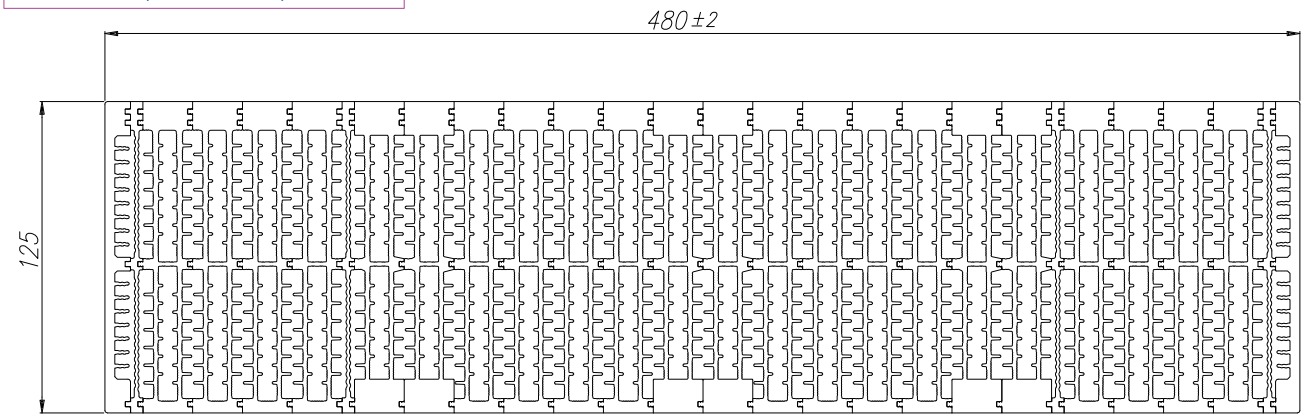


Dimension H on request

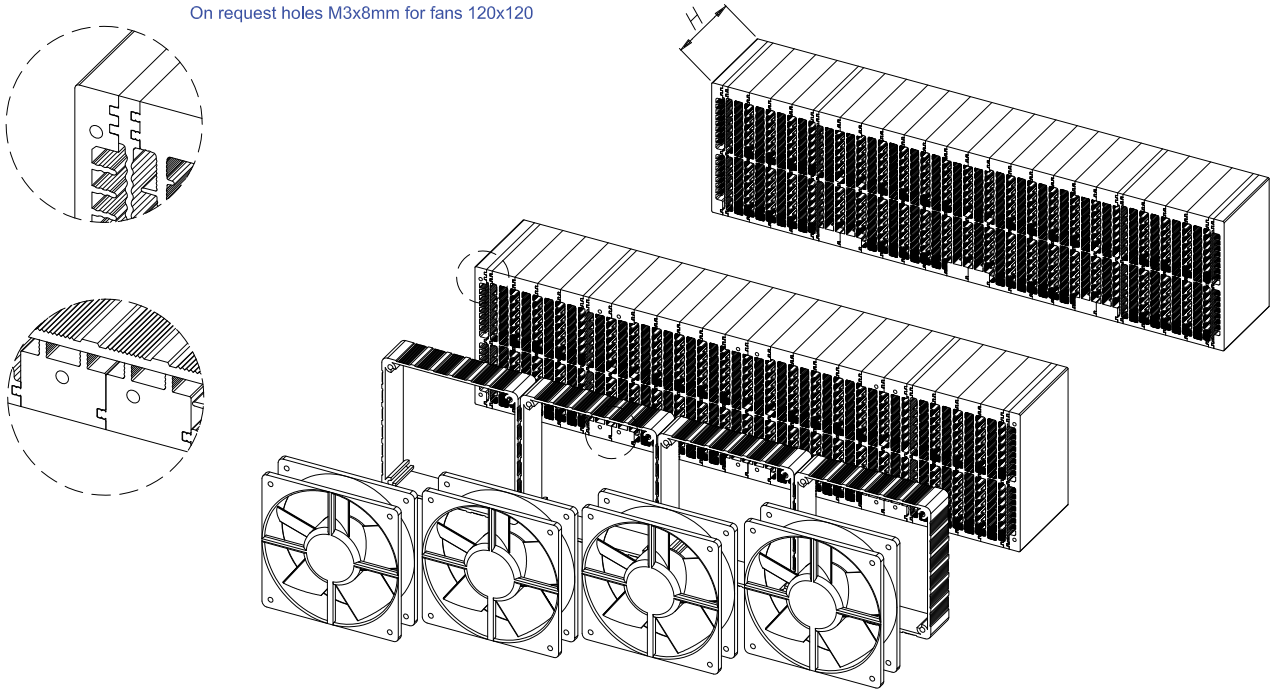
TECNOAL BOLOGNA - ITALY

I 125W11B	Peso Kg/m / Weight Kg/m 65.50	Ventilazione forzata / Forced ventilation	Lung. campione mm / Sample length mm 300	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0115

I 125TTC (CODE OLD)



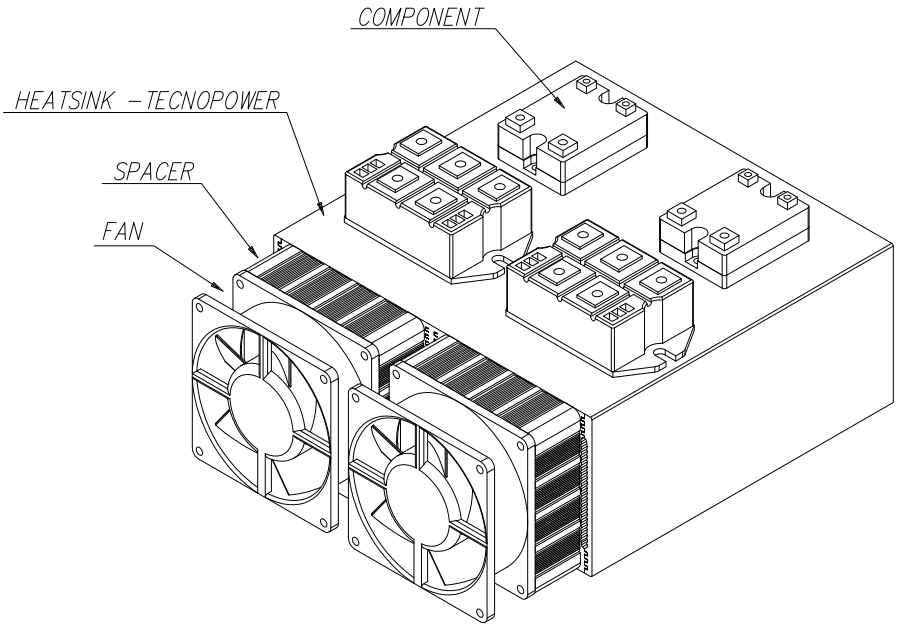
Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120



Dimension H on request

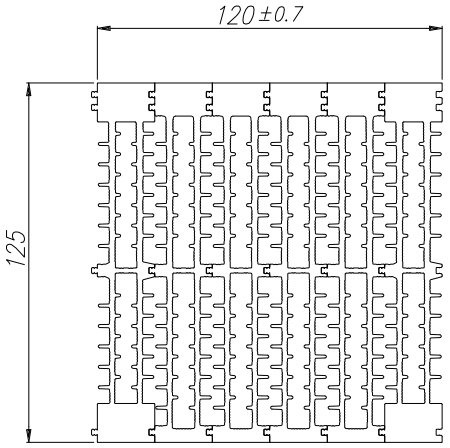
TECNOAL BOLOGNA - ITALY

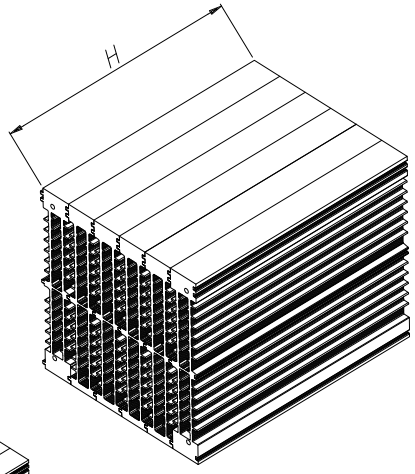
A



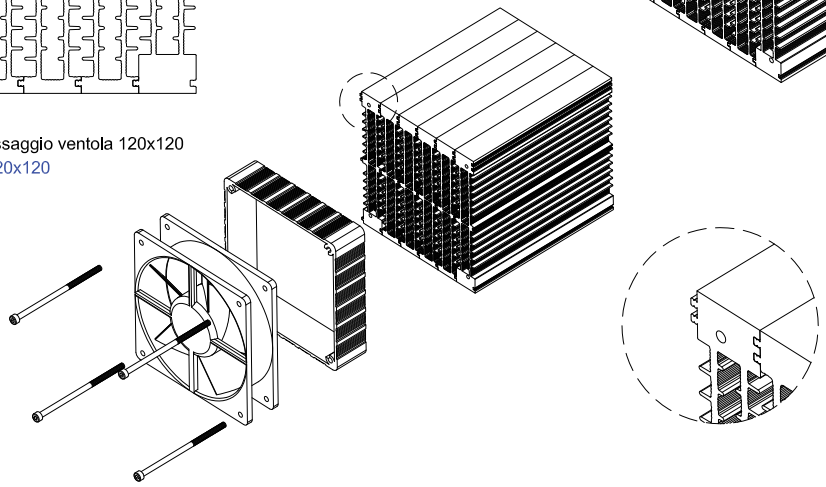
A

I 125W1C	Peso Kg/m Weight Kg/m 16.10	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.046





Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

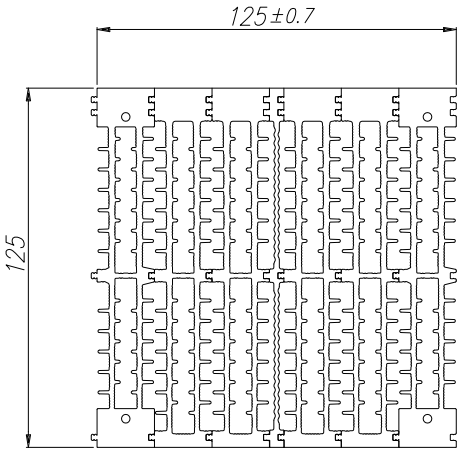


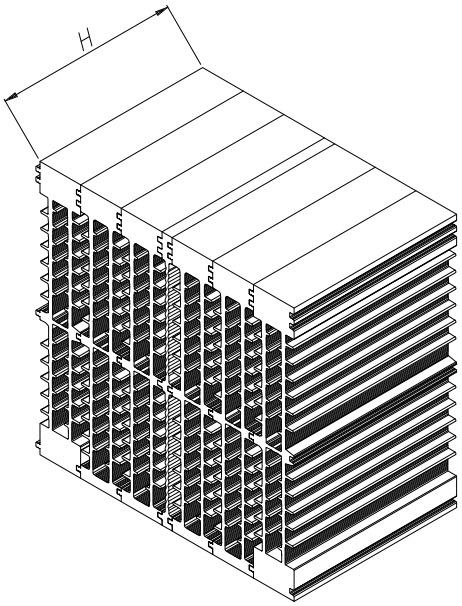
Dimension H on request

TECNOAL BOLOGNA - ITALY

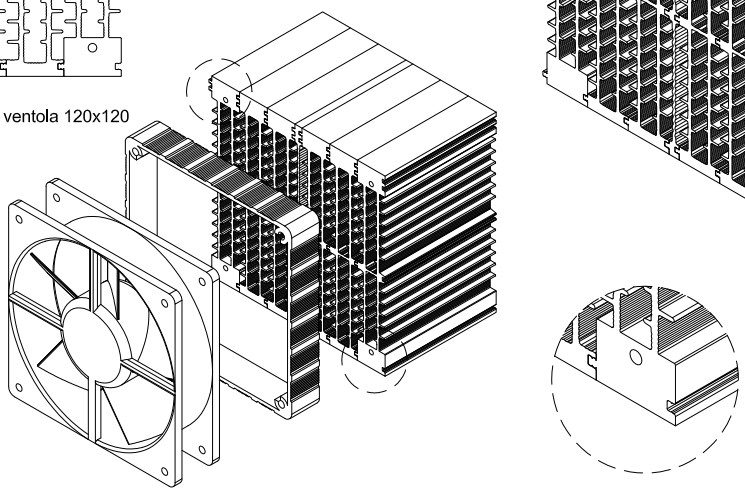
B

I 125W2C	Peso Kg/m Weight Kg/m 16.80	Ventilazione forzata Forced ventilation	Lung. camplone mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.045





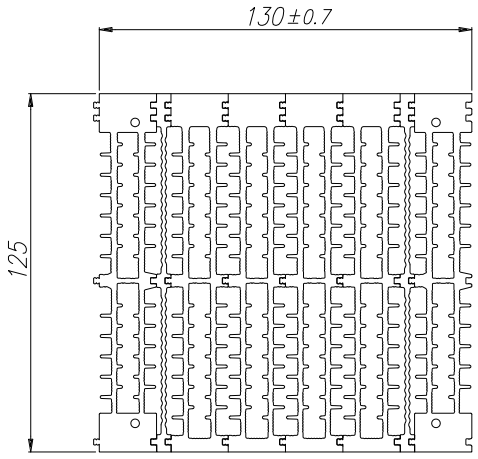
Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

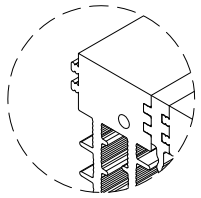


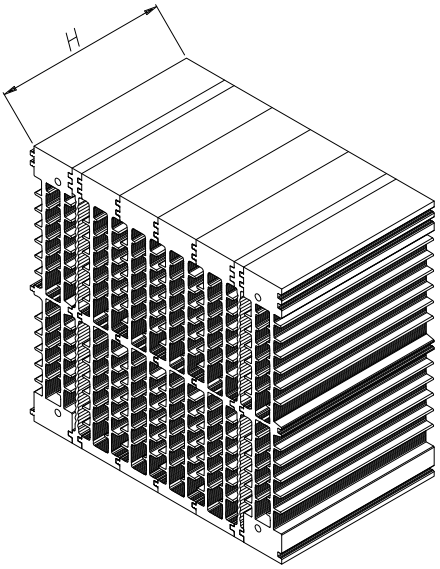
Dimension H on request

TECNOAL BOLOGNA - ITALY

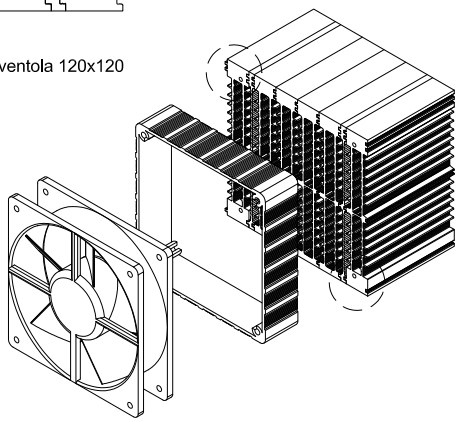
I 125W3C	Peso Kg/m Weight Kg/m 18.20	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.043

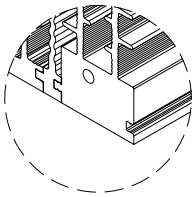






Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120



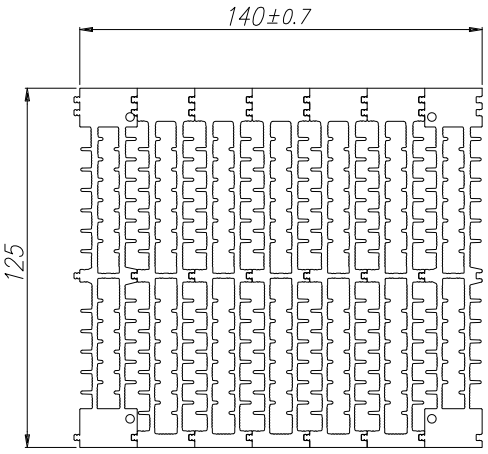


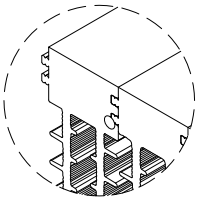
Dimension H on request

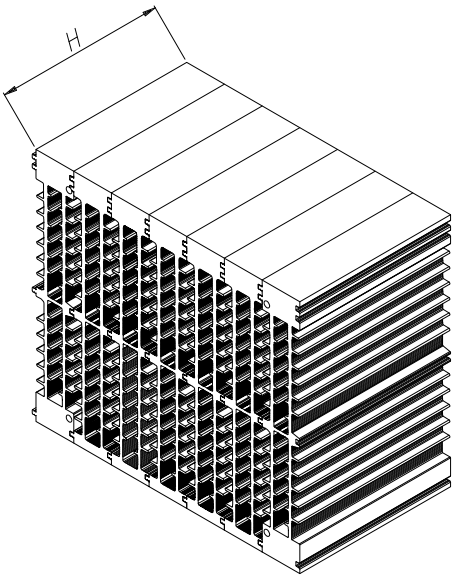
TECNOAL BOLOGNA - ITALY

A

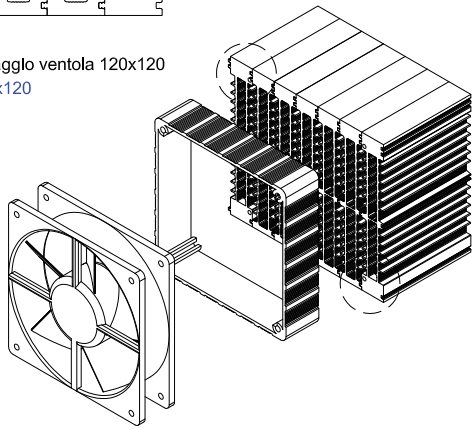
I 125W4C	Peso Kg/m Weight Kg/m 18.6	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.039

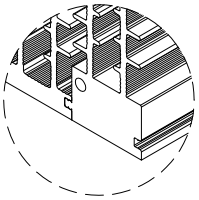






Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120





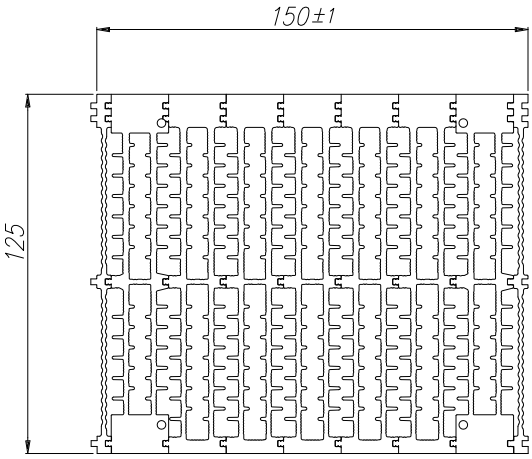
Dimension H on request

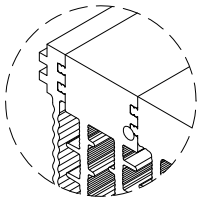
TECNOAL BOLOGNA - ITALY

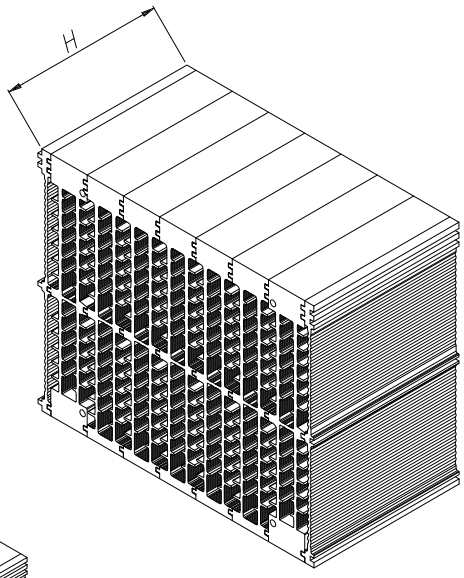
B

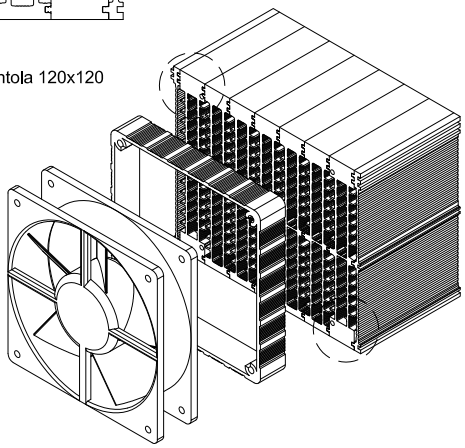
A

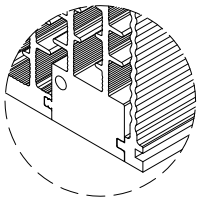
I 125W5C	Peso Kg/m Weight Kg/m 20.10	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.037











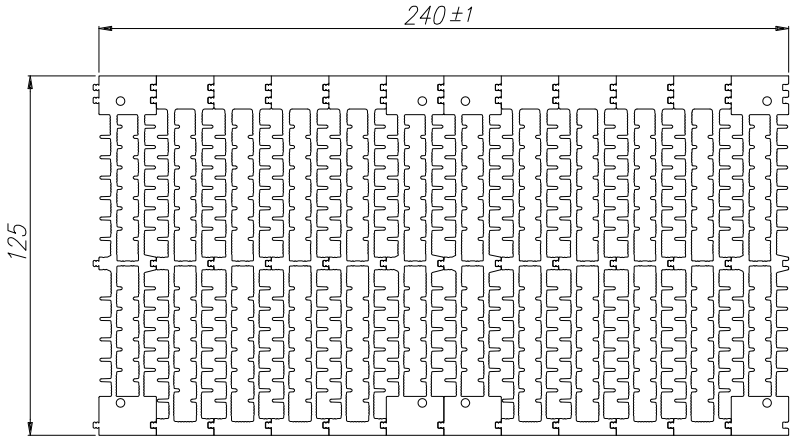
Su richiesta foratura M3x8mm per fissaggio ventola 120x120
On request holes M3x8mm for fan 120x120

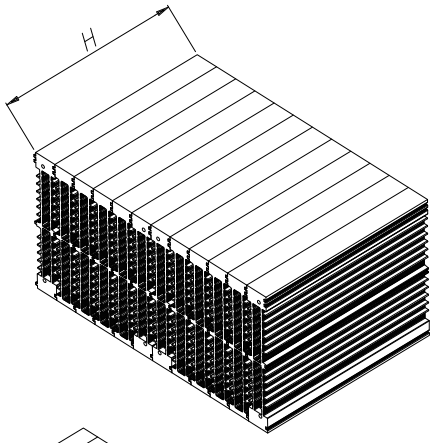
Dimension H on request

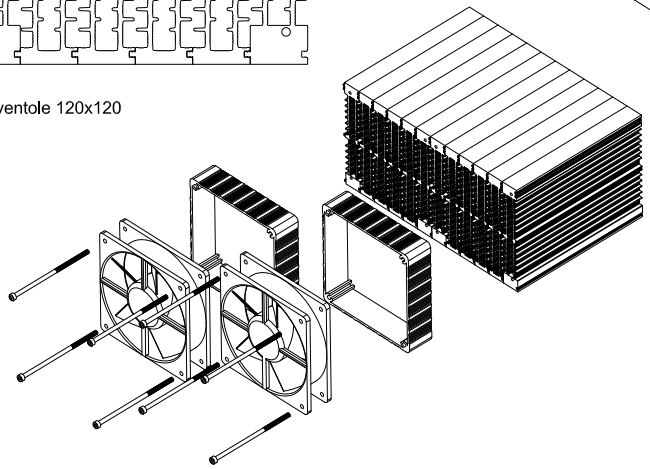
TECNOAL BOLOGNA - ITALY

B

I 125W7C	Peso Kg/m Weight Kg/m 32.20	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.022





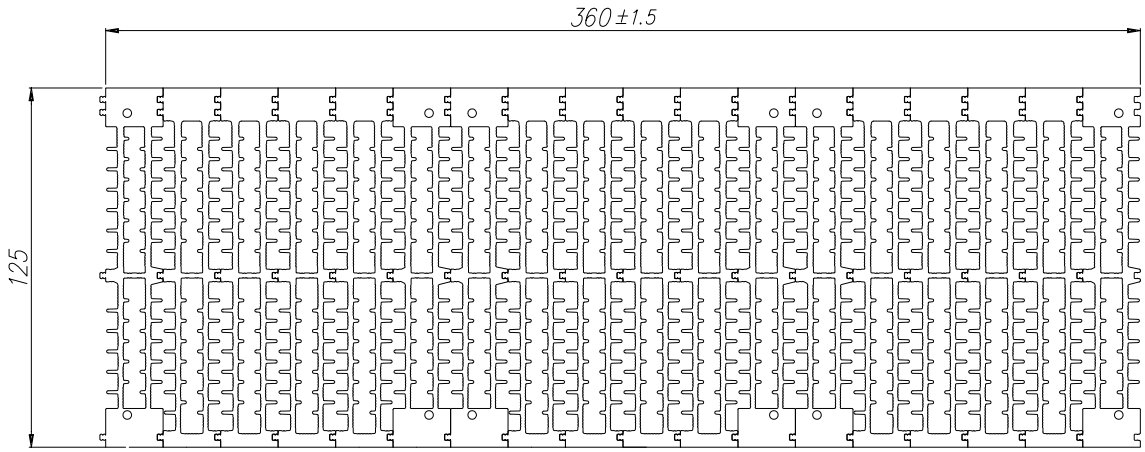


Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

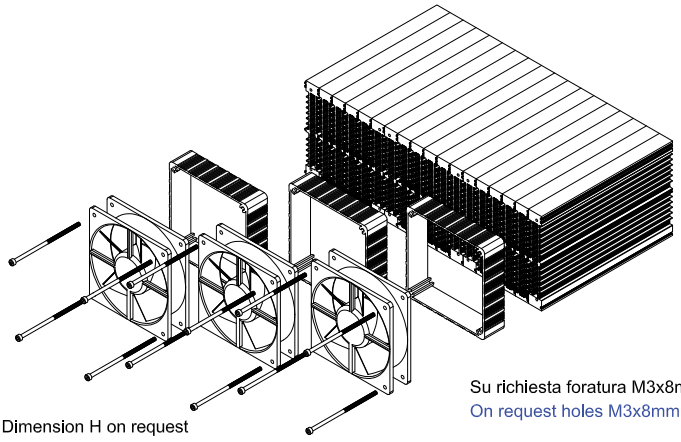
Dimension H on request

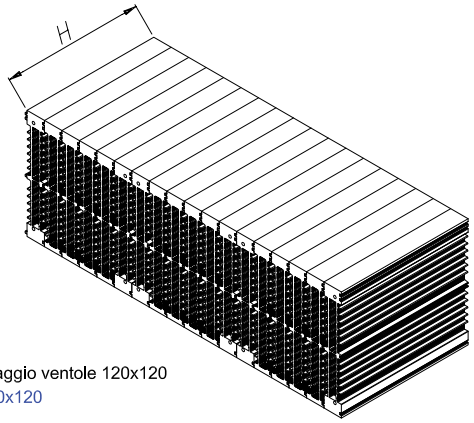
TECNOAL BOLOGNA - ITALY

I 125W9C	Peso Kg/m Weight Kg/m 48.25	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0152



A



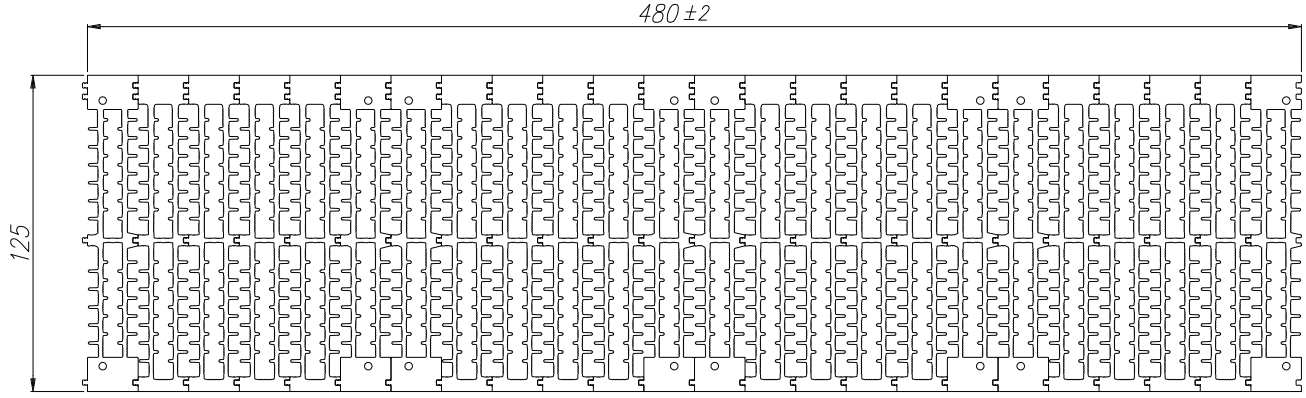


Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

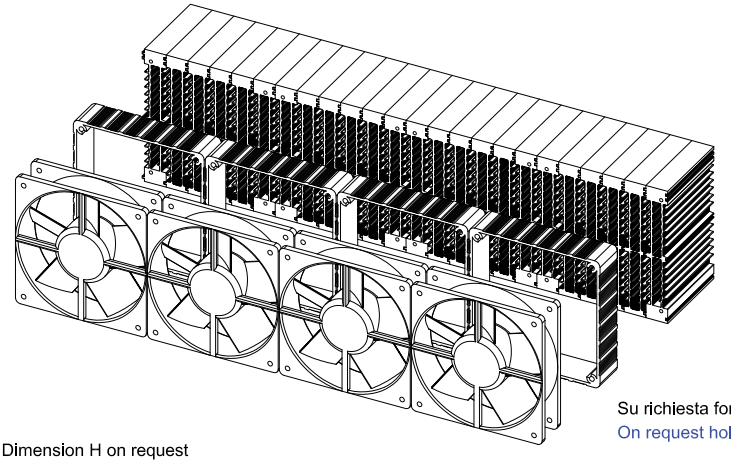
Dimension H on request

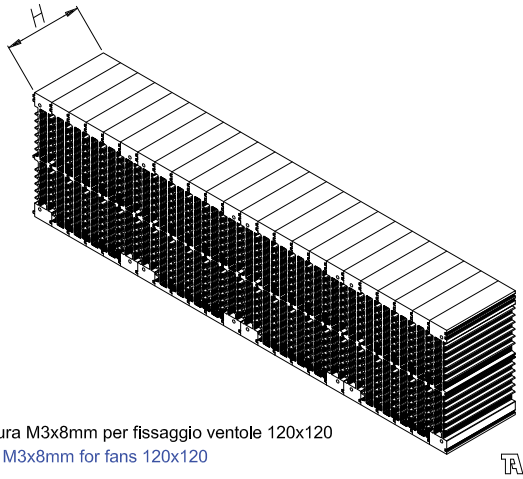
TECNOAL BOLOGNA - ITALY

I 125W11C	Peso Kg/m Weight Kg/m 70.4	Ventilazione forzata Forced ventilation	Lung. campione mm Sample length mm 300	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec) 6.0	Rt °C/W 0.0116



B



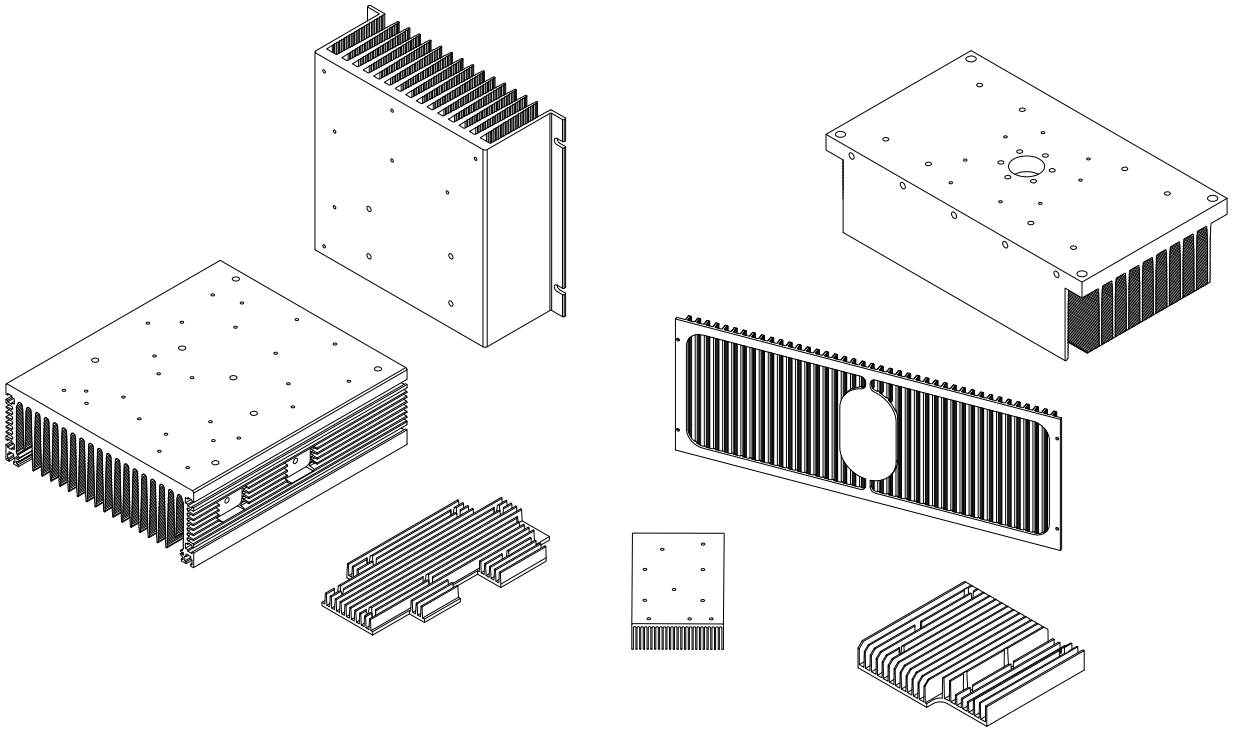


Su richiesta foratura M3x8mm per fissaggio ventole 120x120
On request holes M3x8mm for fans 120x120

Dimension H on request

TECNOAL BOLOGNA - ITALY

PROFILI SERIE "K" DISSIPATORI A "PETTINE"
"COMB" PROFILES SERIES "K"



Le attuali esigenze di dissipazione hanno indotto i progettisti più "tradizionalisti", ad orientarsi su profili aventi dimensioni sempre maggiori, dal momento che con l' estrusione esistono limiti dimensionali.
Tecnoal ha introdotto nel proprio catalogo una vasta gamma di profili di grandi dimensioni ottenuti mediante saldatura.
Recentemente, al fine di ridurre i costi, i tempi produttivi e di garantire il processo di lavorazione è stata inserita una nuova linea di saldatura completamente automatica e computerizzata.
I profili saldati risultano avere caratteristiche meccaniche ed estetiche simili ai profili integrali. In caso di ossidazione anodica la zona saldata avrà una tonalità cromatica leggermente diversa dal resto del pezzo.
Tecnoal è in grado di eseguire anche su tali pezzi tutte le lavorazioni meccaniche, così come sui profili integrali.
Si possono altresì creare dei nuovi profili rispondenti a specifiche esigenze del cliente, qualora i quantitativi lo consentano.
I profili specificati nel presente catalogo sono gestiti a magazzino in barre di lunghezza compresa tra i 3 e i 5m a seconda dei modelli e del relativo peso al metro lineare.
Tecnoal è in grado di fornire il particolare comprensivo di tutte le lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:
1 - Profilo e relativa lunghezza di taglio (Esempio: K500/400 – viene così indicato il profilo K500 tagliato a 400mm).
2 - Quantitativo del lotto di produzione
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali anodizzazione (indicare il colore), alodyne, ecc....

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

The current dissipation requirements focus more traditional designers on profiles with increasing size as with extrusion there are dimensional limits.
Tecnoal has introduced in its catalogue a wide range of large welded profiles.
Recently, in order to reduce costs, production lead time and to grant the quality of the manufacturing process, it was started a new welding line completely automatic and computerized.
The welded profiles have mechanical and aesthetic features similar to the full profiles. In case of anodic oxidation welded area will have a slightly different tone color from the rest of the piece.
Tecnoal is able to make on these pieces all machining as well as on full profiles.
New profiles can be designed to meet specific customers request depending on quantities requested.
All profiles of this series are stored in bars with length between 3 and 5 meters depending to the model and relative linear weight.
Tecnoal is able to provide this series including all machining and any surface treatments.
For quotations please provide the following informations:
1 - Profile and relevant length (Example: K500/400 – Specifies the profile K500 cut to 400mm).
2 - Quantity of batch production.
3 - Any machining, to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne, etc...

Our commercial and technical office is at your disposal for any clarification.

TECNOAL
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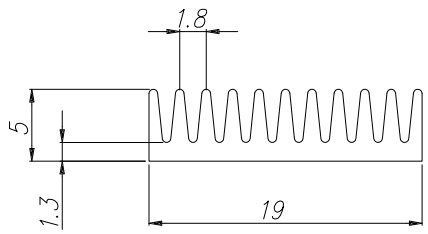
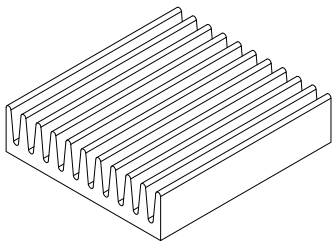
K19

Peso Kg/m Weight Kg/m	0.15	Rt °C/W	9	Lung. campione mm Sample length mm	50



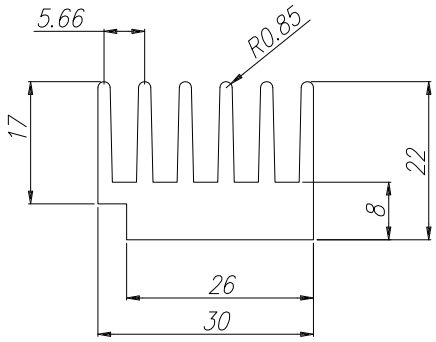


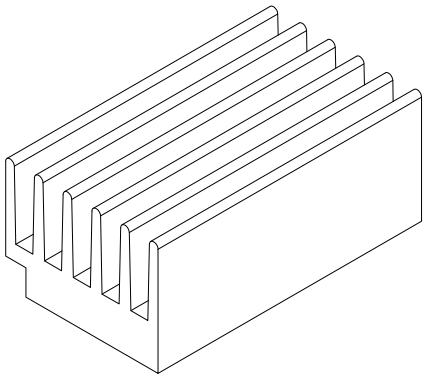
A

TECNOAL BOLOGNA - ITALY

K30

Peso Kg/m Weight Kg/m	1.04	Rt °C/W	4.8	Lung. campione mm Sample length mm	100



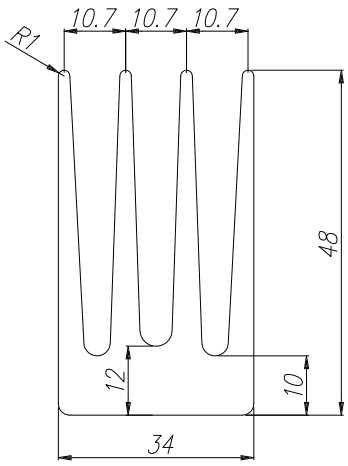


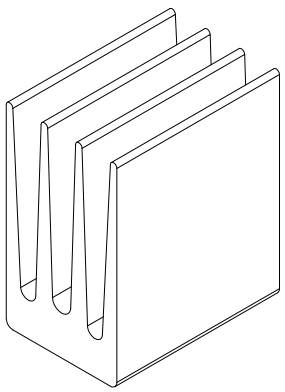
B

TECNOAL BOLOGNA - ITALY

K34

Peso Kg/m Weight Kg/m	2.85
Rt °C/W	1.65
Lung. campione mm Sample length mm	100



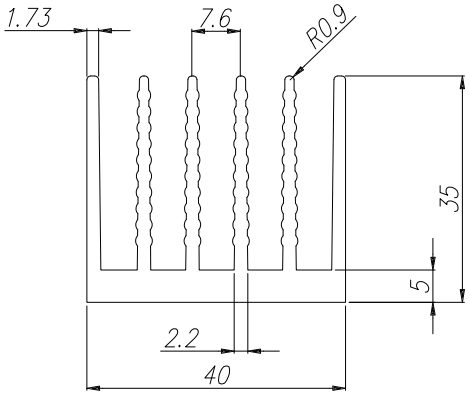


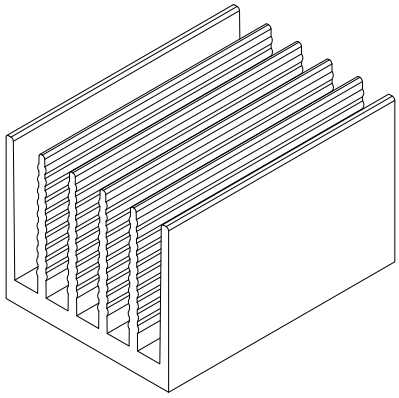
C

TECNOAL BOLOGNA - ITALY

K40

Peso Kg/m Weight Kg/m	1.53
Rt °C/W	3.9
Lung. campione mm Sample length mm	100



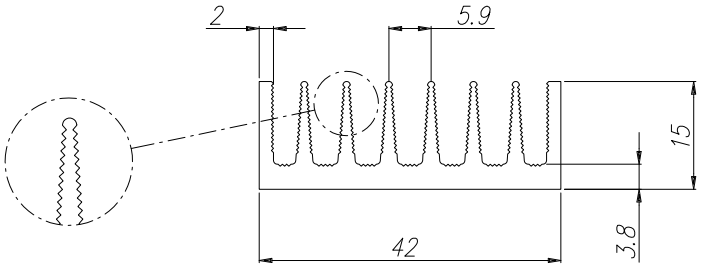


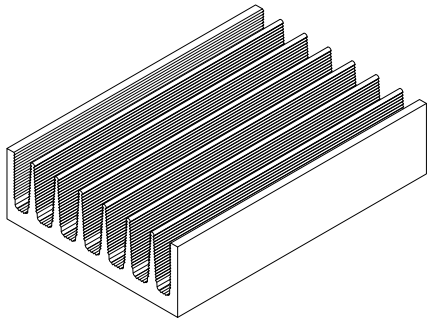
D

TECNOAL BOLOGNA - ITALY

A

K42	Peso Kg/m Weight Kg/m 0.95	Rt °C/W 4.2	Lung. campione mm Sample length mm 100

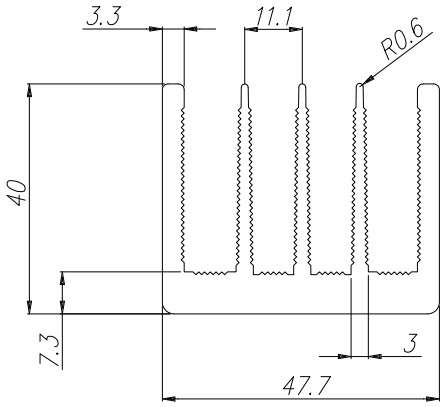


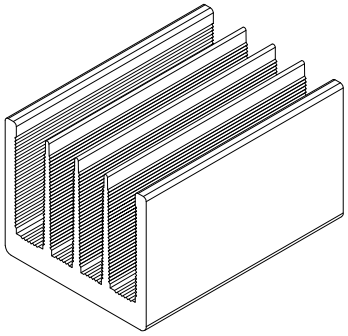


TECNOAL BOLOGNA - ITALY

B

K48	
Peso Kg/m Weight Kg/m	2.00
Rt °C/W	2.1
Lung. campione mm Sample length mm	100

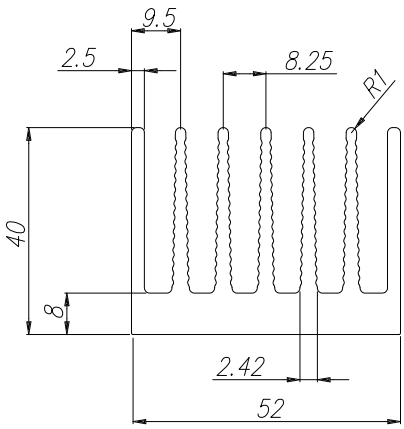


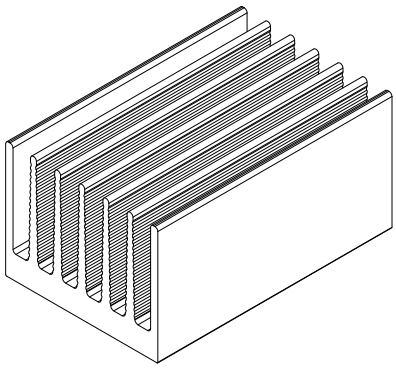


TECNOAL BOLOGNA - ITALY

C

K52	
Peso Kg/m Weight Kg/m	2.50
Rt °C/W	2.0
Lung. campione mm Sample length mm	100

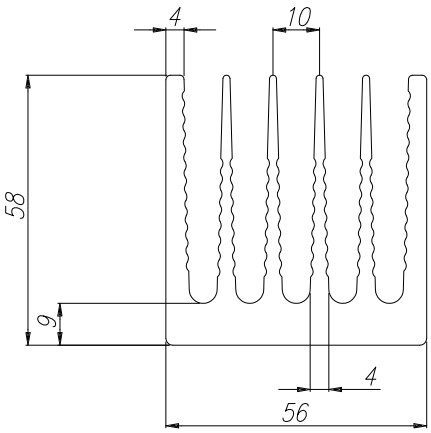


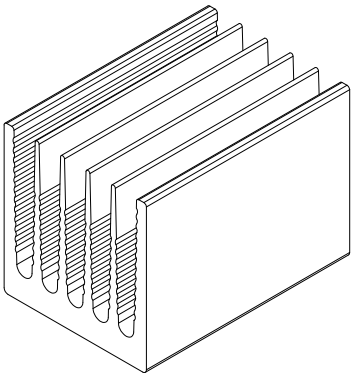


TECNOAL BOLOGNA - ITALY

D

K56	
Peso Kg/m Weight Kg/m	3.90
Rt °C/W	1.6
Lung. campione mm Sample length mm	100

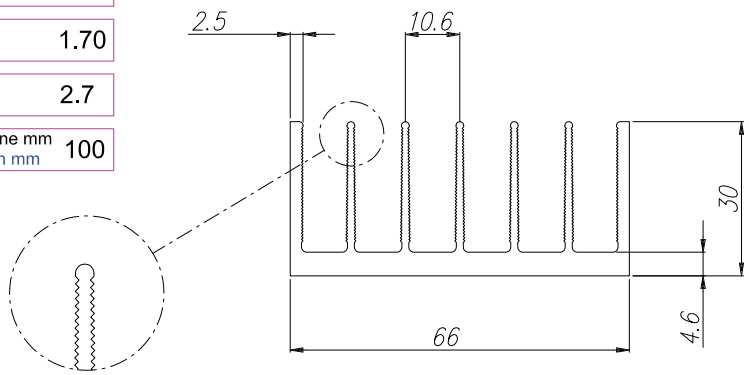


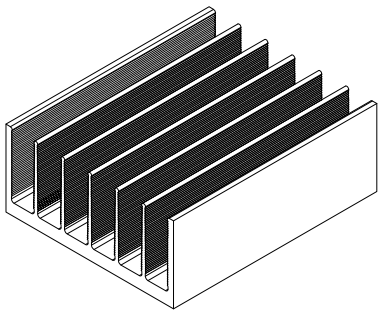


TECNOAL BOLOGNA - ITALY

K65

Peso Kg/m Weight Kg/m	1.70
Rt °C/W	2.7
Lung. campione mm Sample length mm	100



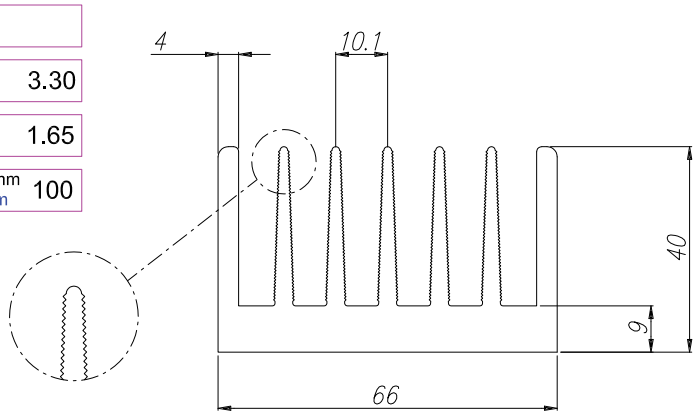


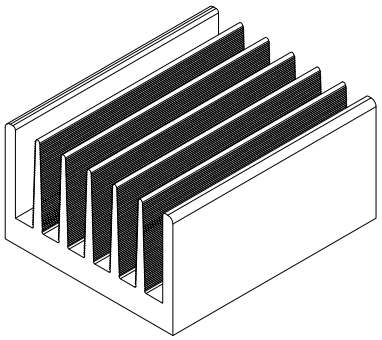
A

TECNOAL BOLOGNA - ITALY

K66B

Peso Kg/m Weight Kg/m	3.30
Rt °C/W	1.65
Lung. campione mm Sample length mm	100



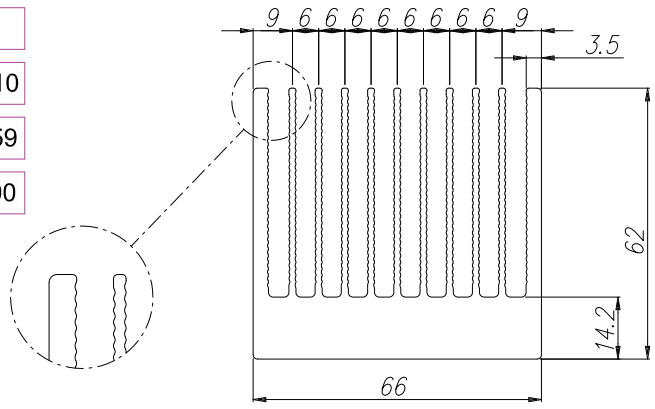


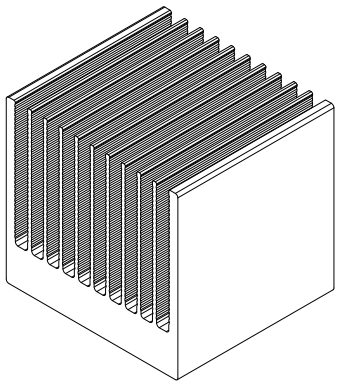
B

TECNOAL BOLOGNA - ITALY

KA66

Peso Kg/m Weight Kg/m	5.10
Rt °C/W	1.59
Lung. campione mm Sample length mm	100





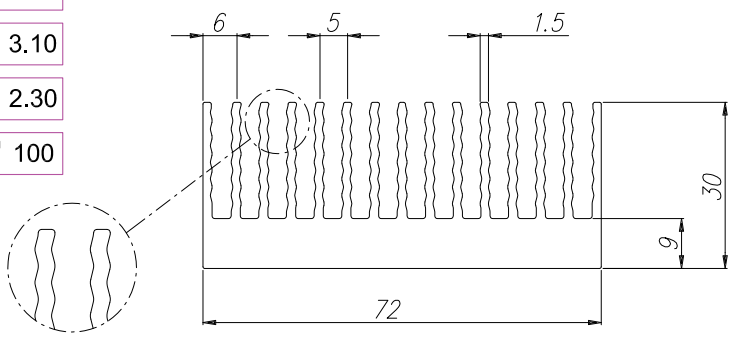
C

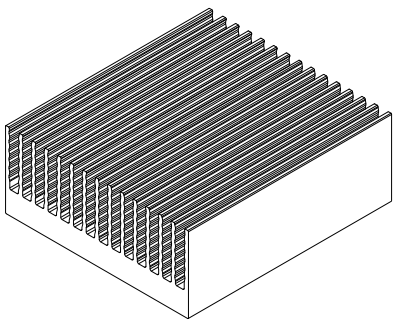
Ventilazione forzata Forced ventilation	Rt °C/W	0.22	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100

TECNOAL BOLOGNA - ITALY

K72

Peso Kg/m Weight Kg/m	3.10
Rt °C/W	2.30
Lung. campione mm Sample length mm	100





D

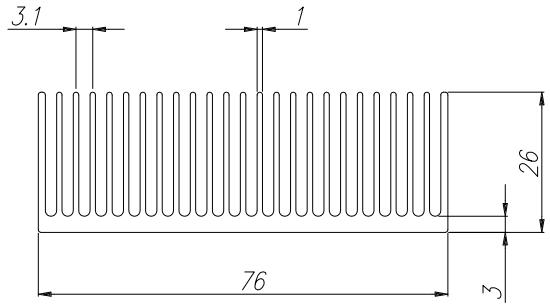
Ventilazione forzata Forced ventilation	Rt °C/W	0.32	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100

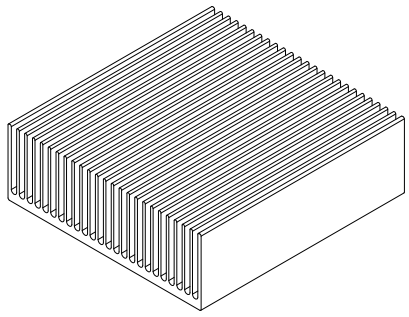
TECNOAL BOLOGNA - ITALY

A

K76

Peso Kg/m Weight Kg/m	2.30
Rt °C/W	1.75
Lung. campione mm Sample length mm	150





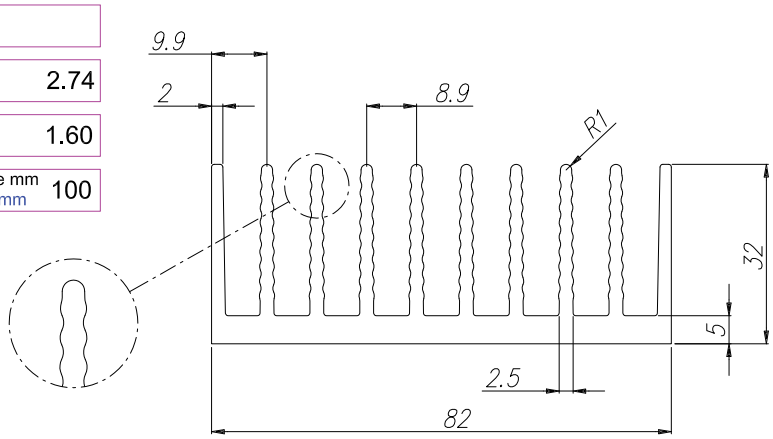
Ventilazione forzata Forced ventilation	Rt °C/W	0.21	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	150

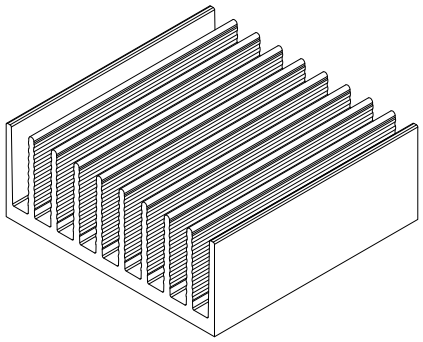
TECNOAL BOLOGNA - ITALY

B

KE82

Peso Kg/m Weight Kg/m	2.74
Rt °C/W	1.60
Lung. campione mm Sample length mm	100



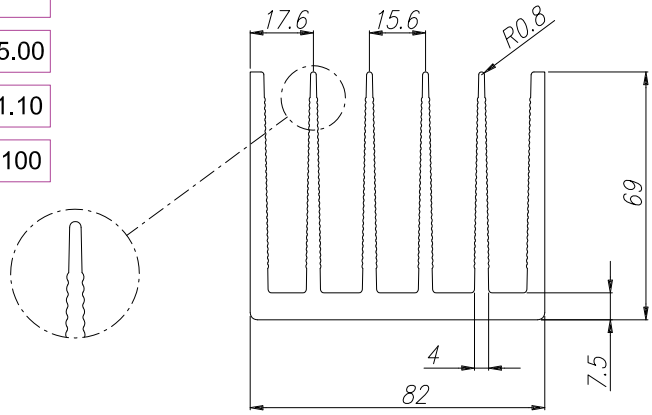


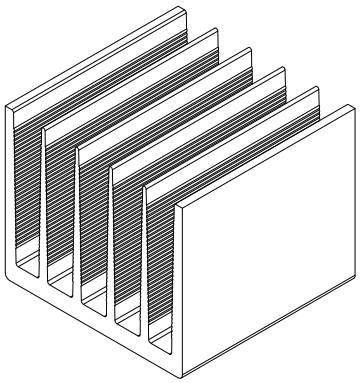
TECNOAL BOLOGNA - ITALY

C

KEA82

Peso Kg/m Weight Kg/m	5.00
Rt °C/W	1.10
Lung. campione mm Sample length mm	100



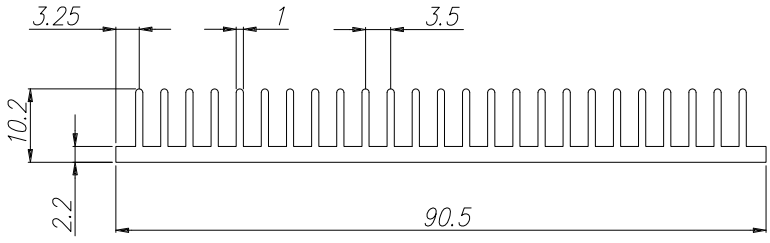


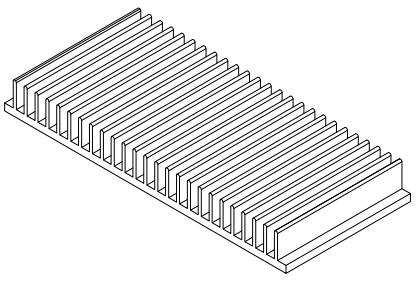
TECNOAL BOLOGNA - ITALY

D

K91

Peso Kg/m Weight Kg/m	1.07	Rt °C/W	3.35	Lung. campione mm Sample length mm	100



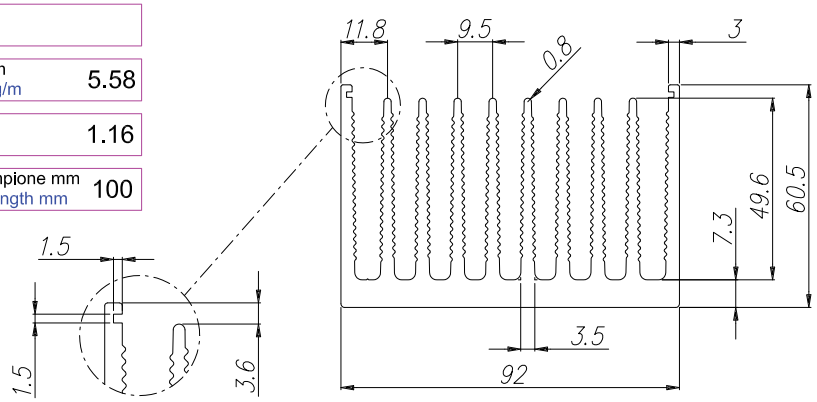


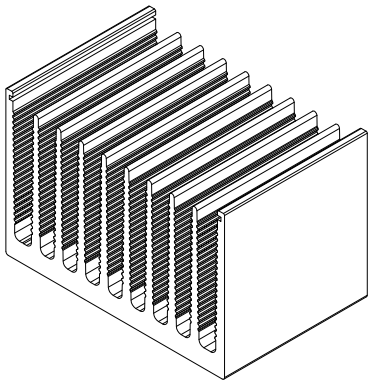
Ventilazione forzata Forced ventilation	Rt °C/W	0.325	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	100

TECNOAL BOLOGNA - ITALY

K92

Peso Kg/m Weight Kg/m	5.58
Rt °C/W	1.16
Lung. campione mm Sample length mm	100





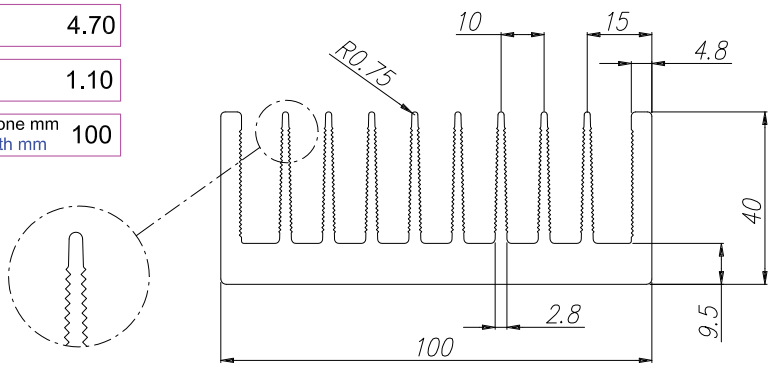
A

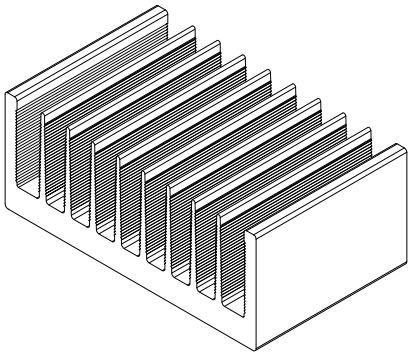
Ventilazione forzata Forced ventilation		Rt °C/W	0.160	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	5.0	Lung. campione mm Sample length mm	100

TECNOAL BOLOGNA - ITALY

K100

Peso Kg/m Weight Kg/m	4.70
Rt °C/W	1.10
Lung. campione mm Sample length mm	100



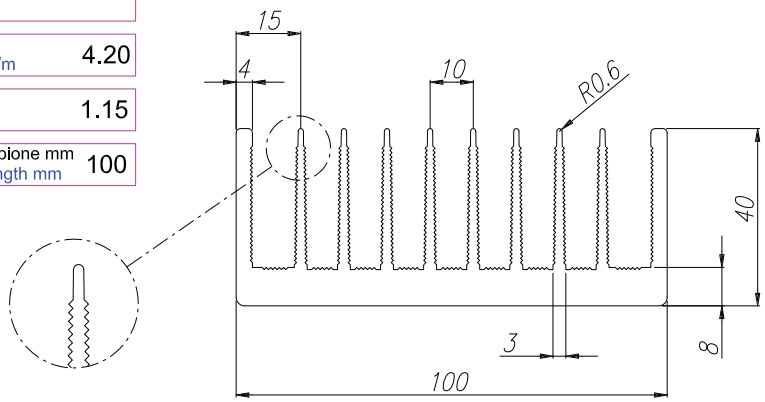


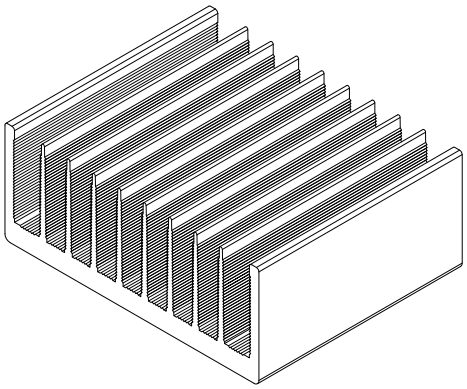
B

TECNOAL BOLOGNA - ITALY

K100A

Peso Kg/m Weight Kg/m	4.20
Rt °C/W	1.15
Lung. campione mm Sample length mm	100



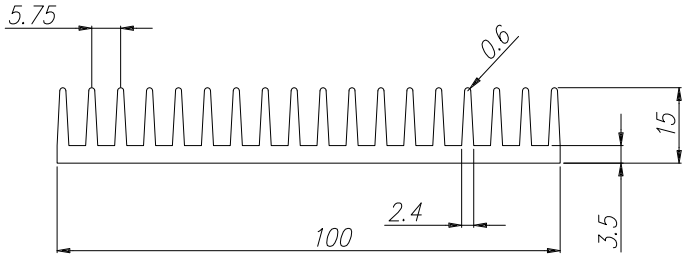


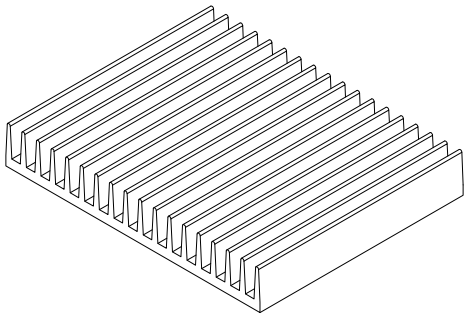
C

TECNOAL BOLOGNA - ITALY

KE100

Peso Kg/m Weight Kg/m	2.15	Rt °C/W	3.0	Lung. campione mm Sample length mm	100



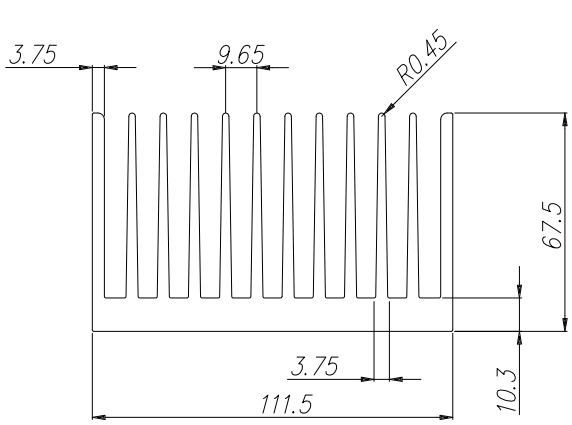


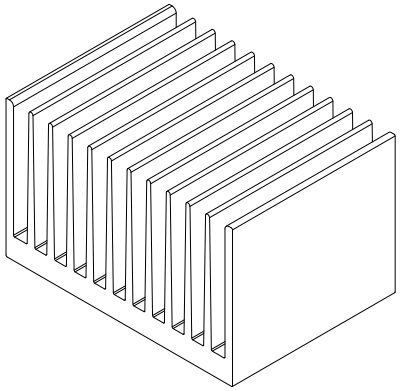
D

TECNOAL BOLOGNA - ITALY

A

K112	
Peso Kg/m	8.70
Rt °C/W	0.90
Lung. campione mm Sample length mm	100

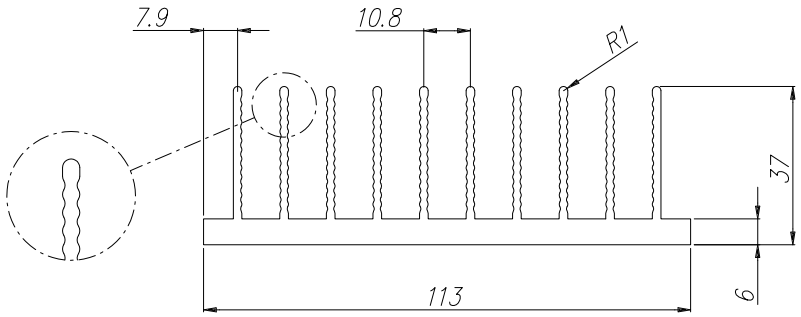


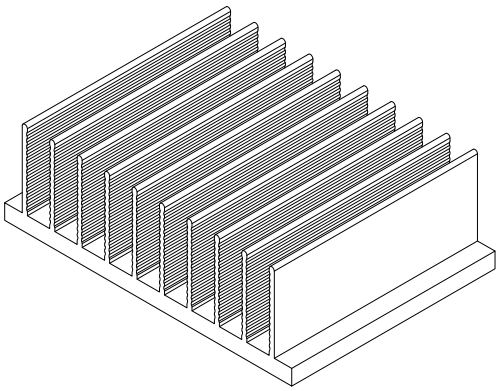


TECNOAL BOLOGNA - ITALY

B

K113	Peso Kg/m Weight Kg/m	3.40	Rt °C/W	1.30	Lung. campione mm Sample length mm	100

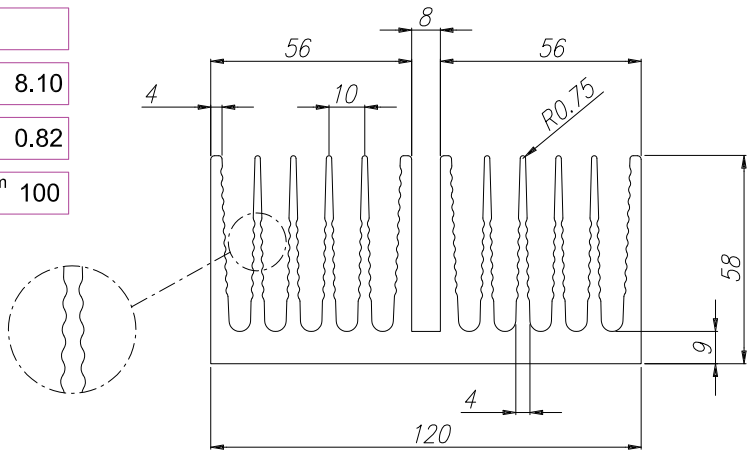


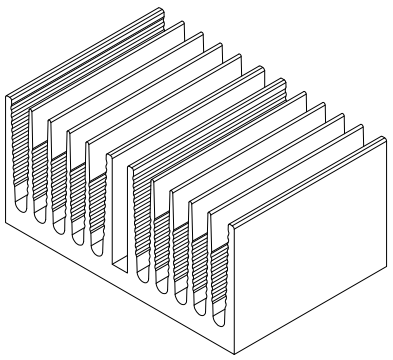


TECNOAL BOLOGNA - ITALY

C

K120	
Peso Kg/m Weight Kg/m	8.10
Rt °C/W	0.82
Lung. campione mm Sample length mm	100

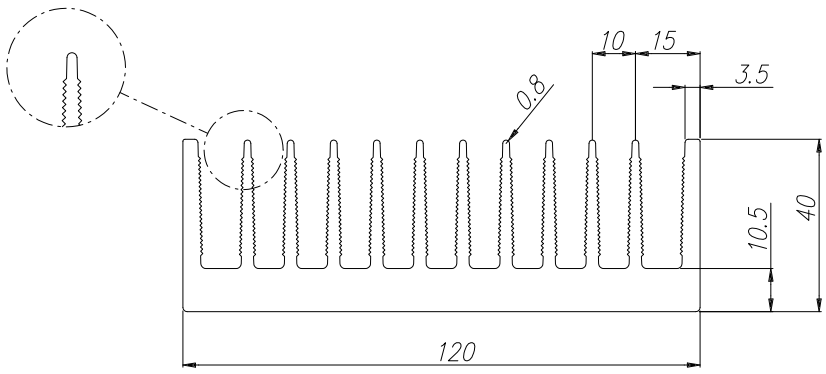


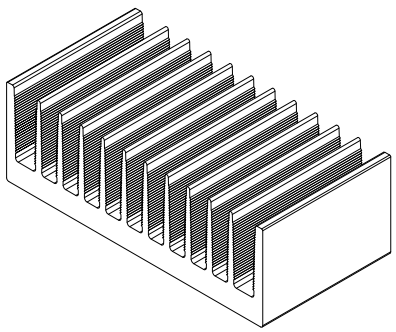


TECNOAL BOLOGNA - ITALY

D

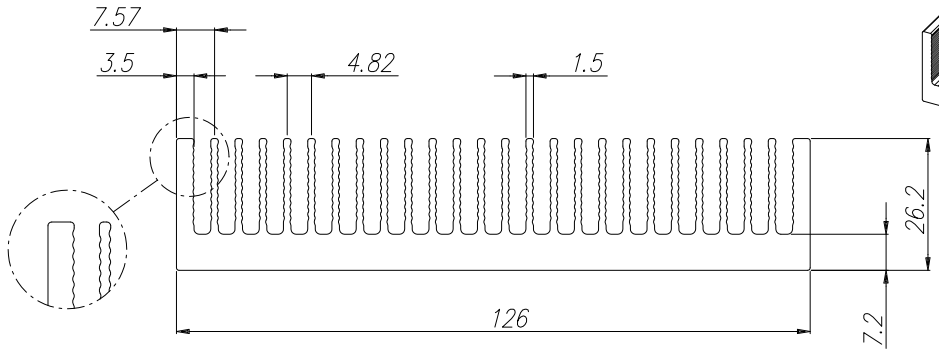
KA120	Peso Kg/m Weight Kg/m	6.00	Rt °C/W	0.88	Lung. campione mm Sample length mm	100

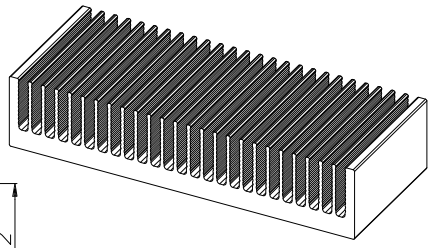




TECNOAL BOLOGNA - ITALY

KF126	Peso Kg/m / Weight Kg/m 4.38	Rt °C/W 0.5	Lung. campione mm / Sample length mm 100



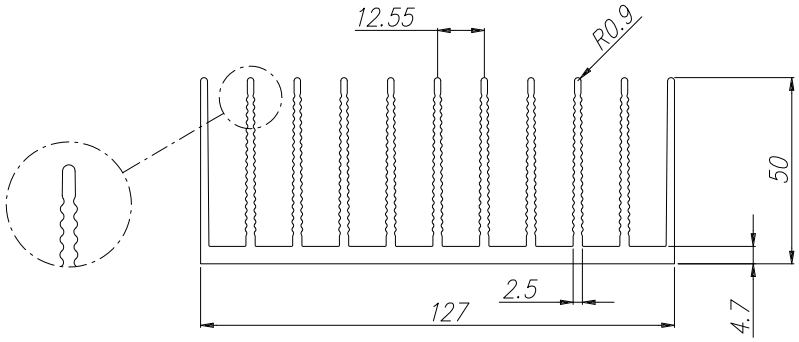


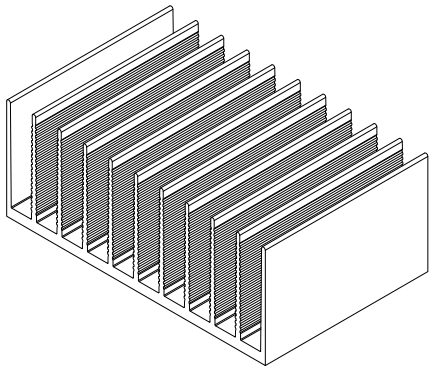
A

Ventilazione forzata / Forced ventilation	Rt °C/W 0.147	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec) 5.0	Lung. campione mm / Sample length mm 100

TECNOAL BOLOGNA - ITALY

K127	Peso Kg/m / Weight Kg/m 4.60	Rt °C/W 1.1	Lung. campione mm / Sample length mm 100

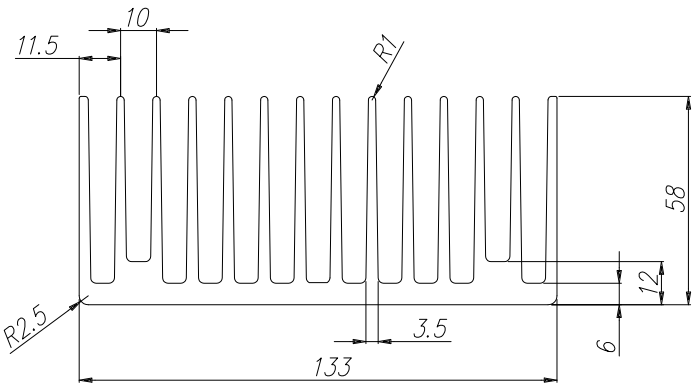


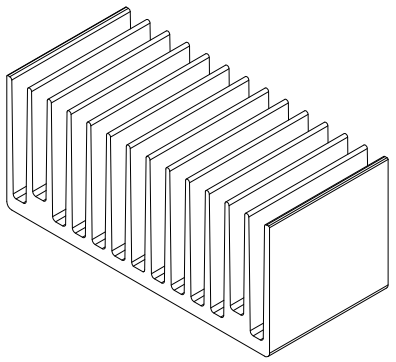


B

TECNOAL BOLOGNA - ITALY

K133	Peso Kg/m / Weight Kg/m 7.53	Rt °C/W 0.78	Lung. campione mm / Sample length mm 100

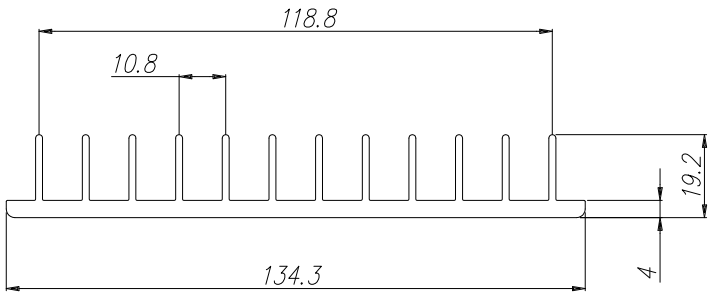


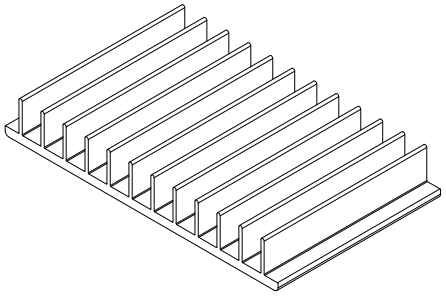


C

TECNOAL BOLOGNA - ITALY

K134	Peso Kg/m / Weight Kg/m 2.40	Rt °C/W 1.20	Lung. campione mm / Sample length mm 150



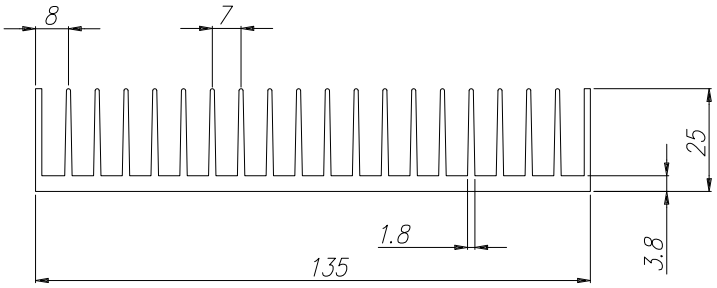


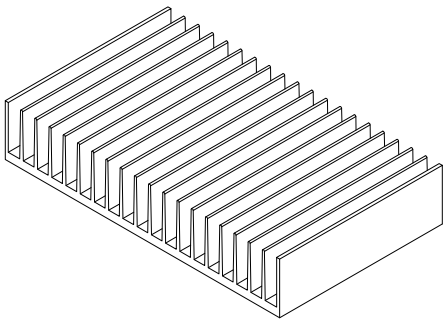
D

TECNOAL BOLOGNA - ITALY

A

K135	Peso Kg/m / Weight Kg/m	3.10	Rt °C/W	1.15	Lung. campione mm / Sample length mm	150

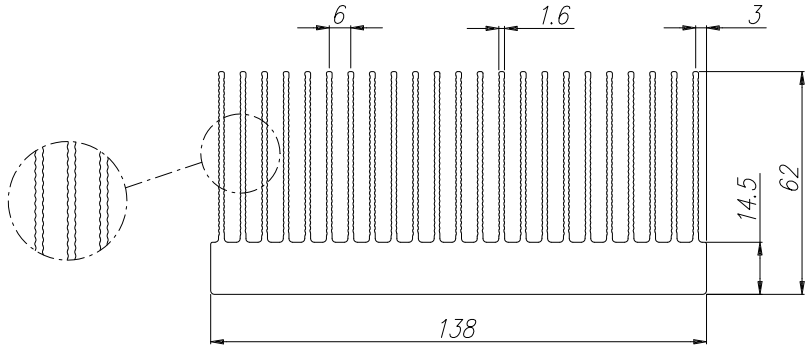


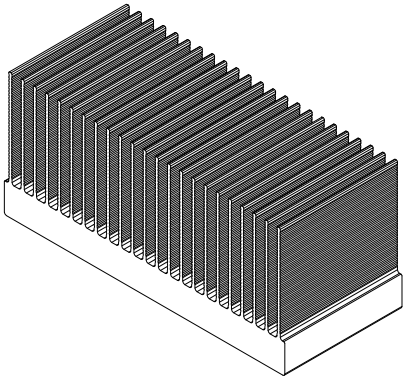


TECNOAL BOLOGNA - ITALY

B

K138	Peso Kg/m / Weight Kg/m	9.60	Rt °C/W	0.80	Lung. campione mm / Sample length mm	200



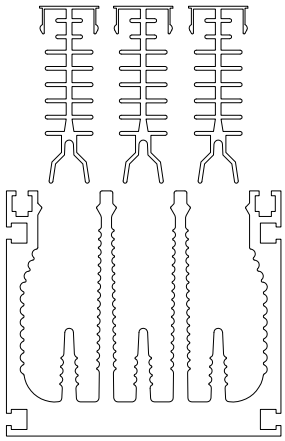


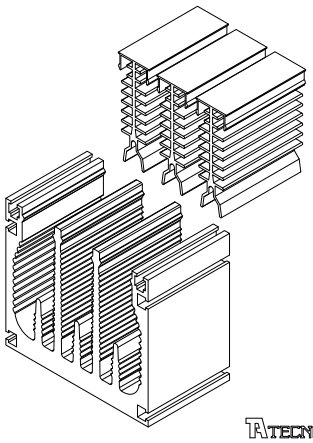
Ventilazione forzata / Forced ventilation	Rt °C/W	0.079	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec)	5.0	Lung. campione mm / Sample length mm	200

TECNOAL BOLOGNA - ITALY

C

KXC140	Peso Kg/m / Weight Kg/m	1.95



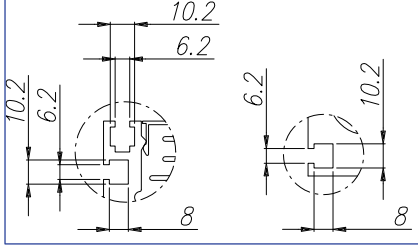


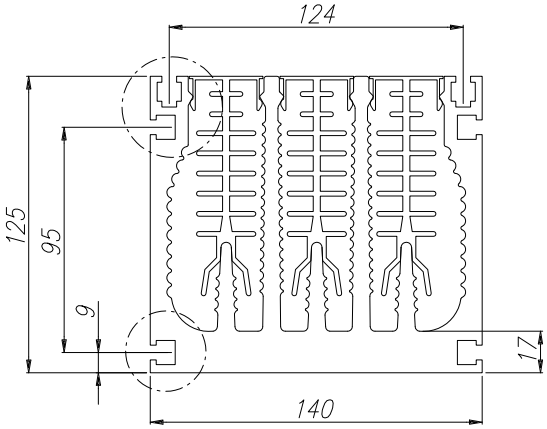
KX140	Peso Kg/m / Weight Kg/m	17.85

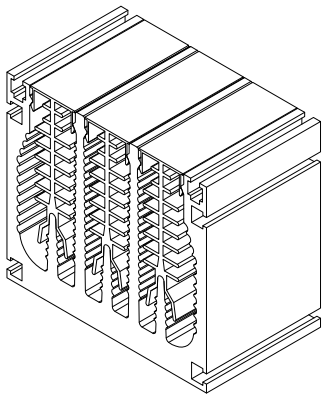
TECNOAL BOLOGNA - ITALY

D

KXH140	Peso Kg/m / Weight Kg/m	23.7
Rt °C/W		0.30
Lung. campione mm / Sample length mm		200

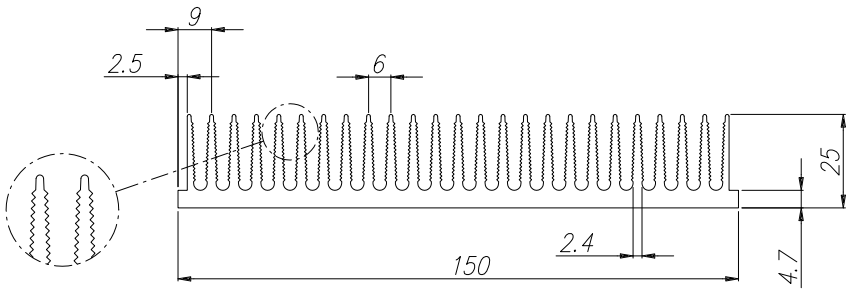


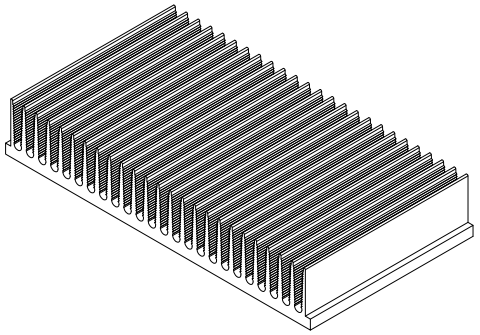




TECNOAL BOLOGNA - ITALY

K150	Peso Kg/m / Weight Kg/m	4.90	Rt °C/W	0.90	Lung. campione mm / Sample length mm	150

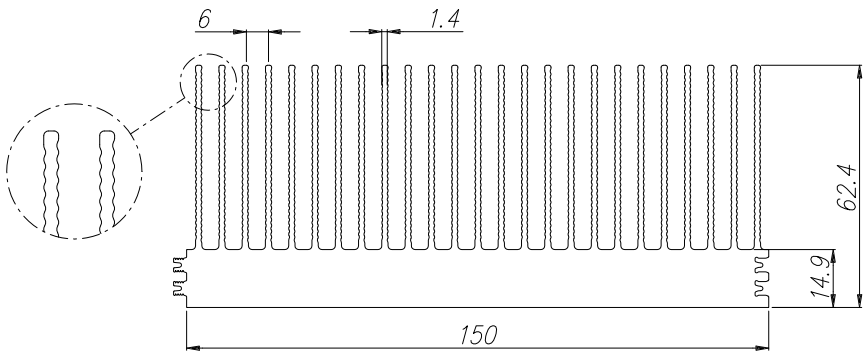


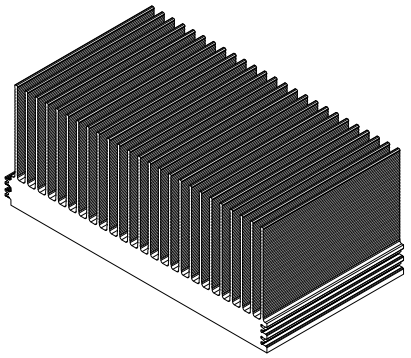


A

TECNOAL BOLOGNA - ITALY

I 150	Peso Kg/m / Weight Kg/m	10.5	Rt °C/W	0.56	Lung. campione mm / Sample length mm	200



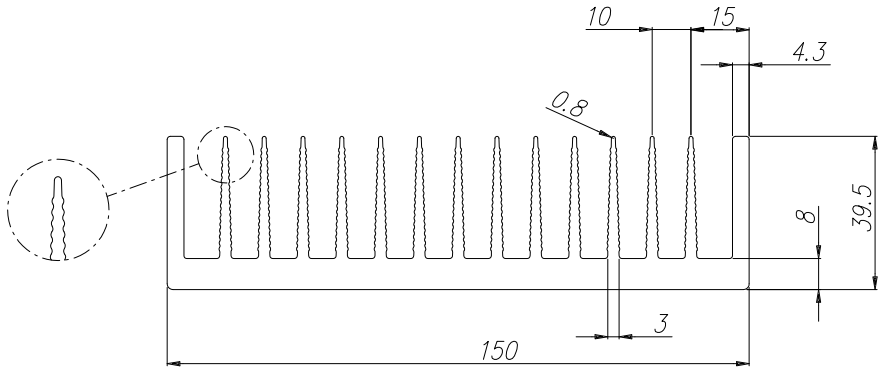


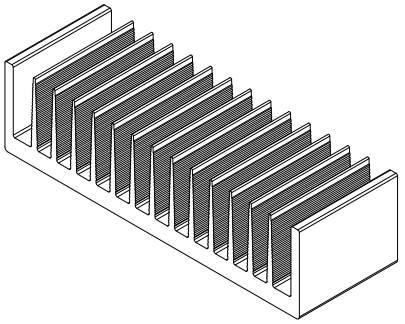
B

Ventilazione forzata / Forced ventilation	Rt °C/W	0.075	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec)	5.0	Lung. campione mm / Sample length mm	200

TECNOAL BOLOGNA - ITALY

KE150	Peso Kg/m / Weight Kg/m	6.50	Rt °C/W	0.62	Lung. campione mm / Sample length mm	150

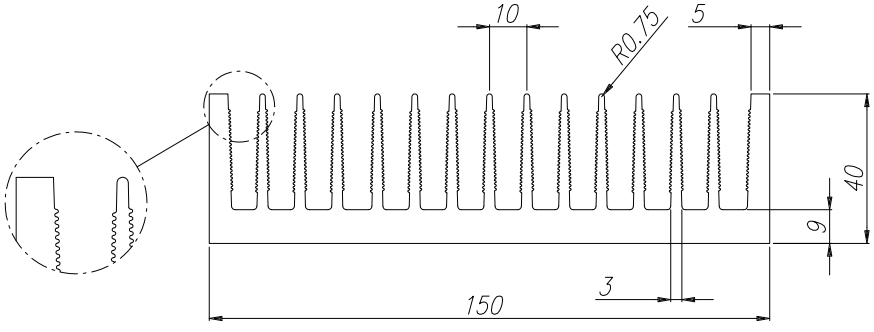


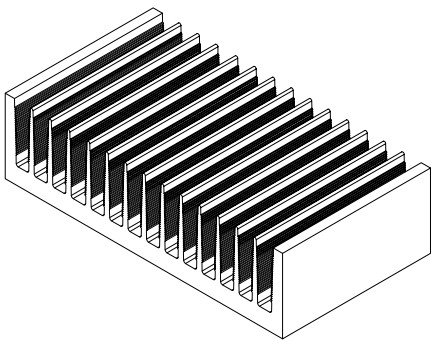


C

TECNOAL BOLOGNA - ITALY

KE150A	Peso Kg/m / Weight Kg/m	7.42	Rt °C/W	0.62	Lung. campione mm / Sample length mm	150



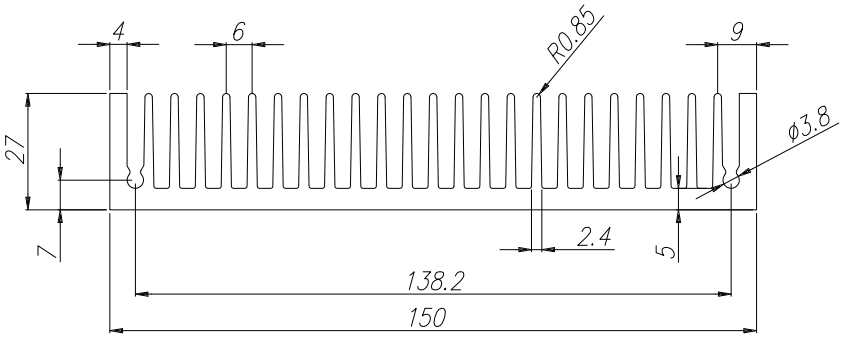


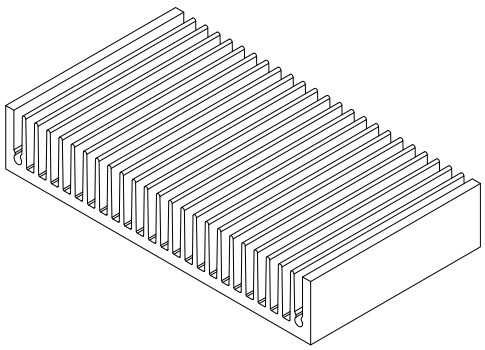
D

TECNOAL BOLOGNA - ITALY

A

KK150	Peso Kg/m / Weight Kg/m	5.30	Rt °C/W	0.90	Lung. campione mm / Sample length mm	150

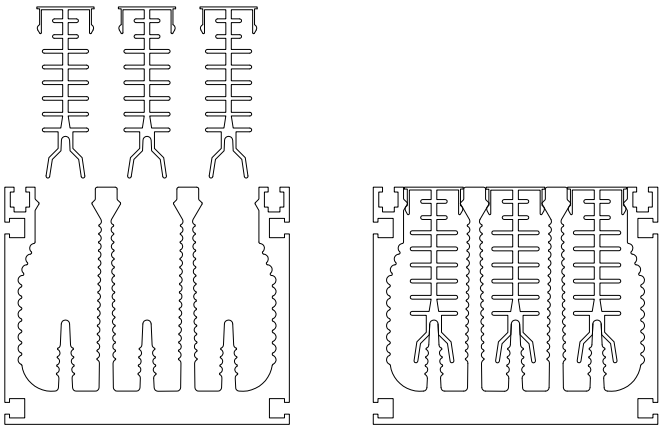


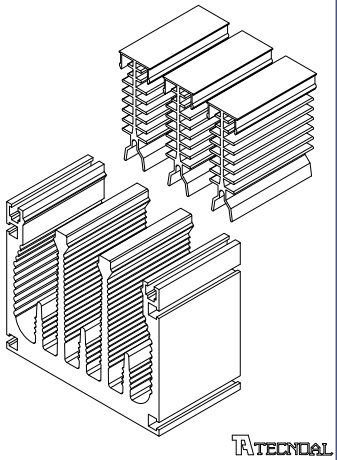


TECNOAL BOLOGNA - ITALY

B

KXC140	Peso Kg/m / Weight Kg/m	1.95



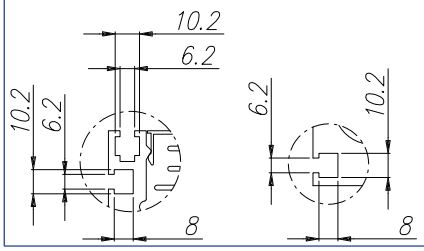


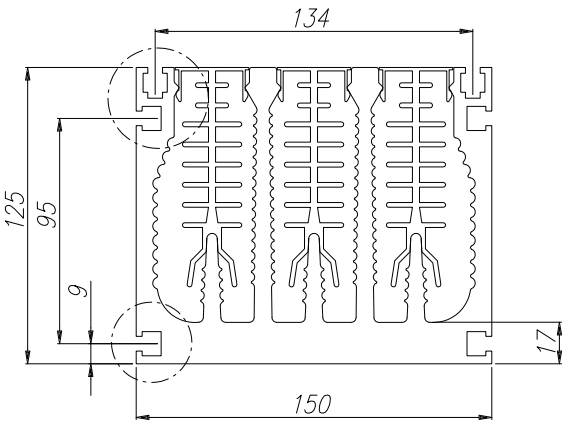
KX150	Peso Kg/m / Weight Kg/m	18.20

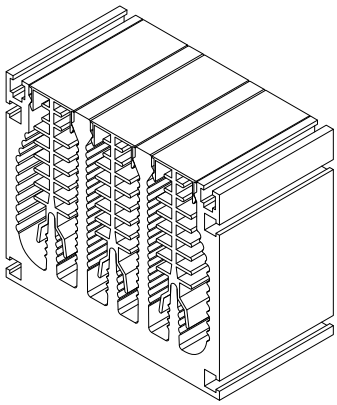
TECNOAL BOLOGNA - ITALY

C

KXH150	Peso Kg/m / Weight Kg/m	24.1	Rt °C/W	0.29	Lung. campione mm / Sample length mm	200



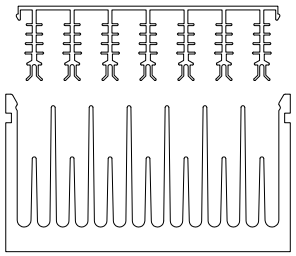


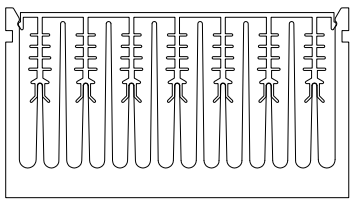


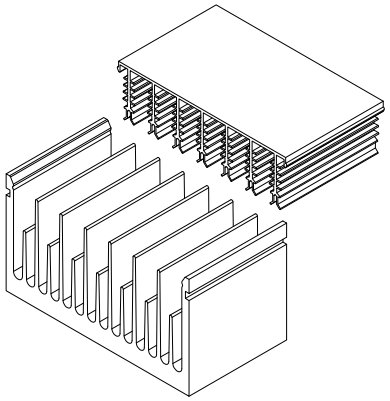
TECNOAL BOLOGNA - ITALY

D

KEAC150	Peso Kg/m / Weight Kg/m	3.20





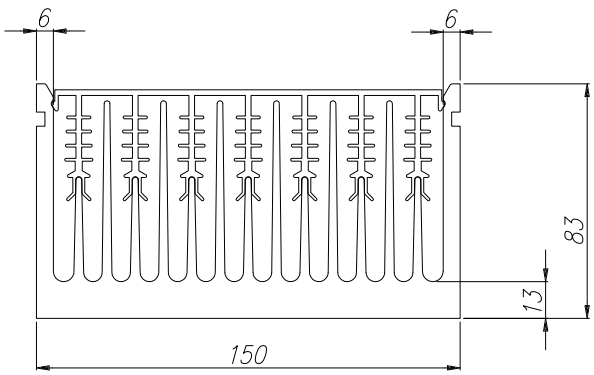


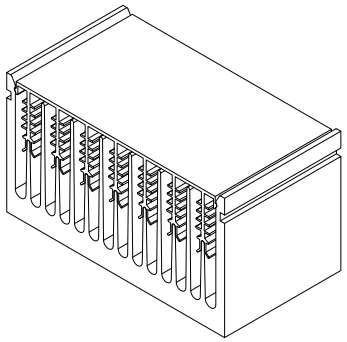
KEA150	Peso Kg/m / Weight Kg/m	12.60

TECNOAL BOLOGNA - ITALY

KEAH150

Peso Kg/m Weight Kg/m	15.28
Rt °C/W	0.70
Lung. campione mm Sample length mm	100



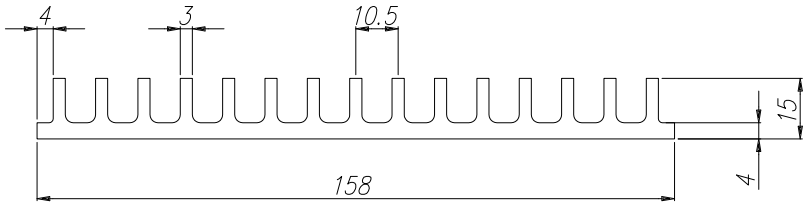


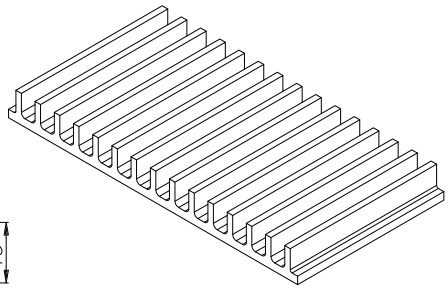
A

TECNOAL BOLOGNA - ITALY

K158

Peso Kg/m Weight Kg/m	3.20	Rt °C/W	1.0	Lung. campione mm Sample length mm	150



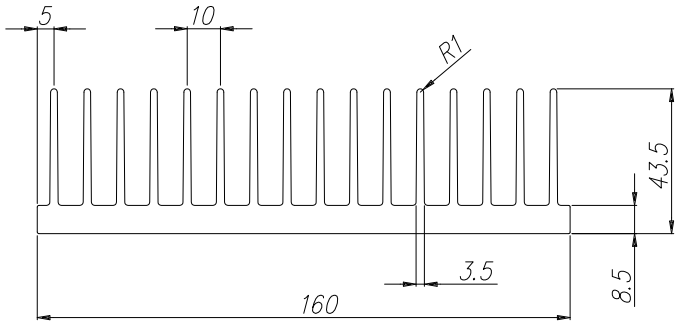


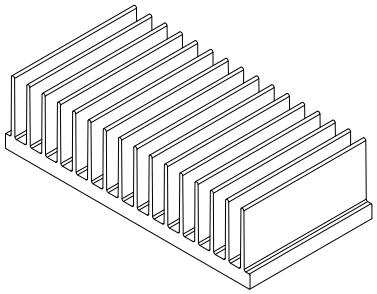
B

TECNOAL BOLOGNA - ITALY

K160

Peso Kg/m Weight Kg/m	7.23	Rt °C/W	0.55	Lung. campione mm Sample length mm	150



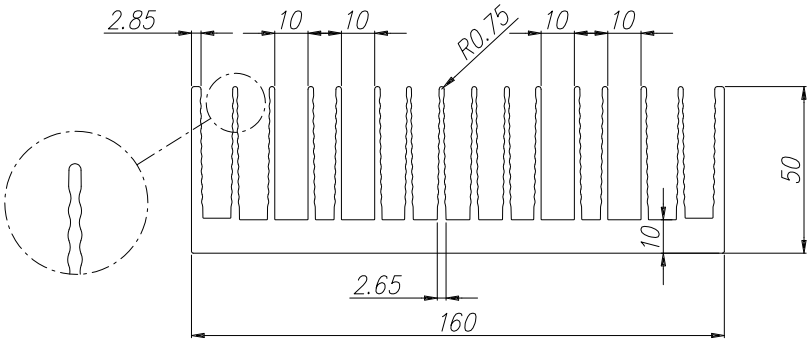


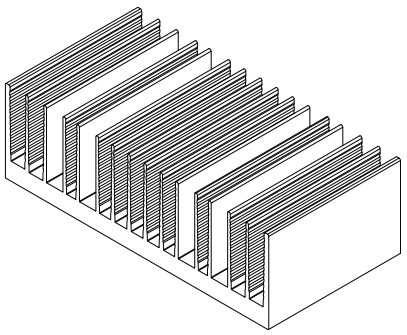
C

TECNOAL BOLOGNA - ITALY

KA160

Peso Kg/m Weight Kg/m	7.70	Rt °C/W	0.69	Lung. campione mm Sample length mm	150



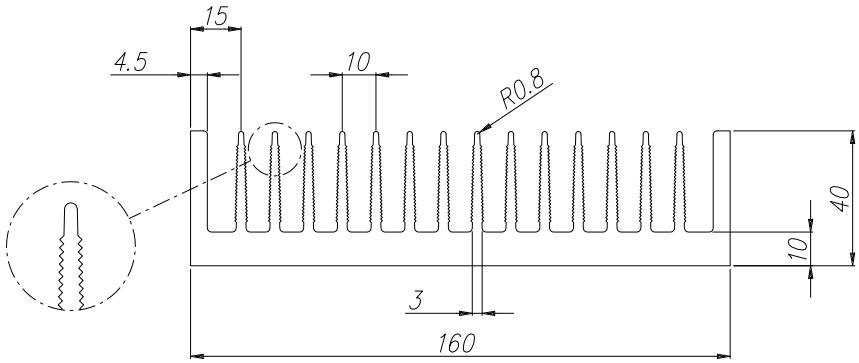


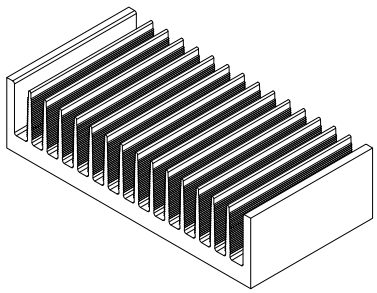
D

TECNOAL BOLOGNA - ITALY

A

KE160A	Peso Kg/m / Weight Kg/m 8.10	Rt °C/W 0.76	Lung. campione mm / Sample length mm 150

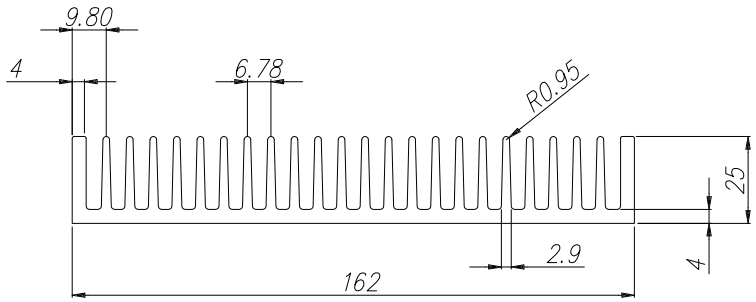


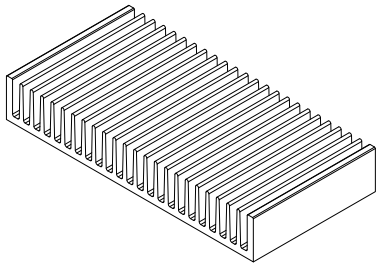


TECNOAL BOLOGNA - ITALY

B

K163	Peso Kg/m / Weight Kg/m 5.20	Rt °C/W 0.85	Lung. campione mm / Sample length mm 150

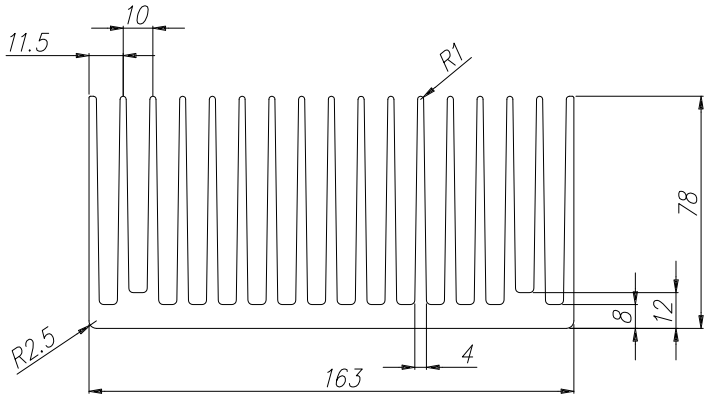


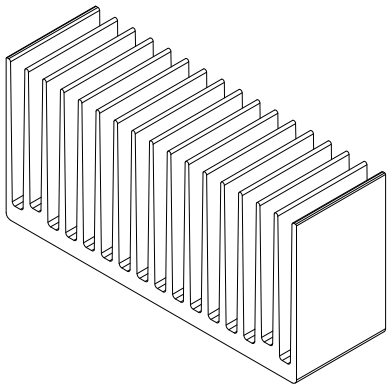


TECNOAL BOLOGNA - ITALY

C

KF163	Peso Kg/m / Weight Kg/m 12.90	Rt °C/W 0.56	Lung. campione mm / Sample length mm 150

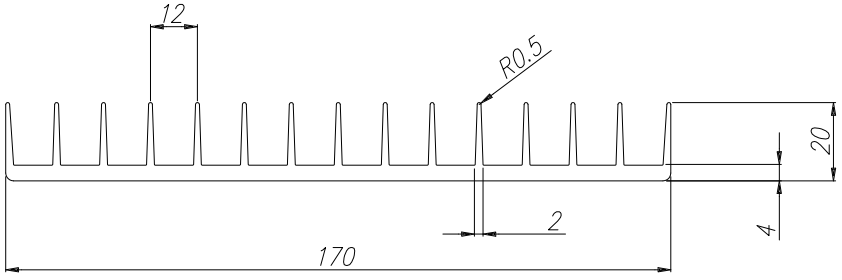


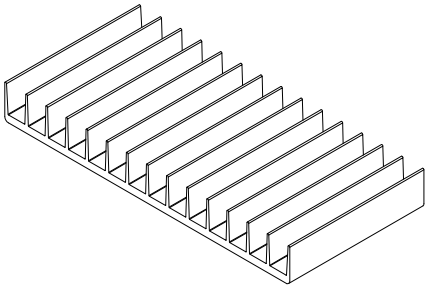


TECNOAL BOLOGNA - ITALY

D

K170	Peso Kg/m / Weight Kg/m 2.83	Rt °C/W 0.92	Lung. campione mm / Sample length mm 150

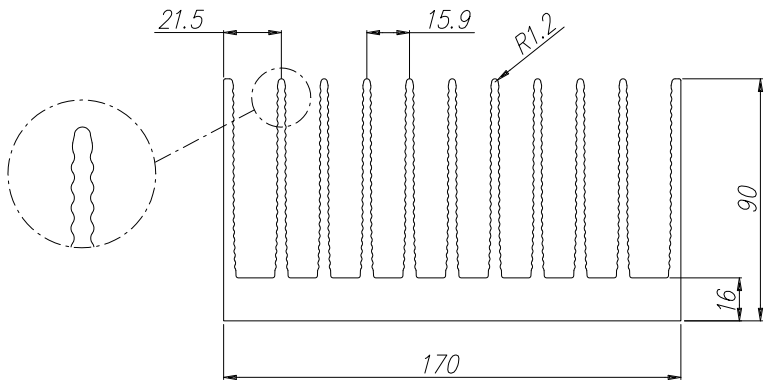


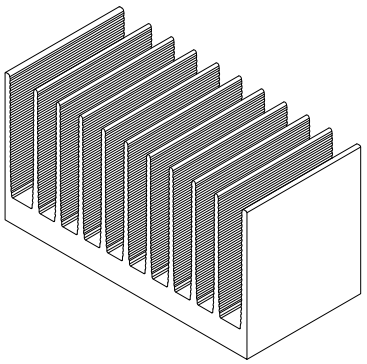


TECNOAL BOLOGNA - ITALY

KE170

Peso Kg/m Weight Kg/m	14.90	Rt °C/W	0.3	Lung. campione mm Sample length mm	200



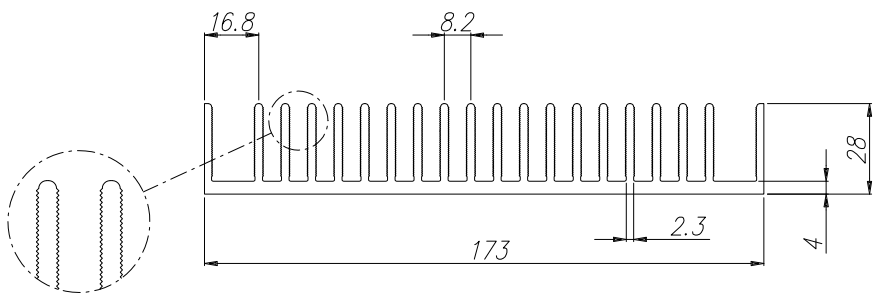


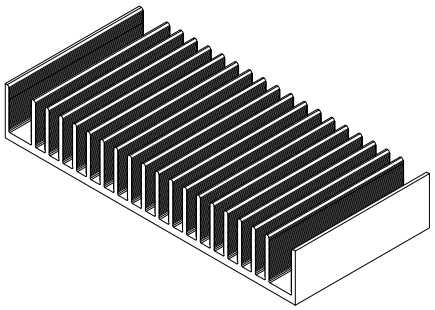
A

TECNOAL BOLOGNA - ITALY

K173

Peso Kg/m Weight Kg/m	4.60	Rt °C/W	0.80	Lung. campione mm Sample length mm	150



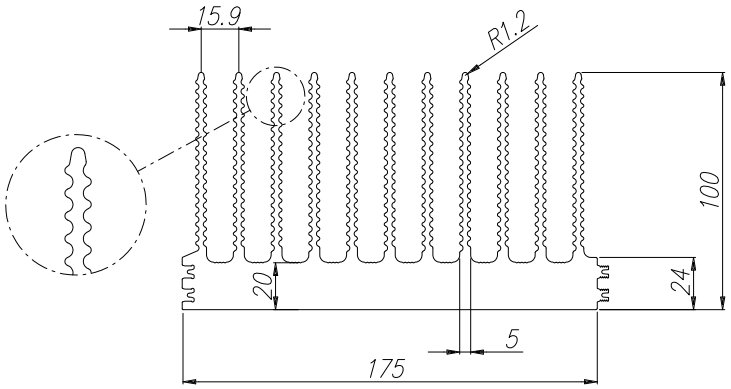


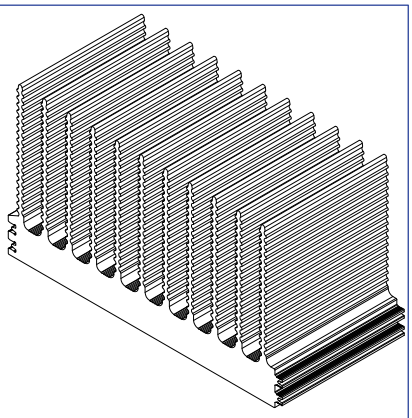
B

TECNOAL BOLOGNA - ITALY

I 100

Peso Kg/m Weight Kg/m	17.1	Rt °C/W	0.41	Lung. campione mm Sample length mm	150



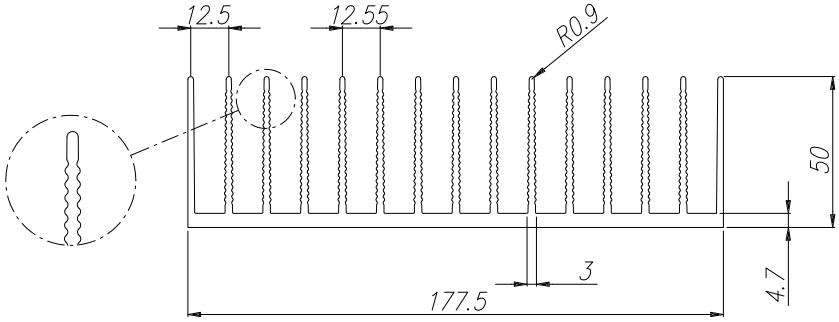


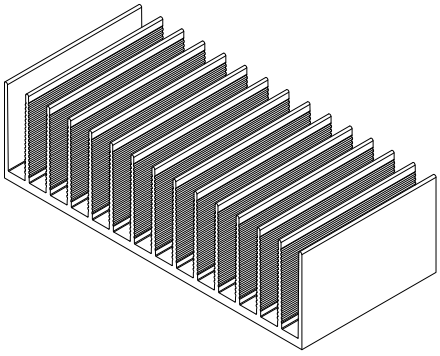
C

TECNOAL BOLOGNA - ITALY

K177

Peso Kg/m Weight Kg/m	6.13	Rt °C/W	0.50	Lung. campione mm Sample length mm	150



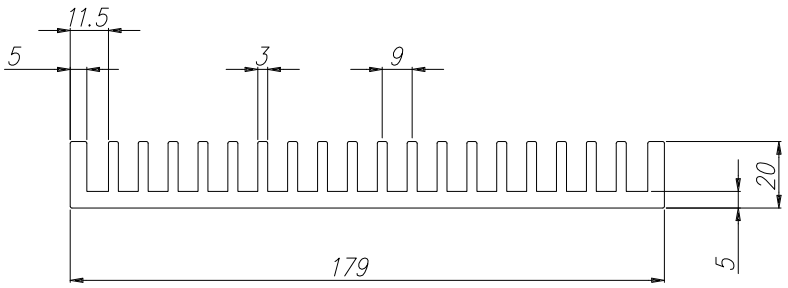


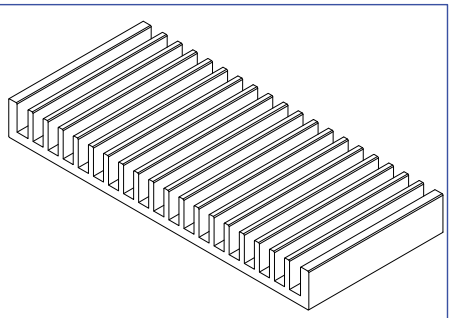
D

TECNOAL BOLOGNA - ITALY

A

K180	Peso Kg/m / Weight Kg/m	5.40	Rt °C/W	0.8	Lung. campione mm / Sample length mm	150

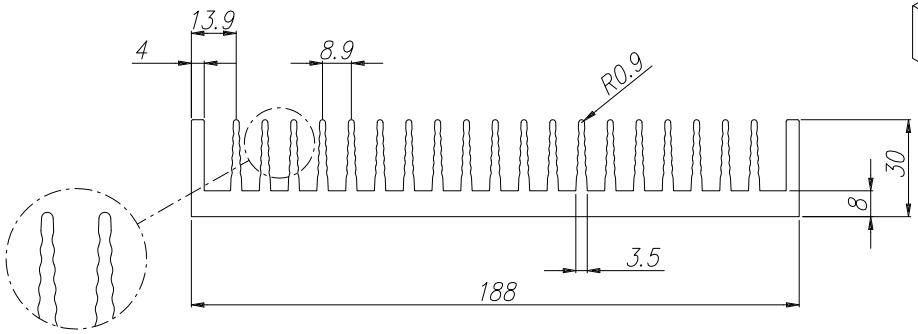


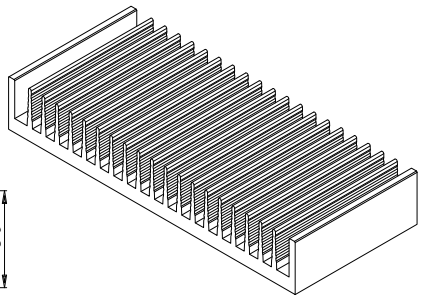


TECNOAL BOLOGNA - ITALY

B

K188	Peso Kg/m / Weight Kg/m	7.34	Rt °C/W	0.55	Lung. campione mm / Sample length mm	150

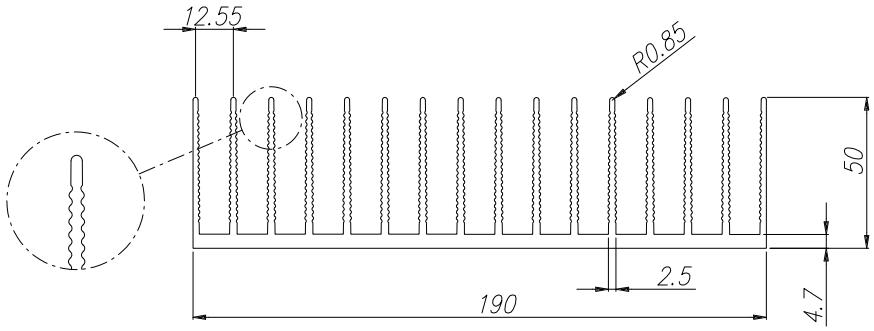


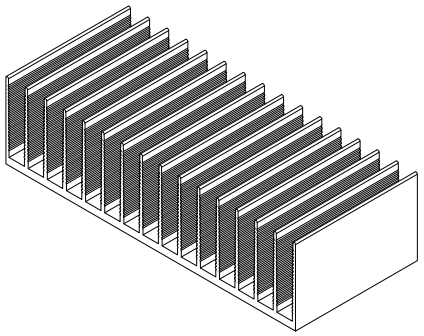


TECNOAL BOLOGNA - ITALY

C

K190	Peso Kg/m / Weight Kg/m	6.80	Rt °C/W	0.42	Lung. campione mm / Sample length mm	150

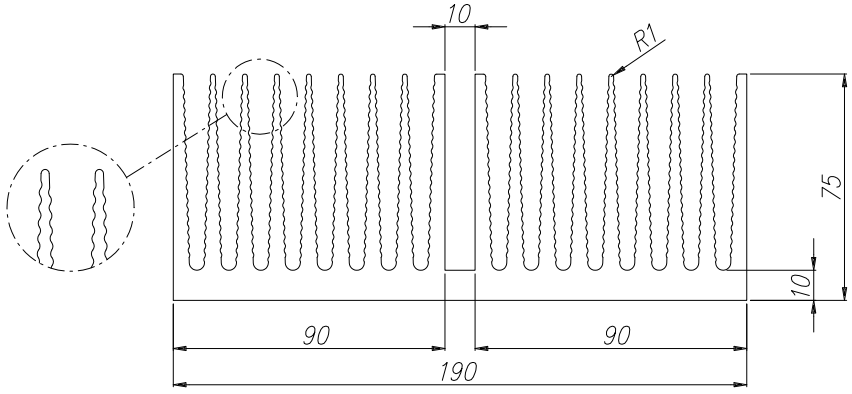


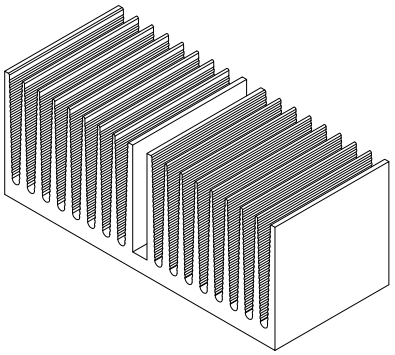


TECNOAL BOLOGNA - ITALY

D

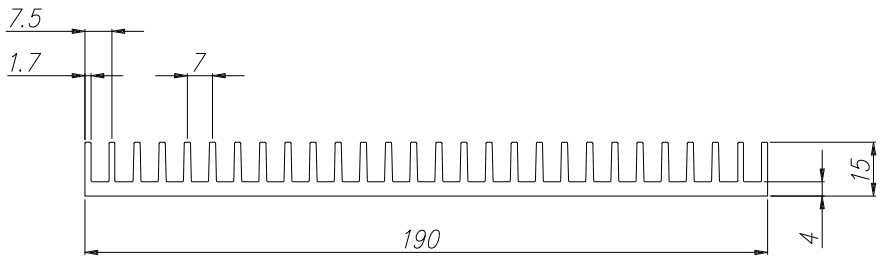
KE190	Peso Kg/m / Weight Kg/m	16.50	Rt °C/W	0.36	Lung. campione mm / Sample length mm	150

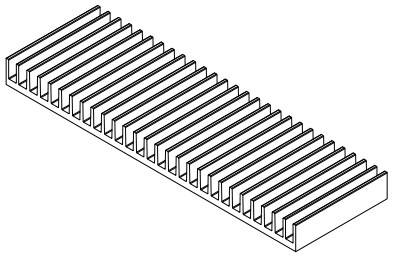




TECNOAL BOLOGNA - ITALY

KK190	Peso Kg/m / Weight Kg/m 3.64	Rt °C/W 0.9	Lung. campione mm / Sample length mm 150

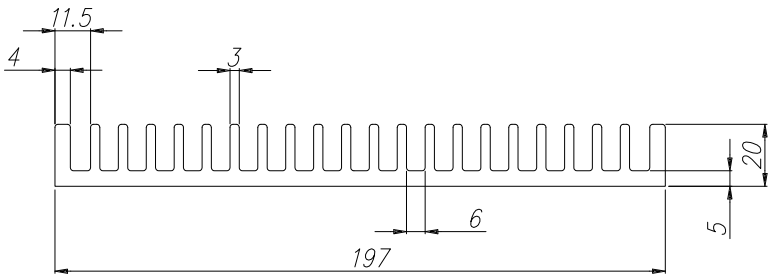


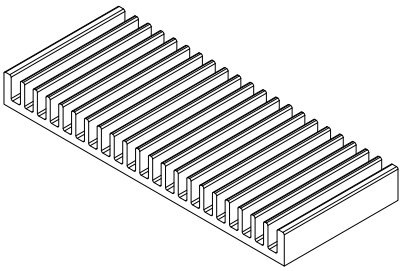


A

TECNOAL BOLOGNA - ITALY

K197	Peso Kg/m / Weight Kg/m 5.80	Rt °C/W 0.75	Lung. campione mm / Sample length mm 150

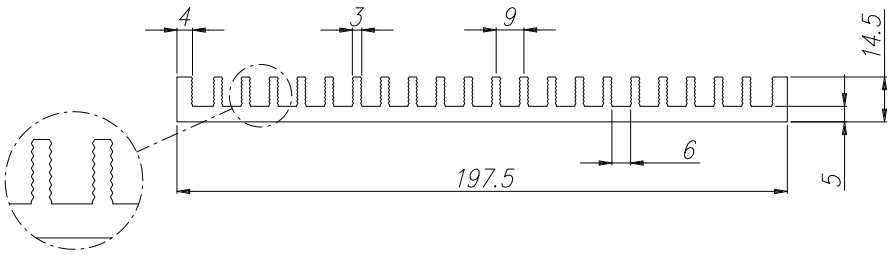


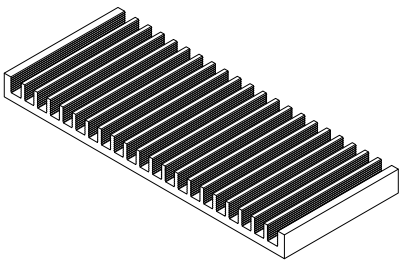


B

TECNOAL BOLOGNA - ITALY

KE197	Peso Kg/m / Weight Kg/m 4.30	Rt °C/W 0.87	Lung. campione mm / Sample length mm 150

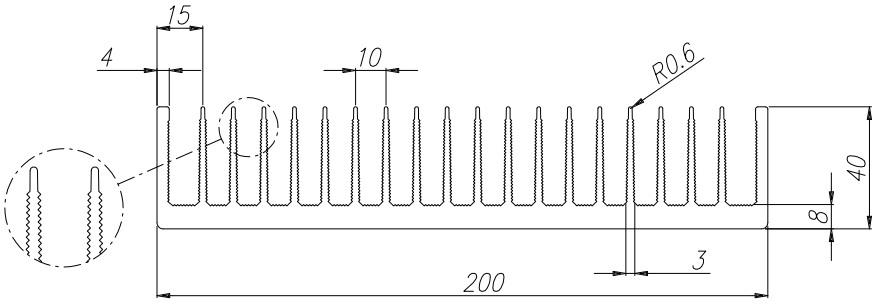


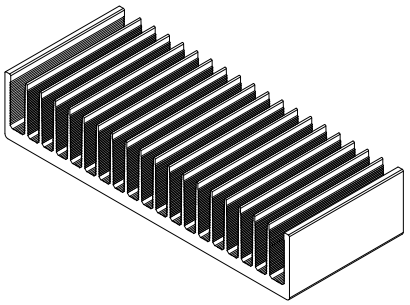


C

TECNOAL BOLOGNA - ITALY

K200	Peso Kg/m / Weight Kg/m 8.20	Rt °C/W 0.50	Lung. campione mm / Sample length mm 150



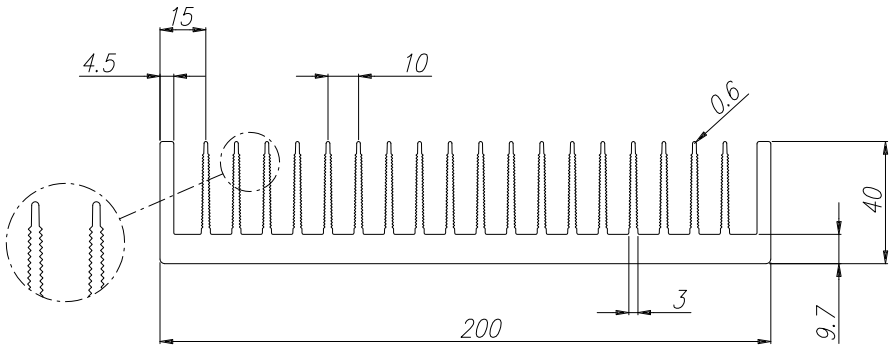


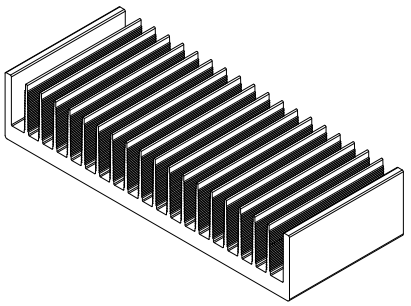
D

TECNOAL BOLOGNA - ITALY

A

K200B	Peso Kg/m / Weight Kg/m 8.70	Rt °C/W 0.50	Lung. campione mm / Sample length mm 150

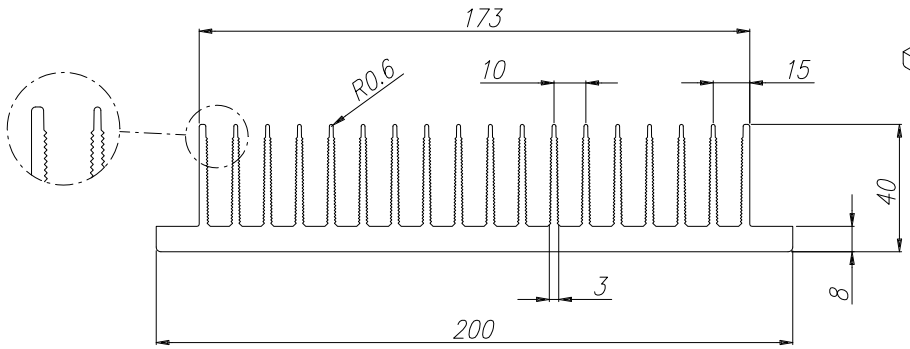


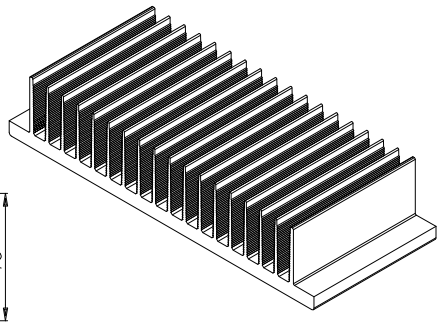


TECNOAL BOLOGNA - ITALY

B

KL200	Peso Kg/m / Weight Kg/m 7.60	Rt °C/W 0.82	Lung. campione mm / Sample length mm 150

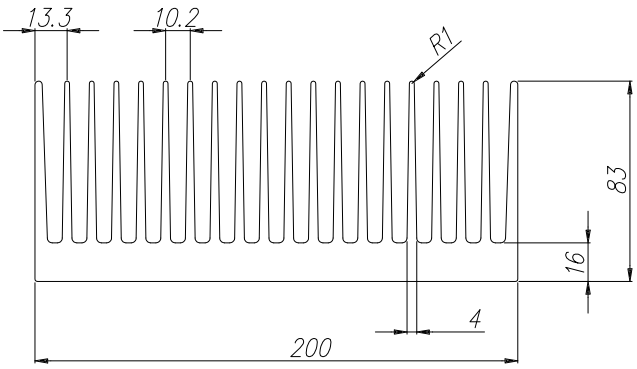


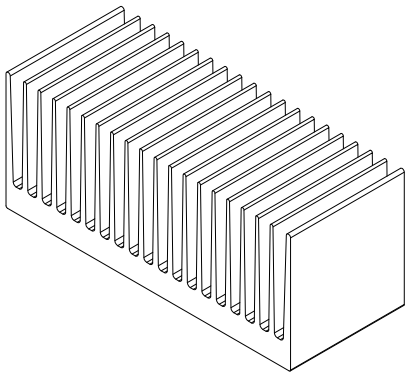


TECNOAL BOLOGNA - ITALY

C

KA200	
Peso Kg/m / Weight Kg/m	19.90
Rt °C/W	0.34
Lung. campione mm / Sample length mm	150

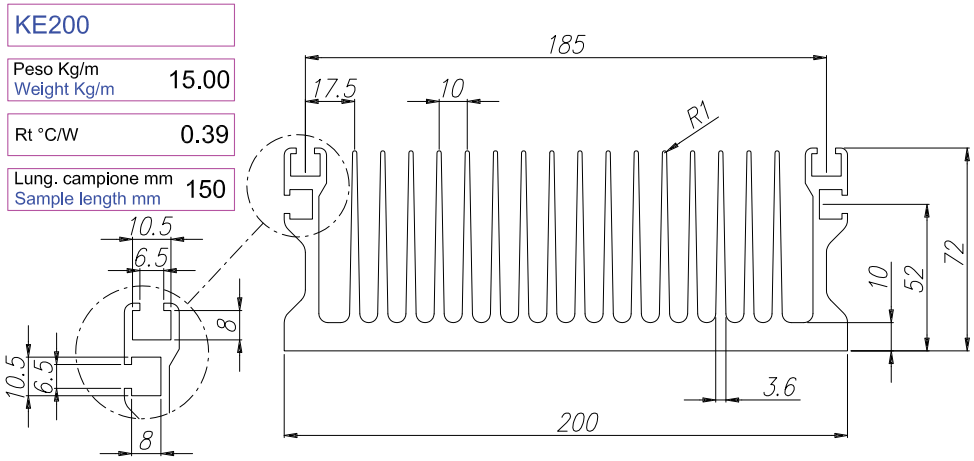


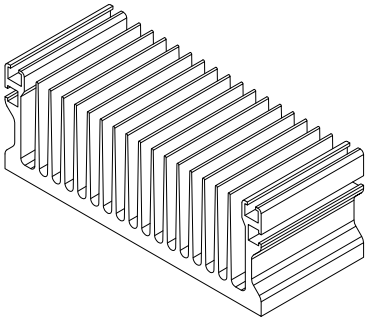


TECNOAL BOLOGNA - ITALY

D

KE200	
Peso Kg/m / Weight Kg/m	15.00
Rt °C/W	0.39
Lung. campione mm / Sample length mm	150

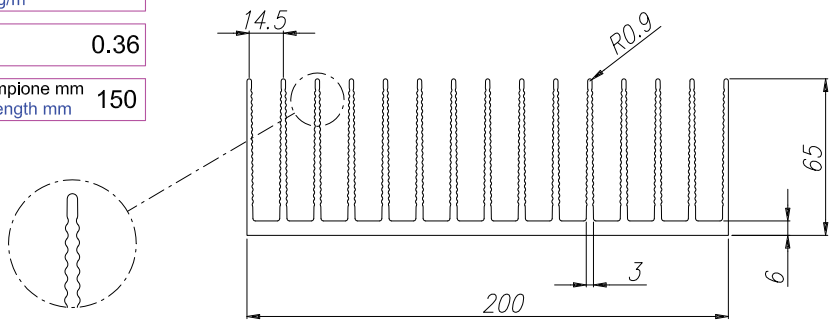


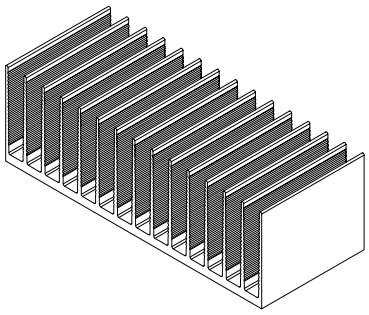


TECNOAL BOLOGNA - ITALY

KEA200

Peso Kg/m Weight Kg/m	8.90
Rt °C/W	0.36
Lung. campione mm Sample length mm	150



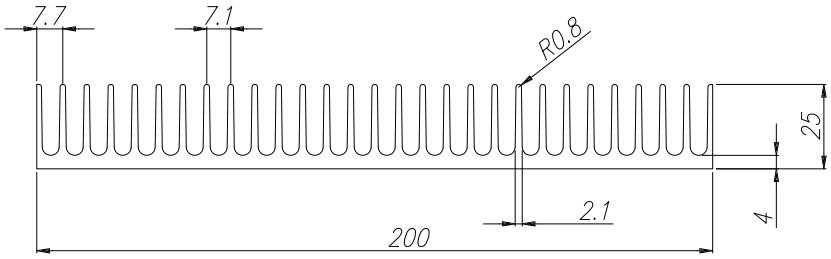


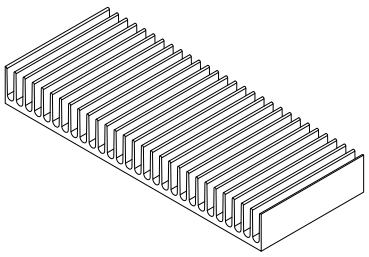
A

TECNOAL BOLOGNA - ITALY

KEAH200

Peso Kg/m Weight Kg/m	5.50	Rt °C/W	0.64	Lung. campione mm Sample length mm	150



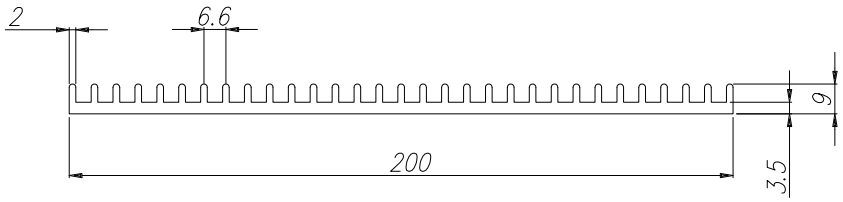


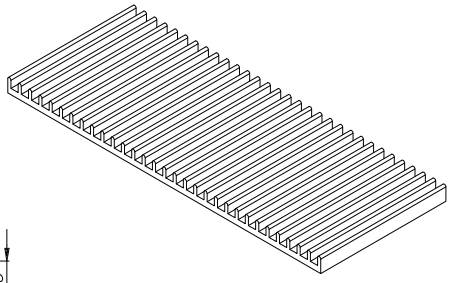
B

TECNOAL BOLOGNA - ITALY

KEI200

Peso Kg/m Weight Kg/m	2.84	Rt °C/W	1.6	Lung. campione mm Sample length mm	150



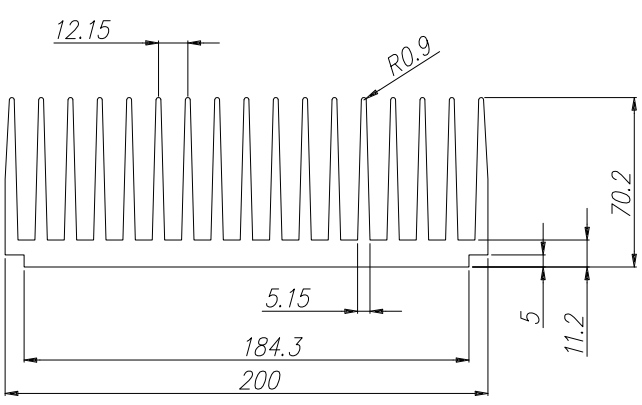


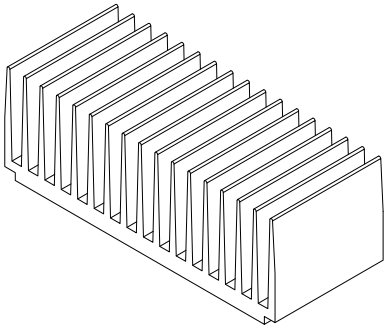
C

TECNOAL BOLOGNA - ITALY

KEIA200

Peso Kg/m Weight Kg/m	15.60
Rt °C/W	0.39
Lung. campione mm Sample length mm	150



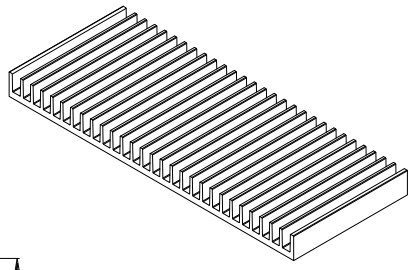


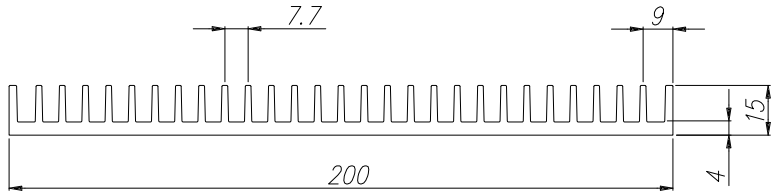
D

TECNOAL BOLOGNA - ITALY

A

KK200	Peso Kg/m / Weight Kg/m	4.00	Rt °C/W	0.85	Lung. campione mm / Sample length mm	150



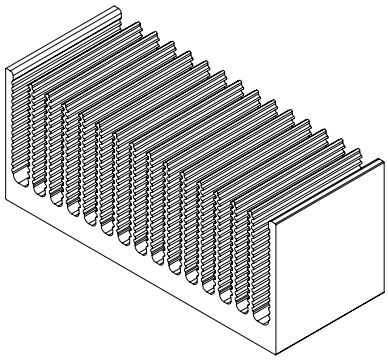


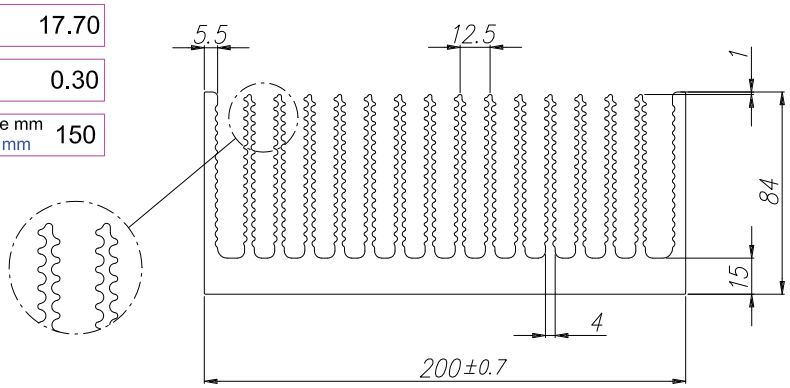
TECNOAL BOLOGNA - ITALY

B

KH200

Peso Kg/m / Weight Kg/m	17.70
Rt °C/W	0.30
Lung. campione mm / Sample length mm	150



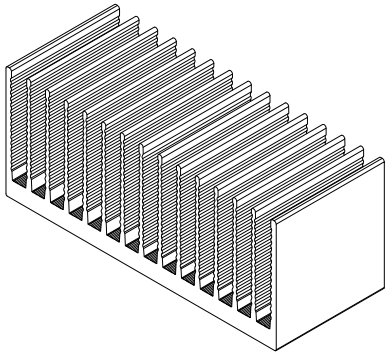


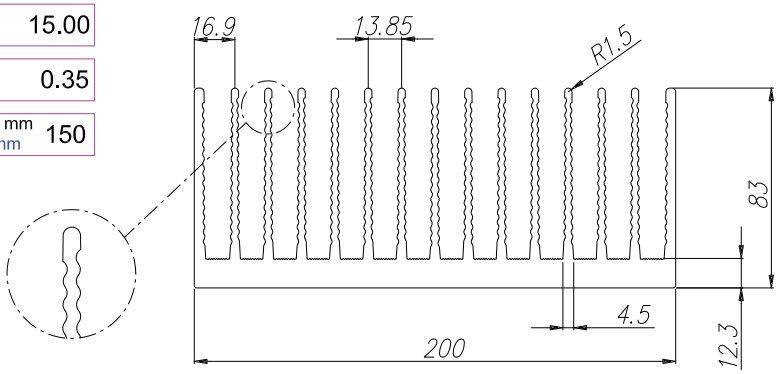
TECNOAL BOLOGNA - ITALY

C

KS200

Peso Kg/m / Weight Kg/m	15.00
Rt °C/W	0.35
Lung. campione mm / Sample length mm	150



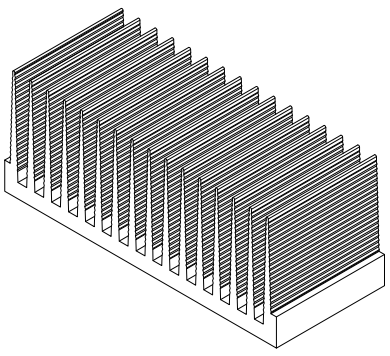


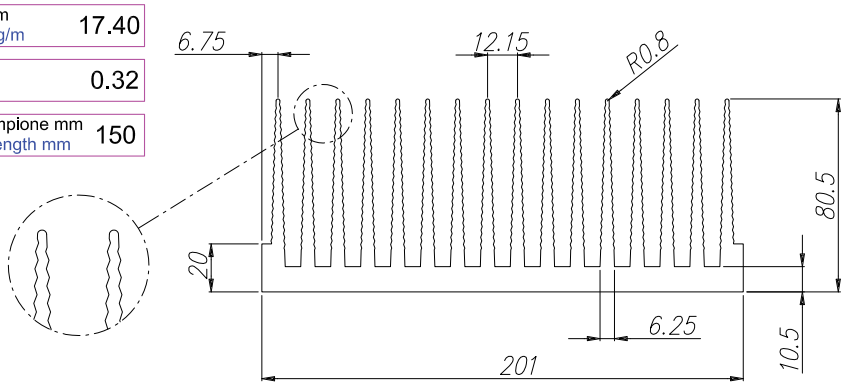
TECNOAL BOLOGNA - ITALY

D

KX200

Peso Kg/m / Weight Kg/m	17.40
Rt °C/W	0.32
Lung. campione mm / Sample length mm	150

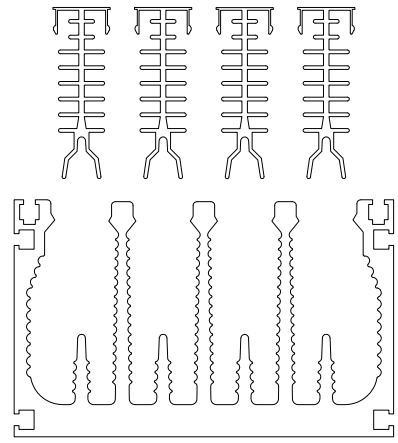


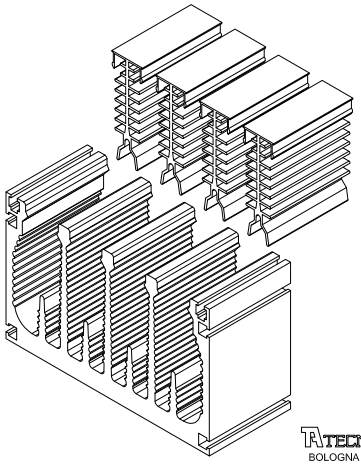


TECNOAL BOLOGNA - ITALY

KXC140

Peso Kg/m Weight Kg/m	1.95





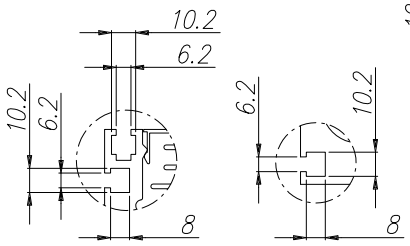
KXE200

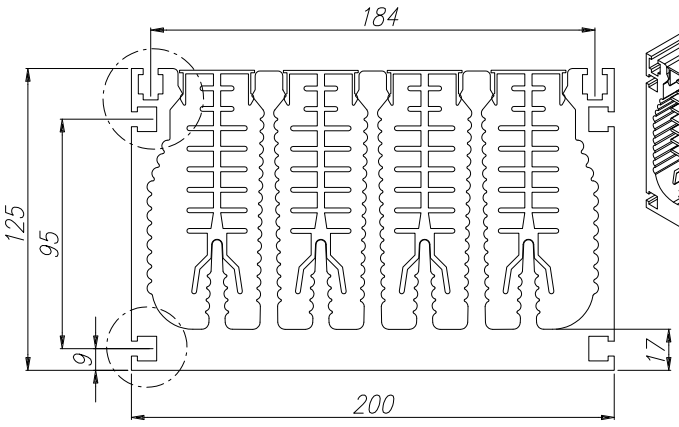
Peso Kg/m Weight Kg/m	23.30

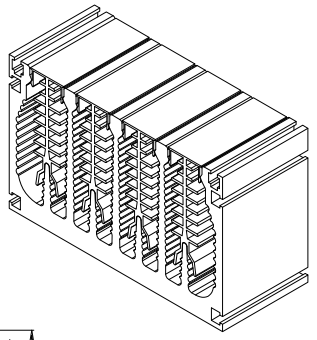
A

KXH200

Peso Kg/m Weight Kg/m	31.10
Rt °C/W	0.10
Lung. campione mm Sample length mm	300



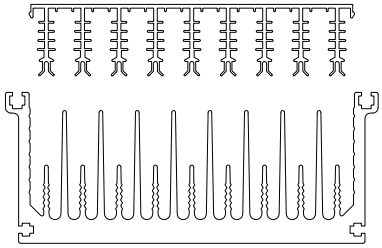


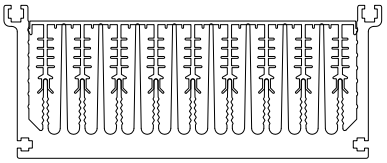


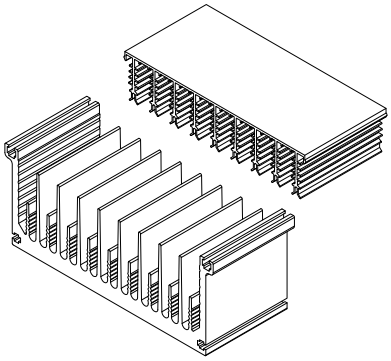
B

KC205

Peso Kg/m Weight Kg/m	4.30







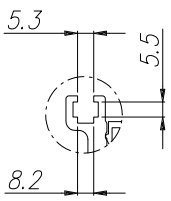
KE205

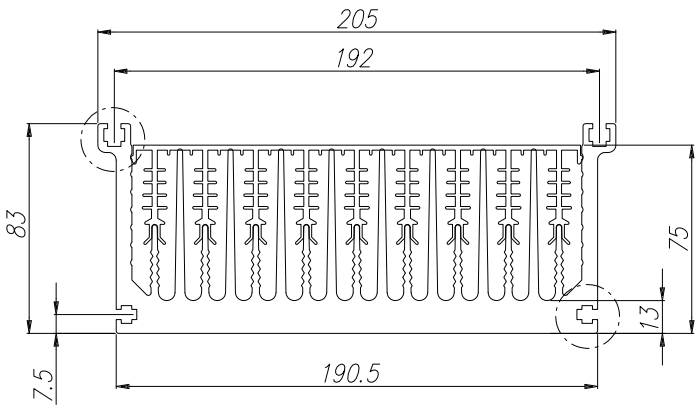
Peso Kg/m Weight Kg/m	15.50

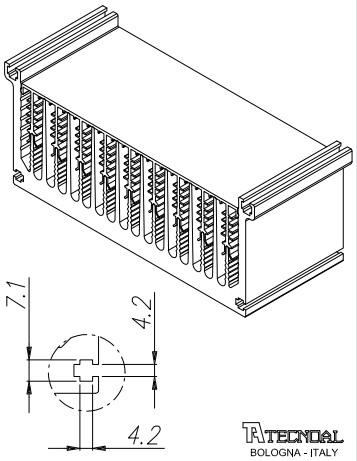
C

K205

Peso Kg/m Weight Kg/m	20.20
Rt °C/W	0.30
Lung. campione mm Sample length mm	300



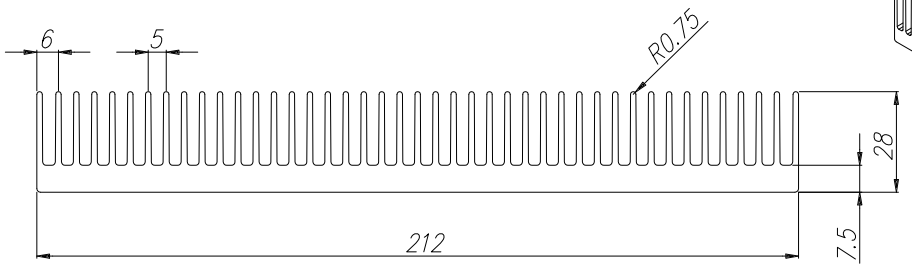


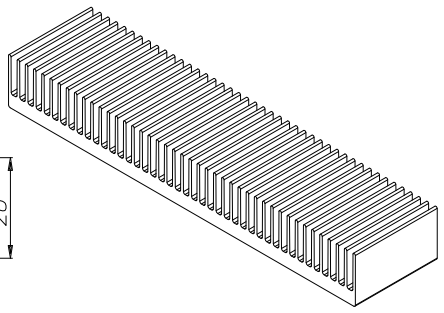


D

A

KF212	Peso Kg/m Weight Kg/m 8.20	Rt °C/W 0.85	Lung. campione mm Sample length mm 150



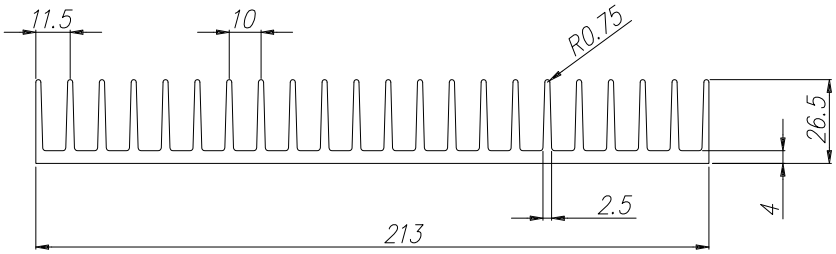


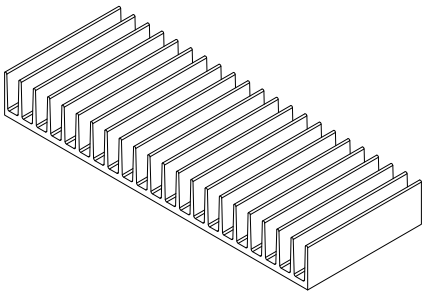
Ventilazione forzata Forced ventilation	Rt °C/W	0.074	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	3.0	Lung. campione mm Sample length mm	150
Ventilazione forzata Forced ventilation	Rt °C/W	0.062	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	5.0	Lung. campione mm Sample length mm	150

TECNOAL BOLOGNA - ITALY

B

K213	Peso Kg/m Weight Kg/m 5.00	Rt °C/W 0.56	Lung. campione mm Sample length mm 150

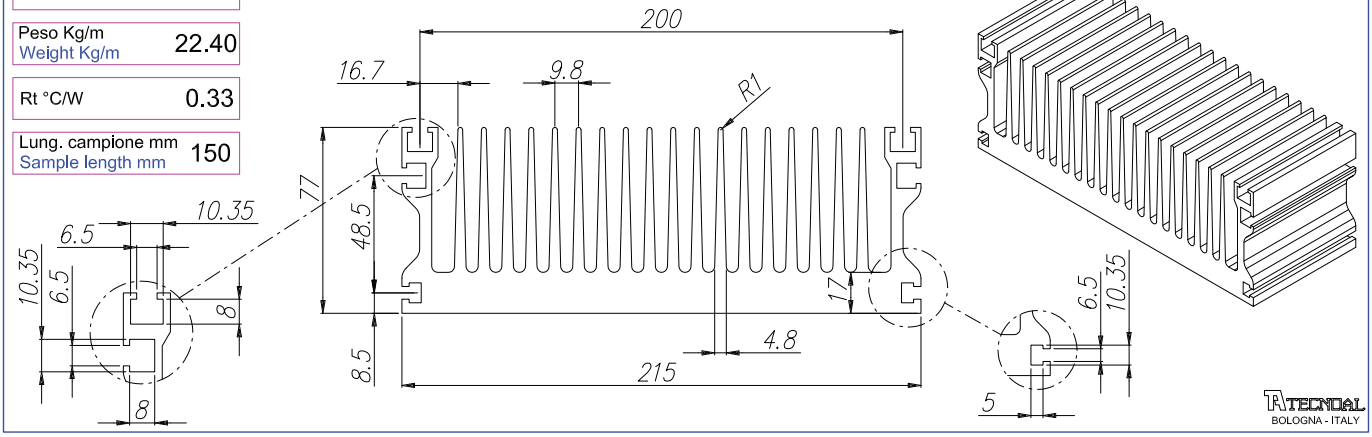




TECNOAL BOLOGNA - ITALY

C

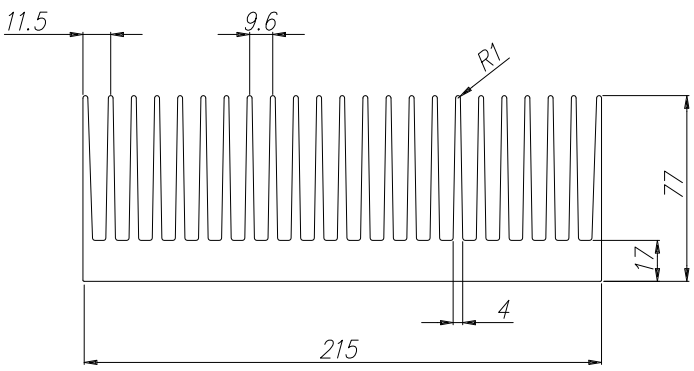
K215
Peso Kg/m Weight Kg/m 22.40
Rt °C/W 0.33
Lung. campione mm Sample length mm 150

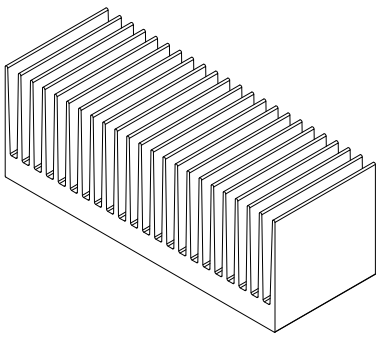


TECNOAL BOLOGNA - ITALY

D

KE215
Peso Kg/m Weight Kg/m 20.90
Rt °C/W 0.36
Lung. campione mm Sample length mm 150

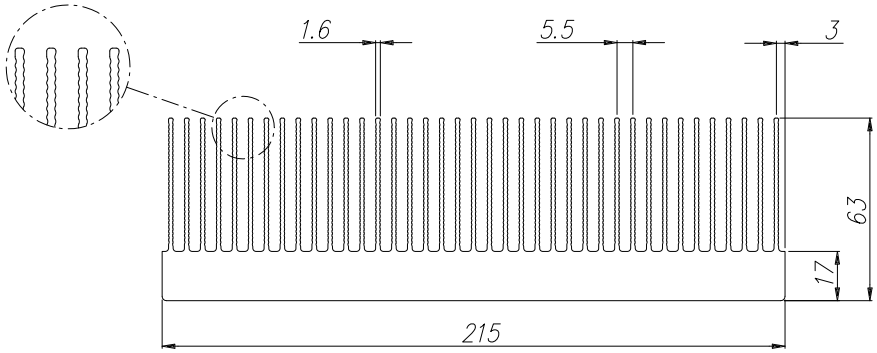


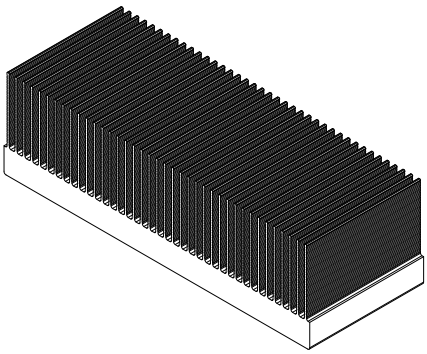


TECNOAL BOLOGNA - ITALY

KF215

Peso Kg/m Weight Kg/m	16.75	Rt °C/W	0.637	Lung. campione mm Sample length mm	150





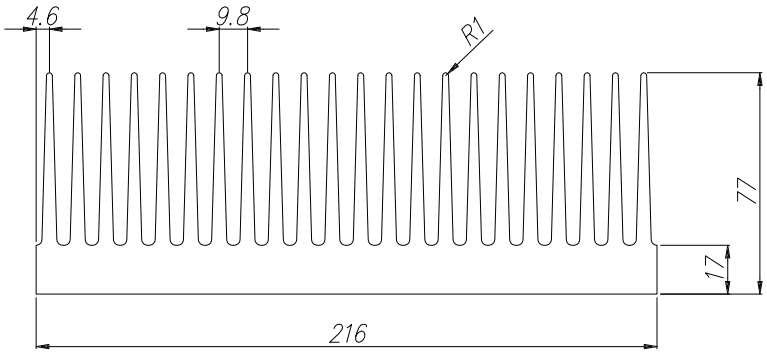
A

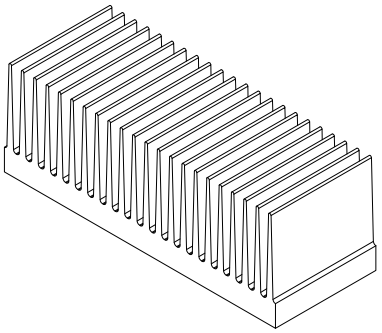
Ventilazione forzata Forced ventilation	Rt °C/W	0.043	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	5.0	Lung. campione mm Sample length mm	150

TECNOAL BOLOGNA - ITALY

K216

Peso Kg/m Weight Kg/m	24.00	Rt °C/W	0.35	Lung. campione mm Sample length mm	150



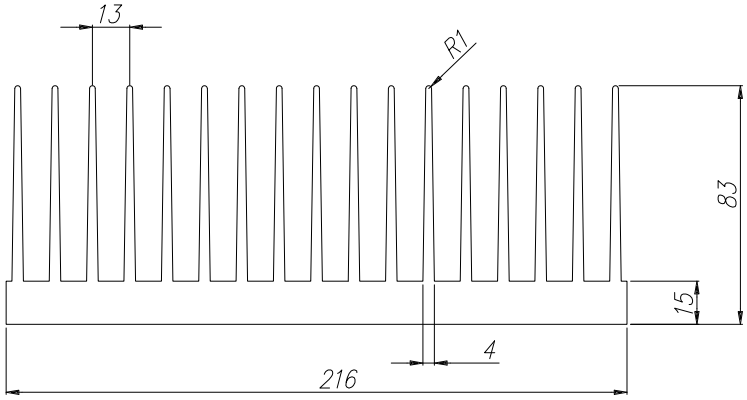


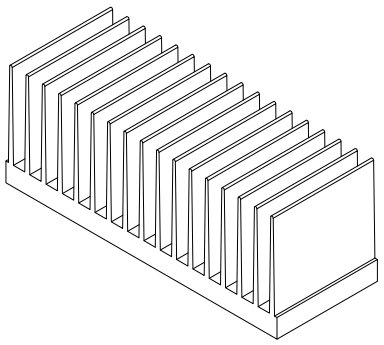
B

TECNOAL BOLOGNA - ITALY

KX216

Peso Kg/m Weight Kg/m	18.50	Rt °C/W	0.36	Lung. campione mm Sample length mm	150



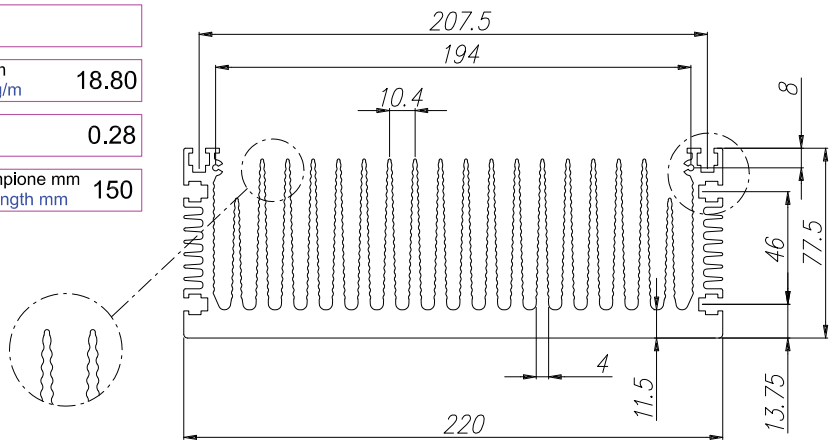


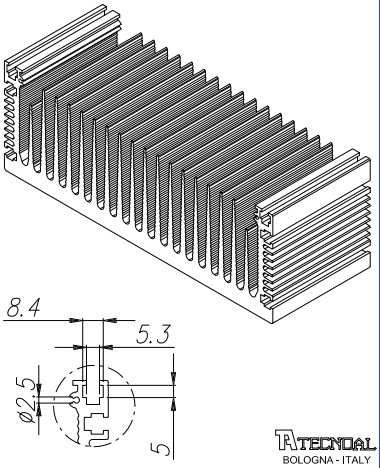
C

TECNOAL BOLOGNA - ITALY

K220

Peso Kg/m Weight Kg/m	18.80
Rt °C/W	0.28
Lung. campione mm Sample length mm	150



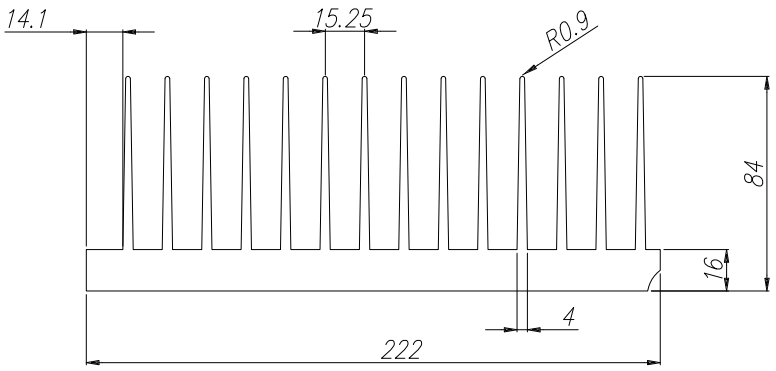


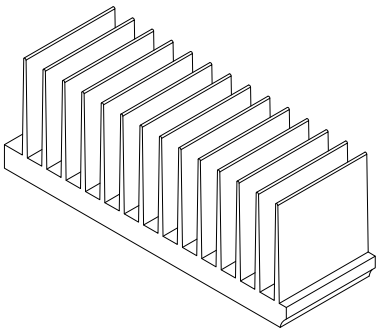
D

TECNOAL BOLOGNA - ITALY

A

K222	Peso Kg/m / Weight Kg/m	17.00	Rt °C/W	0.28	Lung. campione mm / Sample length mm	200

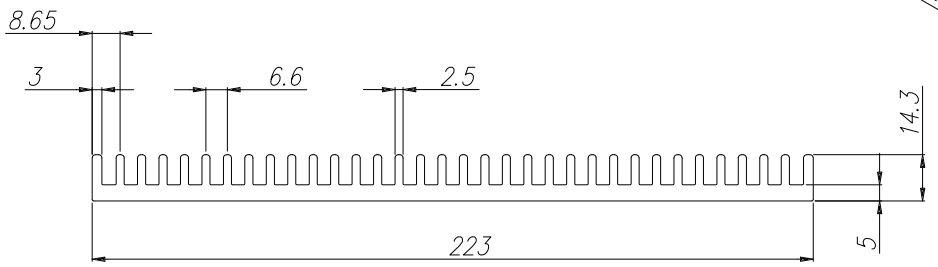


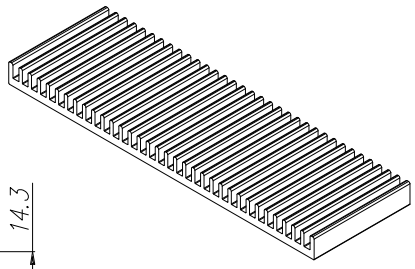


TECNOAL BOLOGNA - ITALY

B

K223	Peso Kg/m / Weight Kg/m	5.14	Rt °C/W	0.82	Lung. campione mm / Sample length mm	150



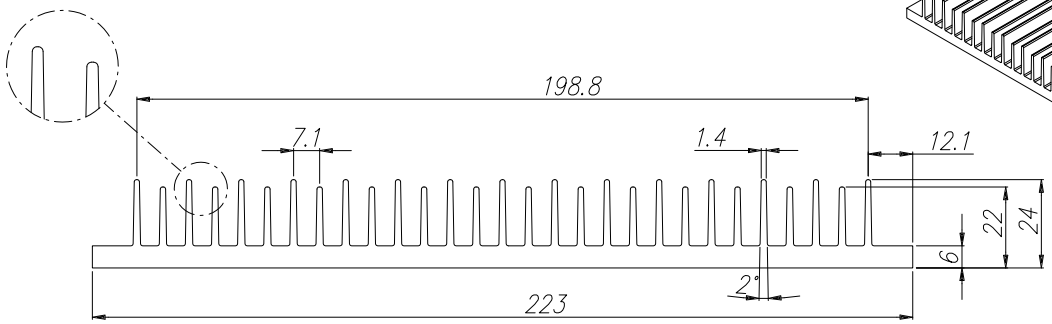


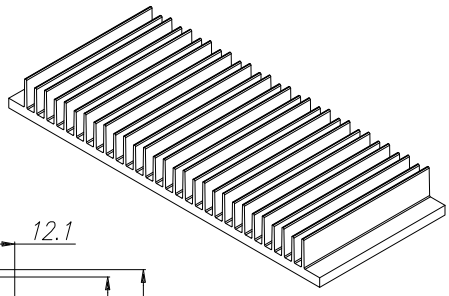
Ventilazione forzata / Forced ventilation	Rt °C/W	0.125	Velocità dell'aria in uscita (m/sec) / Outgoing air speed (m/sec)	5.0	Lung. campione mm / Sample length mm	150

TECNOAL BOLOGNA - ITALY

C

KE223	Peso Kg/m / Weight Kg/m	5.90	Rt °C/W	0.55	Lung. campione mm / Sample length mm	150

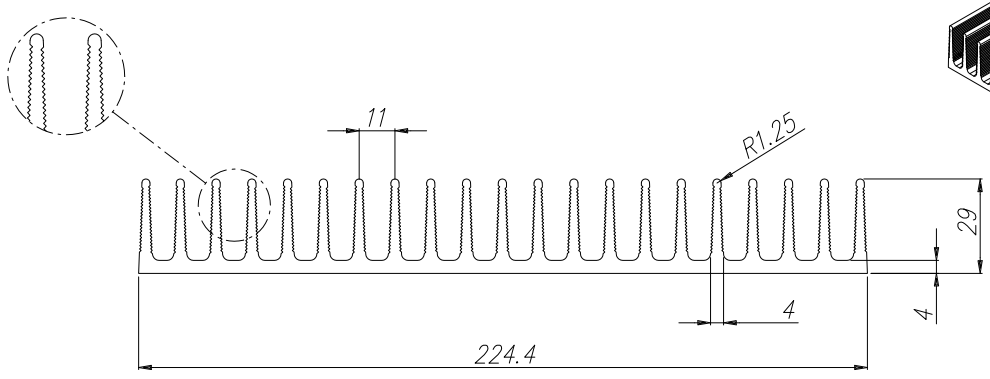


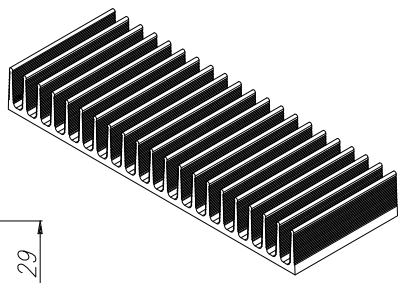


TECNOAL BOLOGNA - ITALY

D

K224	Peso Kg/m / Weight Kg/m	6.70	Rt °C/W	0.44	Lung. campione mm / Sample length mm	150

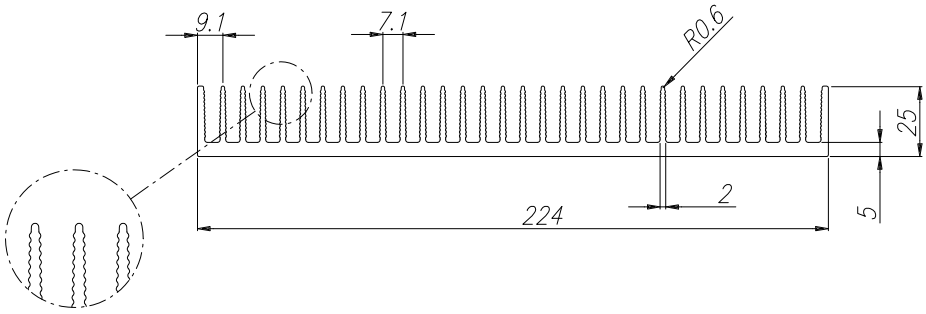


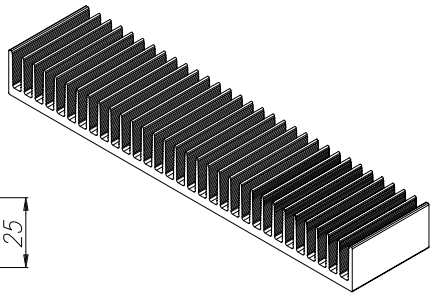


TECNOAL BOLOGNA - ITALY

KE224

Peso Kg/m Weight Kg/m	6.70	Rt °C/W	0.49	Lung. campione mm Sample length mm	150



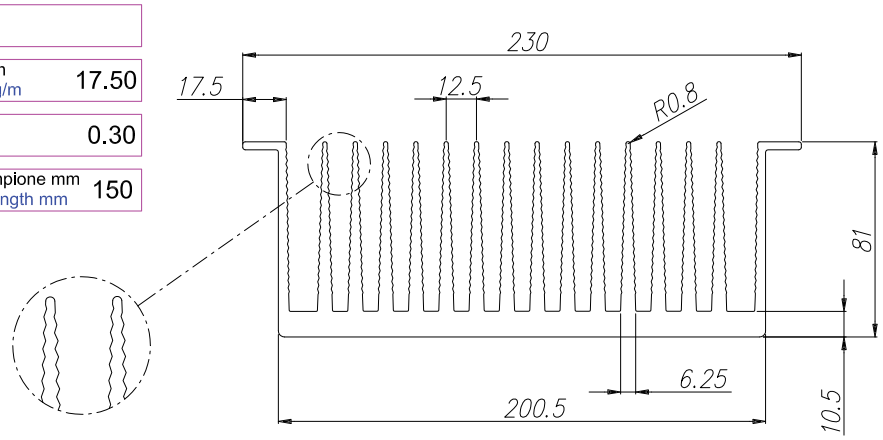


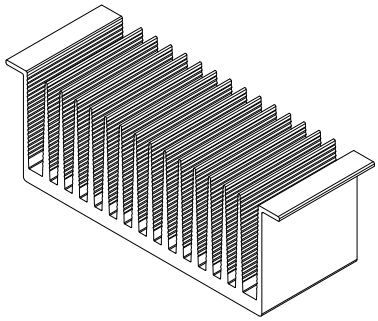
A

TECNOAL BOLOGNA - ITALY

K230

Peso Kg/m Weight Kg/m	17.50
Rt °C/W	0.30
Lung. campione mm Sample length mm	150



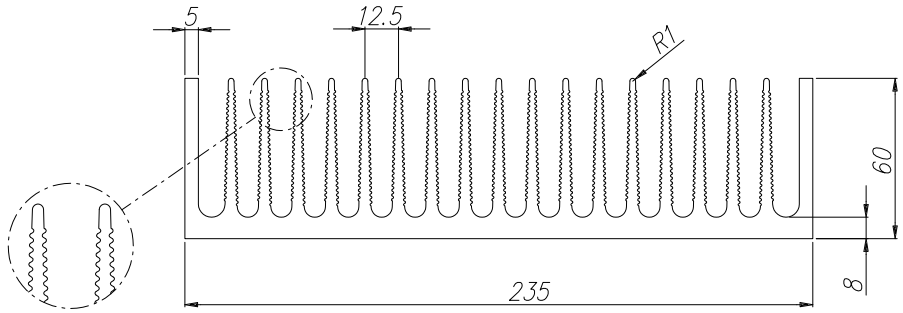


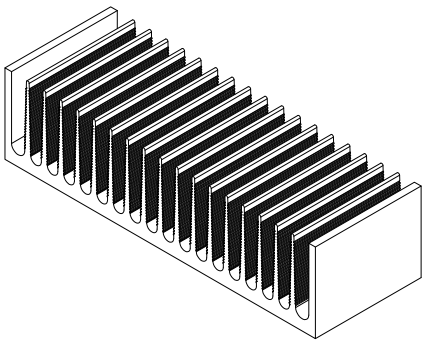
B

TECNOAL BOLOGNA - ITALY

K235

Peso Kg/m Weight Kg/m	14.70	Rt °C/W	0.35	Lung. campione mm Sample length mm	150



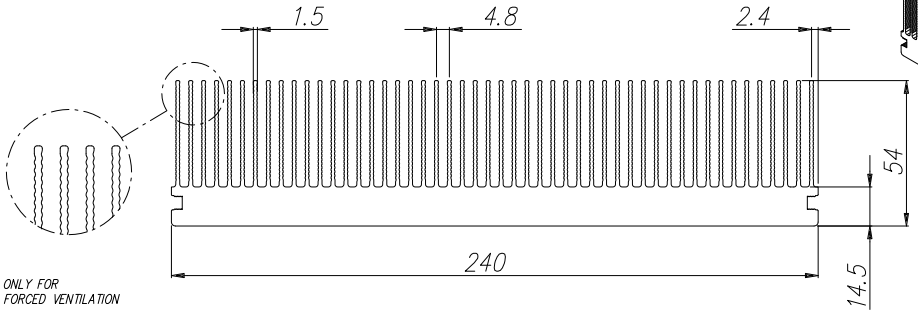


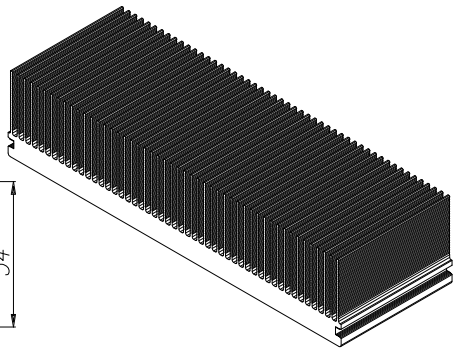
C

TECNOAL BOLOGNA - ITALY

KF240

Peso Kg/m Weight Kg/m	16.50	Rt °C/W	0,54	Lung. campione mm Sample length mm	150





D

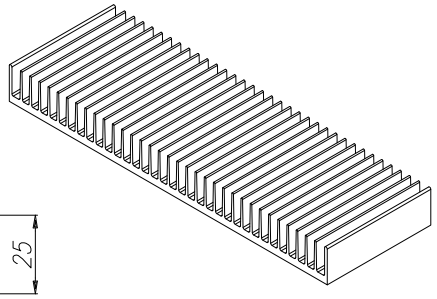
ONLY FOR
FORCED VENTILATION

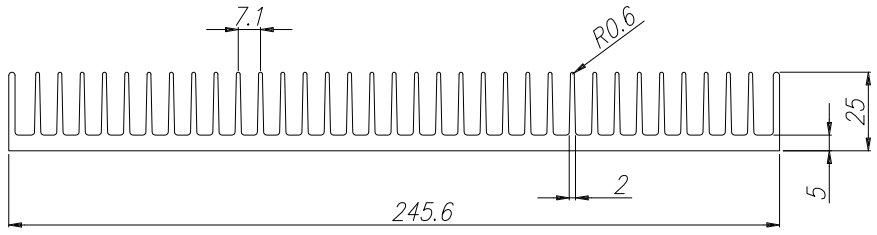
Ventilazione forzata Forced ventilation	Rt °C/W	0,043	Velocità dell'aria in uscita (m/sec) Outgoing air speed (m/sec)	6,0	Lung. campione mm Sample length mm	200

TECNOAL BOLOGNA - ITALY

A

K245	Peso Kg/m / Weight Kg/m 6.60	Rt °C/W 0.49	Lung. campione mm / Sample length mm 150

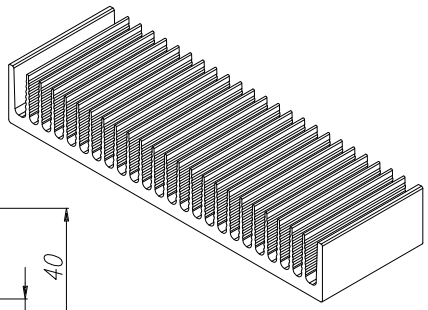


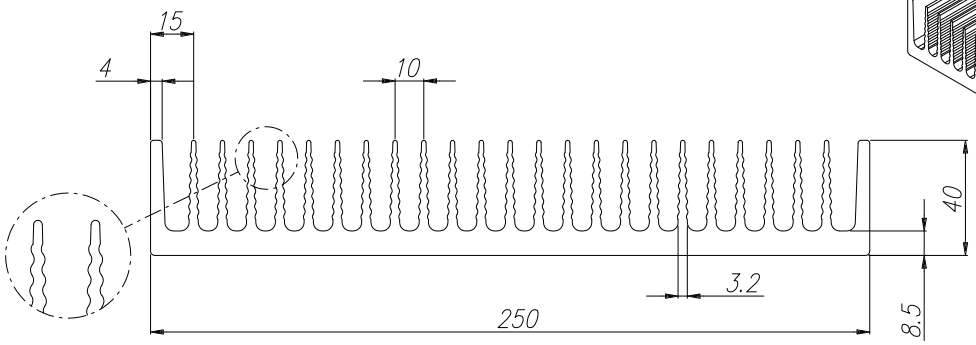


TECNOAL BOLOGNA - ITALY

B

K250	Peso Kg/m / Weight Kg/m 12.5	Rt °C/W 0.40	Lung. campione mm / Sample length mm 150

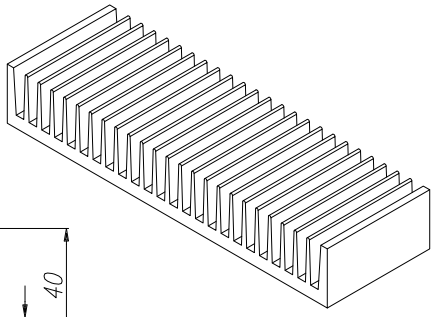


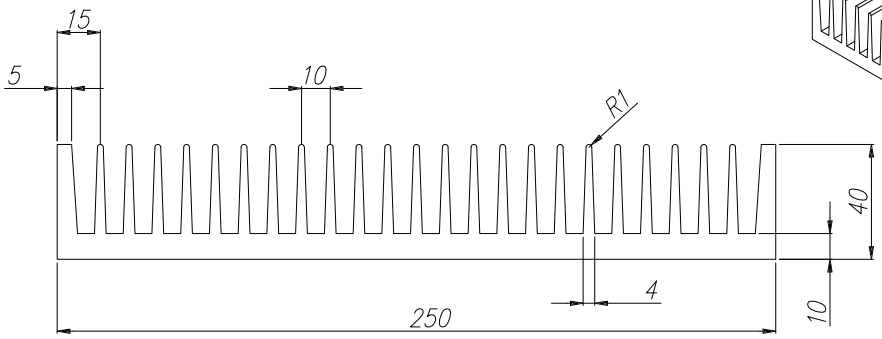


TECNOAL BOLOGNA - ITALY

C

K250E	Peso Kg/m / Weight Kg/m 13.25	Rt °C/W 0.41	Lung. campione mm / Sample length mm 150

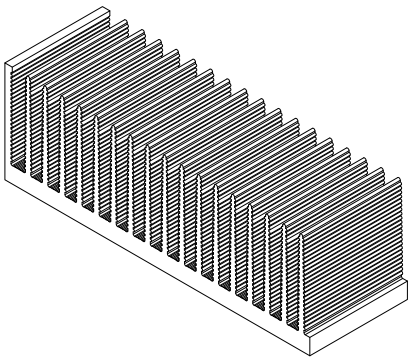


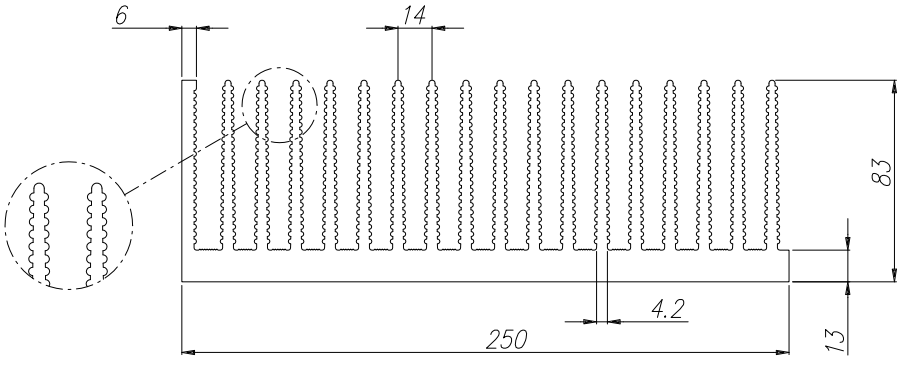


TECNOAL BOLOGNA - ITALY

D

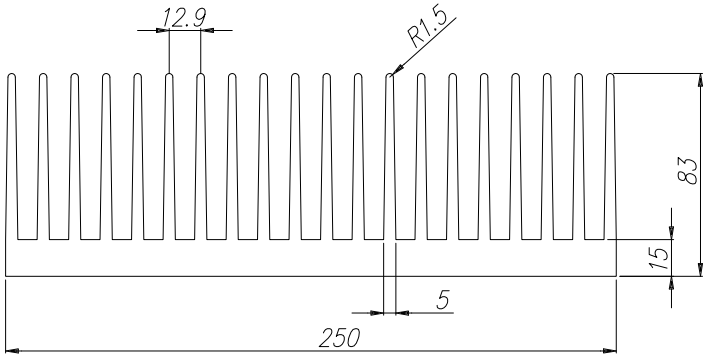
KE250	Peso Kg/m / Weight Kg/m 22.05	Rt °C/W 0.22	Lung. campione mm / Sample length mm 150

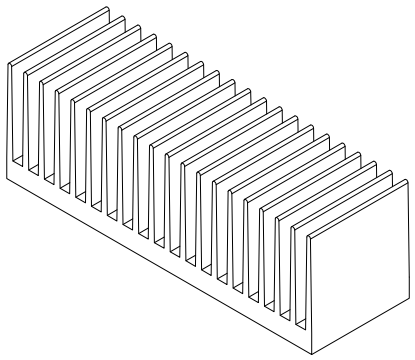




TECNOAL BOLOGNA - ITALY

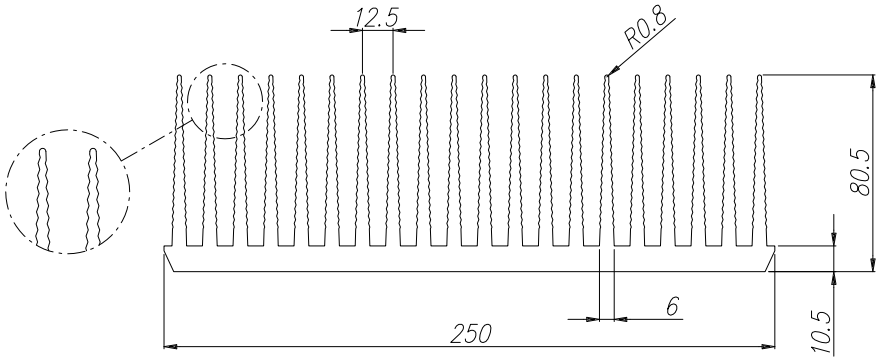
KX250	Peso Kg/m / Weight Kg/m 25.10	Rt °C/W 0.23	Lung. campione mm / Sample length mm 150

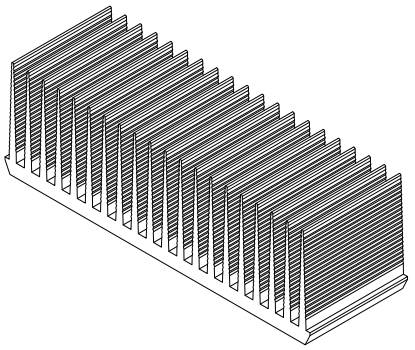




A

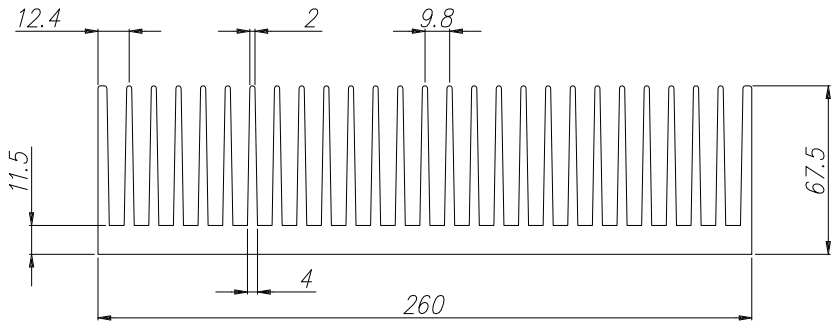
KK250	Peso Kg/m / Weight Kg/m 21.40	Rt °C/W 0.24	Lung. campione mm / Sample length mm 150

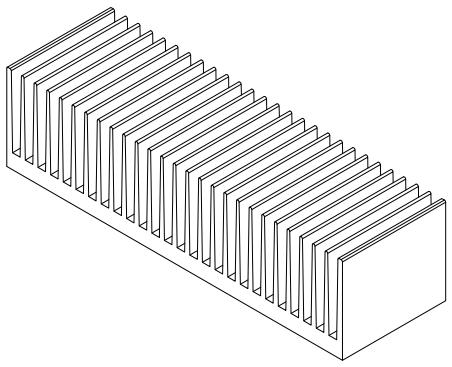




B

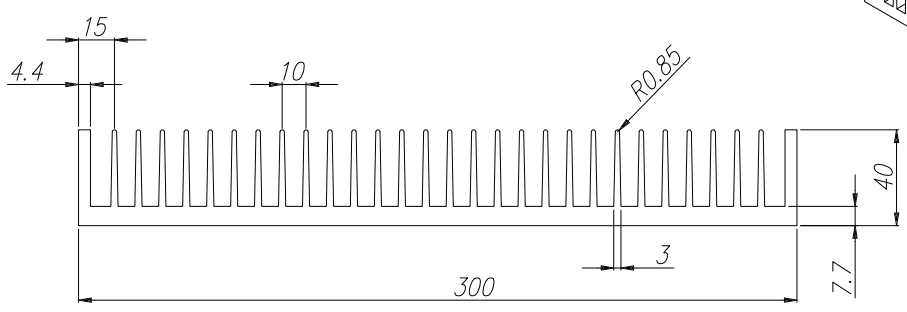
K260	Peso Kg/m / Weight Kg/m 20.65	Rt °C/W 0.29	Lung. campione mm / Sample length mm 150

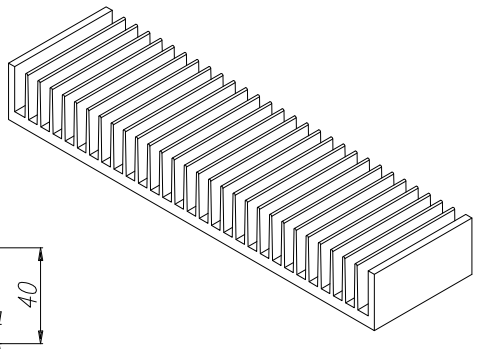




C

K300	Peso Kg/m / Weight Kg/m 12.80	Rt °C/W 0.32	Lung. campione mm / Sample length mm 150

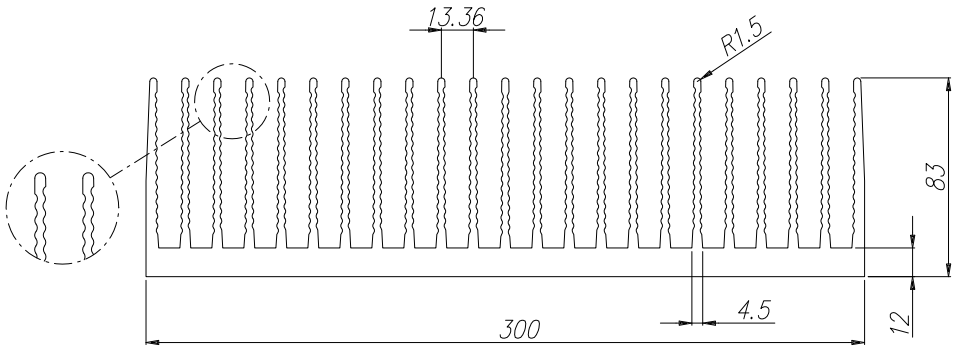


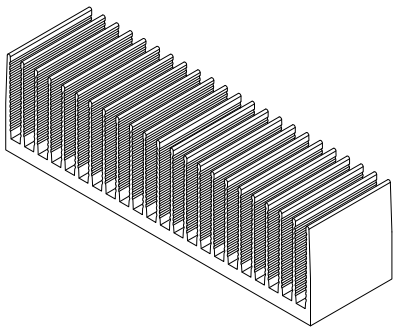


D

A

KE300	Peso Kg/m / Weight Kg/m	22.70	Rt °C/W	0.21	Lung. campione mm / Sample length mm	150

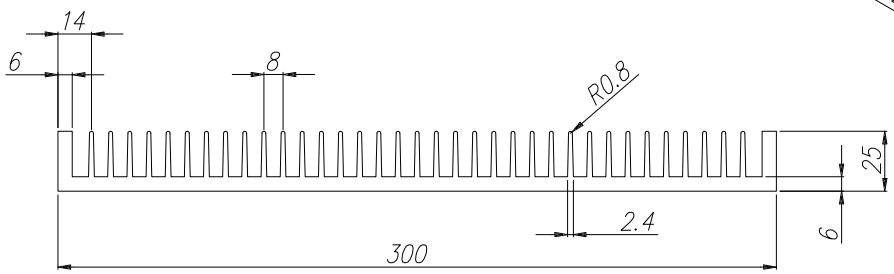


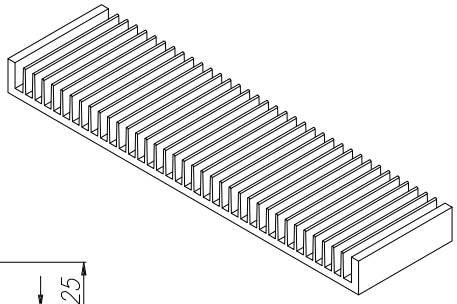


TECNOAL BOLOGNA - ITALY

B

KEA300	Peso Kg/m / Weight Kg/m	9.10	Rt °C/W	0.44	Lung. campione mm / Sample length mm	150

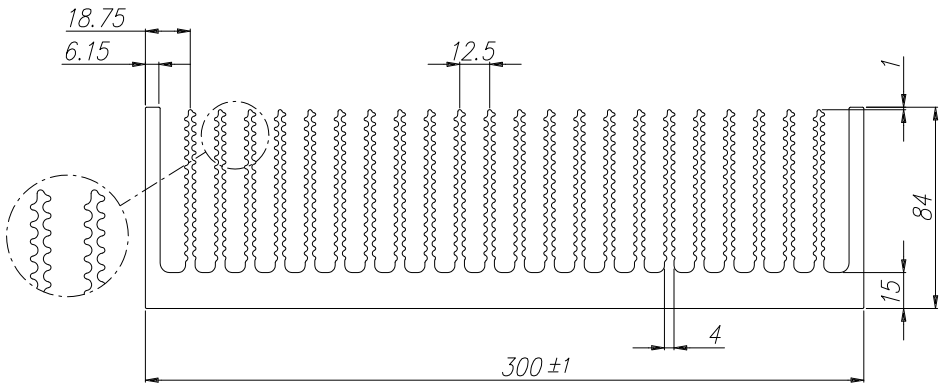


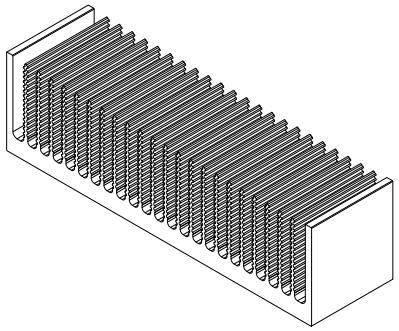


TECNOAL BOLOGNA - ITALY

C

KH300	Peso Kg/m / Weight Kg/m	26.60	Rt °C/W	0.20	Lung. campione mm / Sample length mm	150

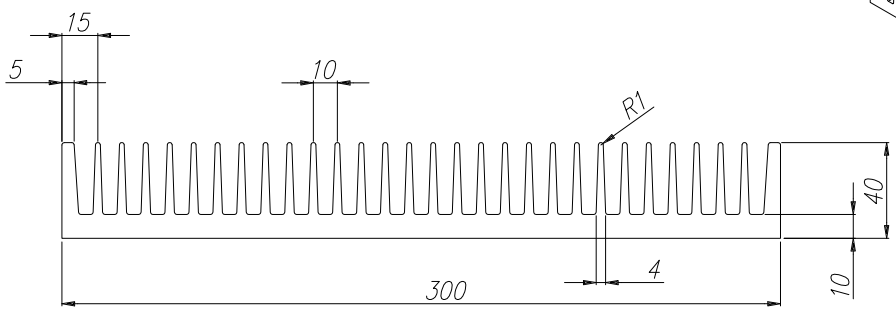


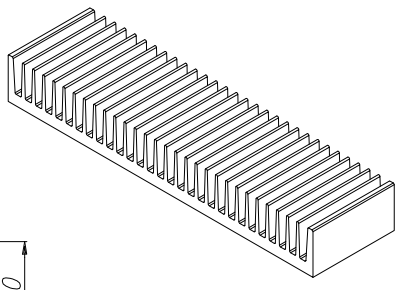


TECNOAL BOLOGNA - ITALY

D

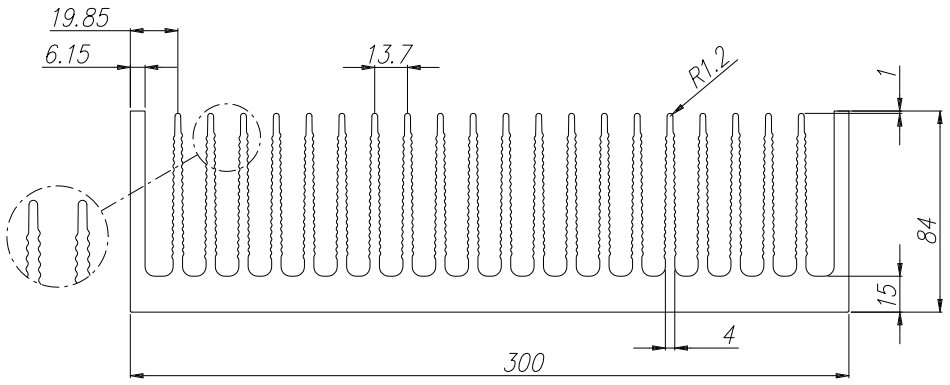
KK300	Peso Kg/m / Weight Kg/m	15.75	Rt °C/W	0.32	Lung. campione mm / Sample length mm	150

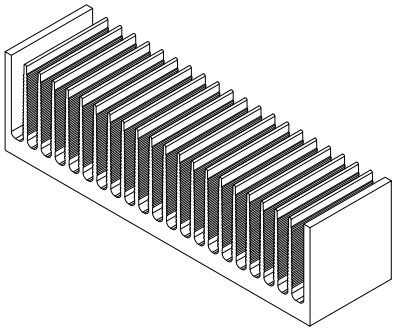




TECNOAL BOLOGNA - ITALY

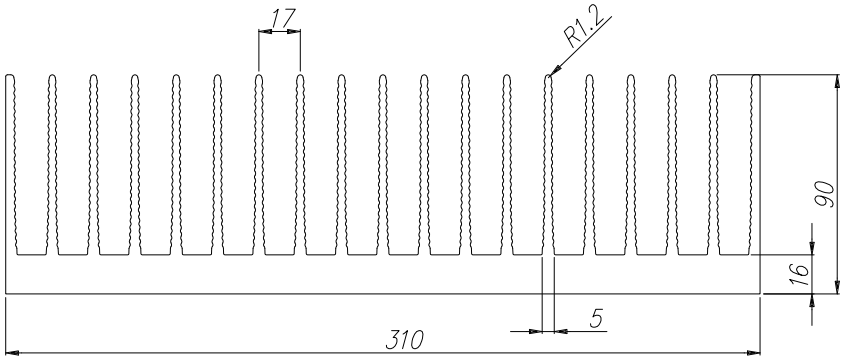
KX300	Peso Kg/m / Weight Kg/m 28.45	Rt °C/W 0.20	Lung. campione mm / Sample length mm 150

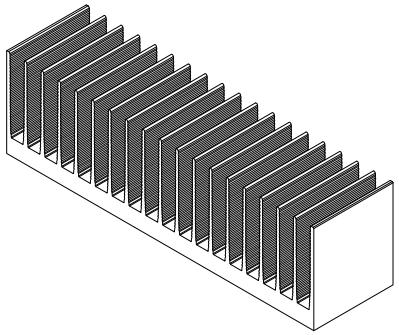




A

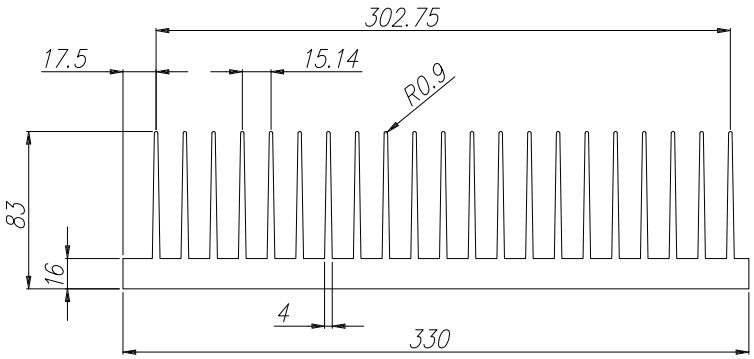
K310	Peso Kg/m / Weight Kg/m 25.95	Rt °C/W 0.21	Lung. campione mm / Sample length mm 200

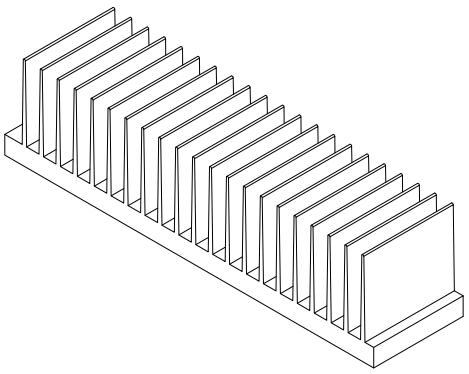




B

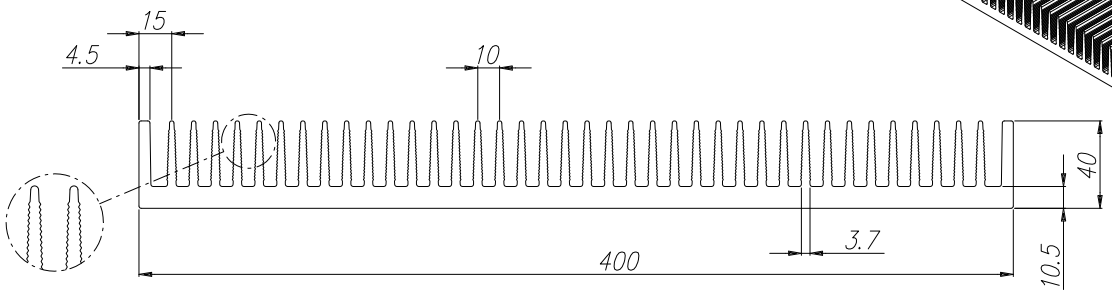
K330	Peso Kg/m / Weight Kg/m 25.20	Rt °C/W 0.19	Lung. campione mm / Sample length mm 200

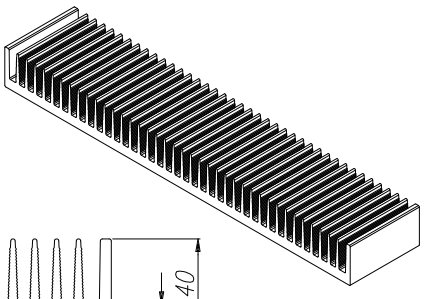




C

K400	Peso Kg/m / Weight Kg/m 21.03	Rt °C/W 0.25	Lung. campione mm / Sample length mm 150

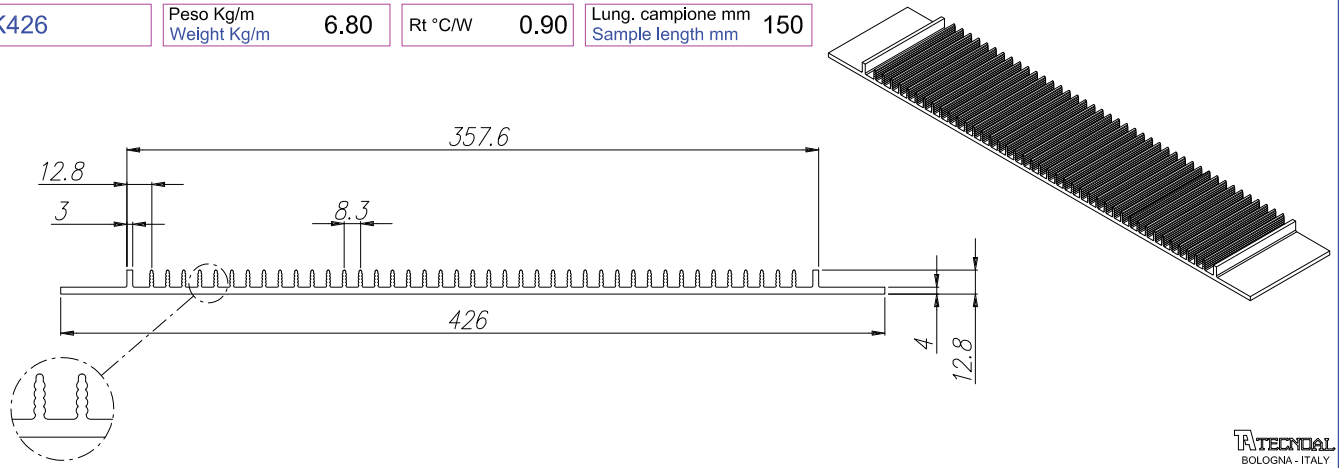




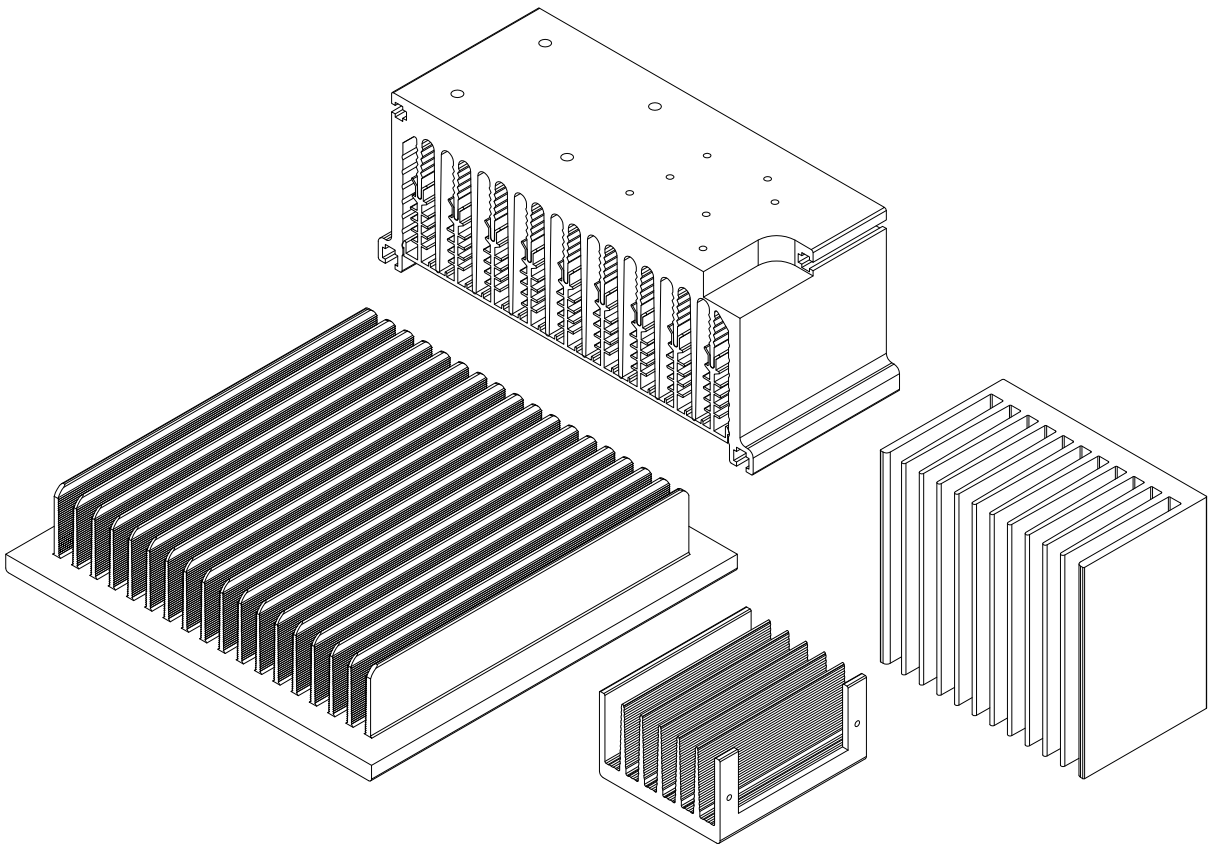
D

A

K426	Peso Kg/m Weight Kg/m 6.80	Rt °C/W 0.90	Lung. campione mm Sample length mm 150

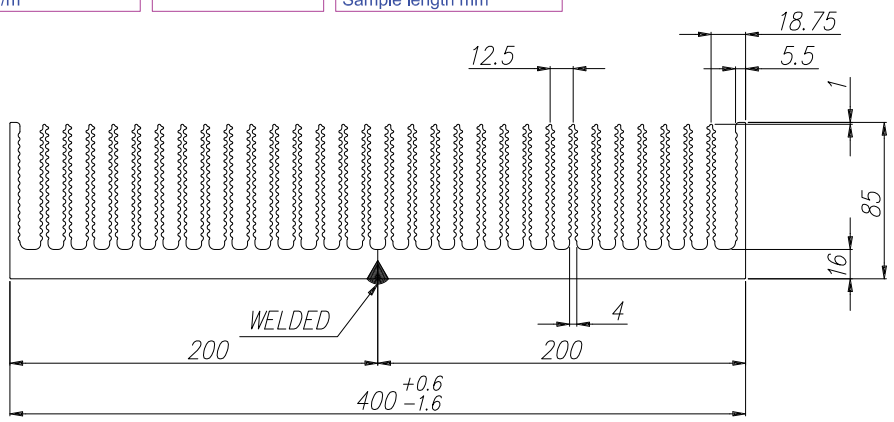


TECNOAL
BOLOGNA - ITALY



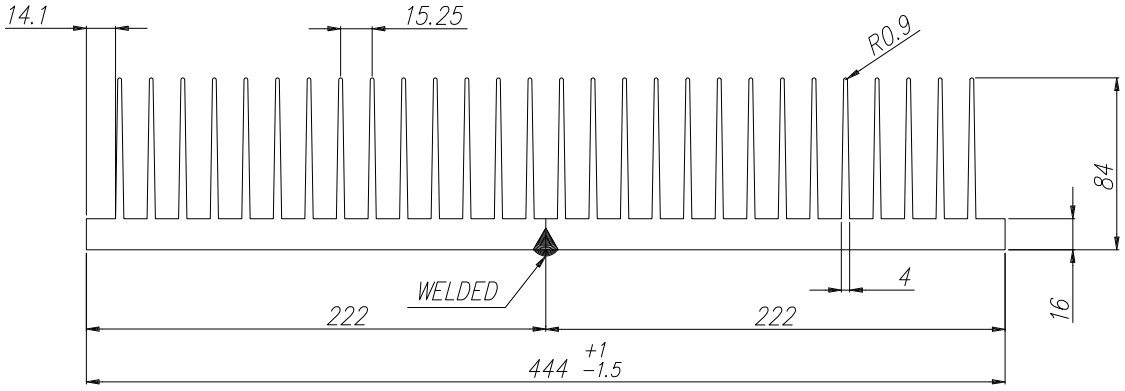
TECNOAL
BOLOGNA - ITALY

KE400	Peso Kg/m / Weight Kg/m 35.77	Rt °C/W 0.15	Lung. campione mm / Sample length mm 150



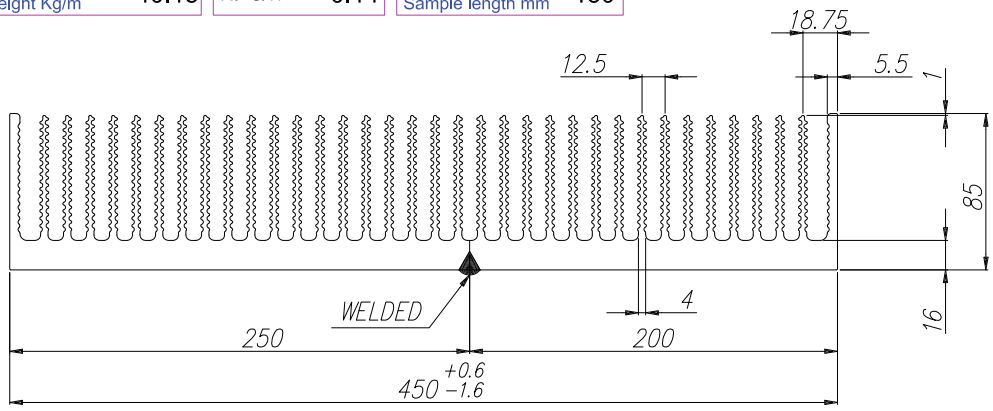
A

K444	Peso Kg/m / Weight Kg/m 34.00	Rt °C/W 0.14	Lung. campione mm / Sample length mm 200



B

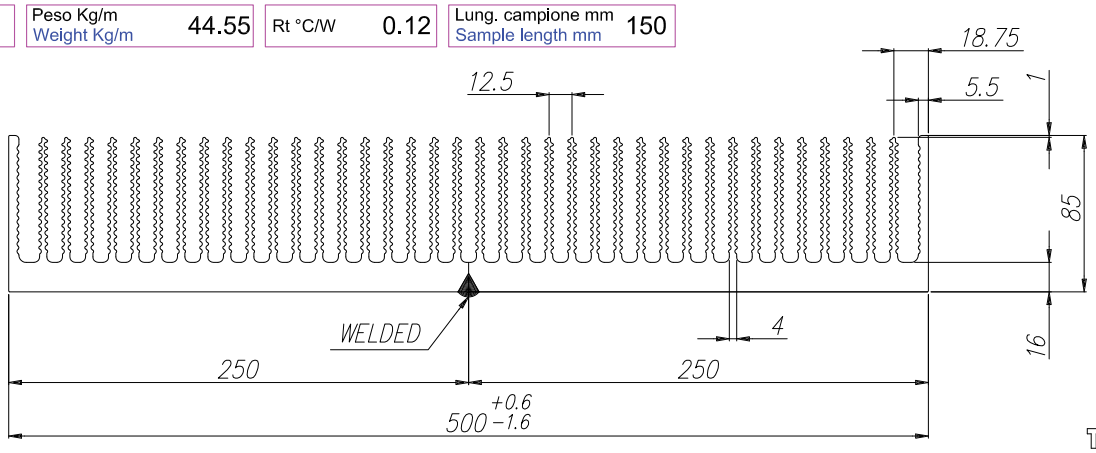
K450	Peso Kg/m / Weight Kg/m 40.15	Rt °C/W 0.14	Lung. campione mm / Sample length mm 150



Up on request

C

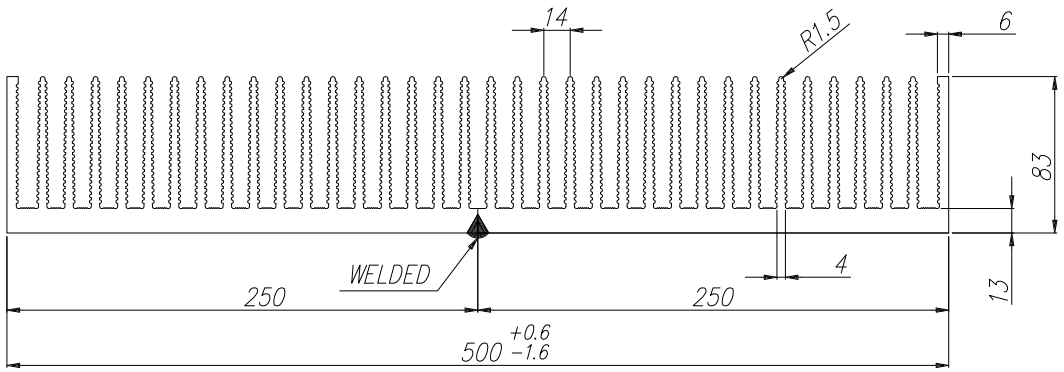
K500	Peso Kg/m / Weight Kg/m 44.55	Rt °C/W 0.12	Lung. campione mm / Sample length mm 150



D

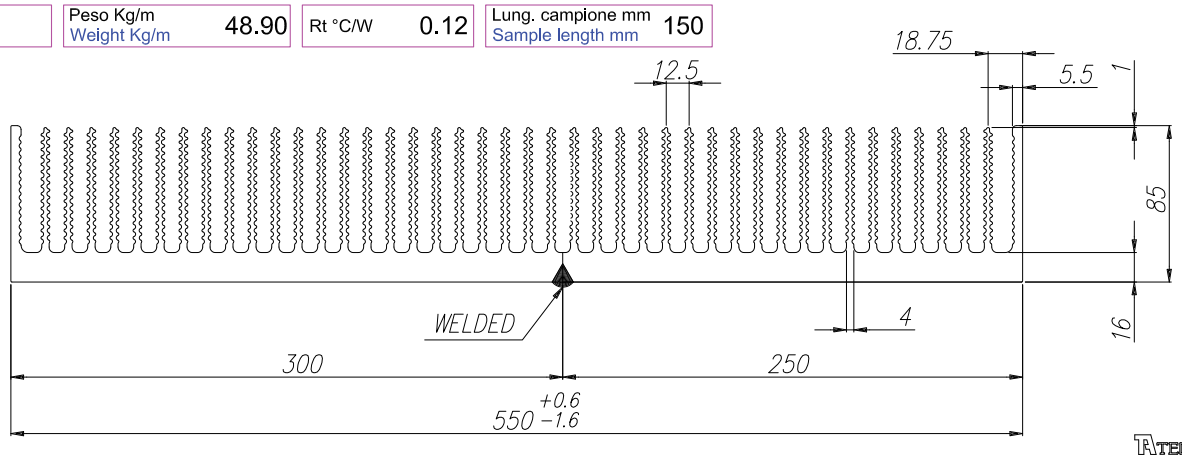
A

K500A	Peso Kg/m / Weight Kg/m 44.10	Rt °C/W 0.13	Lung. campione mm / Sample length mm 150



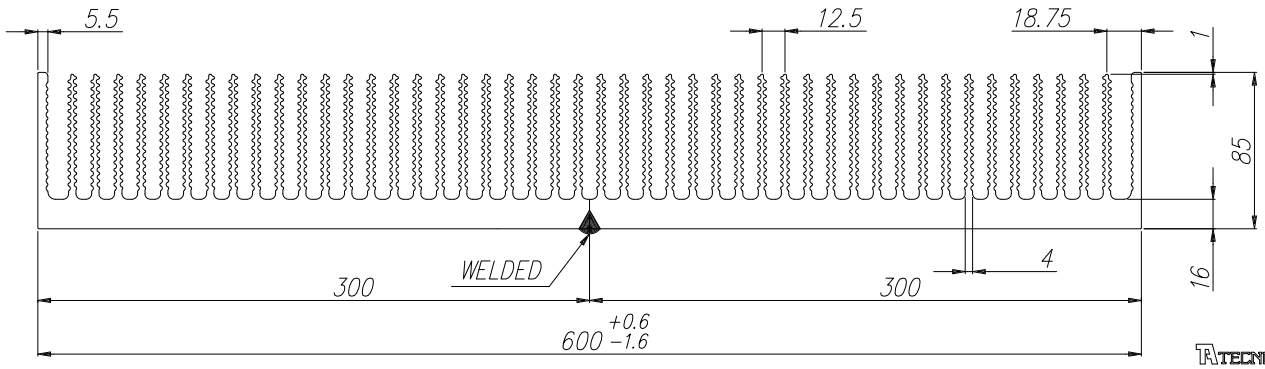
B

K550	Peso Kg/m / Weight Kg/m 48.90	Rt °C/W 0.12	Lung. campione mm / Sample length mm 150



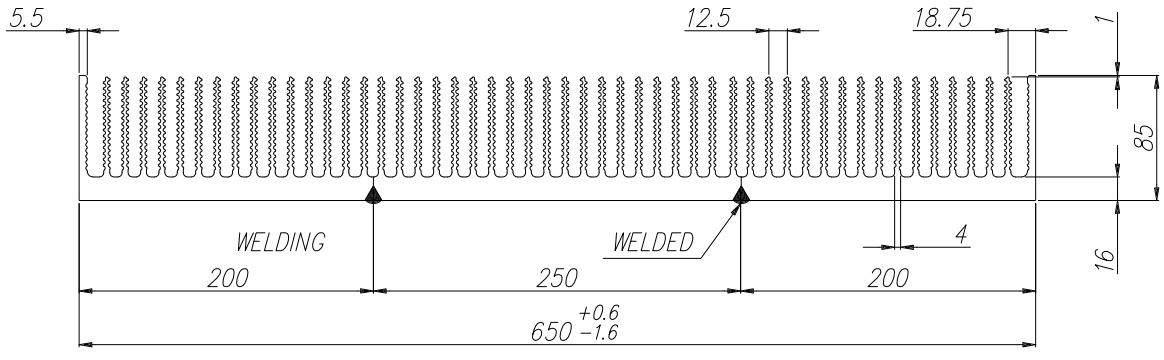
C

K600	Peso Kg/m / Weight Kg/m 53.24	Rt °C/W 0.10	Lung. campione mm / Sample length mm 150



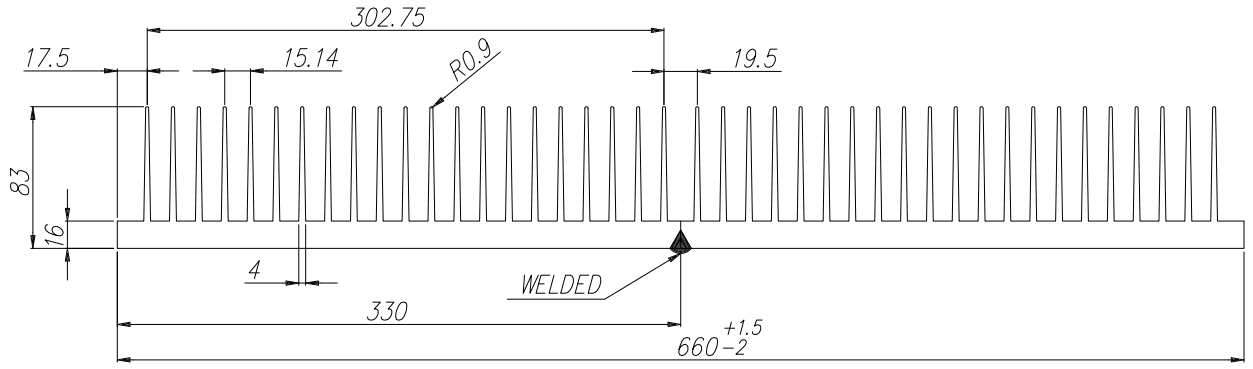
D

K650	Peso Kg/m / Weight Kg/m 57.65	Rt °C/W 0.098	Lung. campione mm / Sample length mm 150



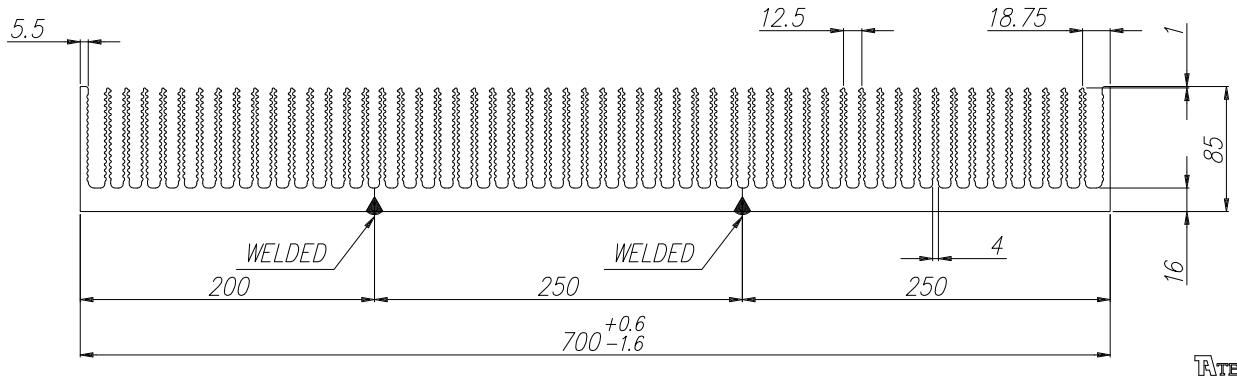
Up on request

K660	Peso Kg/m / Weight Kg/m 50.40	Rt °C/W 0.08	Lung. campione mm / Sample length mm 200



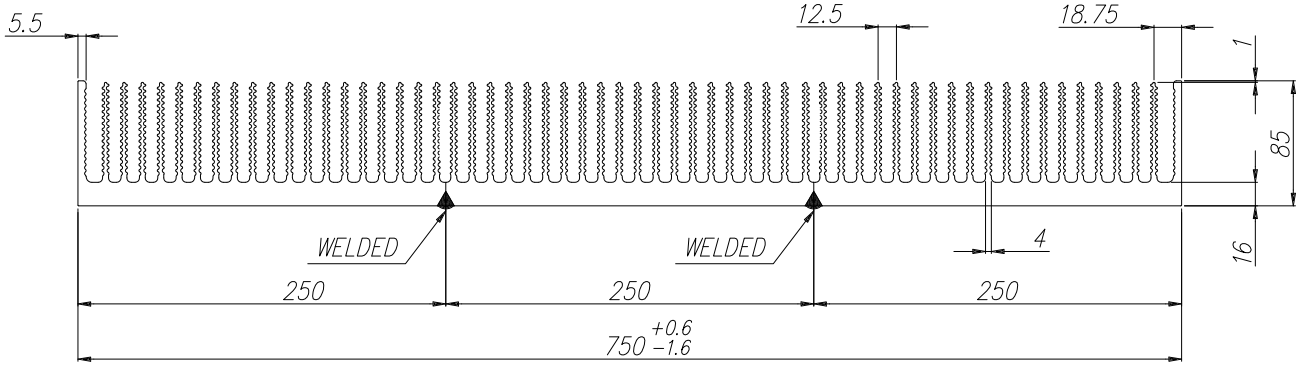
A

K700	Peso Kg/m / Weight Kg/m 62.00	Rt °C/W 0.096	Lung. campione mm / Sample length mm 150



B

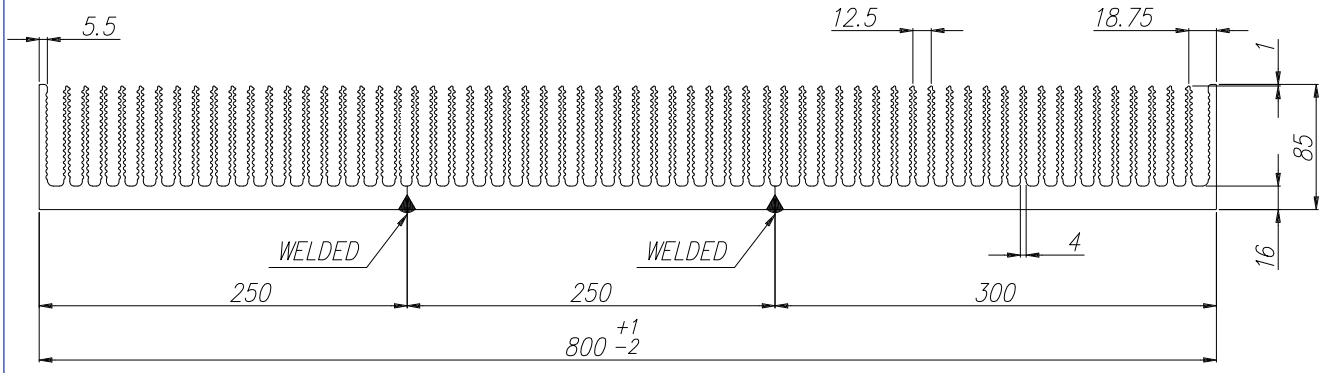
K750	Peso Kg/m / Weight Kg/m 66.38	Rt °C/W 0.095	Lung. campione mm / Sample length mm 150



Up on request

C

K800	Peso Kg/m / Weight Kg/m 70.75	Rt °C/W 0.093	Lung. campione mm / Sample length mm 150

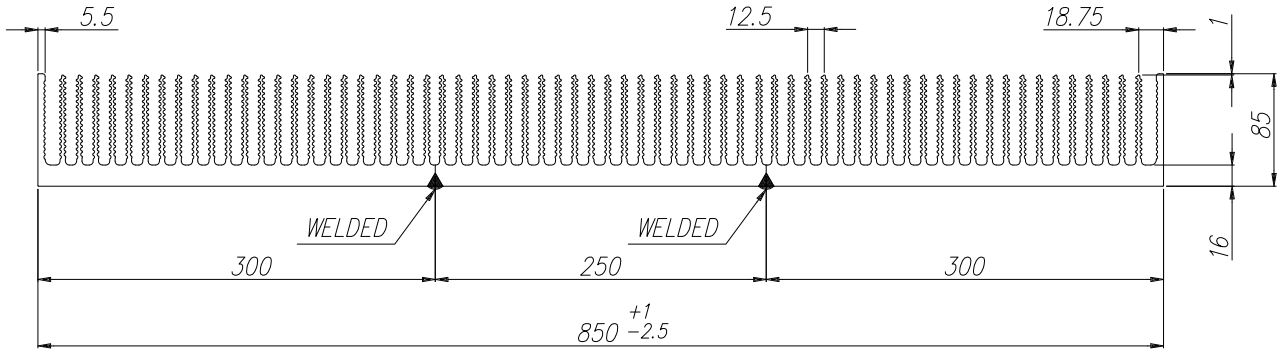


Up on request

D

A

K850	Peso Kg/m / Weight Kg/m 75.15	Rt °C/W 0.090	Lung. campione mm / Sample length mm 150

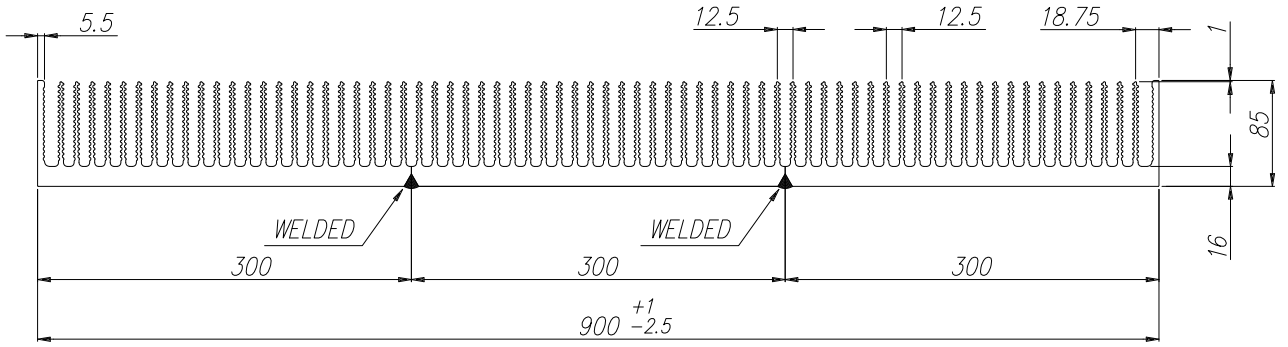


Up on request

TECNOAL BOLOGNA - ITALY

B

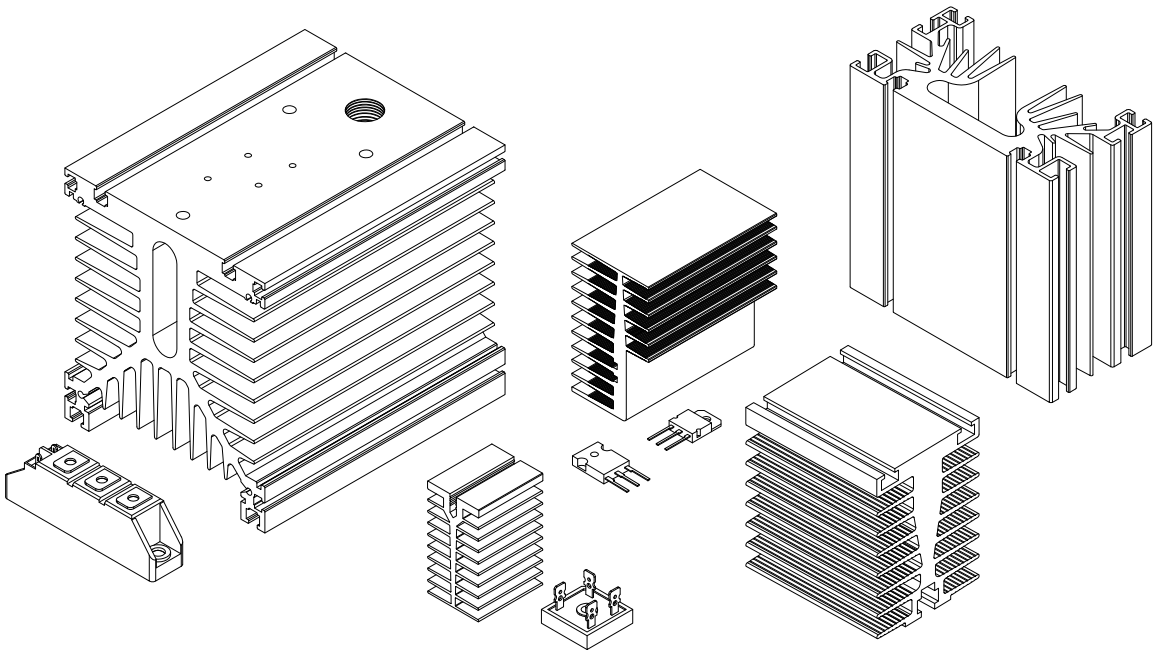
K900	Peso Kg/m / Weight Kg/m 79.50	Rt °C/W 0.086	Lung. campione mm / Sample length mm 150



TECNOAL BOLOGNA - ITALY

TECNOAL BOLOGNA - ITALY

PROFILI SERIE "A"
SERIES "A" PROFILES



I profili della serie A sono estremamente vari sia nelle dimensioni che nelle geometrie.
La principale caratteristica è quella di avere una grande inerzia termica che ne consente un ottimo impiego nei cicli di carico termico intermittente.
Possono essere progettati nuovi profili su richiesta se le quantità lo permettono.
Tutti i profili della serie A sono gestiti a magazzino in barre di lunghezza di 5m.
Tecnoal è in grado di fornire il particolare comprensivo delle lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:
1 - Profilo e relativa lunghezza di taglio (Esempio: A135/350 – viene così indicato il profilo A135 tagliato a 350mm).
2 - Quantitativo del lotto di produzione
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. VI invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali anodizzazione (indicare il colore), alodyne, ecc...

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

Series “A” profiles are very different both in size and in geometry.
The main characteristic is to have a large thermal inertia that allows them to very good use in intermittent thermal load cycles.
New profiles can be designed to meet specific customer requests depending on quantities required.
All profiles series “A” are stored in 5 meters bars length. Tecnoal is able to provide this series including all machining and any surface treatments.
For quotations please provide the following informations:
1 - Profile and relevant length (Example: A135/350 specifies the profile A135 cut to 350mm).
2 - Quantity of batch production.
3 - Any machining, to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne, etc...

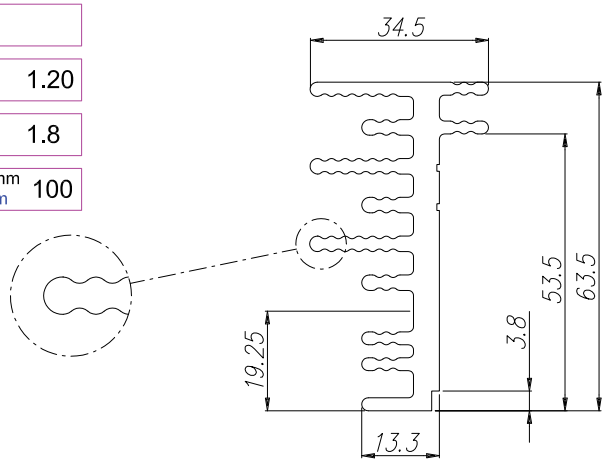
Our commercial and technical office is at your disposal for any clarification.

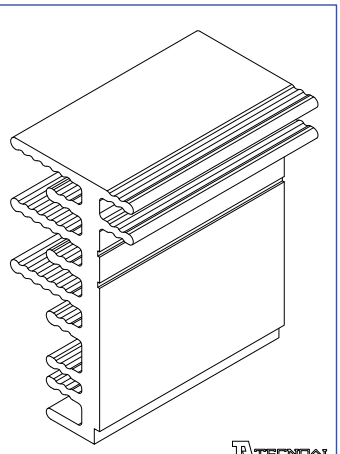
TECNOAL
BOLOGNA - ITALY

A

AX34

Peso Kg/m Weight Kg/m	1.20
Rt °C/W	1.8
Lung. campione mm Sample length mm	100



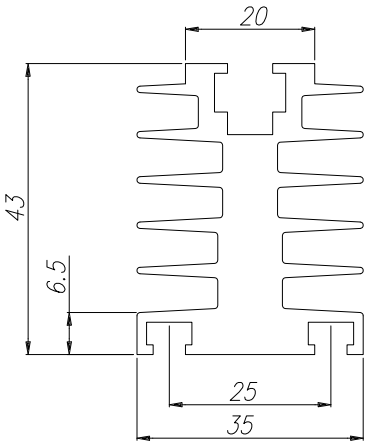


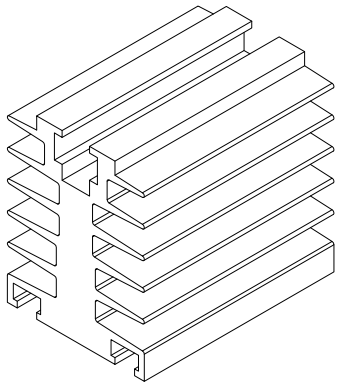
TECNOAL BOLOGNA - ITALY

B

A43

Peso Kg/m Weight Kg/m	1.88
Rt °C/W	3.3
Lung. campione mm Sample length mm	100



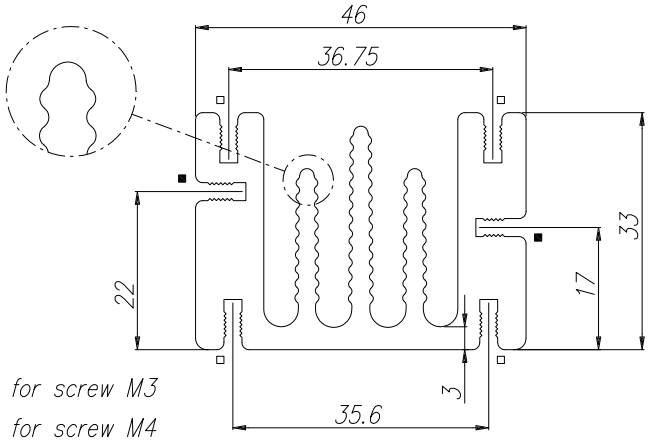


TECNOAL BOLOGNA - ITALY

C

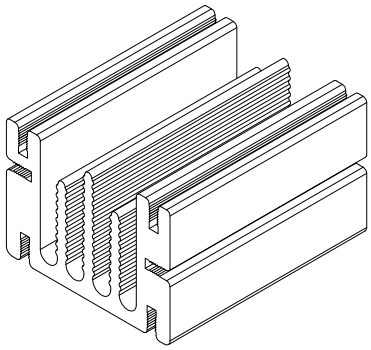
A46

Peso Kg/m Weight Kg/m	2.16
Rt °C/W	3.0
Lung. campione mm Sample length mm	100



▪ Cava per M3 / Groove for screw M3

▫ Cava per M4 / Groove for screw M4

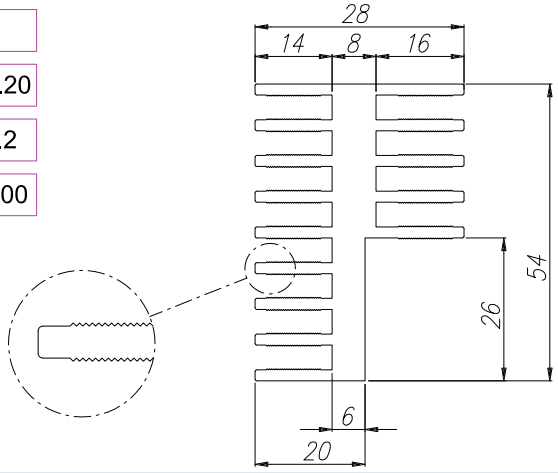


TECNOAL BOLOGNA - ITALY

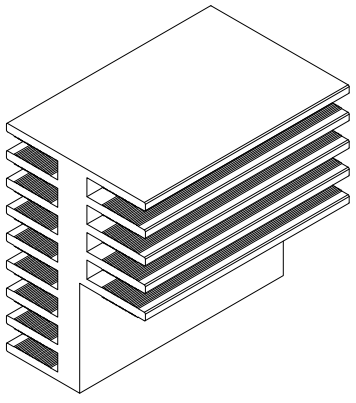
D

A54

Peso Kg/m Weight Kg/m	2.20
Rt °C/W	3.2
Lung. campione mm Sample length mm	100



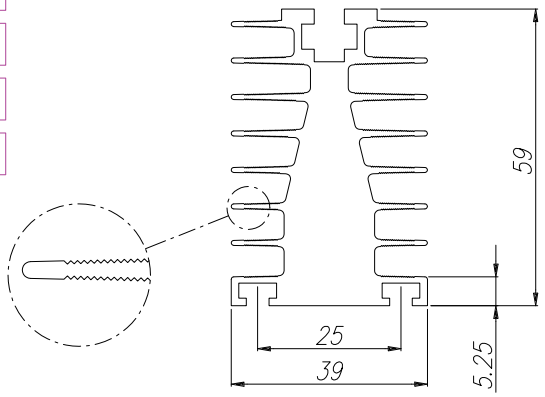
Up on request

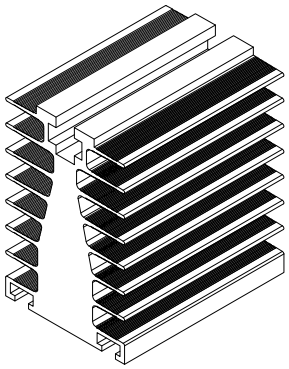


TECNOAL BOLOGNA - ITALY

A59

Peso Kg/m Weight Kg/m	2.85
Rt °C/W	2.4
Lung. campione mm Sample length mm	100



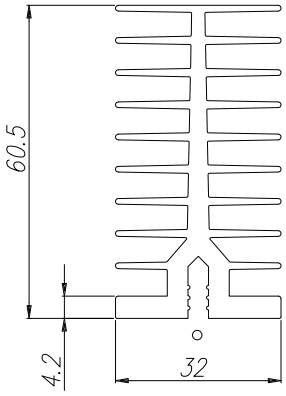


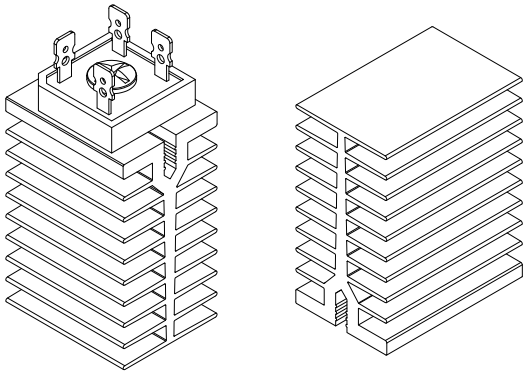
TECNOAL BOLOGNA - ITALY

A

A60

Peso Kg/m Weight Kg/m	1.90
Rt °C/W	2.2
Lung. campione mm Sample length mm	100





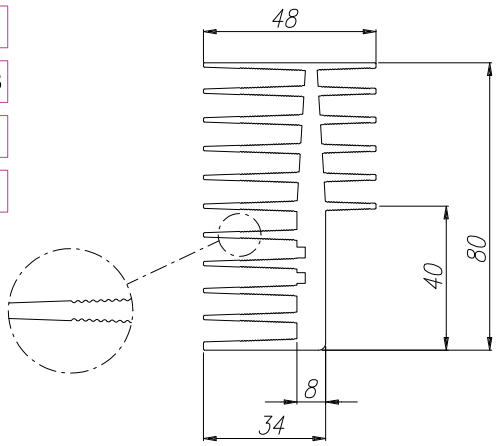
- Cava per autofilettante
- Groove for Self-tapping

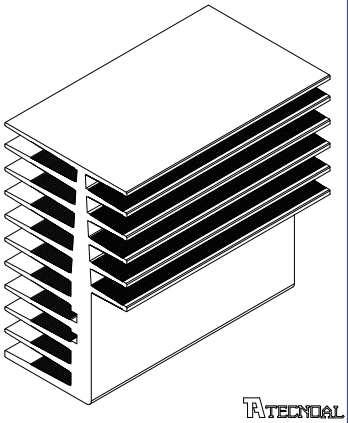
TECNOAL BOLOGNA - ITALY

B

A80

Peso Kg/m Weight Kg/m	3.58
Rt °C/W	1.6
Lung. campione mm Sample length mm	100



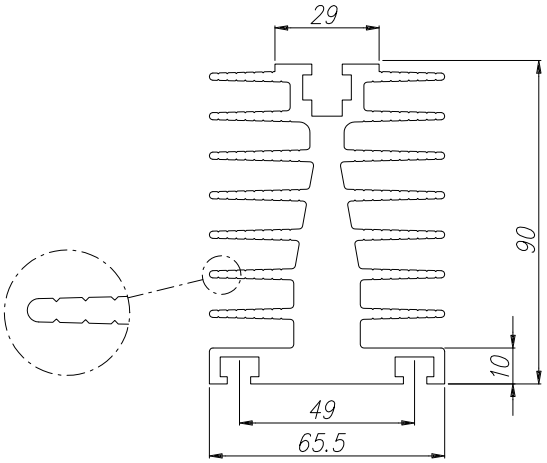


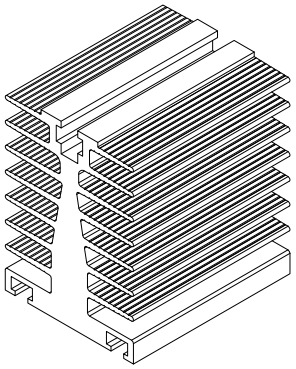
TECNOAL BOLOGNA - ITALY

C

A90

Peso Kg/m Weight Kg/m	6.85
Rt °C/W	0.9
Lung. campione mm Sample length mm	150



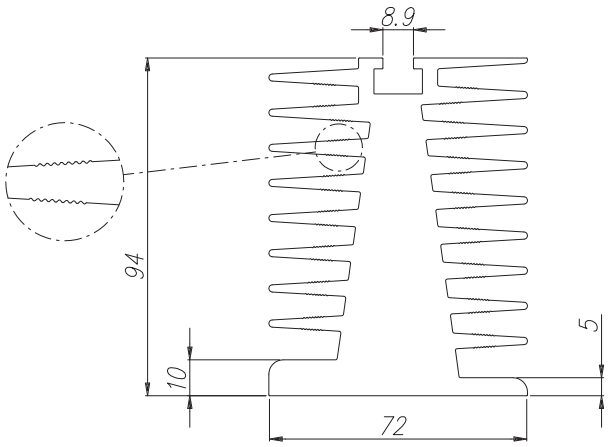


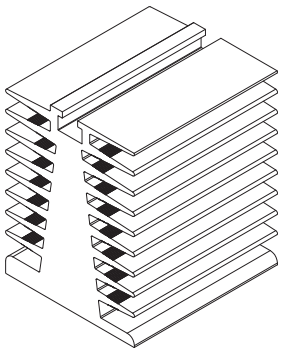
TECNOAL BOLOGNA - ITALY

D

A

A94	
Peso Kg/m Weight Kg/m	10.35
Rt °C/W	0.85
Lung. campione mm Sample length mm	100

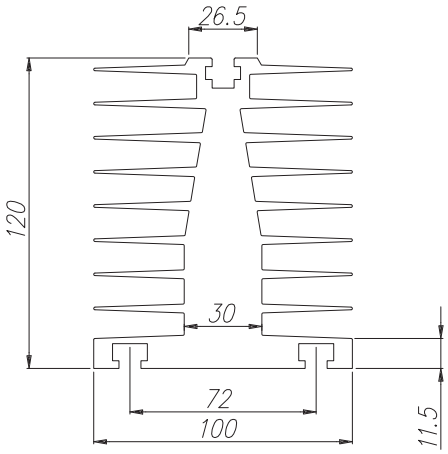


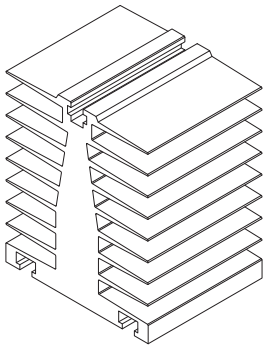


TECNOAL BOLOGNA - ITALY

B

A120	
Peso Kg/m Weight Kg/m	14.50
Rt °C/W	0.6
Lung. campione mm Sample length mm	100

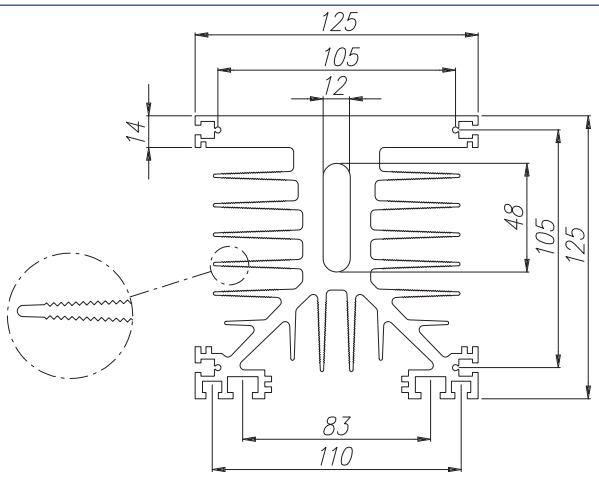


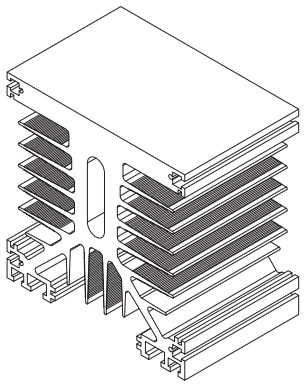


TECNOAL BOLOGNA - ITALY

C

A125	
Peso Kg/m Weight Kg/m	15.65
Rt °C/W	0.5
Lung. campione mm Sample length mm	200

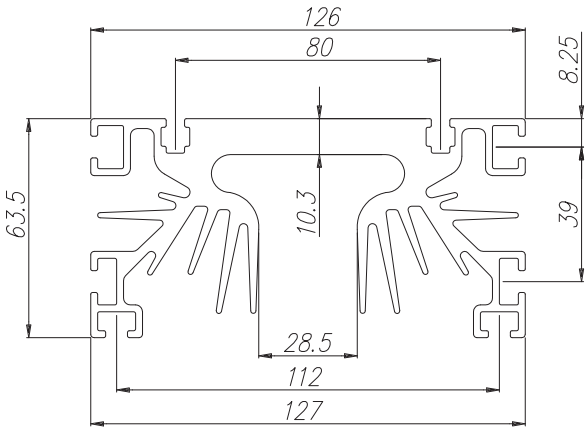


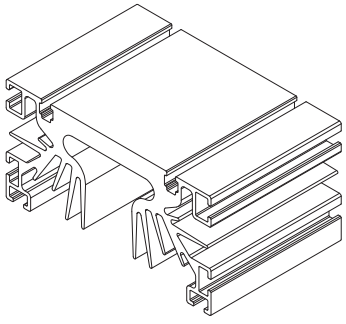


TECNOAL BOLOGNA - ITALY

D

A126	
Peso Kg/m Weight Kg/m	6.98
Rt °C/W	0.8
Lung. campione mm Sample length mm	100

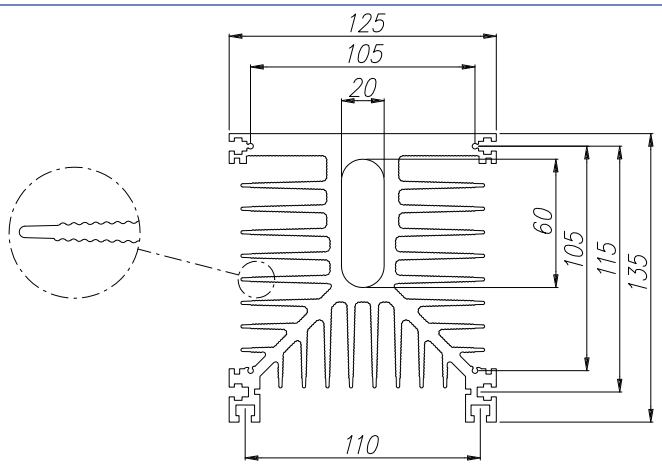


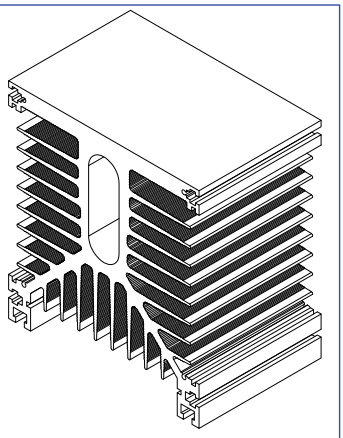


TECNOAL BOLOGNA - ITALY

A134

Peso Kg/m Weight Kg/m	14.80
Rt °C/W	0.6
Lung. campione mm Sample length mm	200

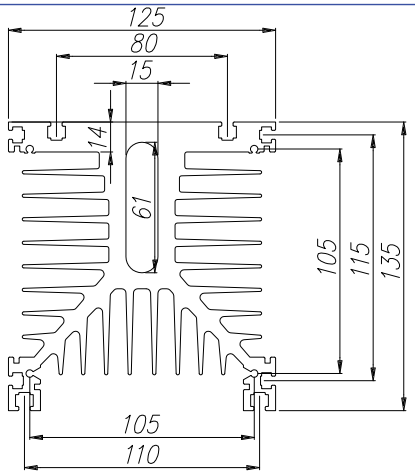


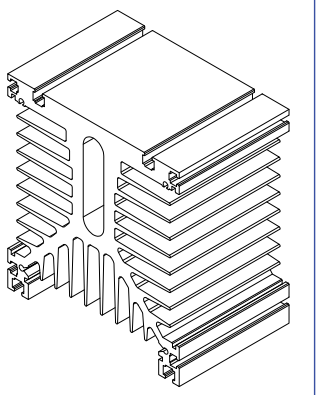


A

A135

Peso Kg/m Weight Kg/m	15.70
Rt °C/W	0.5
Lung. campione mm Sample length mm	200

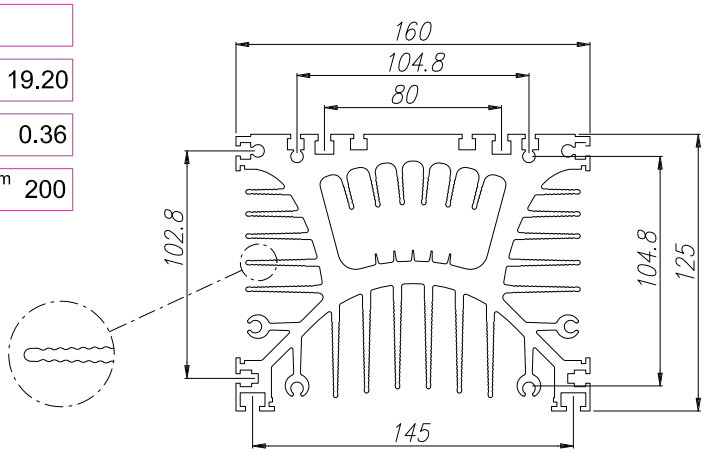


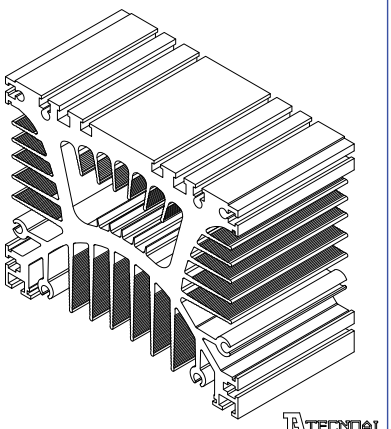


B

A160

Peso Kg/m Weight Kg/m	19.20
Rt °C/W	0.36
Lung. campione mm Sample length mm	200



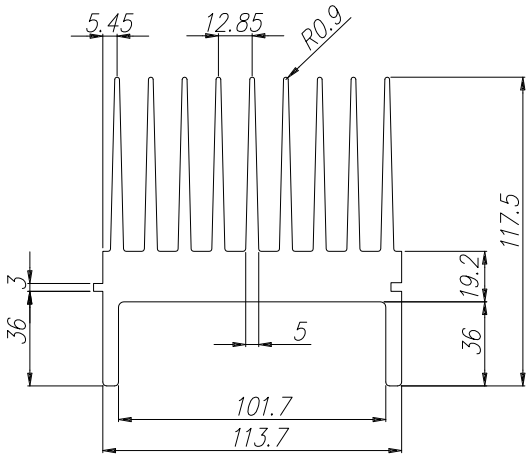


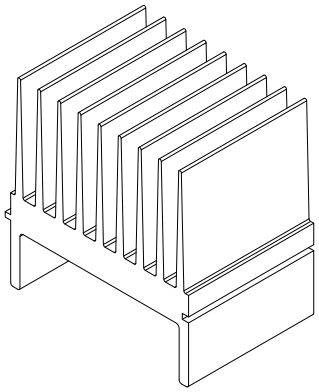
C

X117

Peso Kg/m Weight Kg/m	12.40
Rt °C/W	0.45
Lung. campione mm Sample length mm	200

Up on request



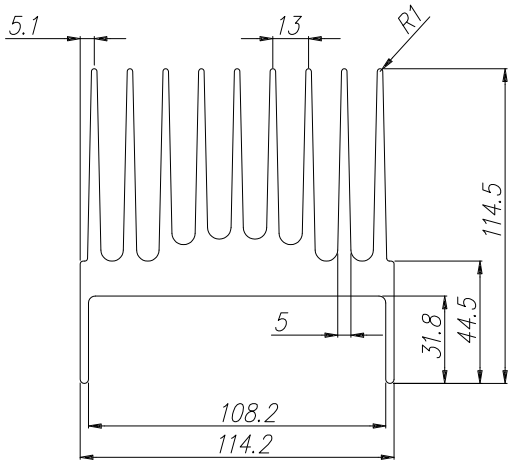


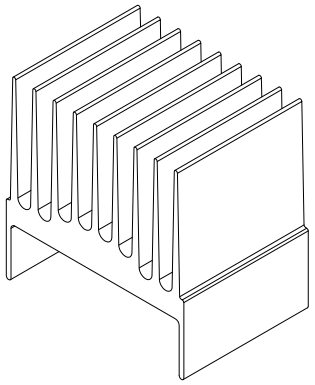
D

A

X117E

Peso Kg/m Weight Kg/m	11.50
Rt °C/W	0.45
Lung. campione mm Sample length mm	200



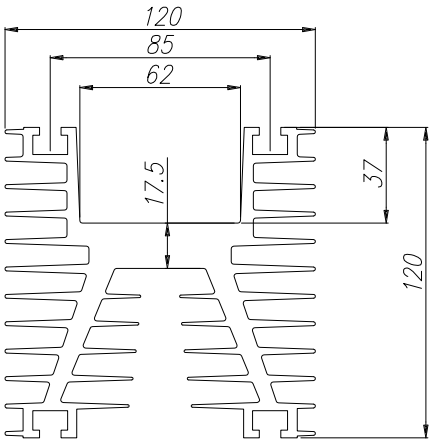


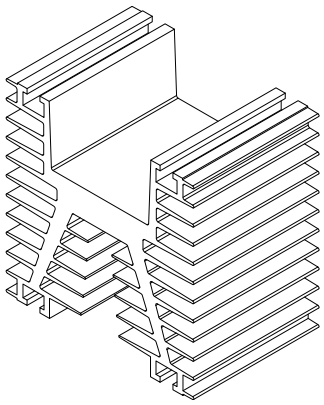
TECNOAL BOLOGNA - ITALY

B

Z120

Peso Kg/m Weight Kg/m	11.40
Rt °C/W	0.6
Lung. campione mm Sample length mm	200



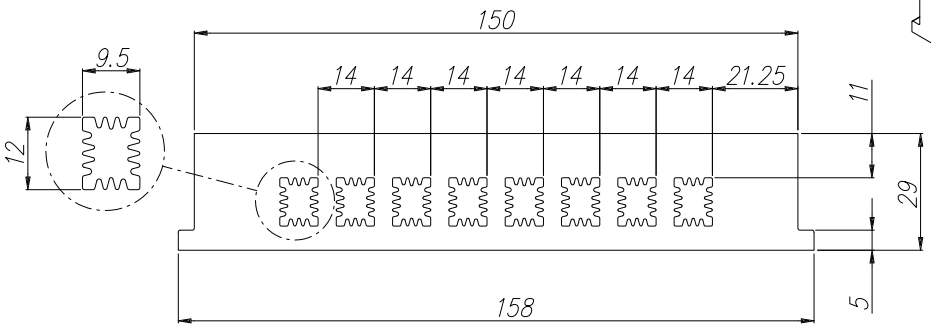


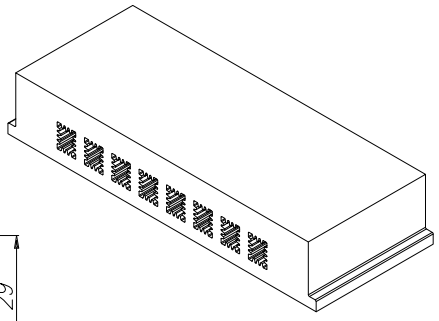
TECNOAL BOLOGNA - ITALY

C

ASI 158

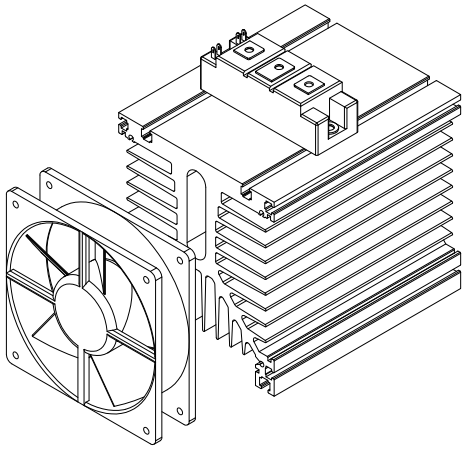
Peso Kg/m Weight Kg/m	10.00	Rt °C/W	--
Lung. campione mm Sample length mm	- - -		





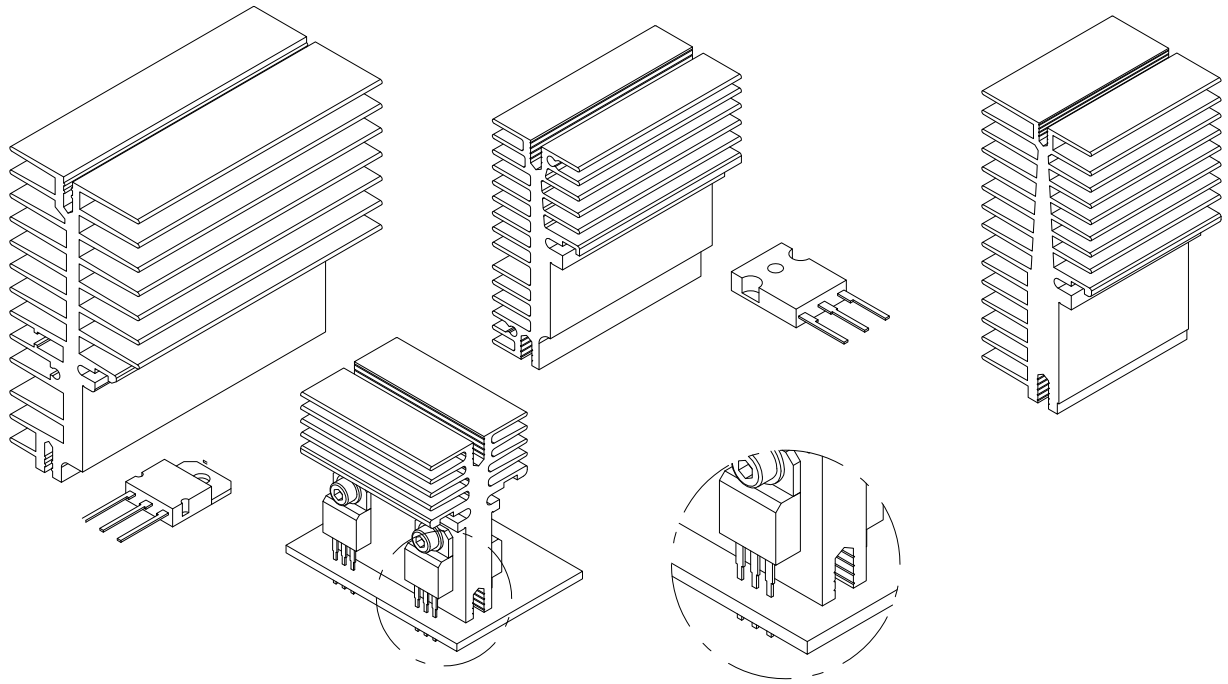
TECNOAL BOLOGNA - ITALY

D



TECNOAL BOLOGNA - ITALY

PROFILI SERIE "A---M"
SERIES "A---M" PROFILES



I profili della serie “A---M” sono estremamente vari sia nelle dimensioni che nelle geometrie.
La principale caratteristica è quella di avere una grande inerzia termica che ne consente un ottimo impiego nei cicli di carico termico intermittente.
I profili della serie “A---M” si differenziano da quelli della serie “A” per la possibilità di fissare il dissipatore al circuito stampato mediante specifiche cave per viti.
Possono essere progettati nuovi profili su richiesta se le quantità lo permettono.
Tutti i profili della serie “A---M” sono gestiti a magazzino in barre di lunghezza di 5m.
Tecnoal è in grado di fornire il particolare comprensivo delle lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:
1 - Profilo e relativa lunghezza di taglio (Esempio: A75M/100 – viene così indicato il profilo A75M tagliato a 100mm).
2 - Quantitativo del lotto di produzione
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. VI invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4- Specificare eventuali trattamenti superficiali, quali anodizzazione (indicare il colore), alodyne, ecc...

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

The profiles of series “A---M” are very different both in size and in geometry.
The main characteristic is to have a large thermal inertia that allows them to good use in intermittent thermal load cycles.
The profiles “A---M” series are different from series “A” for the possibility to mount the heatsink on the printed circuit board through specific grooves for screws.
New profiles can be designed to meet specific customer requests depending on quantities required.
All profiles series “A---M” are stored in bars of 5 meters long.
Tecnoal is able to provide this series including all machining and any surface treatments.
For quotations please provide the following informations:
1 - Profile and relevant length (Example: A75M/100 – specifies the profile A75M cut to 100mm.
2 - Quantity of batch production.
3 - Any machining, to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne, etc...

Our commercial and technical office is at your disposal for any clarification.

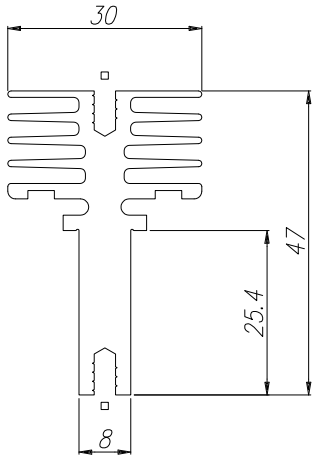
TECNOAL
BOLOGNA - ITALY

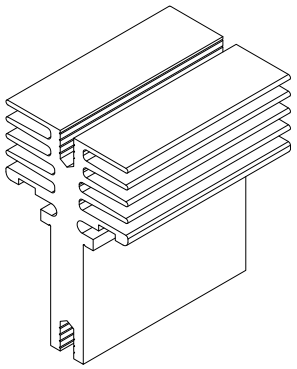
A

A47M

Peso Kg/m Weight Kg/m	1.30
Rt °C/W	3.30
Lung. campione mm Sample length mm	100

- Cava per M4
- Groove for screw M4





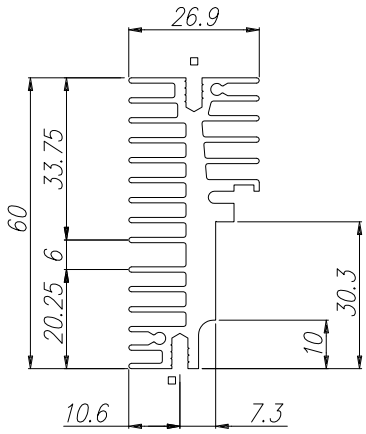
TECNOAL BOLOGNA - ITALY

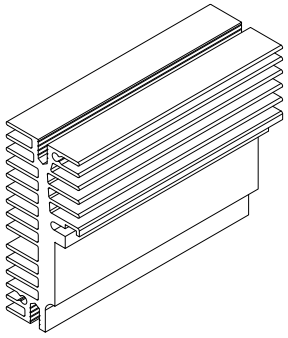
B

A60M

Peso Kg/m Weight Kg/m	1.54
Rt °C/W	3.00
Lung. campione mm Sample length mm	100

- Cava per M4
- Groove for screw M4



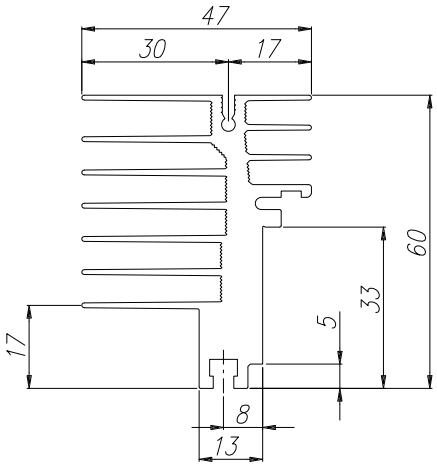


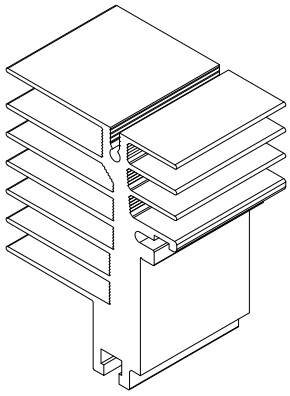
TECNOAL BOLOGNA - ITALY

C

AX60M

Peso Kg/m Weight Kg/m	2.15
Rt °C/W	2.60
Lung. campione mm Sample length mm	100





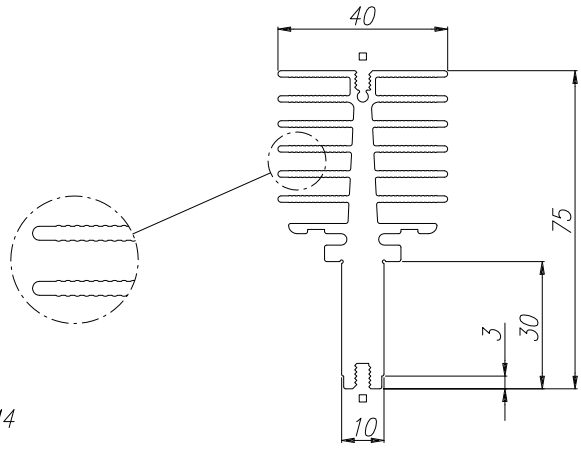
TECNOAL BOLOGNA - ITALY

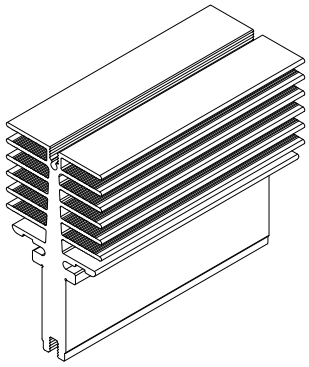
D

A75M

Peso Kg/m Weight Kg/m	2.55
Rt °C/W	2.75
Lung. campione mm Sample length mm	100

- Cava per M4
- Groove for screw M4

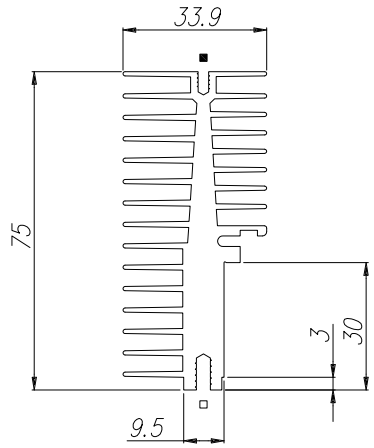


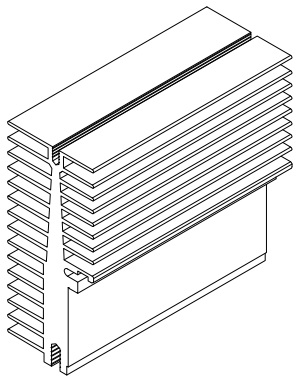


TECNOAL BOLOGNA - ITALY

AX75M

Peso Kg/m Weight Kg/m	2.52
Rt °C/W	2.30
Lung. campione mm Sample length mm	100





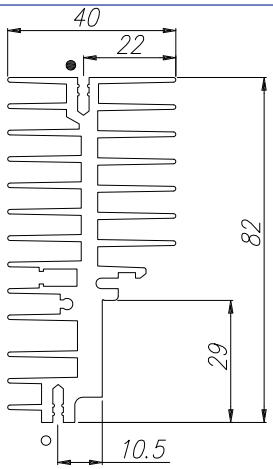
- ▪ Cava per M3 / Groove for screw M3
- ▫ Cava per M4 / Groove for screw M4

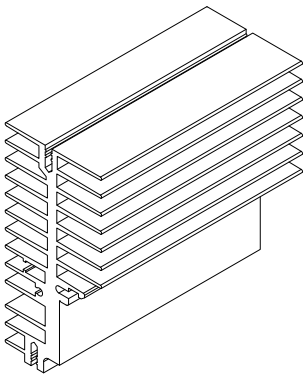
TECNOAL BOLOGNA - ITALY

A

A82M

Peso Kg/m Weight Kg/m	2.55
Rt °C/W	1.90
Lung. campione mm Sample length mm	100





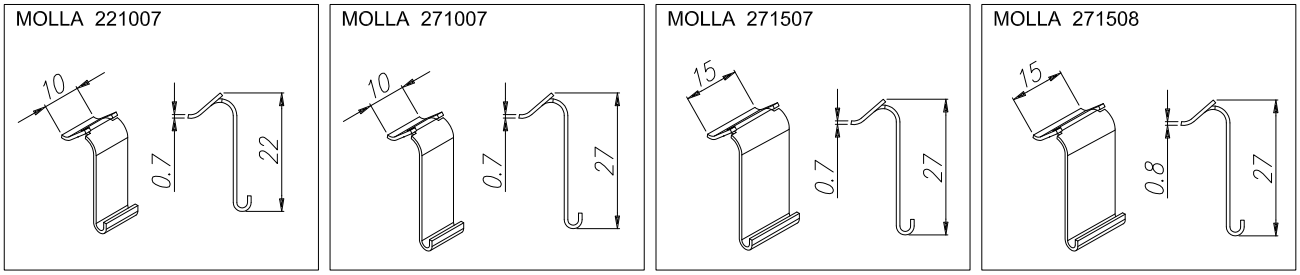
- ● ○ Cava per autofilettante
- ● ○ Groove for Self-tapping

TECNOAL BOLOGNA - ITALY

B

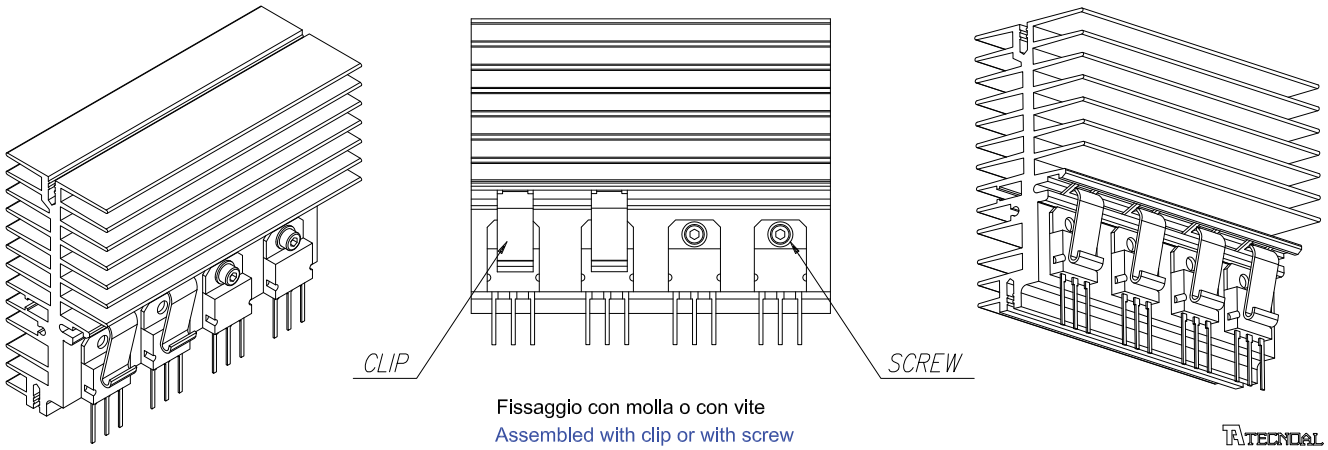
MOLLE PER IL FISSAGGIO DEL COMPONENTE SU DISSIPATORI SERIE TECNOCLIP

CLIPS FOR ASSEMBLY ELECTRONICS COMPONENTS ON HEATSINKS SERIES TECNOCLIP



TECNOAL BOLOGNA - ITALY

C



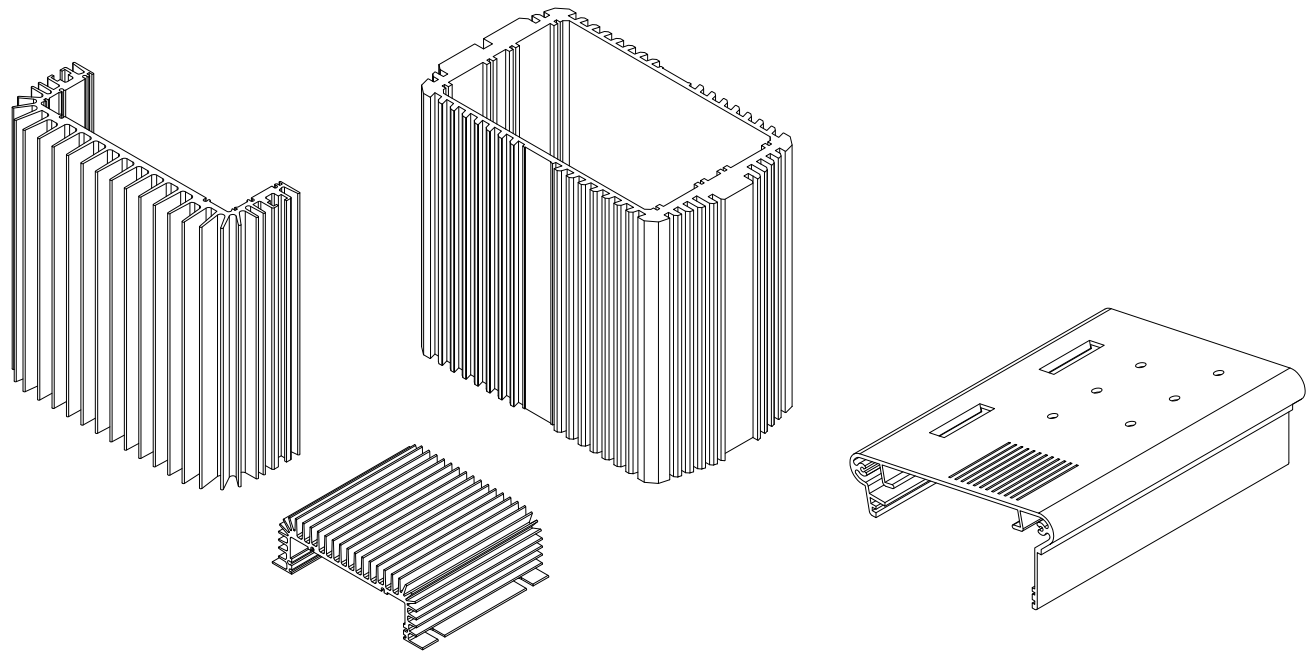
Fissaggio con molla o con vite

Assembled with clip or with screw

TECNOAL BOLOGNA - ITALY

D

PROFILI SERIE "C"
SERIES "C" PROFILES



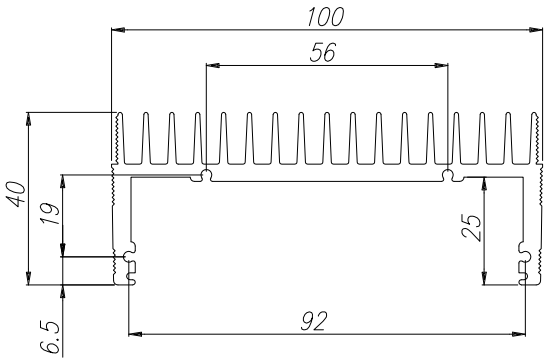
I profili della serie C sono sostanzialmente utilizzati come contenitori, alcuni dei quali essendo alettati hanno anche la funzione di dissipatori di calore.
Tecnoal è in grado di fornire i pezzi completi di lavorazione meccanica e di eventuali trattamenti superficiali.
Possono essere realizzati nuovi profili su specifiche esigenze del cliente, qualora i quantitativi lo consentano.
Tutti i profili della serie C sono gestiti a magazzino in barre da 5m di lunghezza.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:
1 - Profilo e relativa lunghezza di taglio (Esempio: C190/400 viene così indicato il profilo C190 tagliato a 400mm).
2 - Quantitativo del lotto di produzione
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali anodizzazione (indicare il colore), alodyne, ecc...

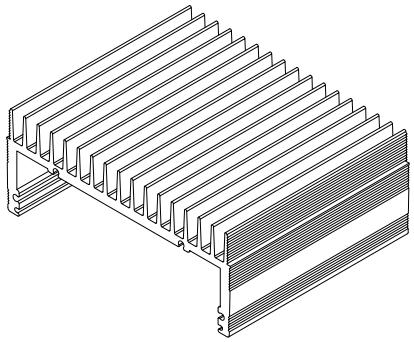
Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

The profiles of series “C” are used as boxes and all models with fins can be used also as heatsink boxes.
Tecnoal is able to provide this series including all machining and any surface treatment.
New profiles can be designed to meet specific customer requests depending on quantities required.
All profiles series “C” are stored in bars of 5 meters long.
For quotations please provide the following informations:
1 - Profile and relevant length (example: C190/400 – Specifies the profile C190 cut to 400mm).
2 - Quantity of batch production.
3 - Any machining, to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne, etc...

Our commercial and technical office is at your disposal for any clarification.

C100	Peso Kg/m / Weight Kg/m 2.40	Rt °C/W 2.2	Lung. campione mm / Sample length mm 100

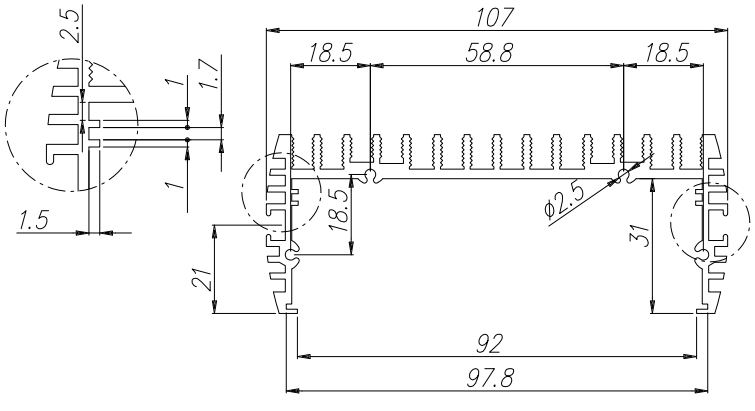


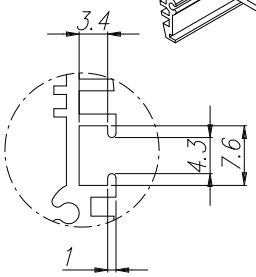


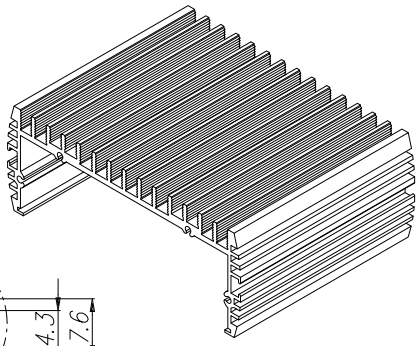
A

TECNOAL BOLOGNA - ITALY

C107	Peso Kg/m / Weight Kg/m 1.96	Rt °C/W 2.6	Lung. campione mm / Sample length mm 100



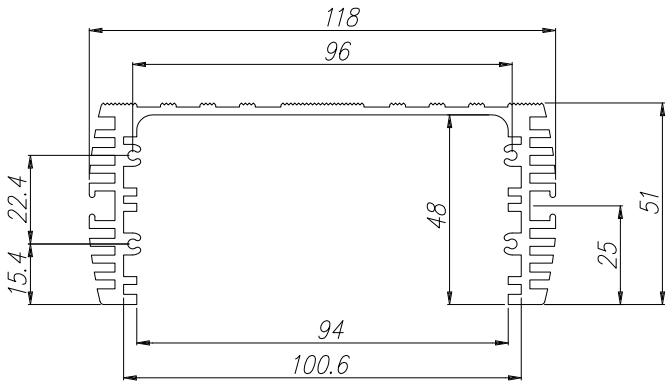


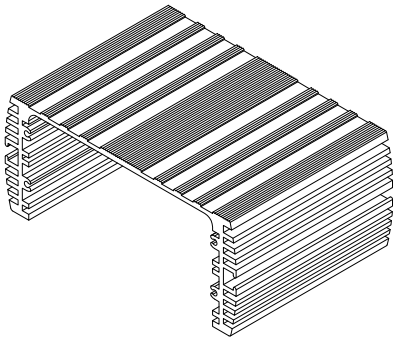


B

TECNOAL BOLOGNA - ITALY

C118	Peso Kg/m / Weight Kg/m 2.40	Rt °C/W 2.1	Lung. campione mm / Sample length mm 150

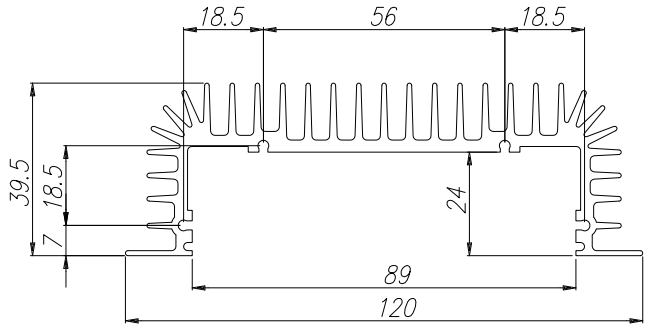


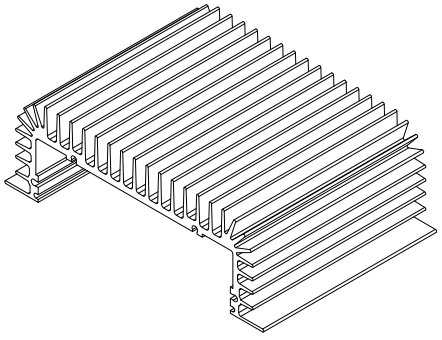


C

TECNOAL BOLOGNA - ITALY

C120	Peso Kg/m / Weight Kg/m 2.25	Rt °C/W 1.2	Lung. campione mm / Sample length mm 150



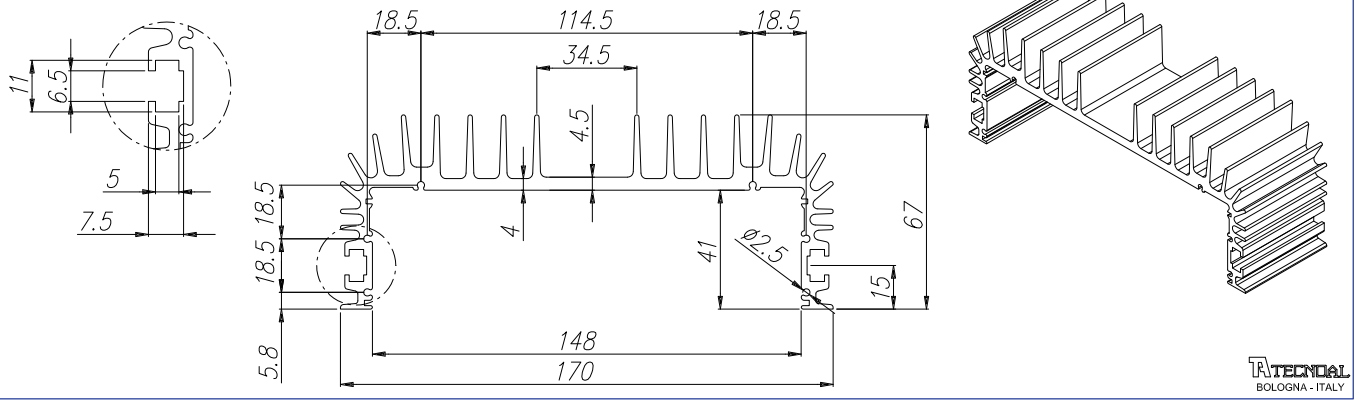


D

TECNOAL BOLOGNA - ITALY

A

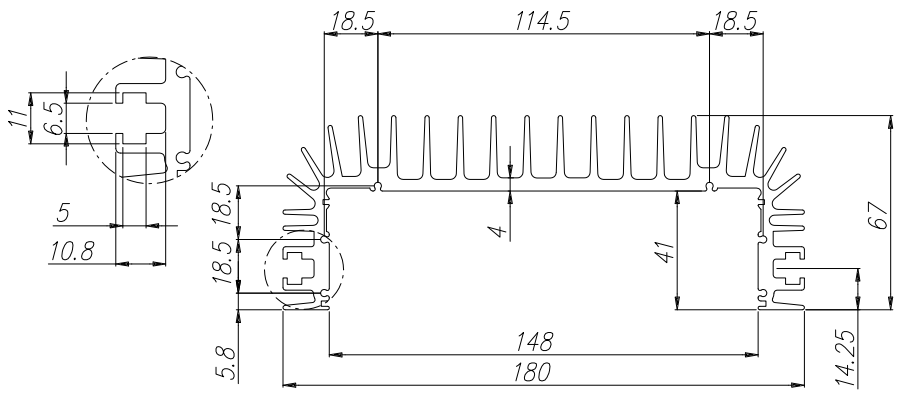
C170	Peso Kg/m / Weight Kg/m	4.48	Rt °C/W	0.95	Lung. campione mm / Sample length mm	200

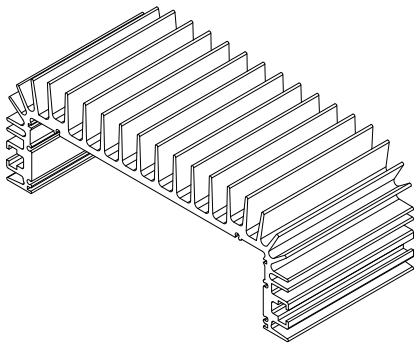


TECNOAL BOLOGNA - ITALY

B

C180	Peso Kg/m / Weight Kg/m	5.60	Rt °C/W	0.7	Lung. campione mm / Sample length mm	200

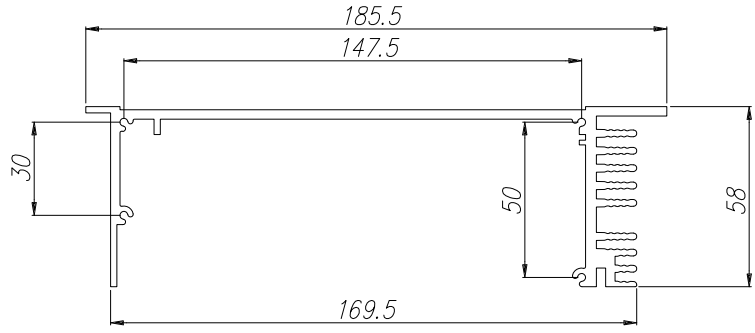


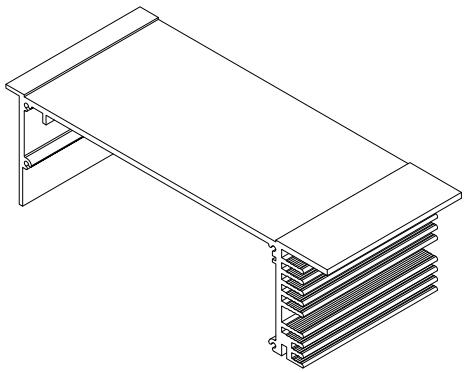


TECNOAL BOLOGNA - ITALY

C

C185	Peso Kg/m / Weight Kg/m	3.30	Rt °C/W	1.5	Lung. campione mm / Sample length mm	200

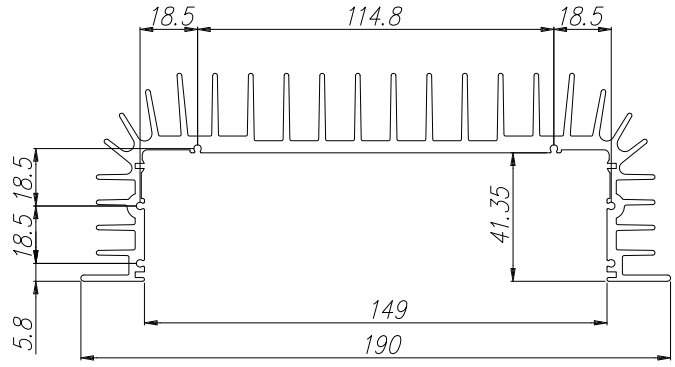


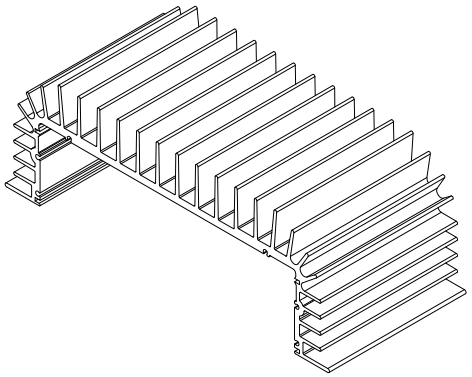


TECNOAL BOLOGNA - ITALY

D

C190	Peso Kg/m / Weight Kg/m	4.95	Rt °C/W	0.9	Lung. campione mm / Sample length mm	150



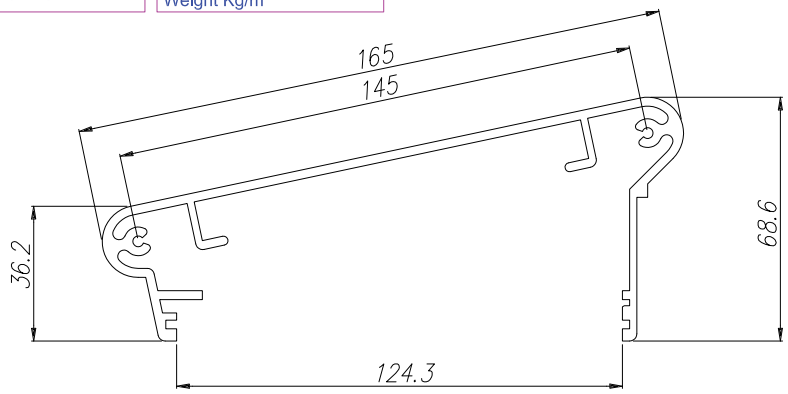


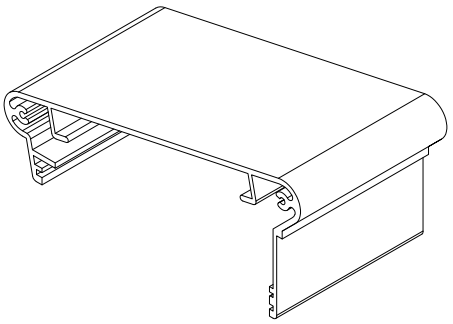
TECNOAL BOLOGNA - ITALY

A

CONSL

Peso Kg/m
Weight Kg/m 2.36





TECNOAL
BOLOGNA - ITALY

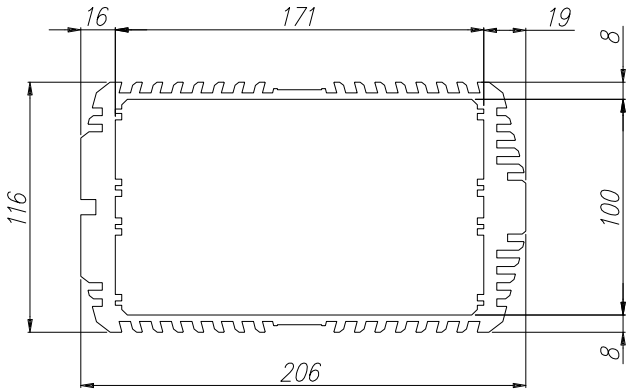
B

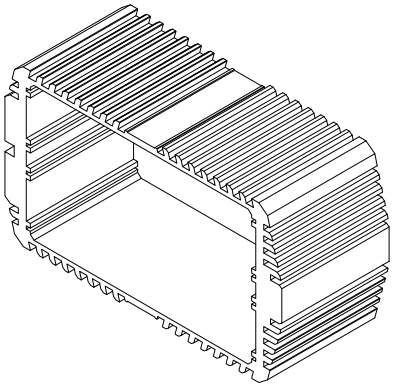
SCS206

Peso Kg/m
Weight Kg/m 12.70

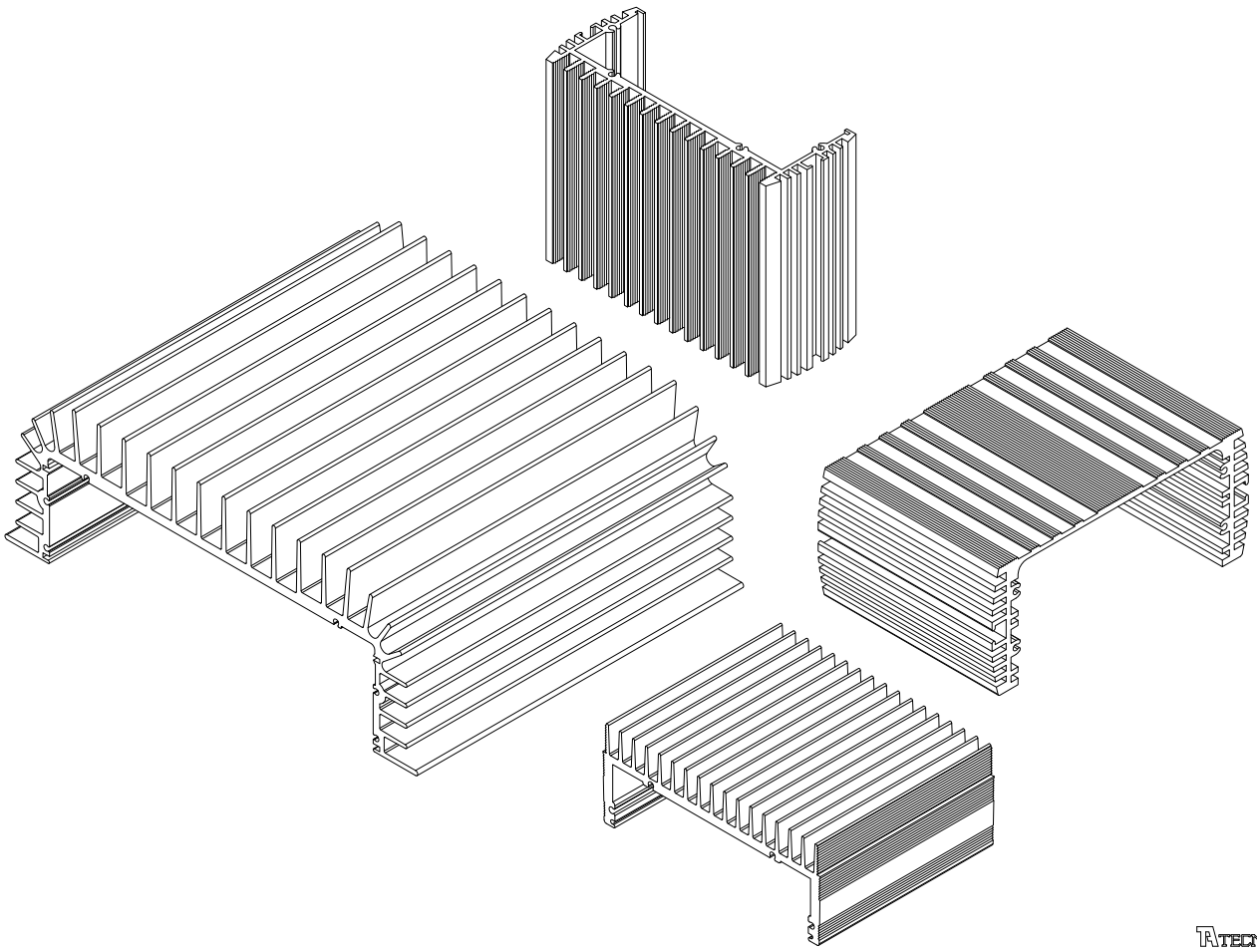
Rt °C/W --

Lung. campione mm
Sample length mm --



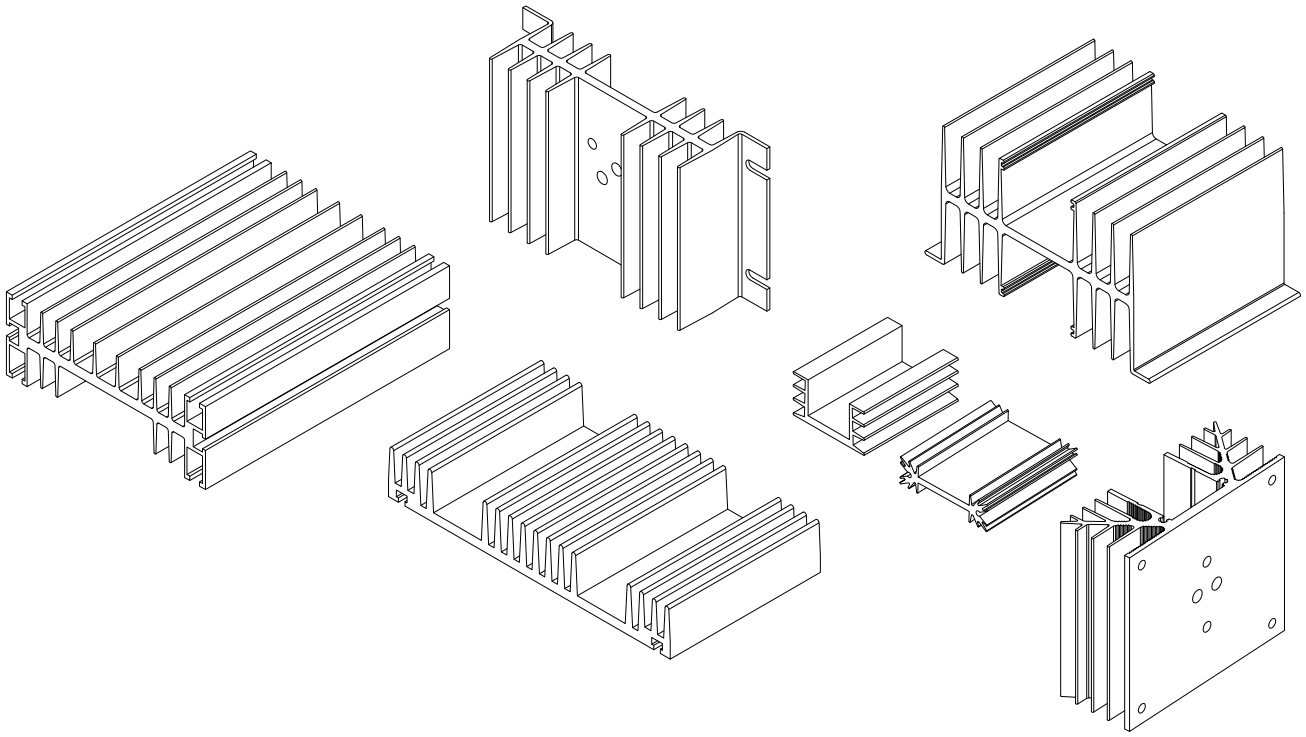


TECNOAL
BOLOGNA - ITALY



TECNOAL
BOLOGNA - ITALY

PROFILI SERIE "T"
SERIES "T" PROFILES



I profili della serie T sono costituiti da zone alettate unite da una zona piana.
Tale zona è solitamente abbastanza sottile in modo da poter essere lavorata mediante operazioni di tranciatura, consentendo grande economia dei costi.
Possono essere realizzati nuovi profili su specifiche esigenze del cliente.
Tutti i profili della serie T sono gestiti a magazzino in barre della lunghezza di 5m.
Tecnoal è in grado di fornire il particolare comprensivo di tutte le lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1 - Profilo e relativa lunghezza di taglio (Esempio: T88/100 – viene così indicato il profilo T88 tagliato a 100mm).
2 - Quantitativo del lotto di produzione
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali anodizzazione, (indicare il colore) alodyne, ecc...

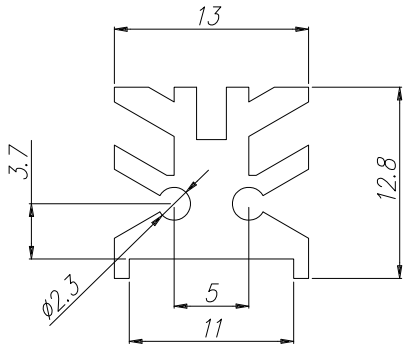
Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

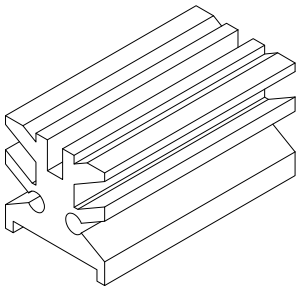
The profiles of T series consist of fins areas joined by a flat area.
This area is usually fairly thin so that it can be worked by means of blanking allowing great cost savings.
New profiles can be made on specific customer requirements.
All profiles series T are stored in bars of 5 meters long.
Tecnoal is able to provide the T series including all machining and any surface treatments.
For quotations please provide the following informations:

1 - Profile and relevant length (Example: T88/100 – specifies the profile T88 cut to 100mm).
2 - Quantity of batch production.
3 - Any machining, to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawing always where dimensions have not been forced.
4 - Specify any surface treatments such anodization including color, alodyne, etc...

Our commercial and technical office is at your disposal for any clarification.

T13	Peso Kg/m / Weight Kg/m 0.26	Rt °C/W 13	Lung. campione mm / Sample length mm 50

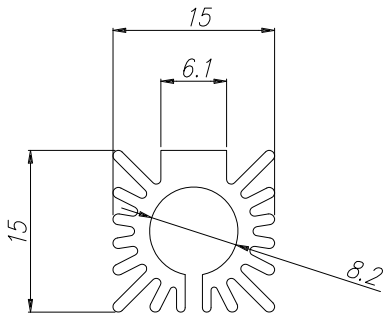


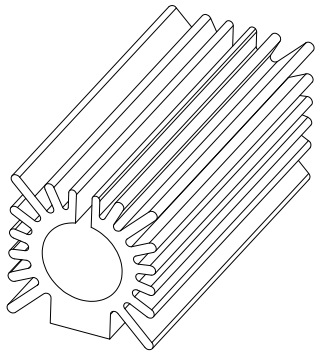


A

TECNOAL BOLOGNA - ITALY

T19	Peso Kg/m / Weight Kg/m 0.27	Rt °C/W 30	Lung. campione mm / Sample length mm 100

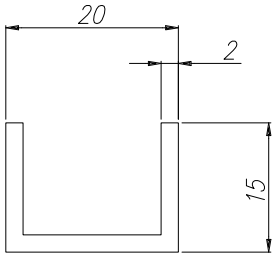


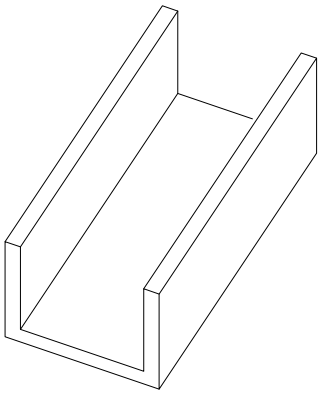


B

TECNOAL BOLOGNA - ITALY

T20	Peso Kg/m / Weight Kg/m 0.24	Rt °C/W 13.7	Lung. campione mm / Sample length mm 100

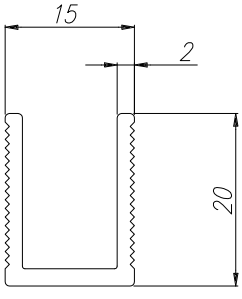


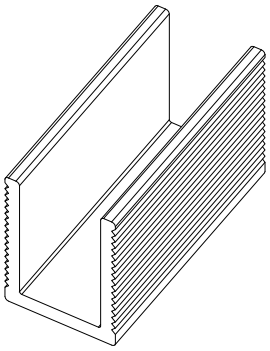


C

TECNOAL BOLOGNA - ITALY

T25	Peso Kg/m / Weight Kg/m 0.25	Rt °C/W 10.3	Lung. campione mm / Sample length mm 100



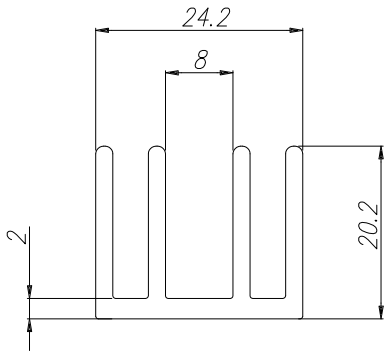


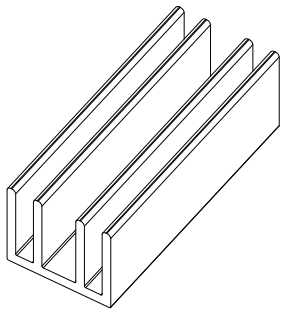
D

TECNOAL BOLOGNA - ITALY

A

TE25	Peso Kg/m / Weight Kg/m 0.54	Rt °C/W 4.8	Lung. campione mm / Sample length mm 100

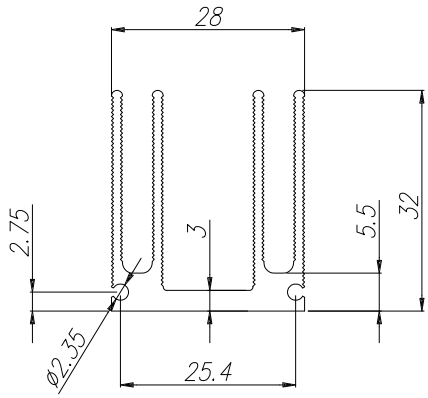


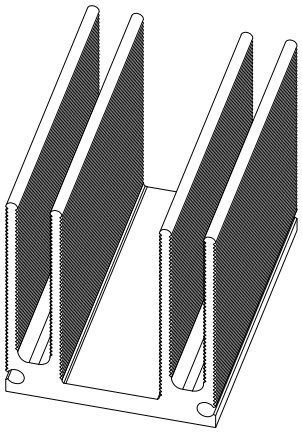


TECNOAL BOLOGNA - ITALY

B

T28T	Peso Kg/m / Weight Kg/m 0.71	Rt °C/W 4.2	Lung. campione mm / Sample length mm 100

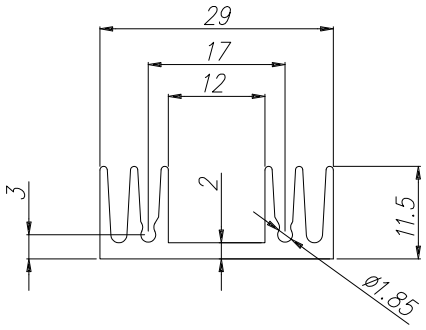


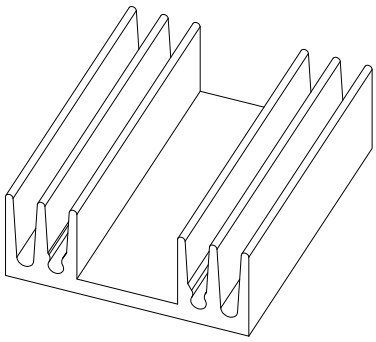


TECNOAL BOLOGNA - ITALY

C

T29	Peso Kg/m / Weight Kg/m 0.35	Rt °C/W 6.3	Lung. campione mm / Sample length mm 100

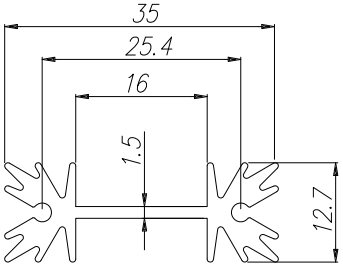


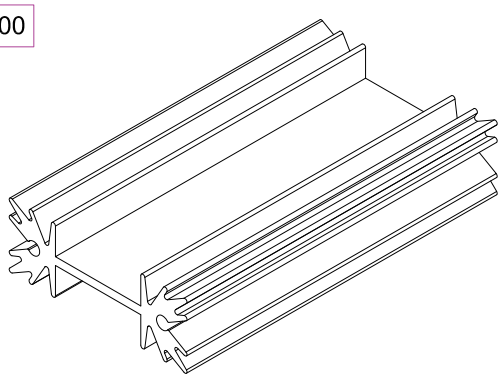


TECNOAL BOLOGNA - ITALY

D

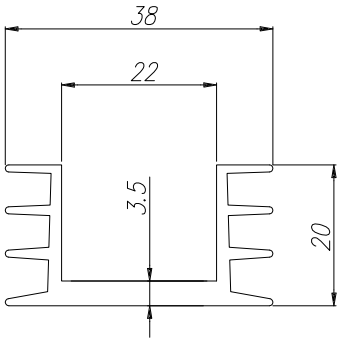
TEA35	Peso Kg/m / Weight Kg/m 0.82	Rt °C/W 3.5	Lung. campione mm / Sample length mm 100

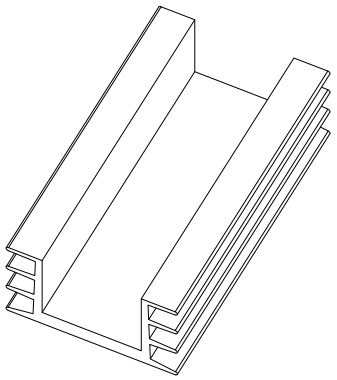




TECNOAL BOLOGNA - ITALY

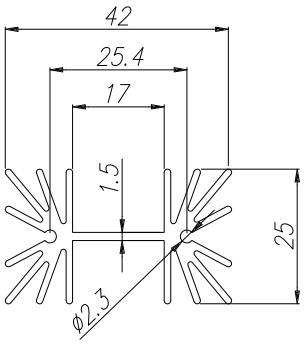
T38	Peso Kg/m / Weight Kg/m 0.60	Rt °C/W 4.6	Lung. campione mm / Sample length mm 100

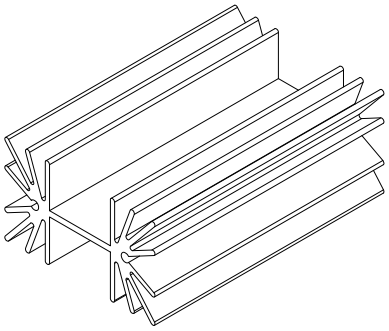




A

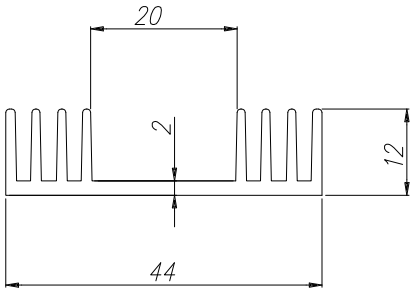
TEA40	Peso Kg/m / Weight Kg/m 0.82	Rt °C/W 3.5	Lung. campione mm / Sample length mm 100

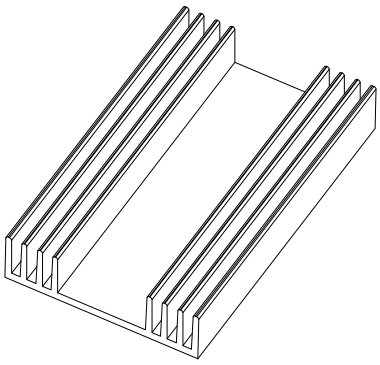




B

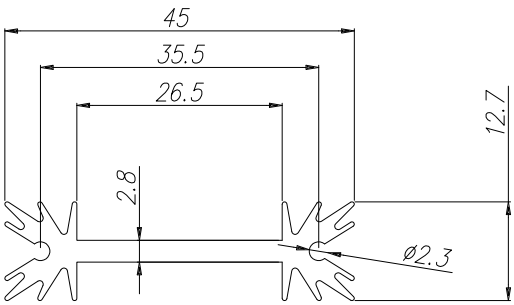
T44	Peso Kg/m / Weight Kg/m 0.55	Rt °C/W 5	Lung. campione mm / Sample length mm 100

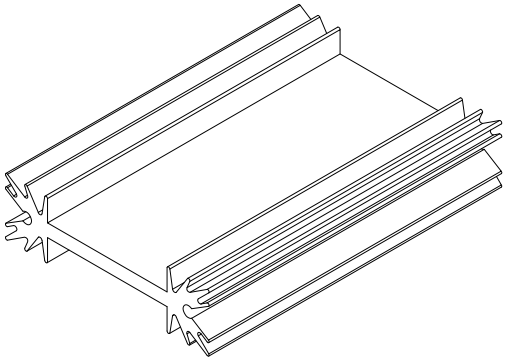




C

TEA45	Peso Kg/m / Weight Kg/m 0.56	Rt °C/W 5.2	Lung. campione mm / Sample length mm 100

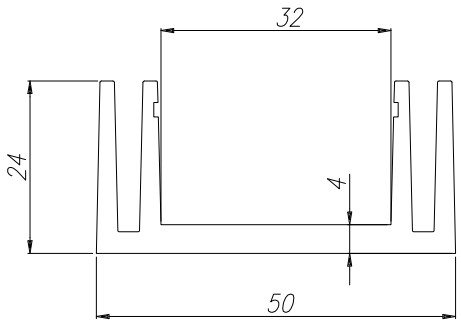


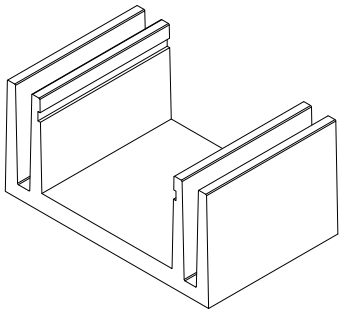


D

A

T50	Peso Kg/m / Weight Kg/m	1.20	Rt °C/W	4.7	Lung. campione mm / Sample length mm	100

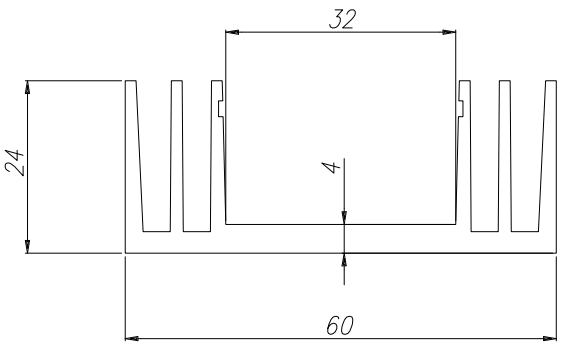


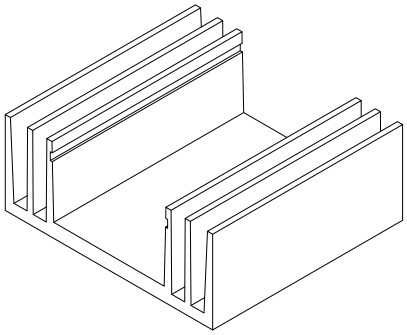


TECNOAL BOLOGNA - ITALY

B

T60	Peso Kg/m / Weight Kg/m	1.23	Rt °C/W	4.1	Lung. campione mm / Sample length mm	100

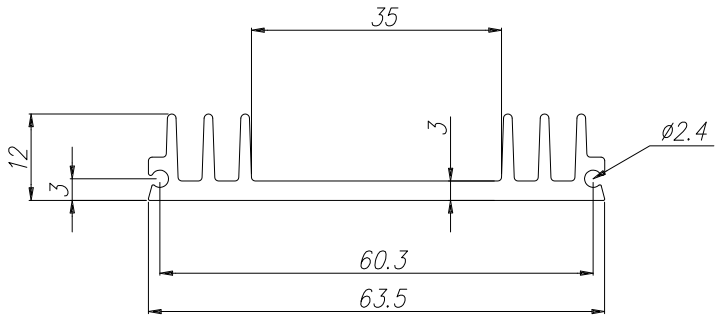


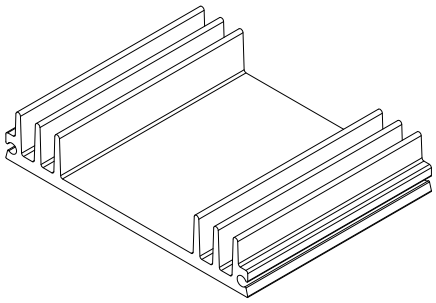


TECNOAL BOLOGNA - ITALY

C

T63	Peso Kg/m / Weight Kg/m	0.69	Rt °C/W	4.8	Lung. campione mm / Sample length mm	100

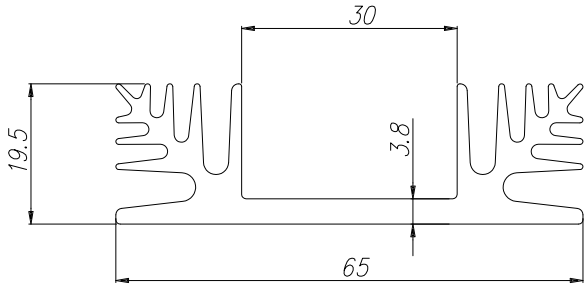


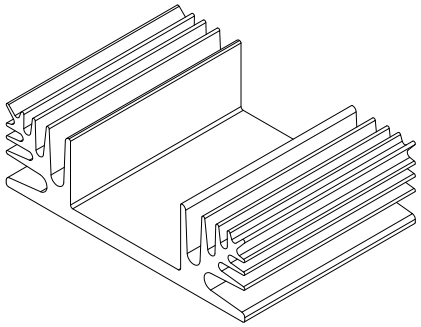


TECNOAL BOLOGNA - ITALY

D

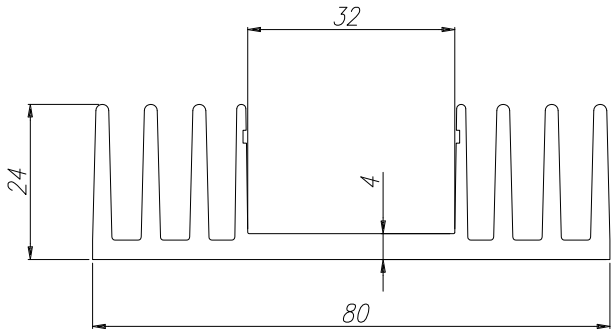
TE65	Peso Kg/m / Weight Kg/m	1.30	Rt °C/W	3.0	Lung. campione mm / Sample length mm	100

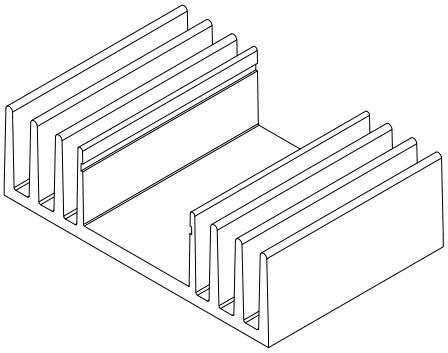




TECNOAL BOLOGNA - ITALY

T80	Peso Kg/m Weight Kg/m 1.80	Rt °C/W 3.6	Lung. campione mm Sample length mm 100

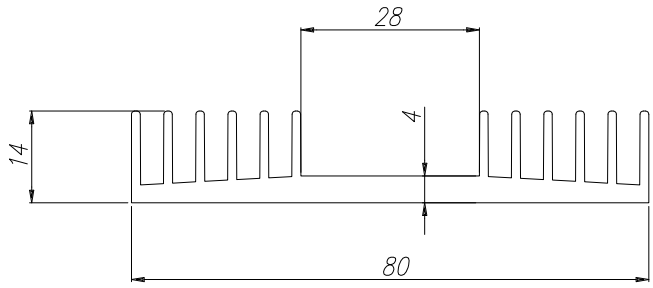


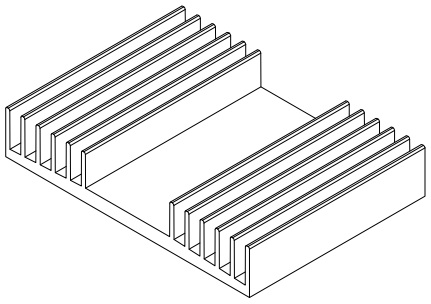


A

TECNOAL BOLOGNA - ITALY

TE80	Peso Kg/m Weight Kg/m 1.20	Rt °C/W 4.1	Lung. campione mm Sample length mm 100

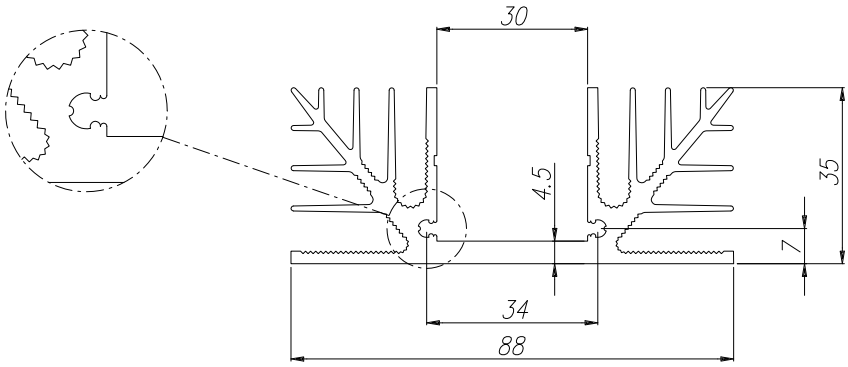


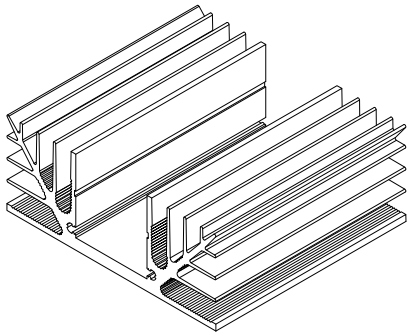


B

TECNOAL BOLOGNA - ITALY

T88	Peso Kg/m Weight Kg/m 2.37	Rt °C/W 1.7	Lung. campione mm Sample length mm 100

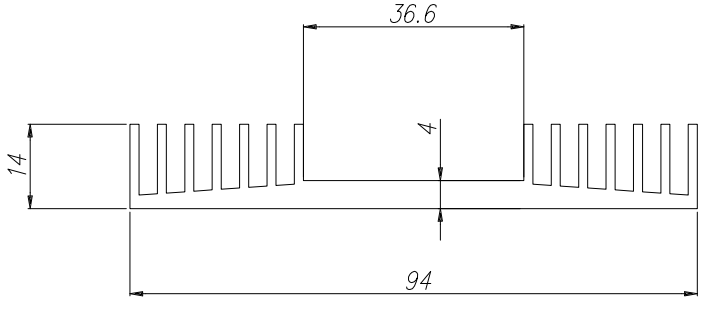


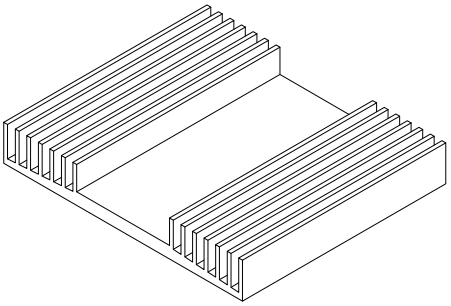


C

TECNOAL BOLOGNA - ITALY

T94	Peso Kg/m Weight Kg/m 1.55	Rt °C/W 3.1	Lung. campione mm Sample length mm 100



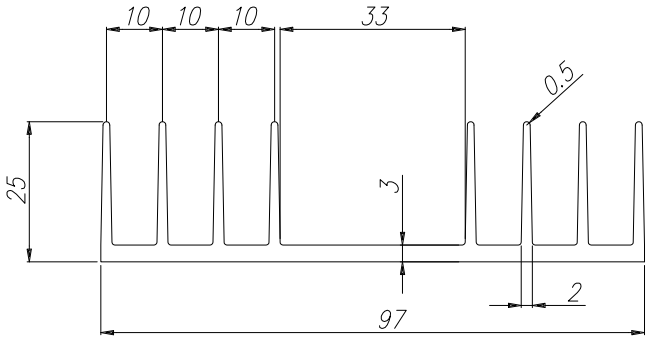


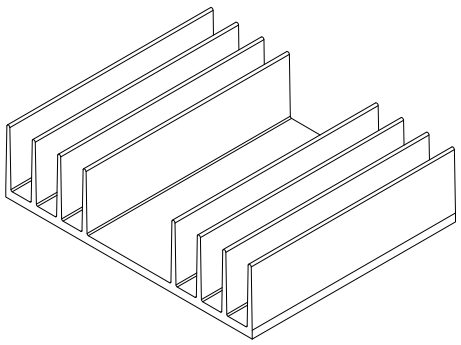
D

TECNOAL BOLOGNA - ITALY

A

T97	Peso Kg/m / Weight Kg/m 1.50	Rt °C/W 2.6	Lung. campione mm / Sample length mm 100

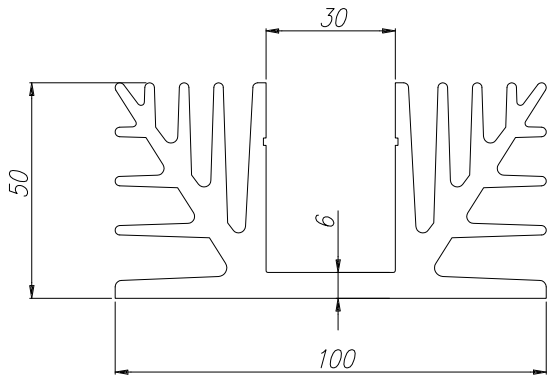


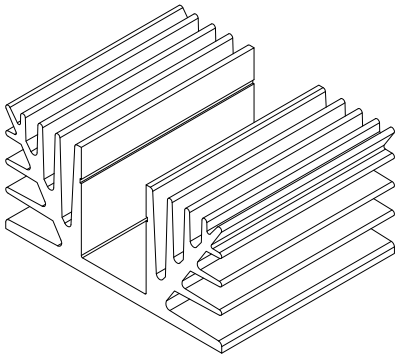


TECNOAL BOLOGNA - ITALY

B

TEA100	Peso Kg/m / Weight Kg/m 4.20	Rt °C/W 1.6	Lung. campione mm / Sample length mm 100

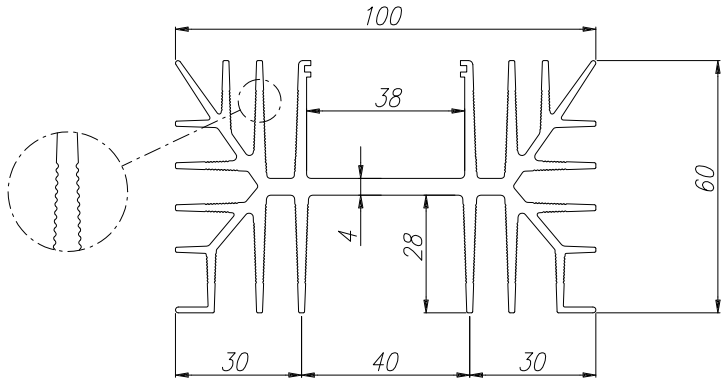


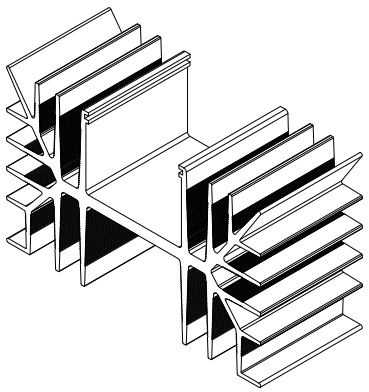


TECNOAL BOLOGNA - ITALY

C

TEAX100	Peso Kg/m / Weight Kg/m 3.13	Rt °C/W 1.1	Lung. campione mm / Sample length mm 100

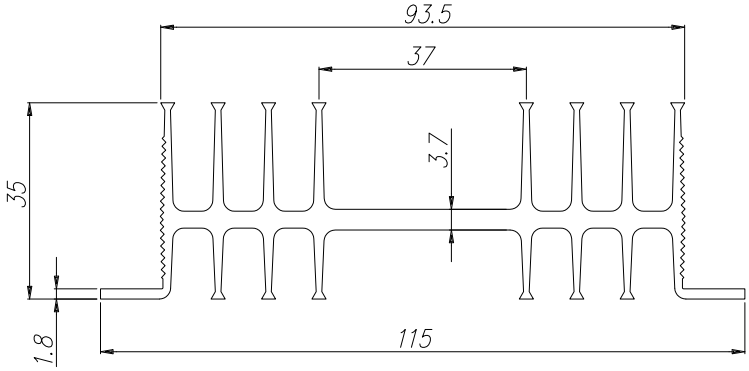


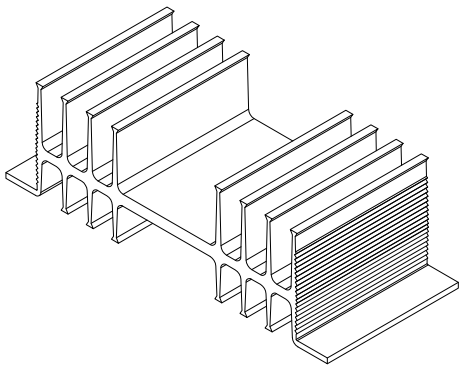


TECNOAL BOLOGNA - ITALY

D

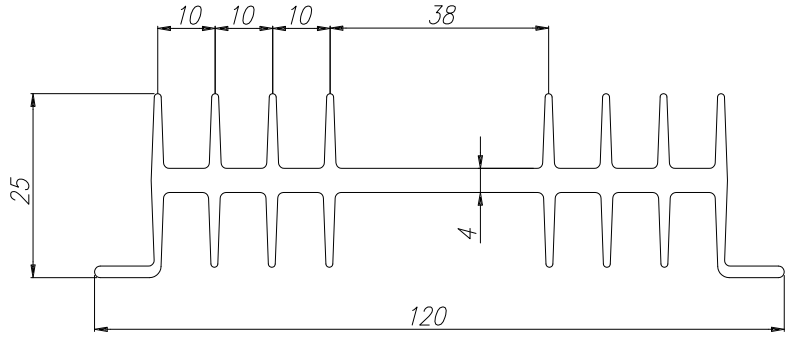
T115	Peso Kg/m / Weight Kg/m 2.16	Rt °C/W 1.9	Lung. campione mm / Sample length mm 100

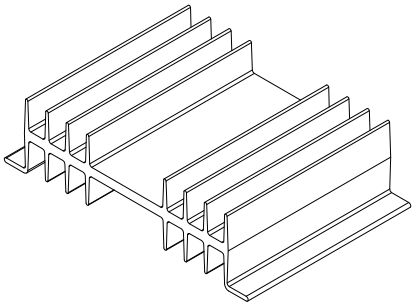




TECNOAL BOLOGNA - ITALY

TEAX Y120	Peso Kg/m / Weight Kg/m 2.30	Rt °C/W 2.00	Lung. campione mm / Sample length mm 100

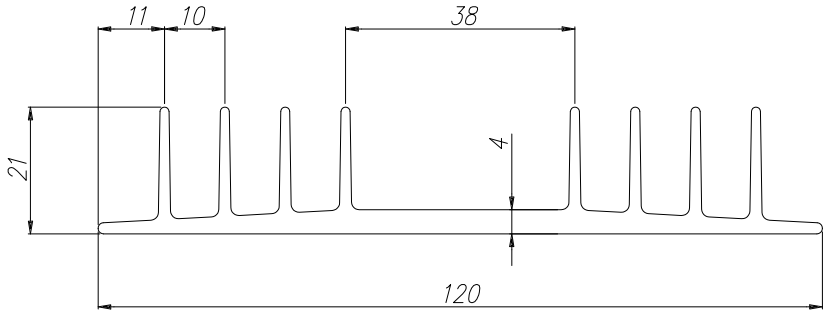


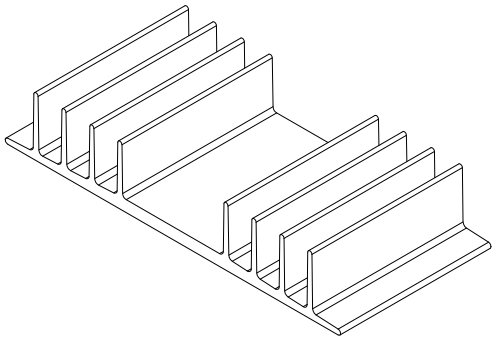


A

TECNOAL BOLOGNA - ITALY

TEAX120	Peso Kg/m / Weight Kg/m 1.80	Rt °C/W 2.2	Lung. campione mm / Sample length mm 100

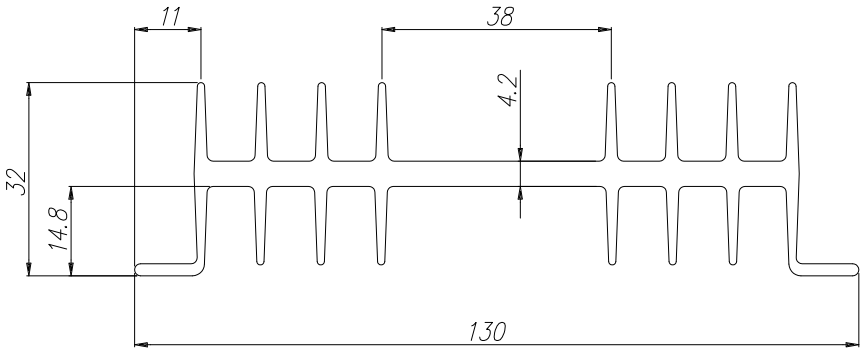


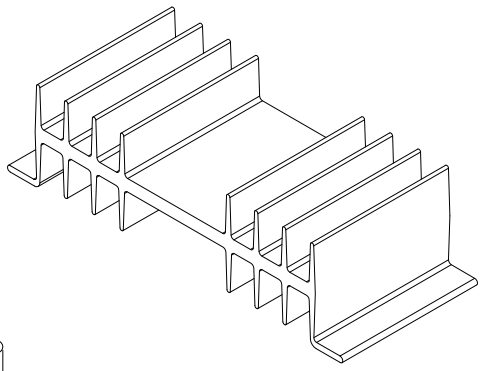


B

TECNOAL BOLOGNA - ITALY

T130	Peso Kg/m / Weight Kg/m 2.47	Rt °C/W 1.8	Lung. campione mm / Sample length mm 100

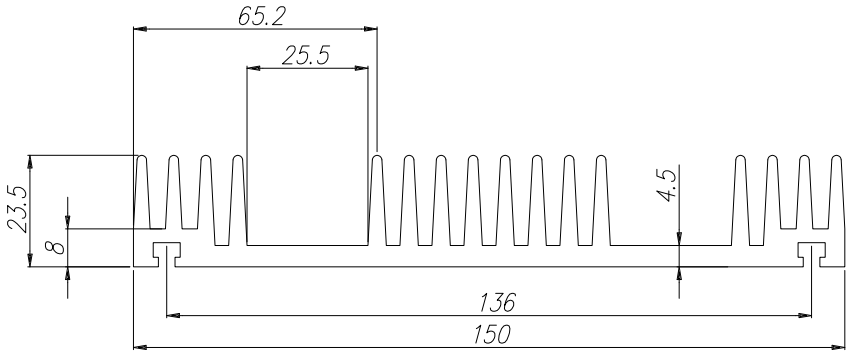


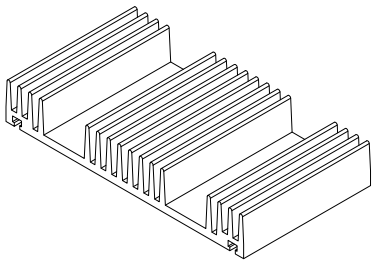


C

TECNOAL BOLOGNA - ITALY

T150	Peso Kg/m / Weight Kg/m 3.30	Rt °C/W 1.1	Lung. campione mm / Sample length mm 100



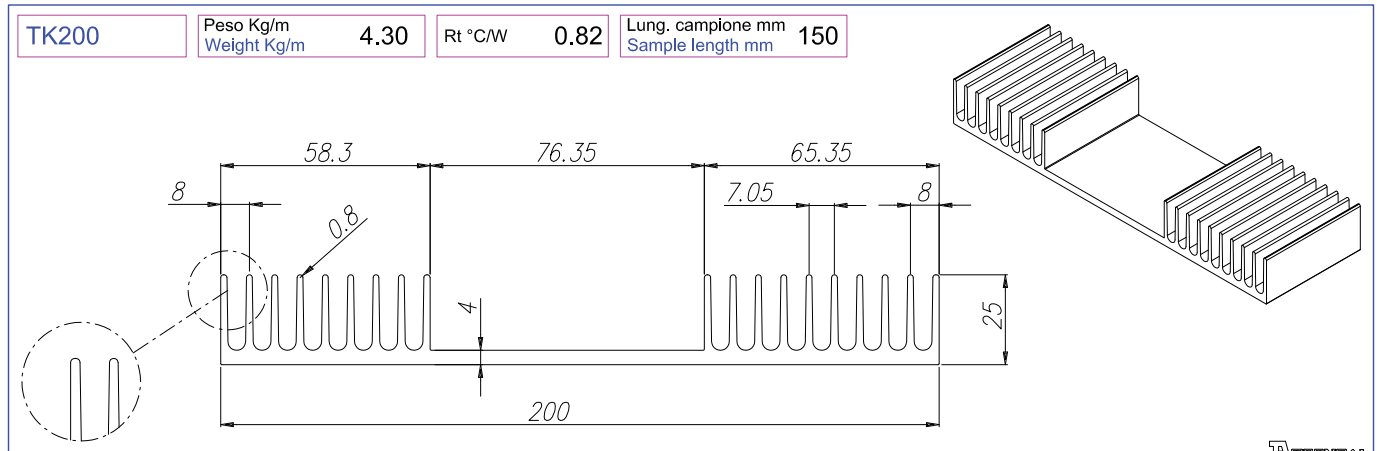


D

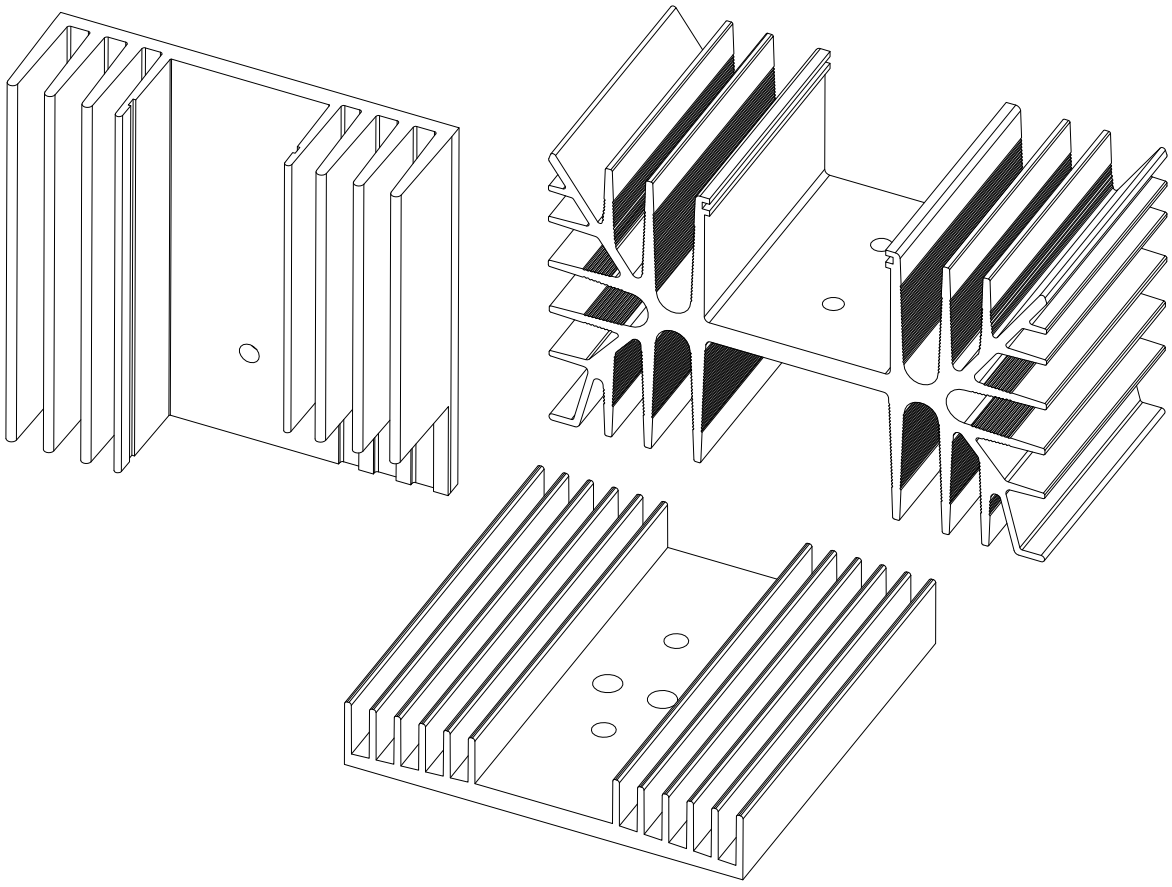
TECNOAL BOLOGNA - ITALY

A

TK200	Peso Kg/m Weight Kg/m 4.30	Rt °C/W 0.82	Lung. campione mm Sample length mm 150



TECNOAL
BOLOGNA - ITALY

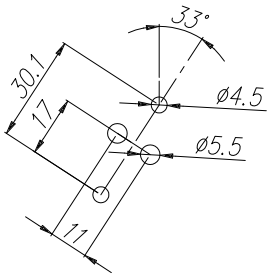


TECNOAL
BOLOGNA - ITALY

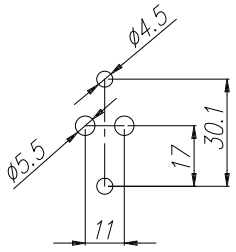
FORATURA STANDARD DEI PROFILI SERIE T PER TO3 A 90° E A 33°
STANDARD DRILLING OF SERIES " T " FOR CASE TO3 90° AND 33°

Di seguito sono indicate le forature standard per TO3 eseguita di tranciatura sui profili della serie T nelle lunghezze di 40, 75 e 100mm. Molti profili della serie T aventi queste forature vengono tenuti a magazzino già anodizzati neri.

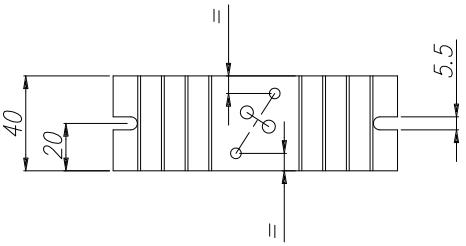
Standard drilling drawing for heatsink series "T": lenght 40, 75, 100mm



TO3 a 33°

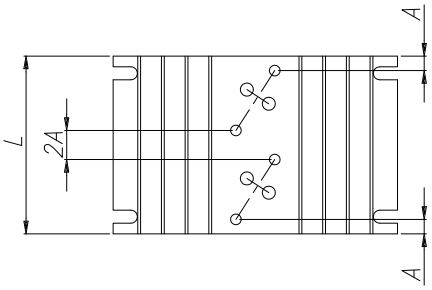


TO3 a 90°



Foratura per 1 TO3 a 33°
Lunghezza L = 40

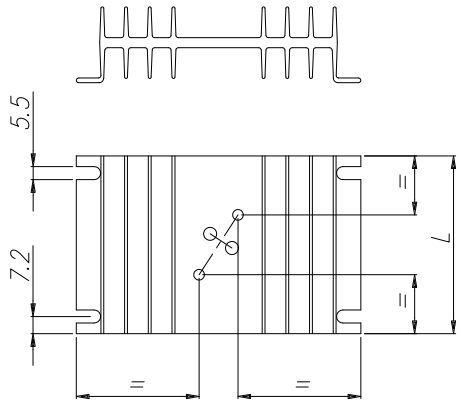
Drilling for 1 TO3 a 33°
Lenght L = 40



Foratura per 2 TO3 a 33°
Lunghezza L = 75, 100

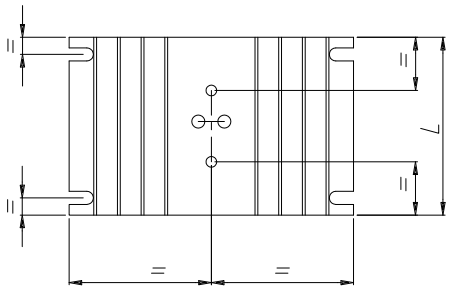
Drilling for 2 TO3 a 33°
Lenght L = 75 - 100

Esempio di profilo serie T Example serie T profiles



Foratura per 1 TO3 a 33°
Lunghezza L = 75, 100

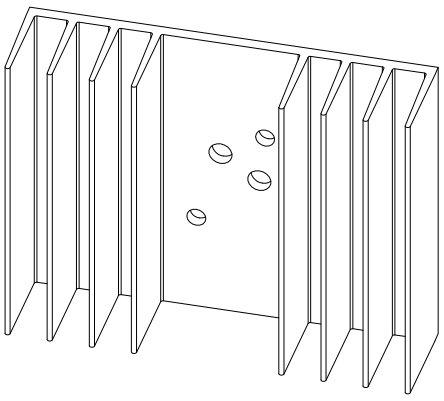
Drilling for 1 TO3 a 33°
Lenght L = 75 - 100

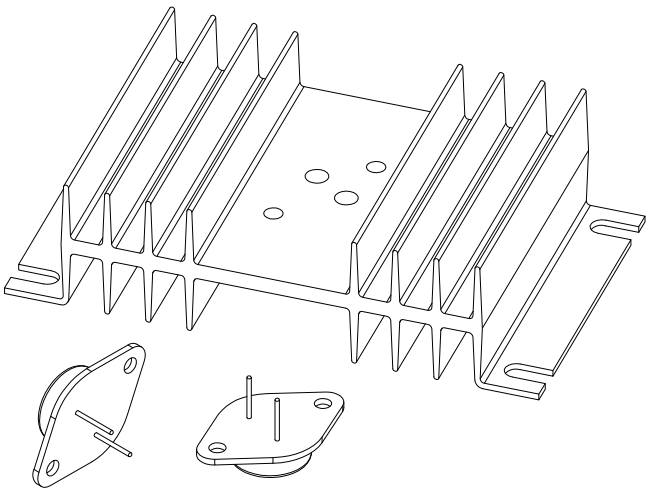


Foratura per 1 TO3 a 90°
Lunghezza L = 75, 100

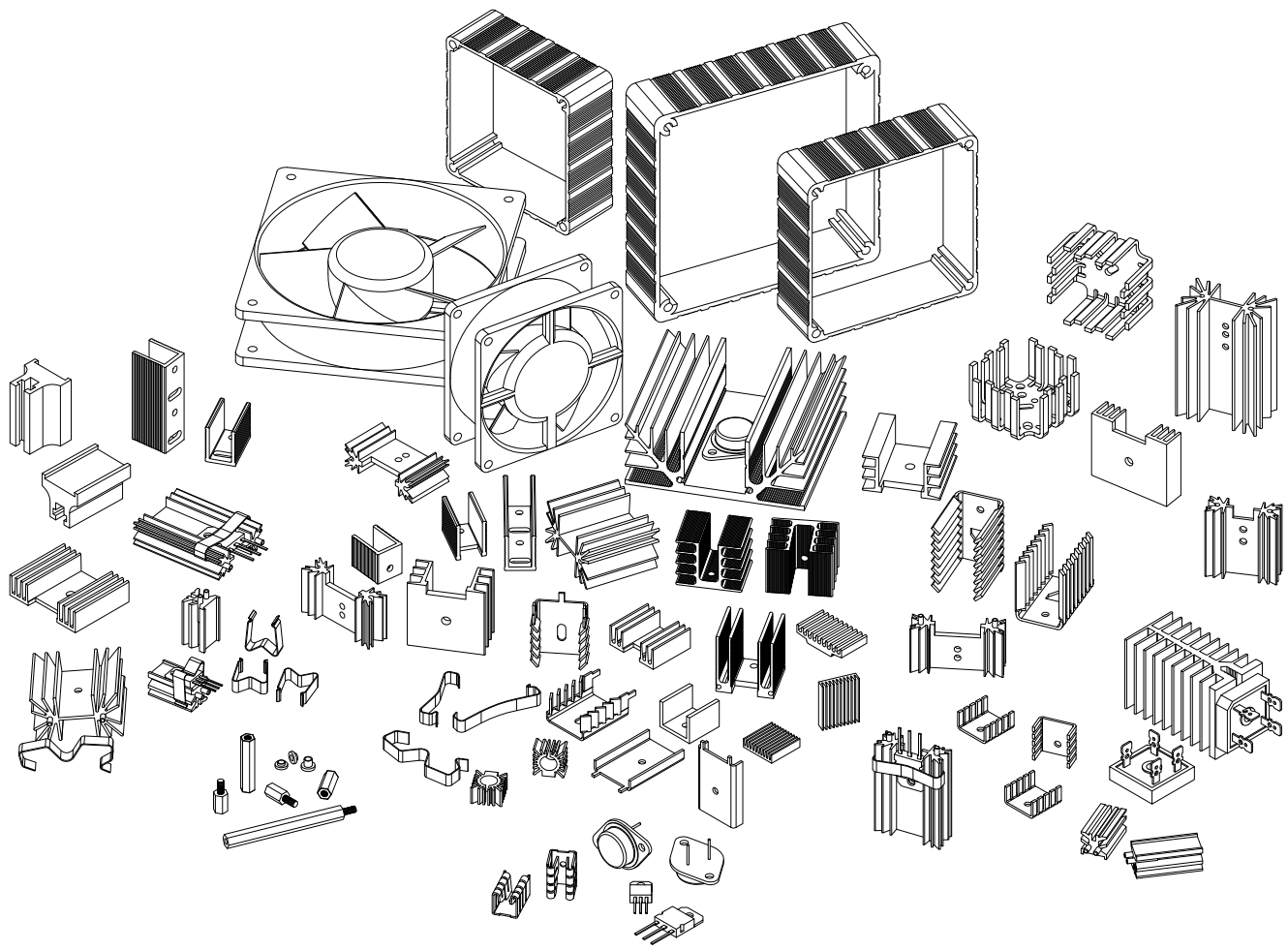
Drilling for 1 TO3 a 90°
Lenght L = 75 - 100

Lunghezza L = 75,100
Lenght L = 75 - 100





PRODOTTI STANDARD
STANDARD ITEMS



Tecnoal dispone di molti dissipatori ed accessori standard utilizzati in ambito elettronico.
Tali prodotti sono disponibili a magazzino in confezioni minime.
Fra questi prodotti oltre ai dissipatori per circuiti stampati figurano:
- Distanziali filettati, per circuiti stampati.
- Miche per l' isolamento elettrico dei componenti.
- Isolanti in plastica per viti.
- Molle per il fissaggio del componente elettronico al dissipatore.
- Grasso termo conduttivo, per garantire un accoppiamento ottimale fra componente elettronico e dissipatore.
- Spacer per ventole assiali, che consentono di aumentarne l'efficienza.
- Guide per cassetti rack, personalizzabili.

Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:
1 - Articolo (vedi modello sul catalogo).
2 - Quantitativo richiesto (molti prodotti sono legati ad una confezione minima).

Il nostro ufficio commerciale è a Vostra completa disposizione per qualsiasi chiarimento.

Tecnoal has many standard items and accessories used in electronics.
These products are available from stock in minimum packages.
In addition to heatsinks for printed circuit boards, this product line includes:
- Spacers threaded for printed circuit boards.
- Micas for the insulation of electrical components.
- Insulation for plastic screws.
- Clips for assembling electronic components to heatsink.
- Thermal conductive grease to ensure an optimal coupling between electronic component and heatsink.
- Axial spacer fans for increasing efficiency.
- Slides for rack drawers customizable.

For quotations please provide the following informations:
1 - Items (see model in the catalogue).
2 - Quantity required (many products are linked to a minimum package).

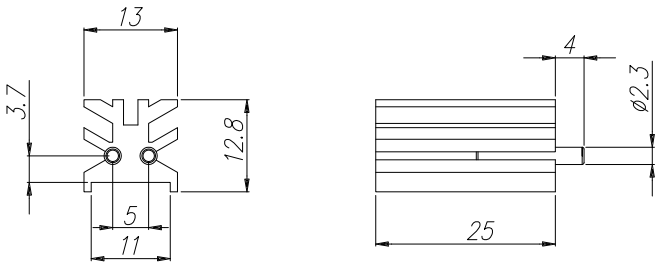
Our commercial and technical office is at your disposal for any clarification.

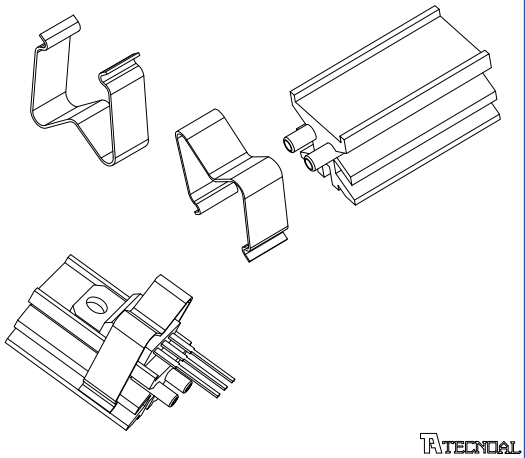
TECNOAL
BOLOGNA - ITALY

ST - T13/25N

Rt °C/W 25

Aluminium, black anodized
Other dimensions on request



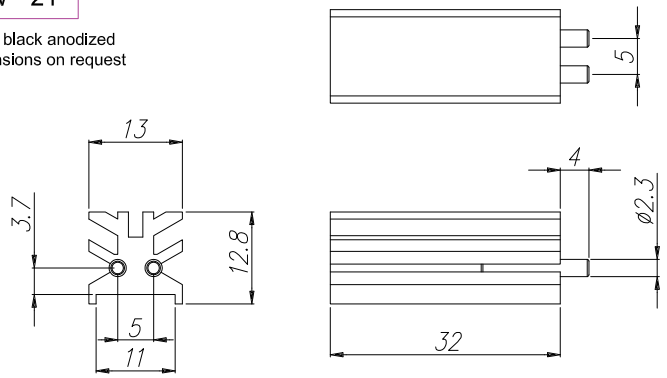


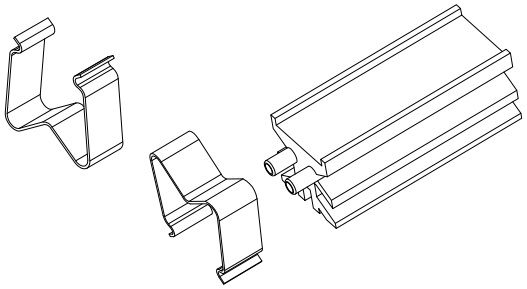
A

ST - T13/32N

Rt °C/W 21

Aluminium, black anodized
Other dimensions on request



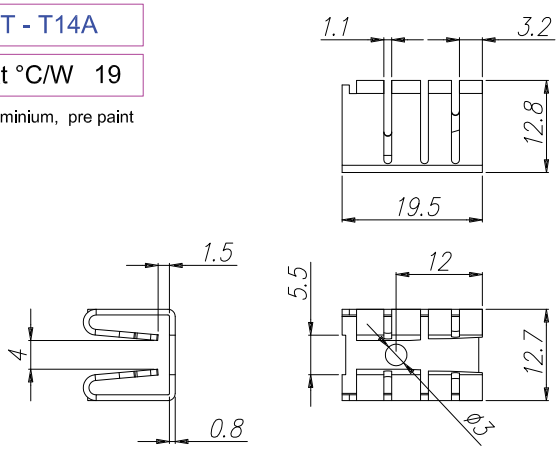


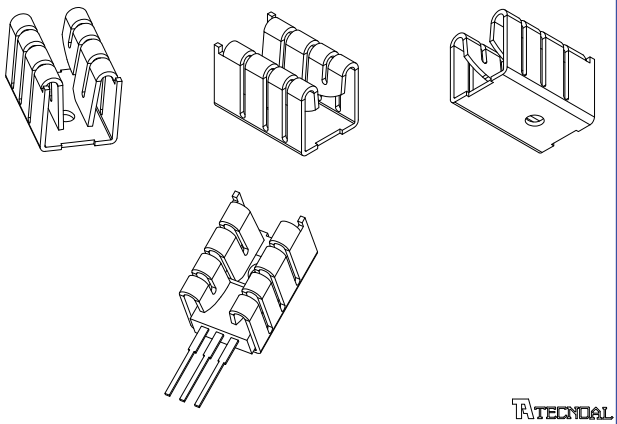
B

ST - T14A

Rt °C/W 19

Aluminium, pre paint



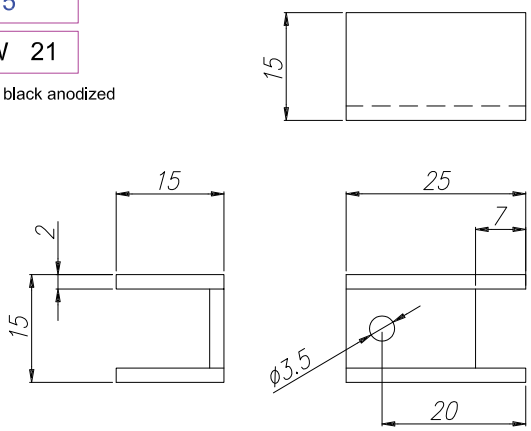


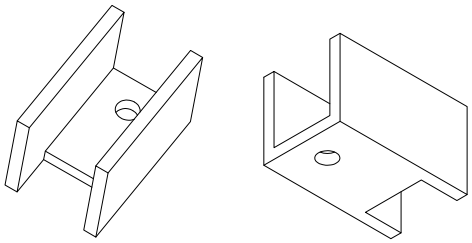
C

ST - T15

Rt °C/W 21

Aluminium, black anodized





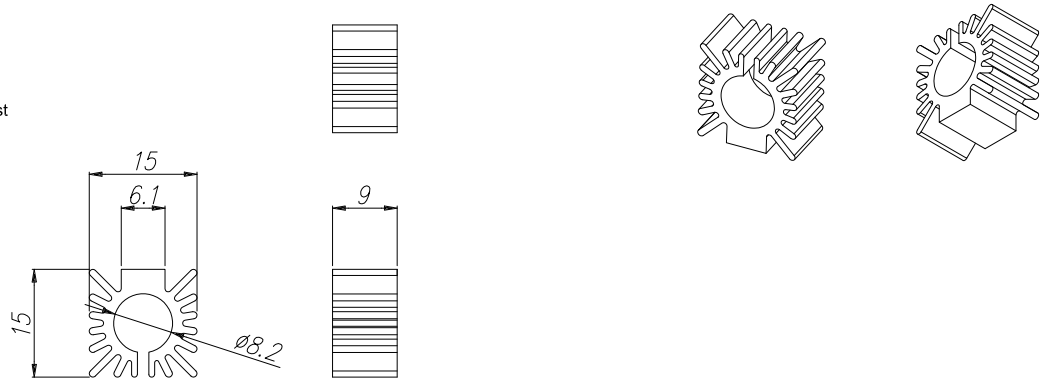
D

A

ST - T19

Rt °C/W 55

Aluminium, black anodized
Other dimensions on request



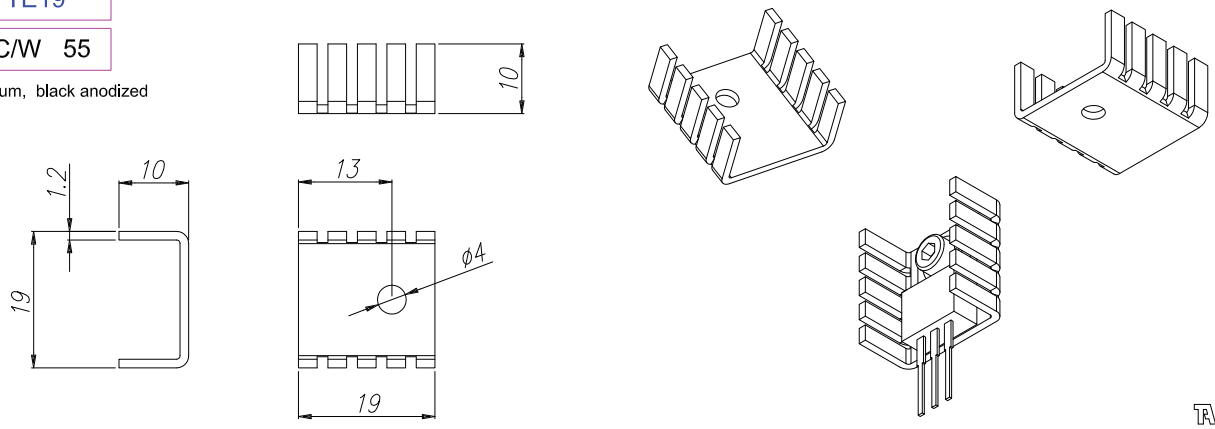
TECNOAL BOLOGNA - ITALY

B

ST - TE19

Rt °C/W 55

Aluminium, black anodized



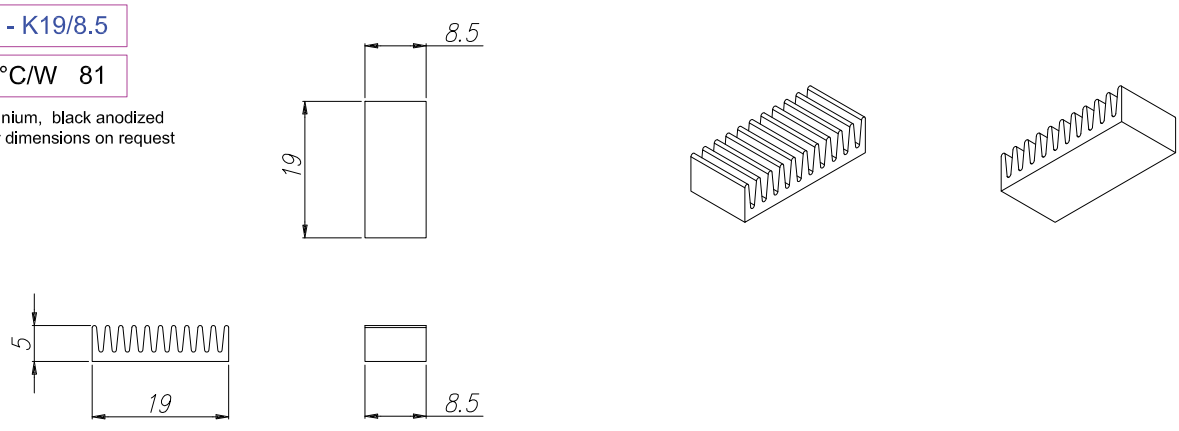
TECNOAL BOLOGNA - ITALY

C

ST - K19/8.5

Rt °C/W 81

Aluminium, black anodized
Other dimensions on request



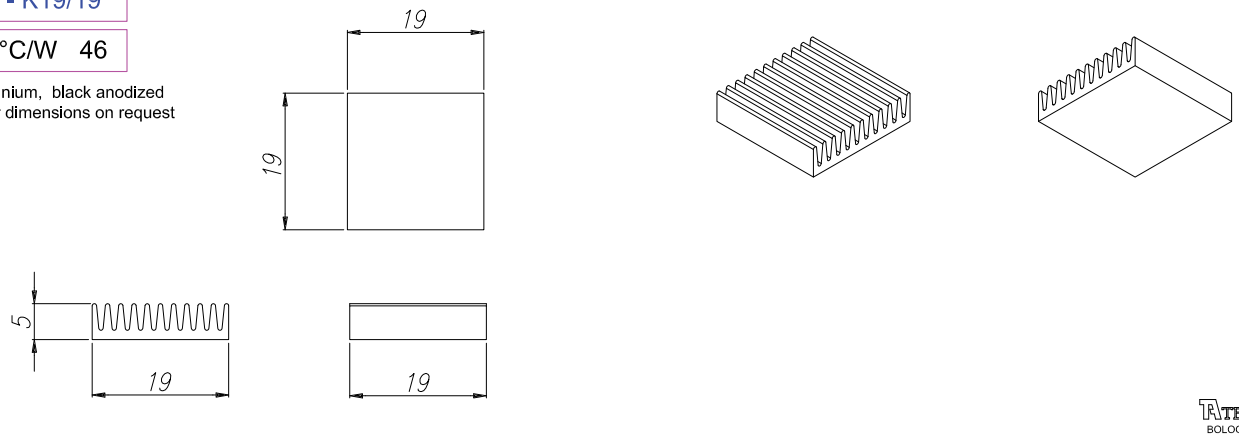
TECNOAL BOLOGNA - ITALY

D

ST - K19/19

Rt °C/W 46

Aluminium, black anodized
Other dimensions on request

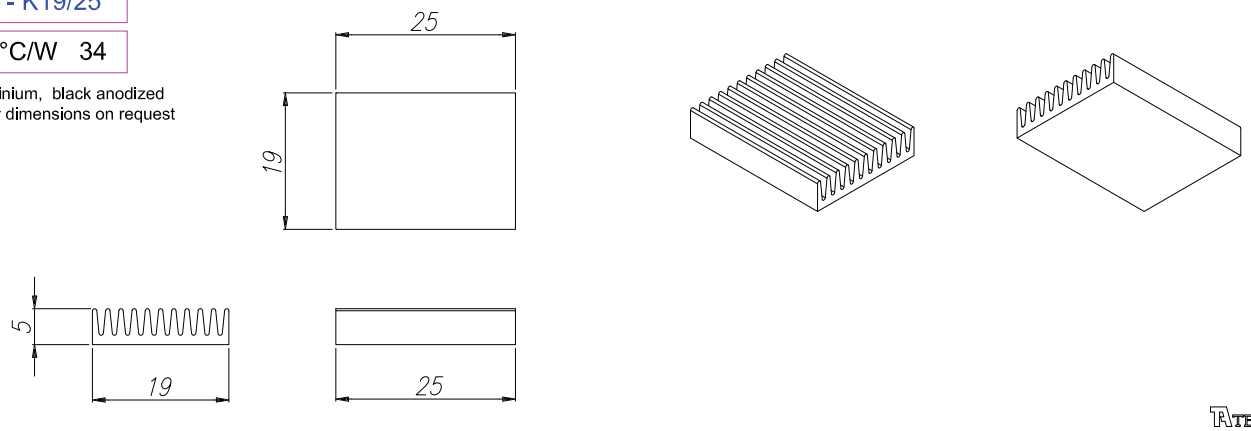


TECNOAL BOLOGNA - ITALY

ST - K19/25

Rt °C/W 34

Aluminium, black anodized
Other dimensions on request

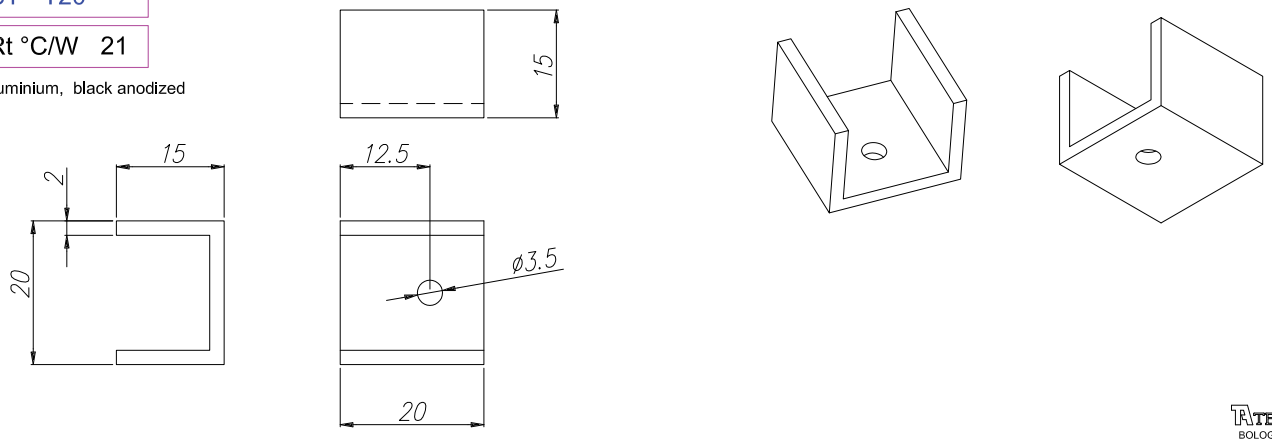


A

ST - T20

Rt °C/W 21

Aluminium, black anodized

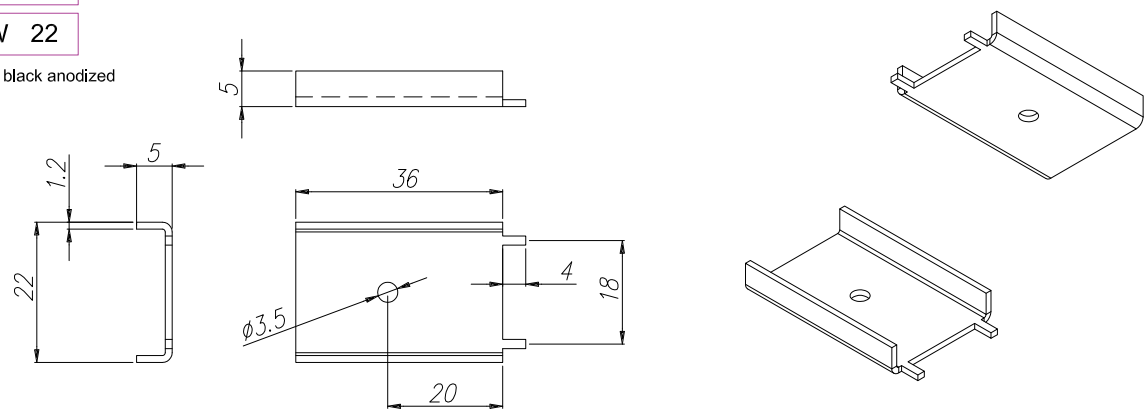


B

ST - T22

Rt °C/W 22

Aluminium, black anodized

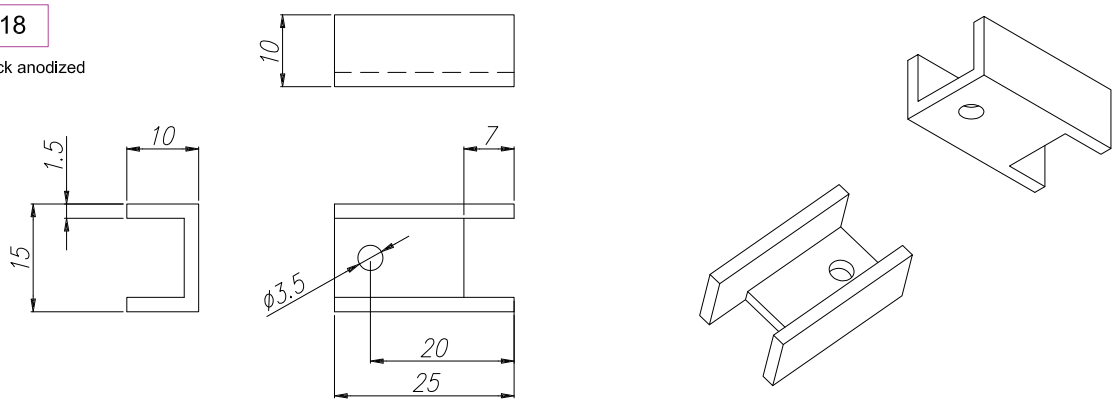


C

ST - T24A

Rt °C/W 18

Aluminium, black anodized



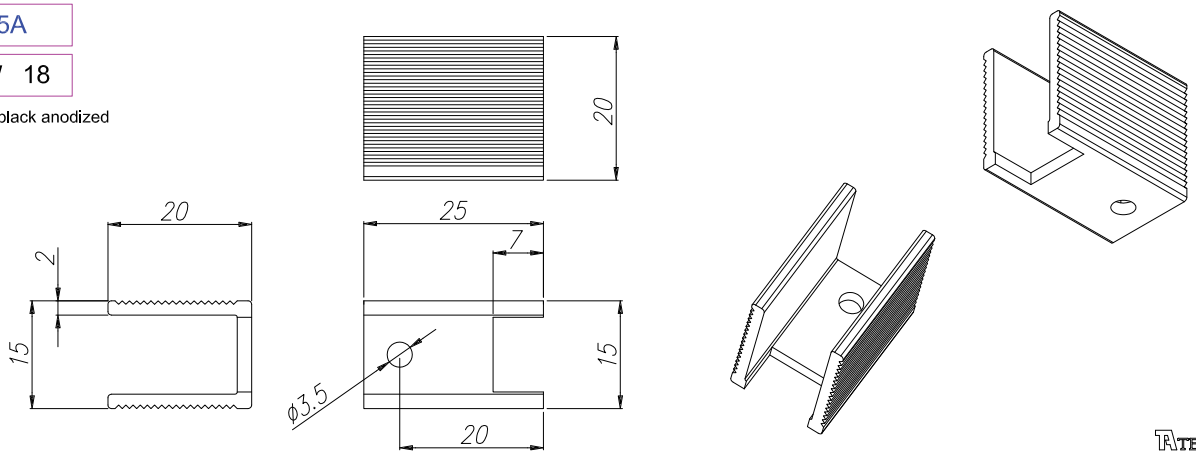
D

A

ST - T25A

Rt °C/W 18

Aluminium, black anodized

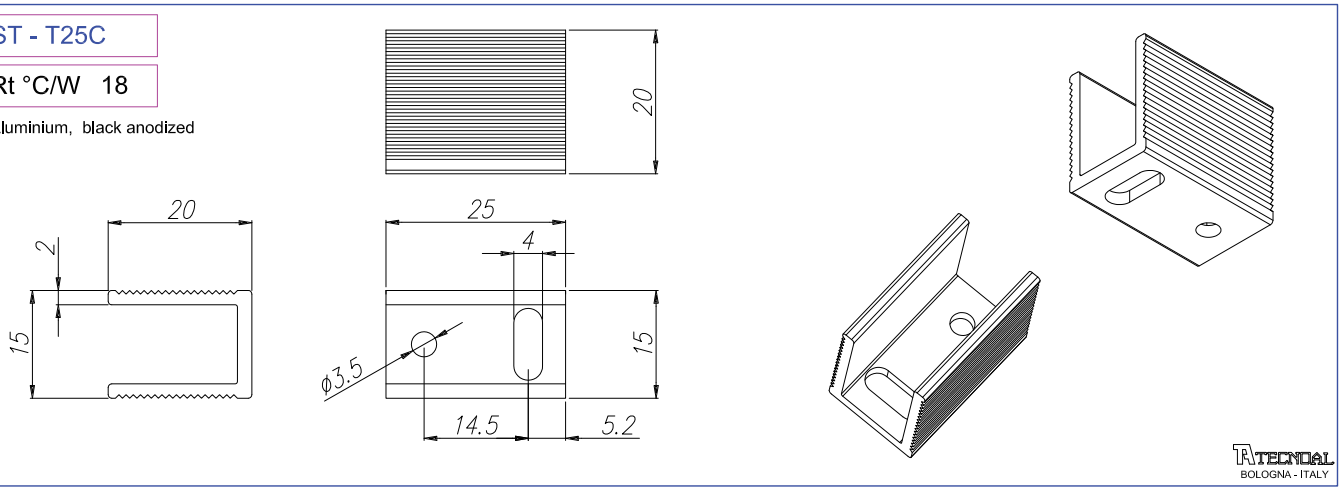


B

ST - T25C

Rt °C/W 18

Aluminium, black anodized

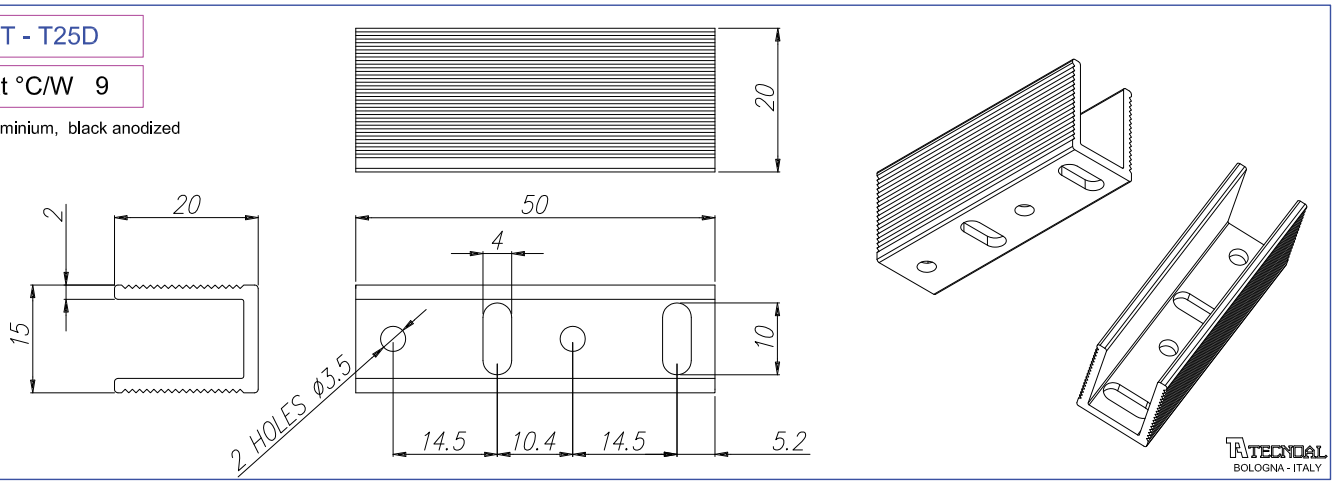


C

ST - T25D

Rt °C/W 9

Aluminium, black anodized

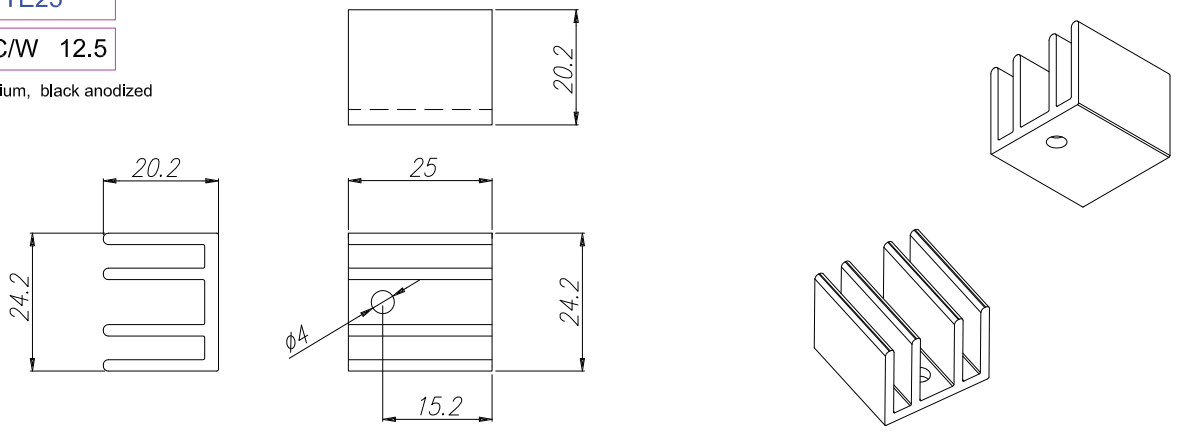


D

ST - TE25

Rt °C/W 12.5

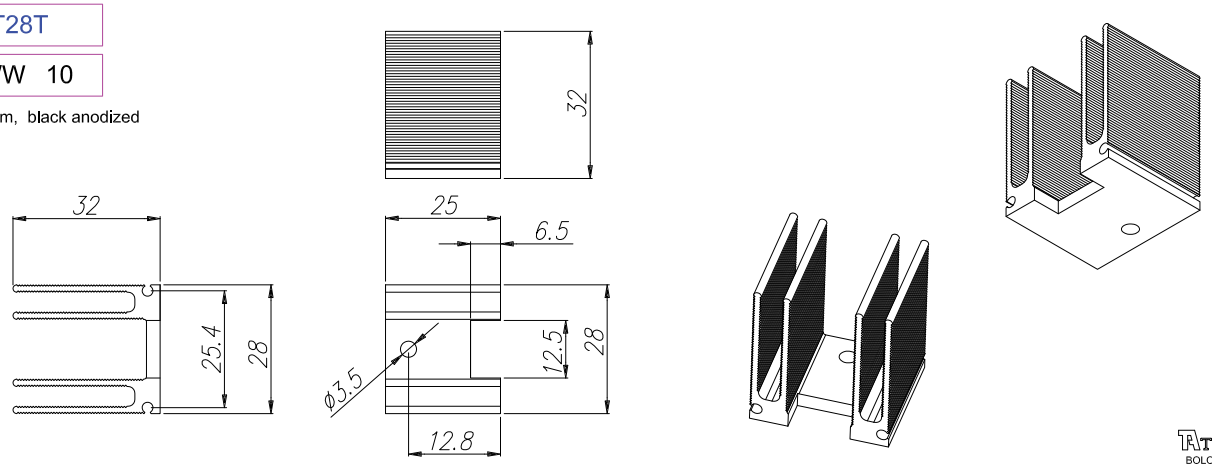
Aluminium, black anodized



ST - T28T

Rt °C/W 10

Aluminium, black anodized

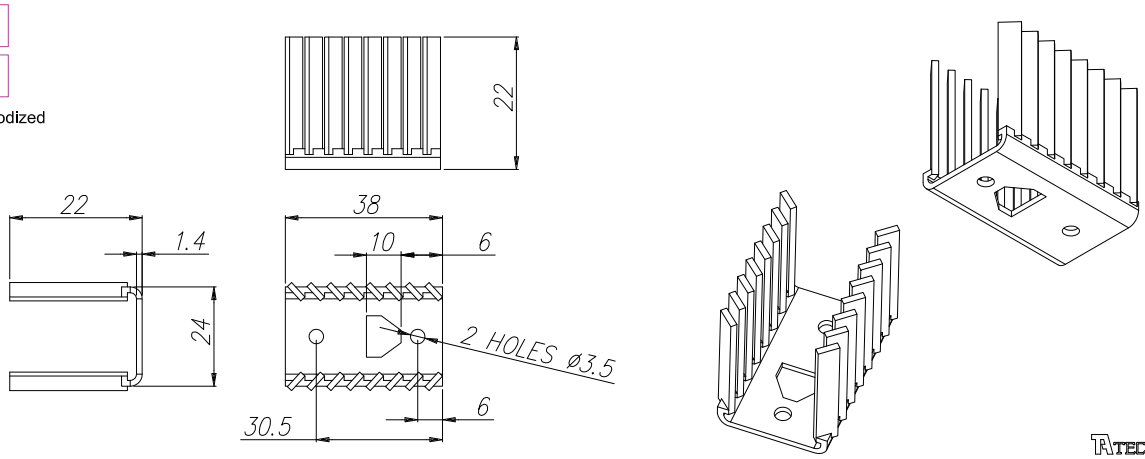


A

ST - TEA28

Rt °C/W 15

Aluminium, black anodized

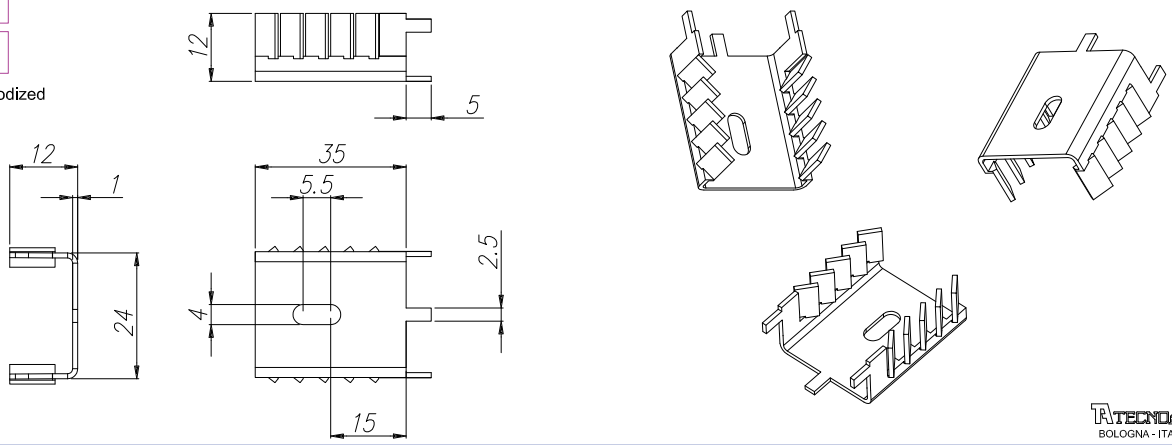


B

ST - TE28

Rt °C/W 14

Aluminium, black anodized

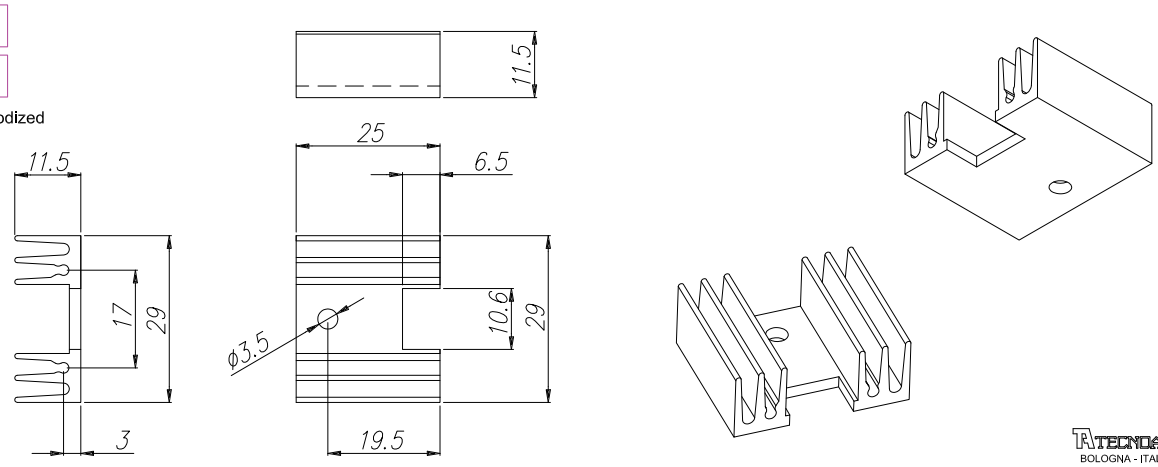


C

ST - T29

Rt °C/W 17

Aluminium, black anodized



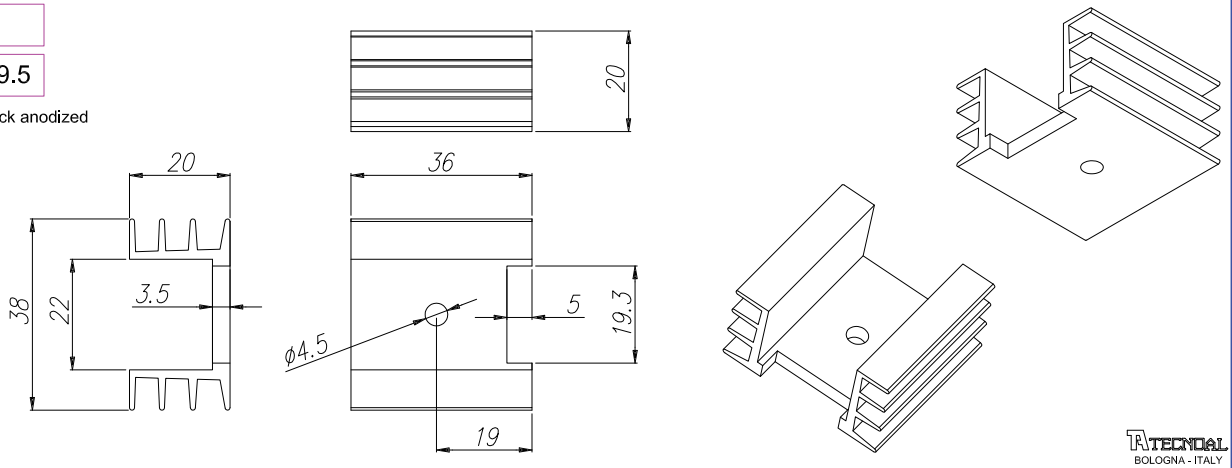
D

A

ST - T38

Rt °C/W 9.5

Aluminium, black anodized



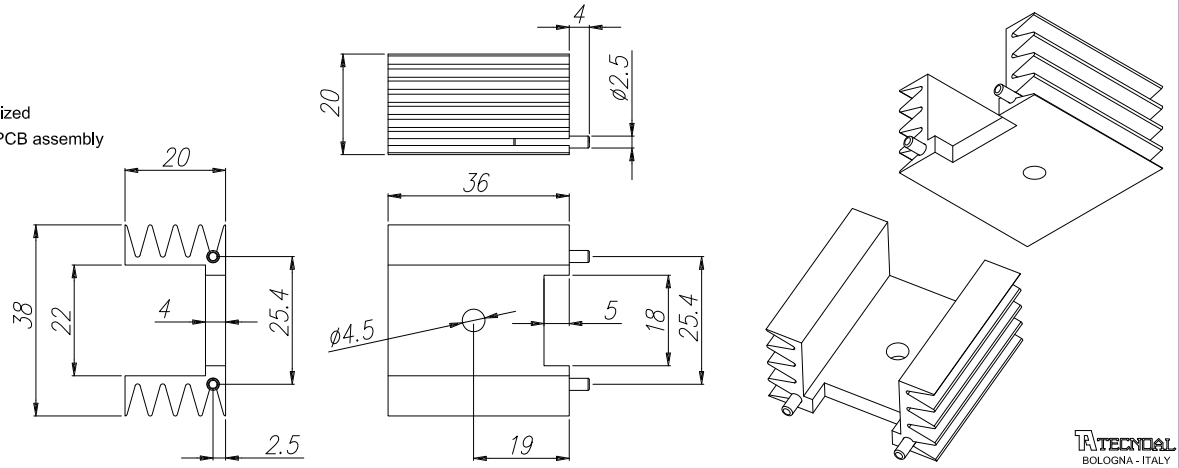
B

ST - T38C

Rt °C/W 9.5

Aluminium, black anodized

Available with pins for PCB assembly

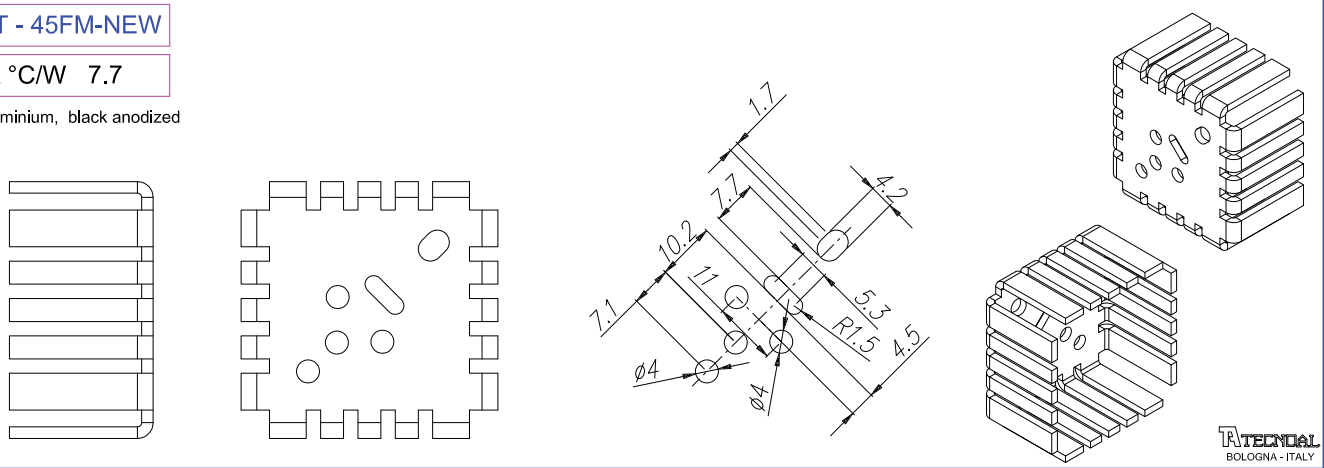


C

ST - 45FM-NEW

Rt °C/W 7.7

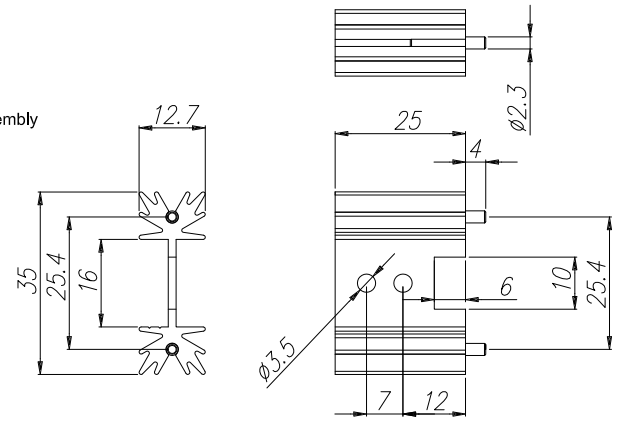
Aluminium, black anodized

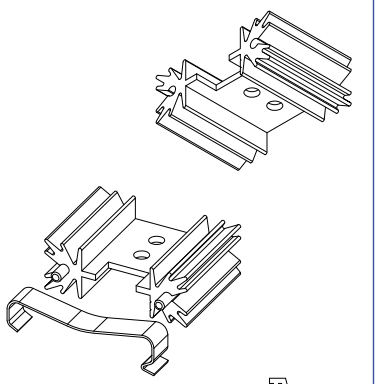


ST - TEA35/25

Rt °C/W 14

Aluminium, black anodized
Available with pins for PCB assembly



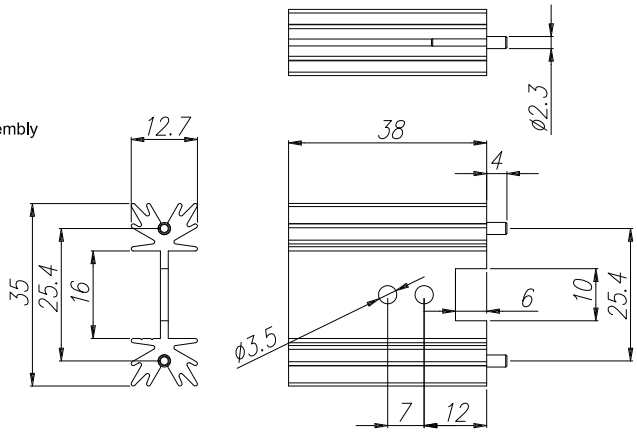


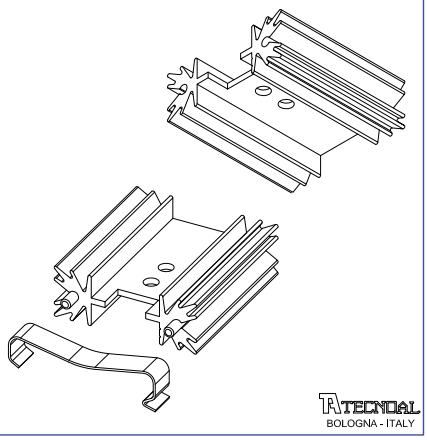
A

ST - TEA35/38

Rt °C/W 11.5

Aluminium, black anodized
Available with pins for PCB assembly



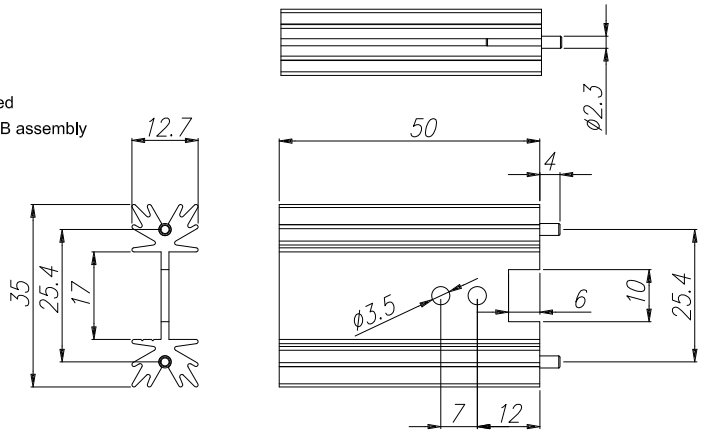


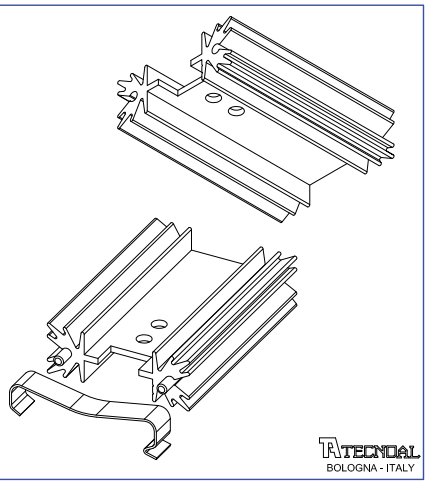
B

ST - TEA35/50

Rt °C/W 8.5

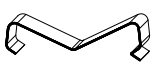
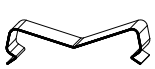
Aluminium, black anodized
Available with pins for PCB assembly

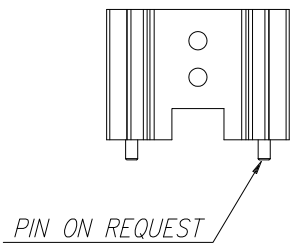


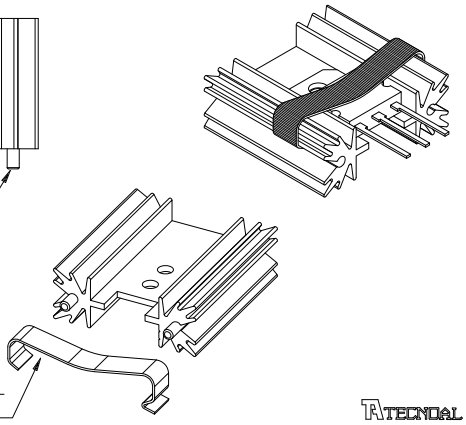


C

MOLLE DI FISSAGGIO — SPRING CLIPS

MOLLA TEA35	MOLLA TEA35A
	
Materiale acciaio inox	Materiale acciaio armonico nichelato





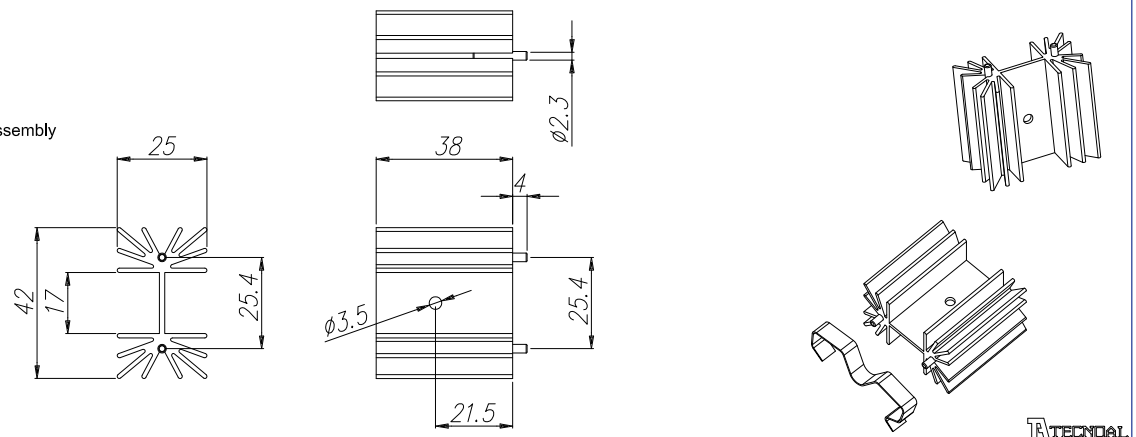
D

A

ST - TEA40/38

Rt °C/W 8

Aluminium, black anodized
Available with pins for PCB assembly



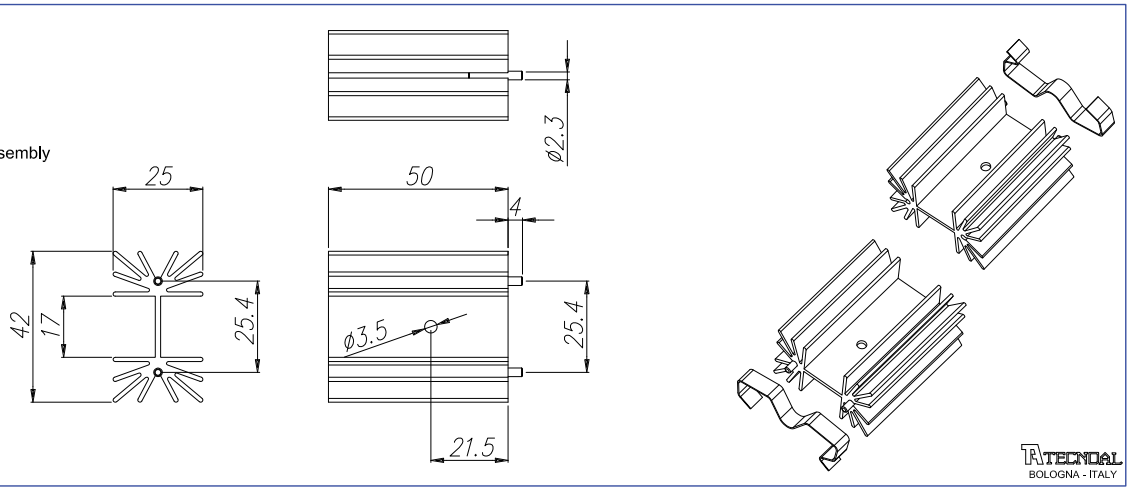
TECNOAL BOLOGNA - ITALY

B

ST - TEA40/50

Rt °C/W 6

Aluminium, black anodized
Available with pins for PCB assembly



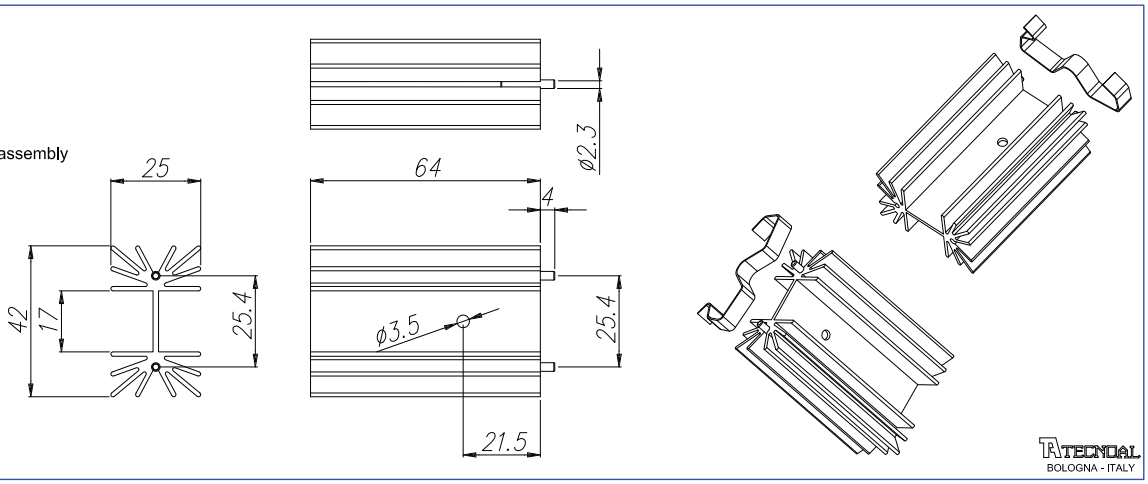
TECNOAL BOLOGNA - ITALY

C

ST - TEA40/64

Rt °C/W 5

Aluminium, black anodized
Available with pins for PCB assembly

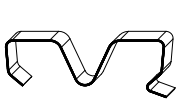


TECNOAL BOLOGNA - ITALY

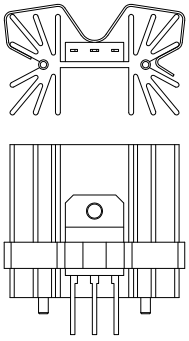
D

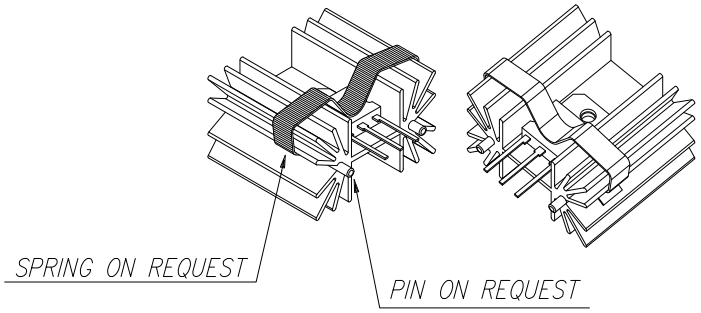
MOLLE DI FISSAGGIO SPRING CLIPS

MOLLA TEA40



Materiale acciaio armonico nichelato



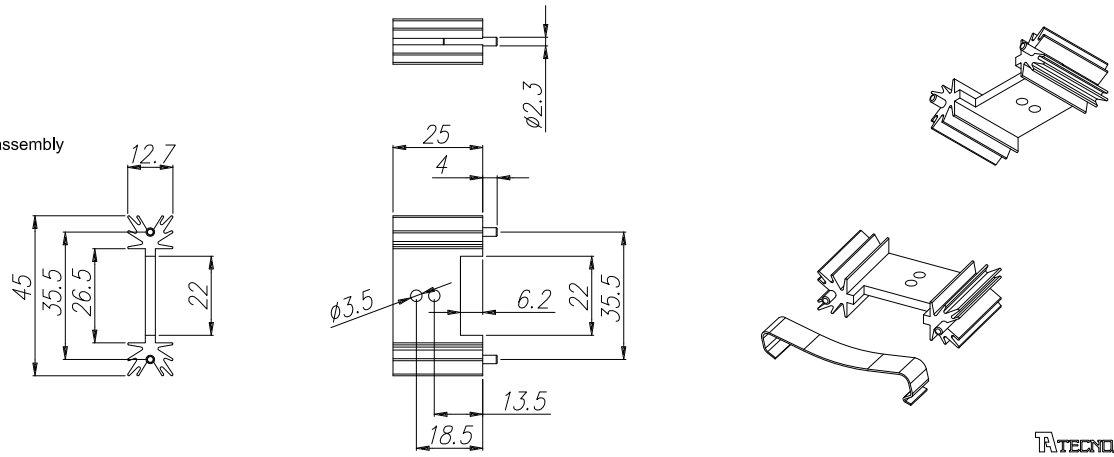


TECNOAL BOLOGNA - ITALY

ST - TEA45/25

Rt °C/W 8.2

Aluminium, black anodized
Available with pins for PCB assembly

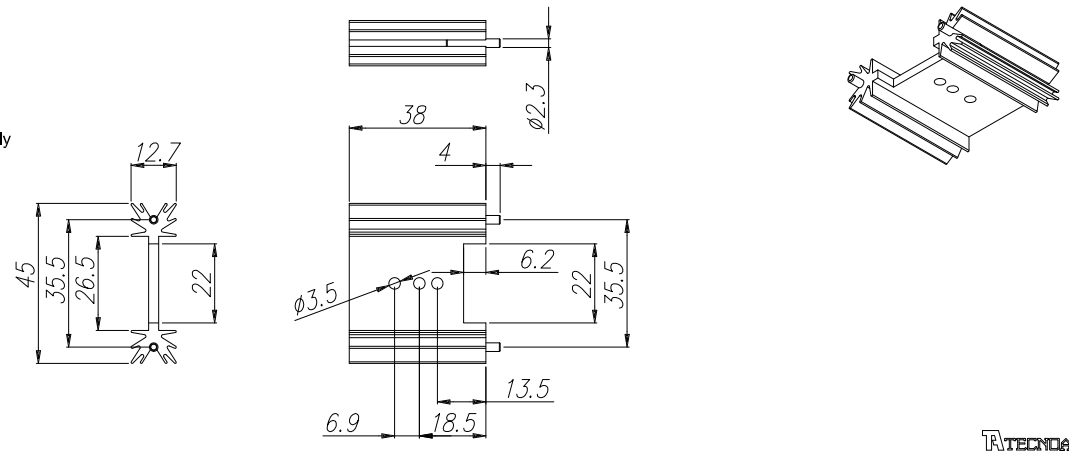


A

ST - TEA45/38

Rt °C/W 7

Aluminium, black anodized
Available with pins for PCB assembly

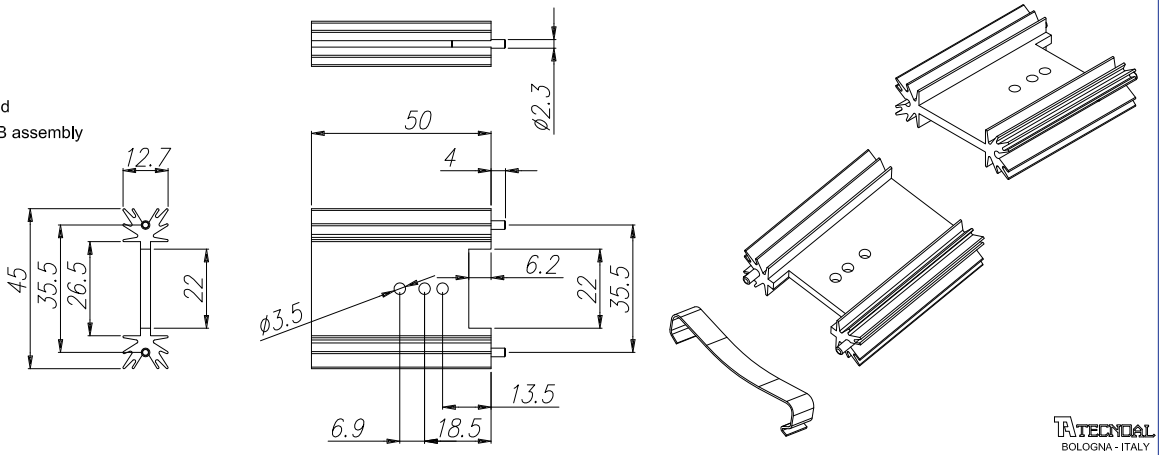


B

ST - TEA45/50

Rt °C/W 6.2

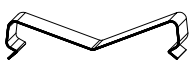
Aluminium, black anodized
Available with pins for PCB assembly



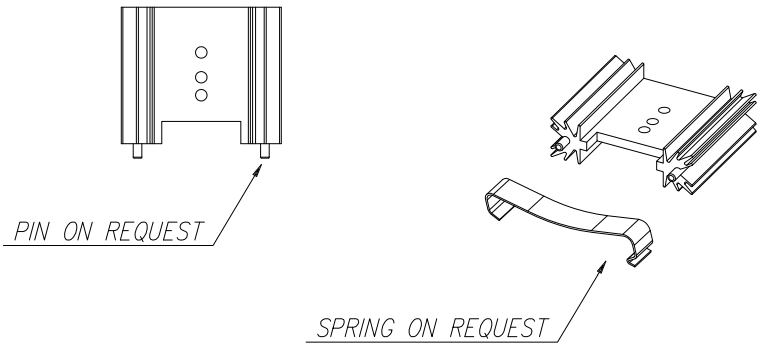
C

MOLLE DI FISSAGGIO SPRING CLIPS

MOLLA TEA45



Materiale acciaio inox



D

ACCESSORISTICA

TECNOAL offre oltre ad una ampia gamma di dissipatori adatti ai più svariati utilizzi, anche molti accessori impiegati in ambito elettronico.

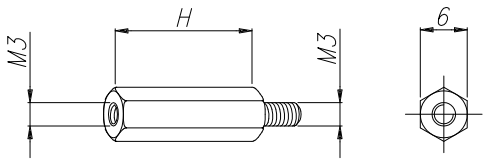
ACCESSORIES

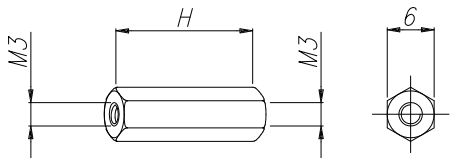
TECNOAL can supply a big series of accessories for electronic emploing.

A

DISTANZIALI M3
SPACER M3

Materiale ottone nichelato esagono 6
Material nickel plated brass hexagon 6





MASCHIO-FEMMINA M3
MALE-FEMALE M3

H							
5	7	10	12	15	20	25	30

H					
5	10	15	20	25	30

FEMMINA-FEMMINA M3
FEMALE-FEMALE M3

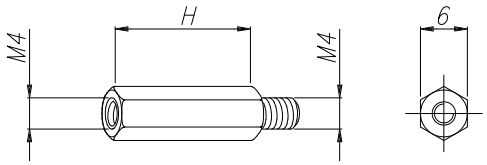
Altre dimensioni a richiesta
Other dimensions on request

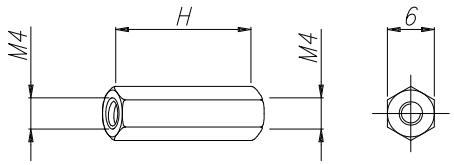
TECNOAL BOLOGNA - ITALY

B

DISTANZIALI M4
SPACER M4

Materiale ottone nichelato esagono 6
Material nickel plated brass hexagon 6





MASCHIO-FEMMINA M4
MALE-FEMALE M4

H				
10	15	20	25	30

H				
10	15	20	25	30

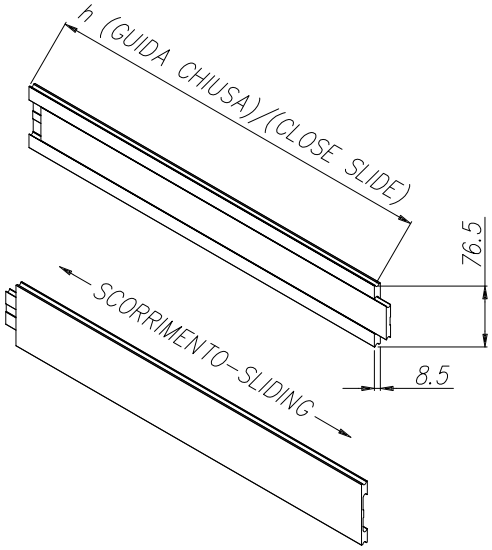
FEMMINA-FEMMINA M4
FEMALE-FEMALE M4

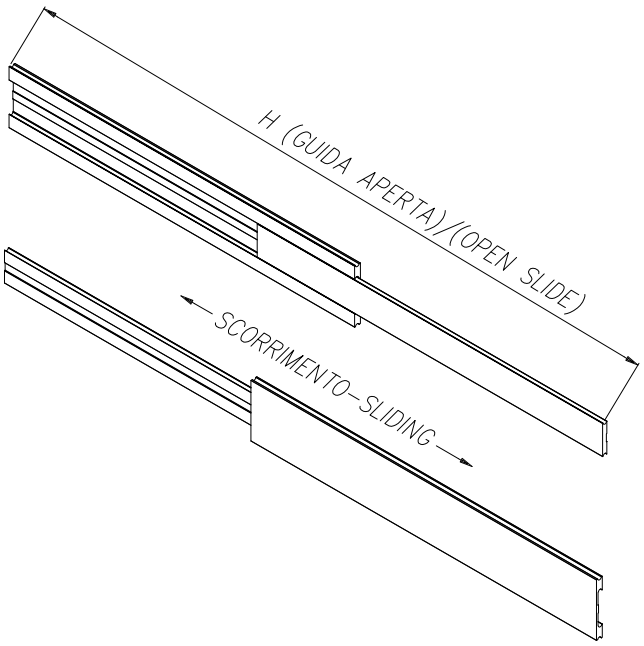
Altre dimensioni a richiesta
Other dimensions on request

TECNOAL BOLOGNA - ITALY

C

GUIDE A SFERE PER CASSETTO RACK
BALL BEARING SLIDES FOR RACK





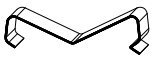
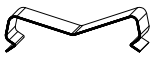
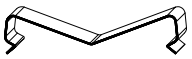
TECNOAL propone delle guide scorrevoli ottenute mediante il montaggio di due profili estrusi in alluminio che conferiscono particolare rigidità e robustezza all' insieme. Essendo ricavate da barre, la lunghezza della guida è a richiesta del cliente.

TECNOAL can supply on request ball bearnig slides in any lenght including all machining and assembly.

TECNOAL BOLOGNA - ITALY

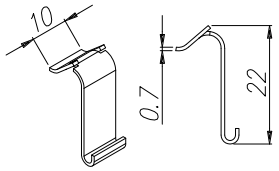
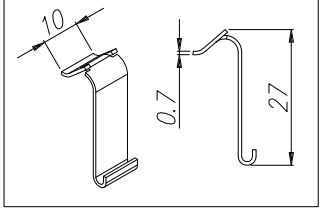
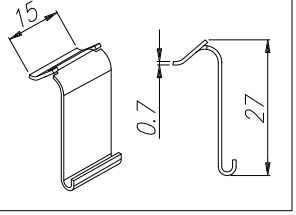
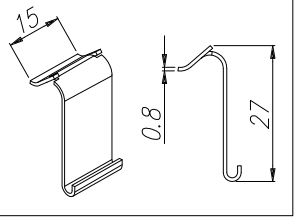
MOLLE DI FISSAGGIO
SPRING CLIPS

MOLLE PER IL FISSAGGIO DEL COMPONENTE SU DISSIPATORI STANDARD
CLIPS FOR ASSEMBLY ELECTRONICS COMPONENTS ON STANDARD HEATSINKS

MOLLA T13	MOLLA TEA35	MOLLA TEA35A	MOLLA TEA40	MOLLA TEA45
				
Materiale acciaio inox	Materiale acciaio inox	Materiale acciaio armonico nichelato	Materiale acciaio armonico nichelato	Materiale acciaio inox

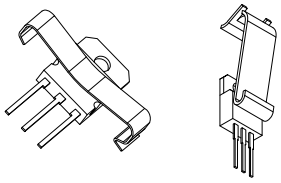
A

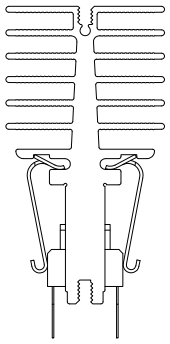
MOLLE PER IL FISSAGGIO DEL COMPONENTE SU DISSIPATORI SERIE TECNOCLIP
CLIPS FOR ASSEMBLY ELECTRONICS COMPONENTS ON HEATSINKS SERIES TECNOCLIP

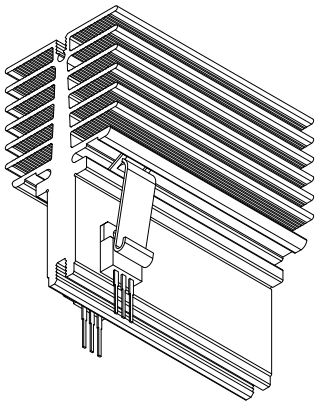
MOLLA 221007	MOLLA 271007	MOLLA 271507	MOLLA 271508
			

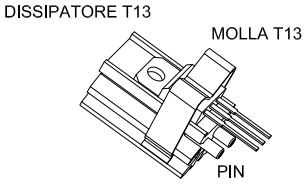
TECNOAL BOLOGNA - ITALY

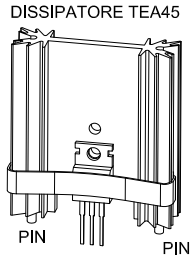
MOLLE: ESEMPI DI UTILIZZO
CLIP: EXAMPLES OF USING

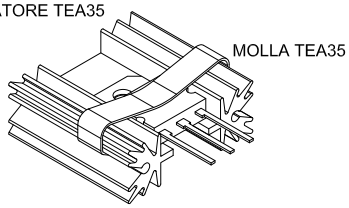


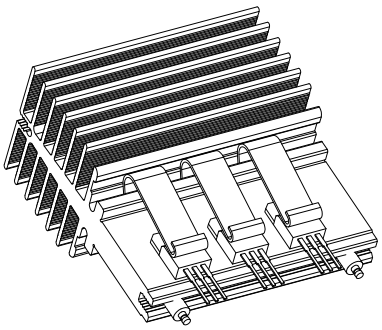


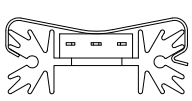


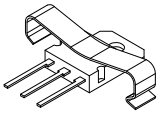








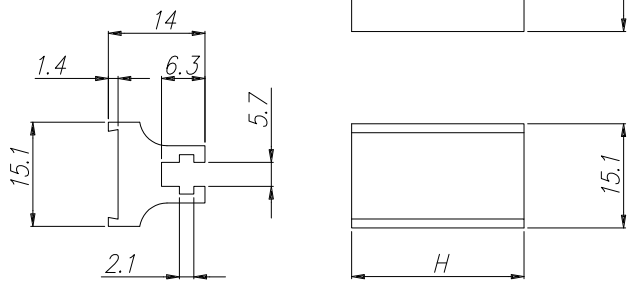


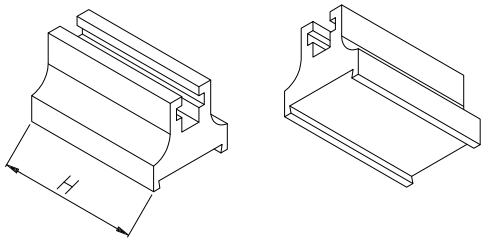


TECNOAL BOLOGNA - ITALY

A

MAN L





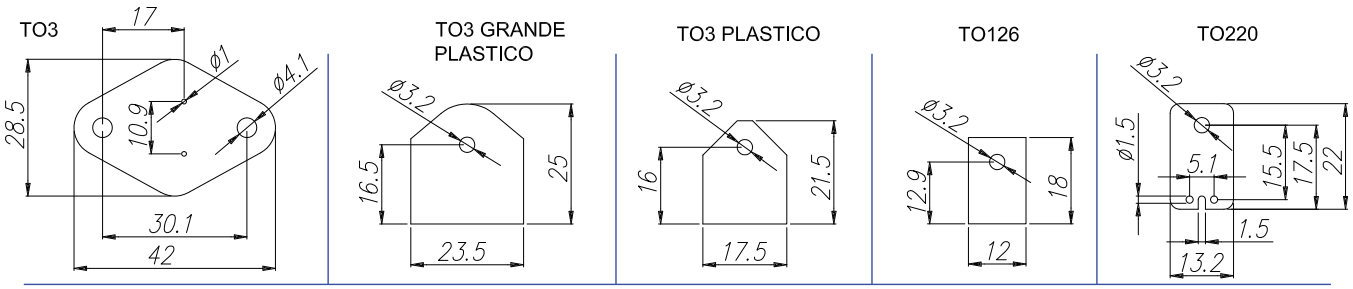
Aluminium, raw, blak anodized, silver anodized
Dimension H on request

Utilizzato come maniglia

TECNOAL BOLOGNA - ITALY

B

MICHE MINERALI NATURALI
NAURAL MINERAL MICAS (MICA INSULATOR)

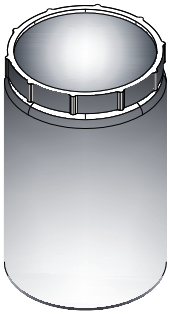


Foglio elastometro termoconduttivo SIL-PAD 400 dimensioni 12" x 12" spessore .007 MIN
Thermoconductive elastometer sheet SIL-PAD 400 (12"x12") thickness .007 MIN

TECNOAL BOLOGNA - ITALY

C

CONFEZIONE DA 2 Kg.
2 Kg. PACKAGE



GRASSO TERMOCONDUTTIVO
THERMAL CONDUCTOR GREASE

UTILIZZO

E' consigliabile utilizzare il grasso termoconduttivo al fine di garantire un contatto ottimale fra componente e superficie del dissipatore, in modo particolare quando la superficie del componente è di dimensioni ragguardevoli come ad esempio i moduli IGBT o quando la superficie del dissipatore non è stata spianata.

USING

Thermal conductive greases are chosen for optimize thermal resistence between electronics components and heatsink surface has not a good roughness and flatness.

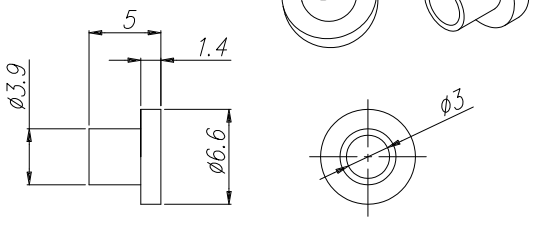
CONFEZIONE DA 200 g.
200 g. PACKAGE

TECNOAL BOLOGNA - ITALY

D

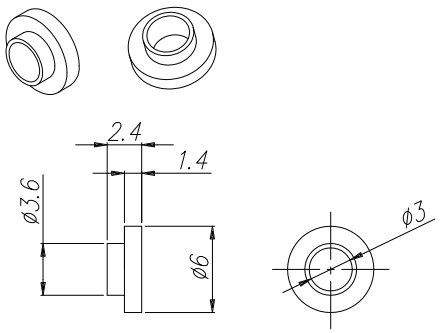
ISOLANTE PER TO3
INSULATION FOR CASE TO3

Materiale nylon
Material nylon



ISOLANTE PER T220
INSULATION FOR CASE TO220

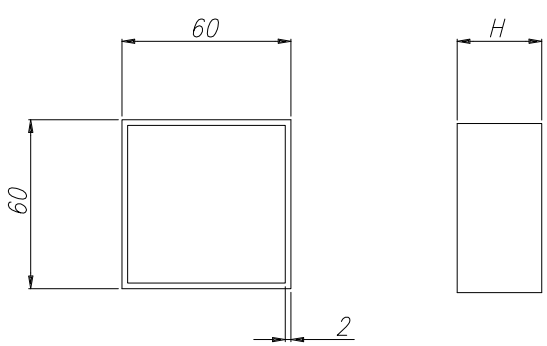
Materiale nylon
Material nylon

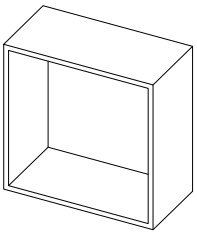


TECNOAL BOLOGNA - ITALY

SPACER 60

Aluminium, black anodized, silver on request
Aluminium, raw on request
Dimensions H, on request



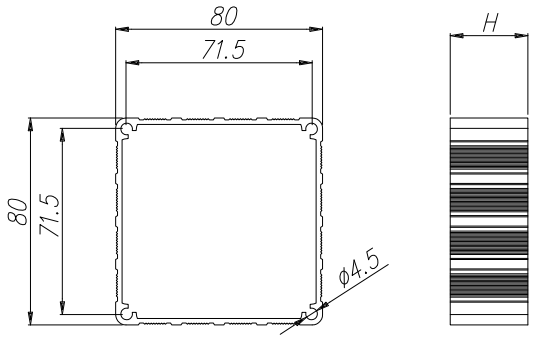


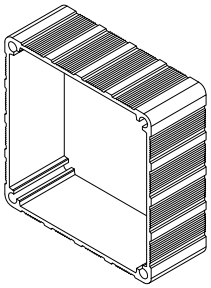
A

TECNOAL BOLOGNA - ITALY

SPACER 80

Aluminium, black anodized, silver on request
Aluminium, raw on request
Dimensions H, on request



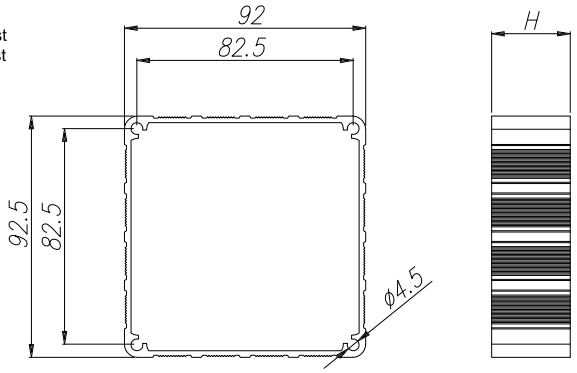


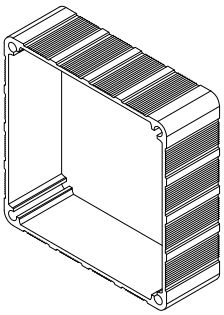
B

TECNOAL BOLOGNA - ITALY

SPACER 92

Aluminium, black anodized, silver on request
Aluminium, raw on request
Dimensions H, on request



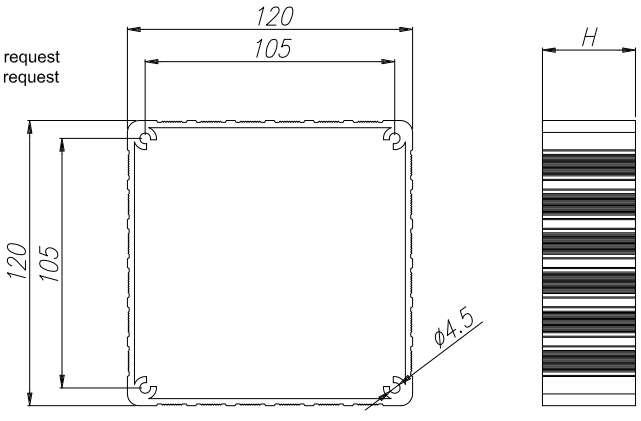


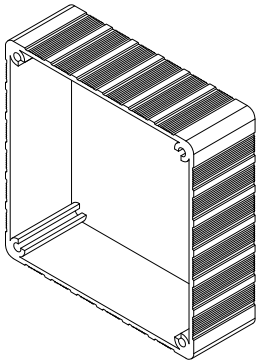
C

TECNOAL BOLOGNA - ITALY

SPACER 120

Aluminium, black anodized, silver on request
Aluminium, raw on request
Dimensions H, on request

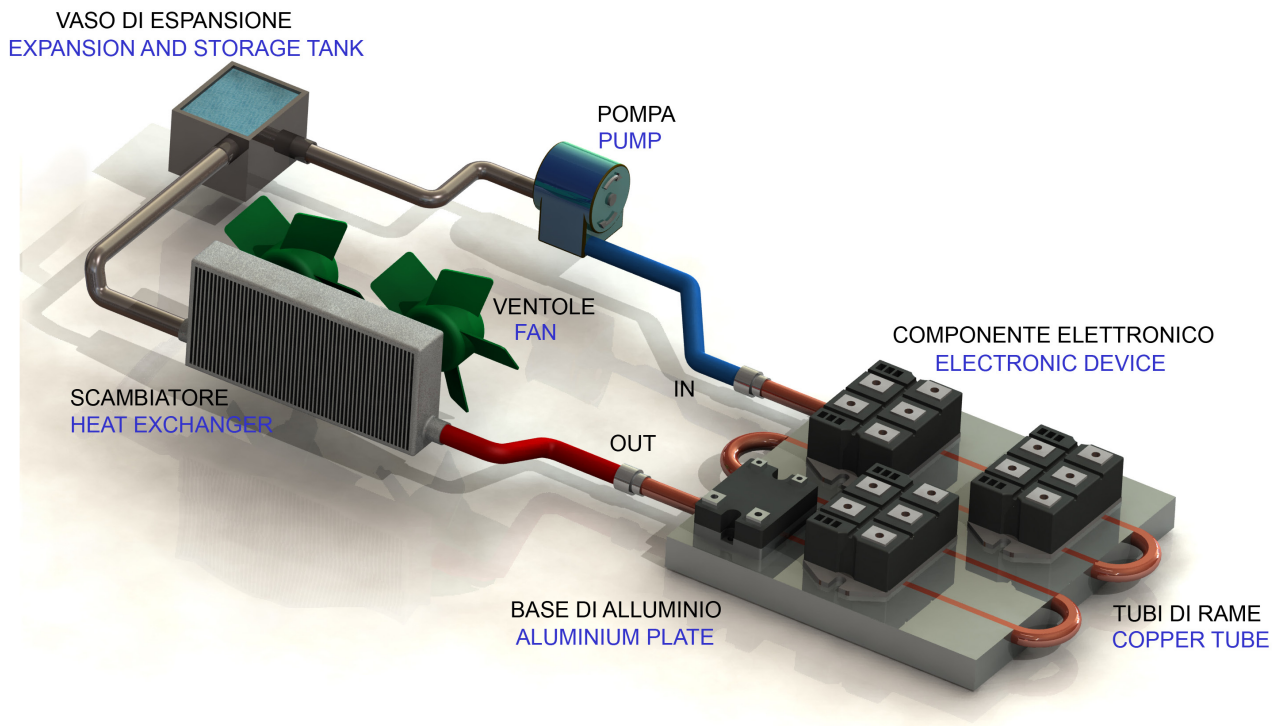




D

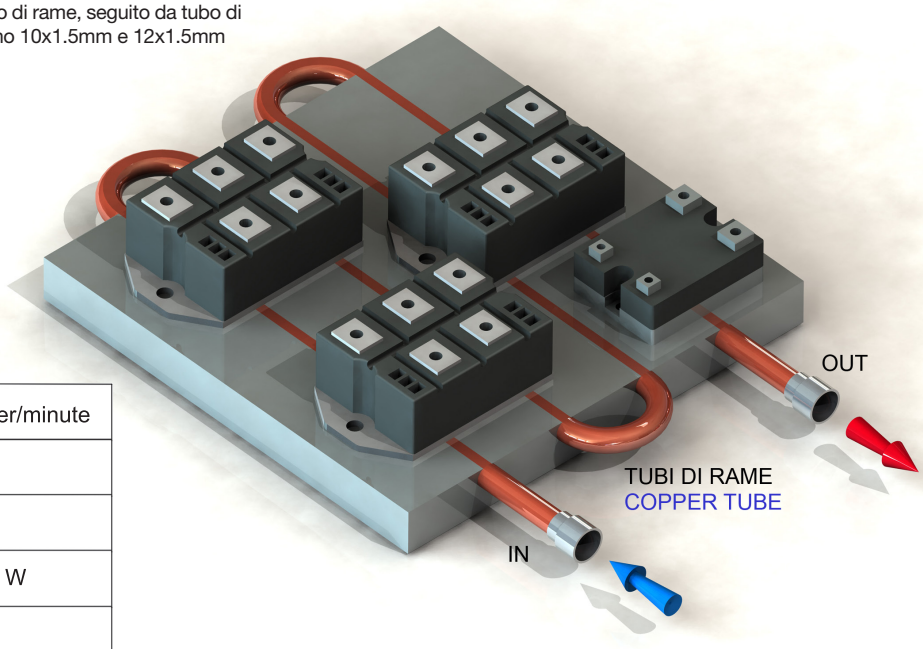
TECNOAL BOLOGNA - ITALY

DISSIPATORI A LIQUIDO
FLUID COOLER

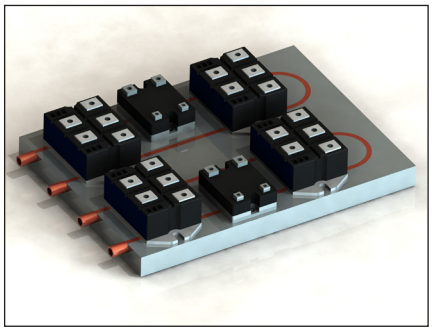
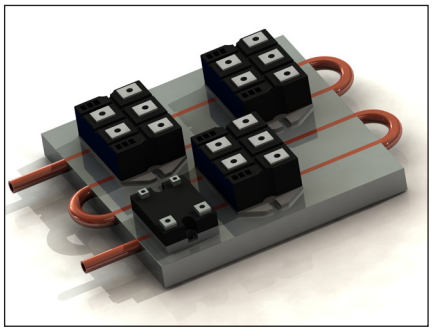
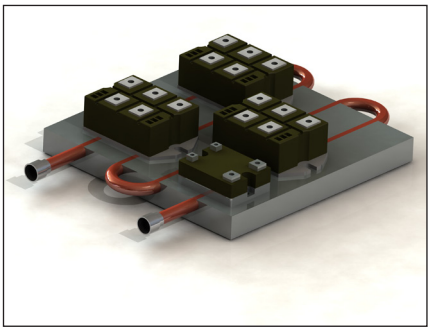
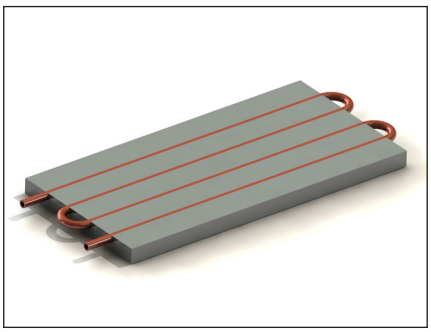
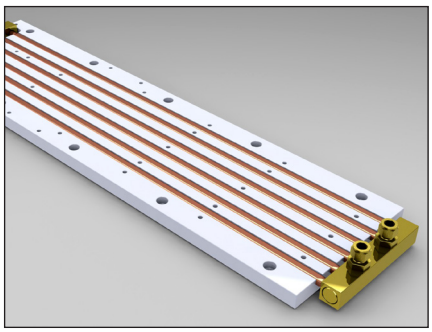
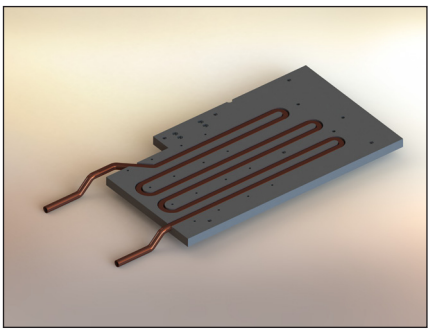
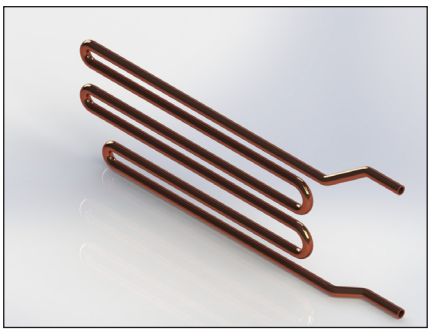
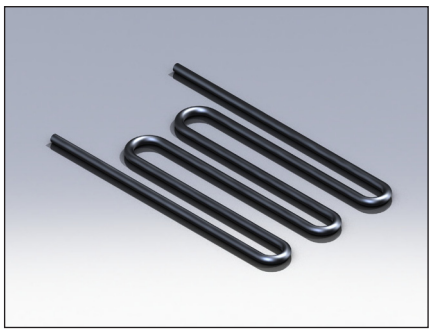
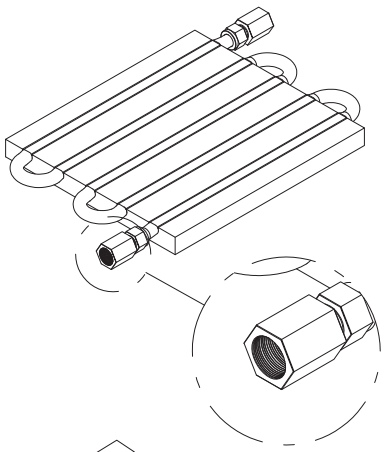
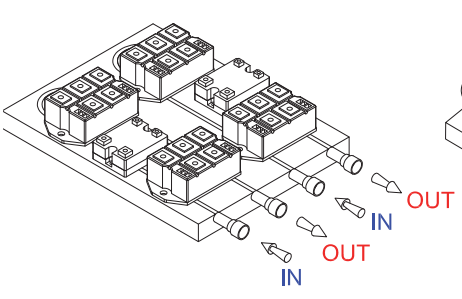
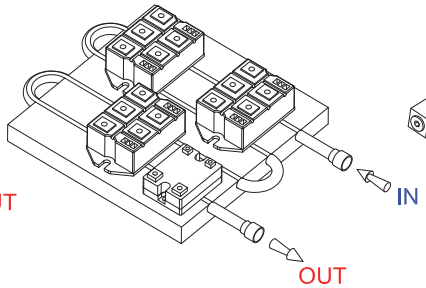
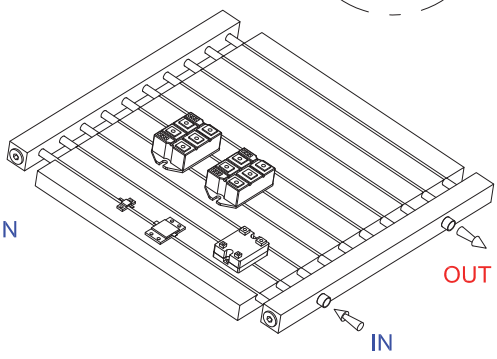


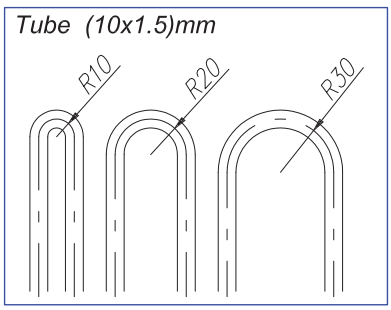
Nei casi in cui il carico termico sia talmente elevato e concentrato da non consentire l'impiego di un dissipatore ad aria, si può ricorrere all'utilizzo di dissipatori a liquido.
I dati di progetto sono essenzialmente la potenza da dissipare, la dimensione totale, il numero ed il percorso dei tubi.
Il dissipatore ad acqua è generalmente composto da:
un piatto in alluminio, un sistema di canalizzazione in tubi di rame opportunamente curvati e provvisti di raccordi di collegamento.
Il tubo di rame viene inserito meccanicamente in una sede opportunamente sagomata realizzata nella base di alluminio senza l'impiego di collanti. Una volta assemblato il tutto, si provvede ad eseguire la spianatura, della superficie di appoggio dei componenti, in modo da garantire un perfetto scambio termico.
Il tubo può essere di 3 tipi di materiale: rame, alluminio e acciaio inox.
I rendimenti più alti si ottengono con tubo di rame, seguito da tubo di alluminio. I diametri dei tubi più usati sono 10x1.5mm e 12x1.5mm

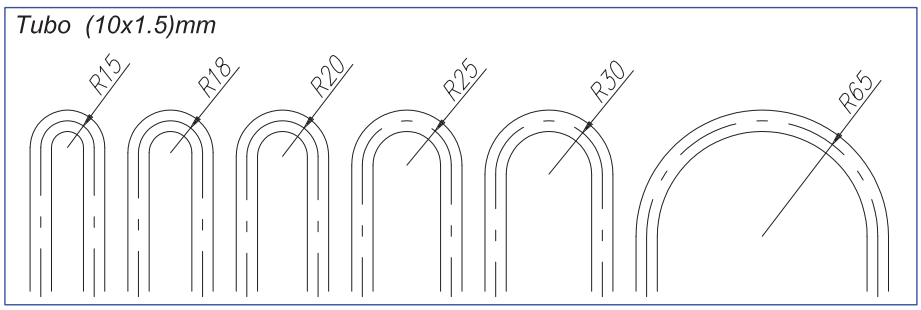
When thermal load is very concentrated air heatsink cannot be used and need fluid heatsink.
Liquid cooler heatsink is made by an aluminum plate where are apply several tubes.
Project data are power load, plate dimensions, numbers and route of tubes. By Tecnoal technology no glue is used and the contact between tubes and aluminum plate is optimal.
The plate surface is milled for guaranteed a very good flatness and roughness. In this mode the thermal resistance between components and plate surface is the minimum possible.
Material tube can be 3 types: copper, aluminum and inox steel.
Regarding efficiency first is copper tube, second aluminium tube and third inox steel tube.
Tube diameter most used are 10x1.5mm and 12x1.5mm.

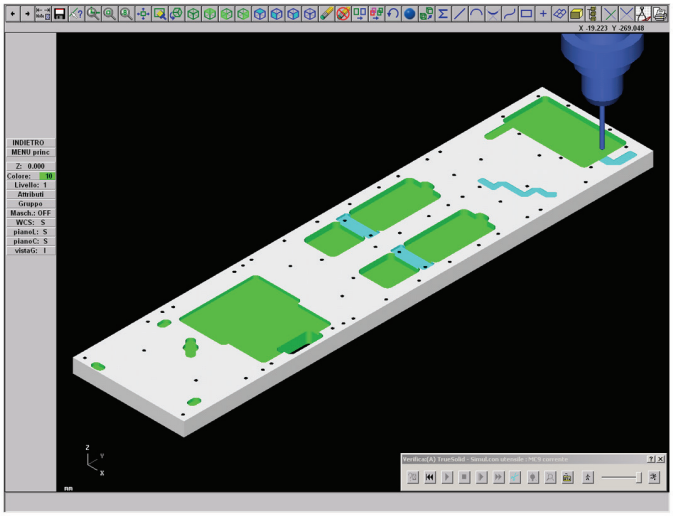


Portata Liquid flow	10 liter/minute
Temperatura acqua in ingresso Imput liquid temperature	16° c
Temperatura acqua in uscita Output liquid temperature	22° c
Potenza dissipata Power load	2700 W
Temperatura superficiale Maximum surface temperature	37° c
Rht	0,0077 ° c/W

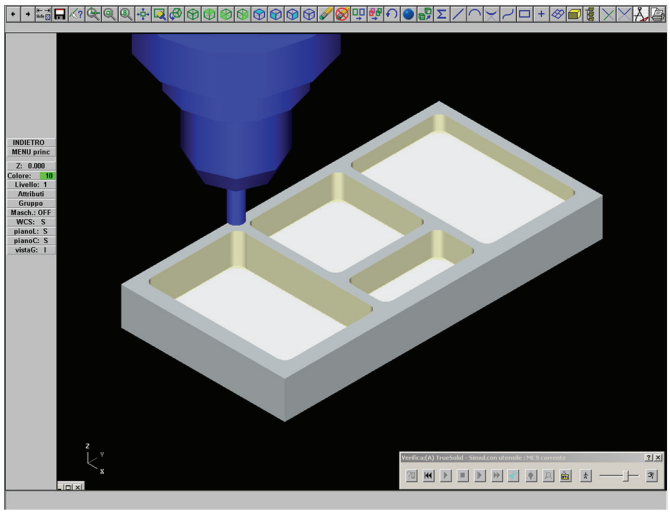










OUT
IN
OUT
IN

IN
OUT

OUT
IN


Tube (10x1.5)mm
R10
R20
R30

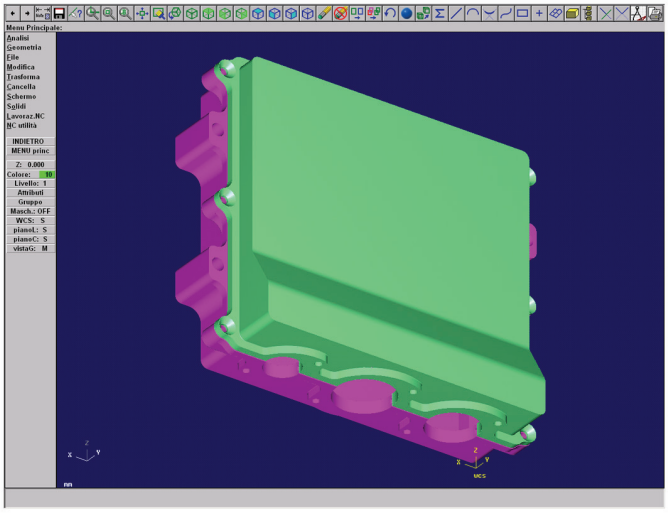

Tubo (10x1.5)mm
R15
R18
R20
R25
R30
R65



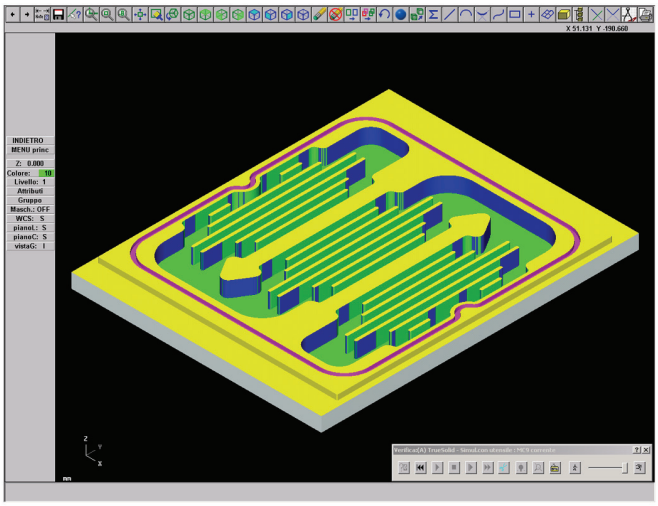
CNC machining simulation with CAD-CAM system



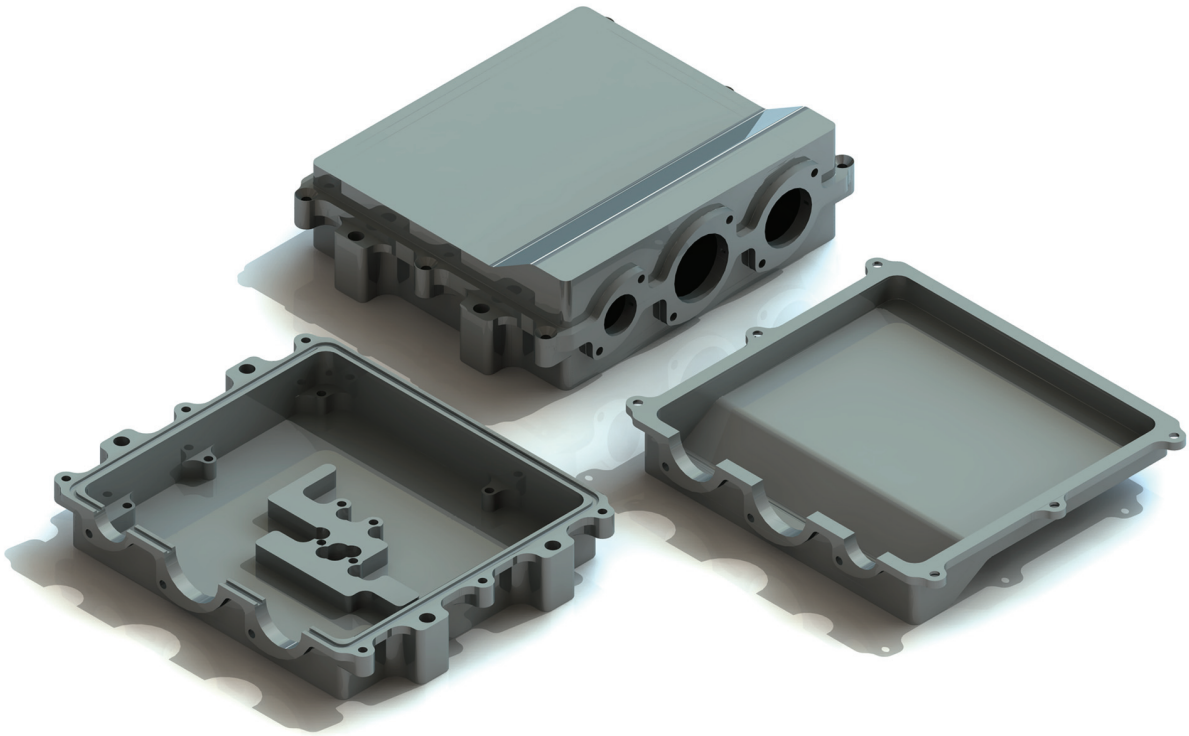
CNC machining simulation with CAD-CAM system



CNC machining simulation with CAD-CAM system

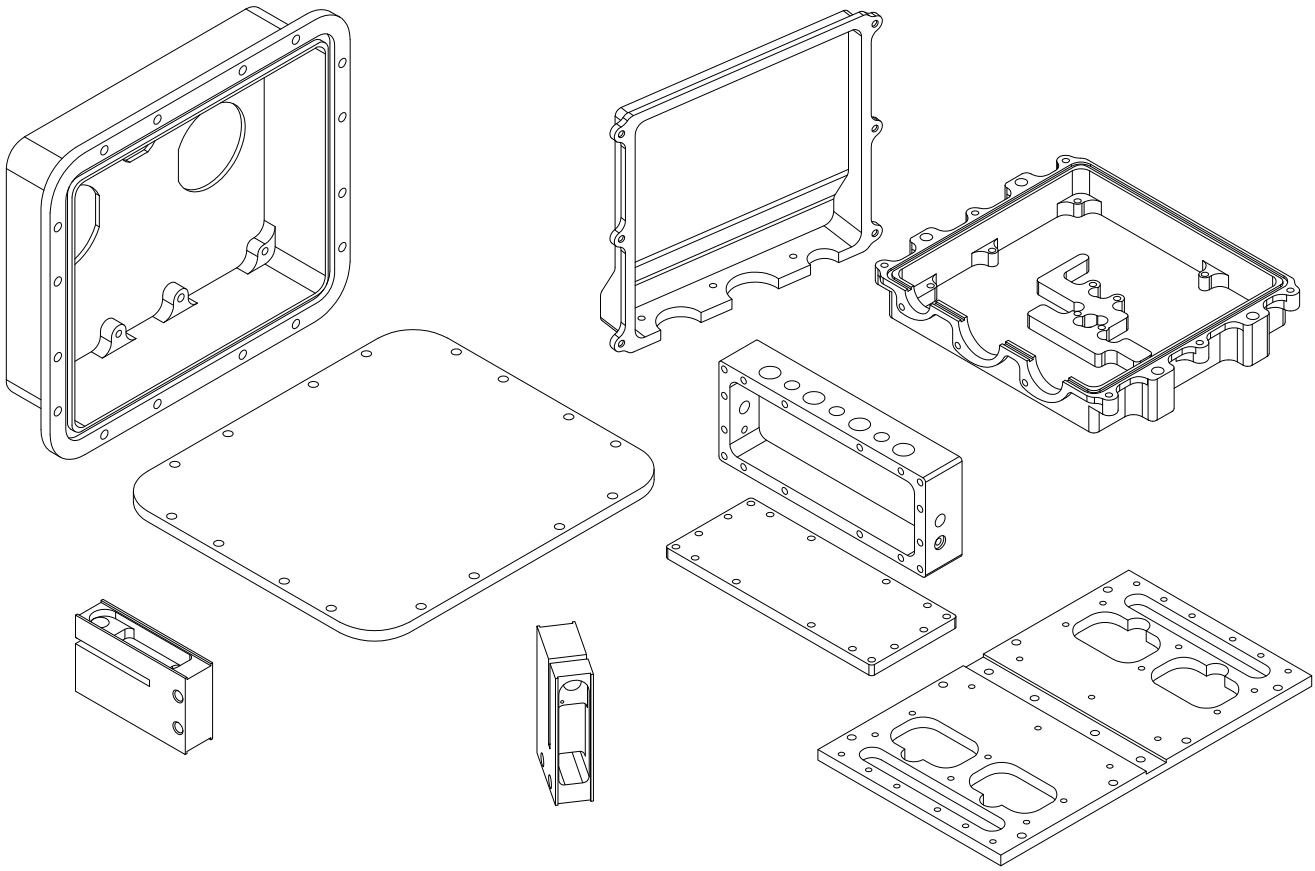


CNC machining simulation with CAD-CAM system



PARTICOLARI RICAVATI DAL PIENO E DA PROFILI COMMERCIALI

TECHNICAL ITEMS DERIVED FROM SOLID AND COMMERCIAL PROFILE



Tecnoal produce particolari ricavati dal pieno, da lastre e da profili commerciali in genere.
Questi pezzi a volte anche molto complessi, vengono solitamente realizzati avvalendosi di un sistema CAD-CAM di ultima generazione, in grado di importare direttamente il disegno fornito dal cliente.
Questo consente di ottenere particolari estremamente precisi oltre a ridurre drasticamente i tempi di produzione.
Nella pagina seguente sono elencati i profili commerciali standard reperibili in tempi rapidi presso i nostri fornitori.
Esistono molti altri profili “commerciali” non presenti in elenco reperibili direttemente in trafileria.
In questo caso però si è vincolati da quantitativi minimi e a tempi di reperimento più lunghi. Sono altresì esclusi dall’elenco le lastre molto usate per ricavare particolari dal pieno di dimensioni considerevoli.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1 - Profilo di partenza e materiale impiegato (alluminio, rame, ottone, ecc...)
2 - Quantitativo del lotto di produzione
3 - Indicazioni delle lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali.

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

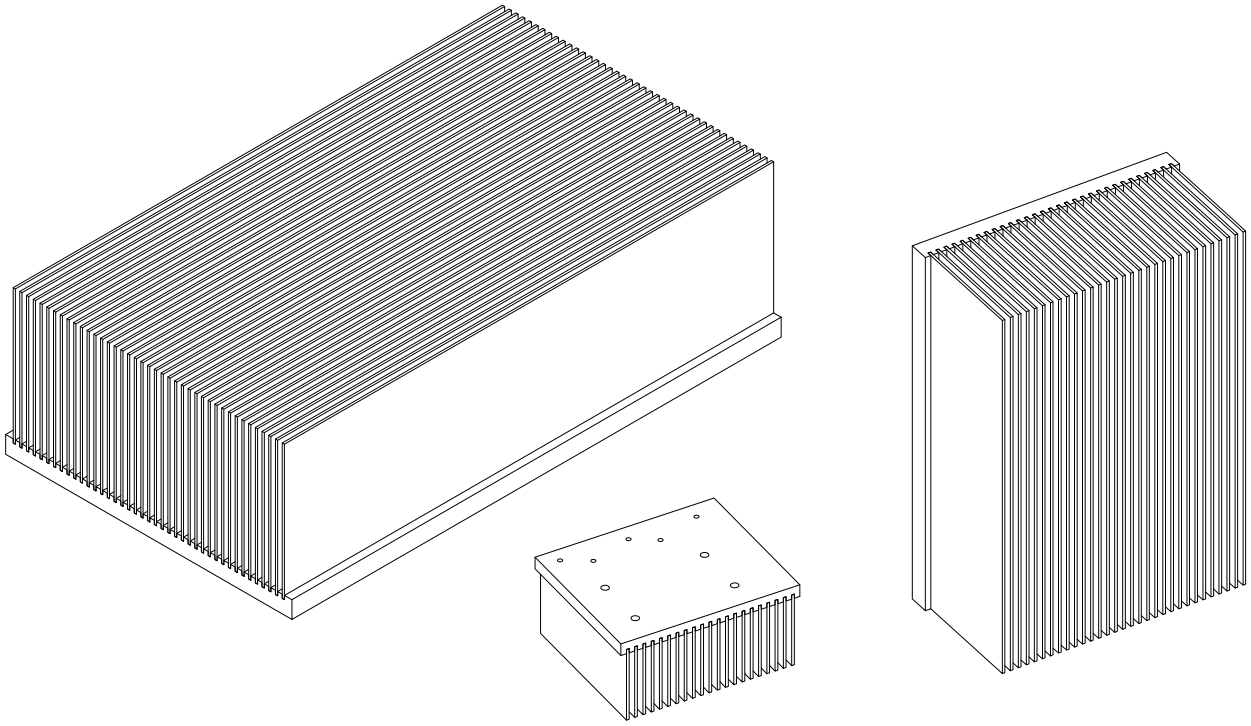
Tecnoal produces special items derived from solid, plates and commercial profiles.
These pieces sometimes very complex, are usually produced using a last generation CAD-CAM system, able to import directly the design provided by the customer.
This gives extremely accurate product as well as reduces drastically the time of production.
The following page lists the commercial standard profiles quickly available from our suppliers.
There are many other “commercial” profiles not listed here.
For quotations please provide the following informations:

1 - Profile required and material used (aluminum, copper, brass, etc...).
2 - Quantity of batch production.
3 - Indications of machining to perform better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawings always where dimensions have not been forced.
4 - Specify any surface treatments.

Our commercial and technical office is at your disposal for any clarification.

TECNOAL
BOLOGNA - ITALY

DISSIPATORI IN RAME INTEGRALE
COPPER HEATSINK



I dissipatori in rame integrale sono impiegati quando i dissipatori in alluminio sono insufficienti. Il procedimento consiste nell'applicare tramite stagnatura ad una base le alette dimensionate per ottenere il migliore risultato.
Essendo il procedimento laborioso, e il rame molto più pesante e costoso dell'alluminio e di difficile lavorabilità, raccomandiamo di utilizzare questi prodotti solo quando non è possibile ottenere le performance richieste con i dissipatori tradizionali.
Tecnoal è in grado di fornire il particolare comprensivo di tutte le lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1 - Dimensioni del dissipatore: dimensioni della base, dimensioni delle alette e relativa distanza fra le stesse (passo).
2 - Quantitativo del lotto di produzione.
3 - Eventuali lavorazioni meccaniche da eseguire, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due possono essere importati direttamente nel nostro sistema CAD-CAM consentendo una tempistica più breve. Vi invitiamo a fornire sempre disegni dove le quote non siano state forzate.
4 - Specificare eventuali trattamenti superficiali, quali nichelatura, stagnatura, ecc....

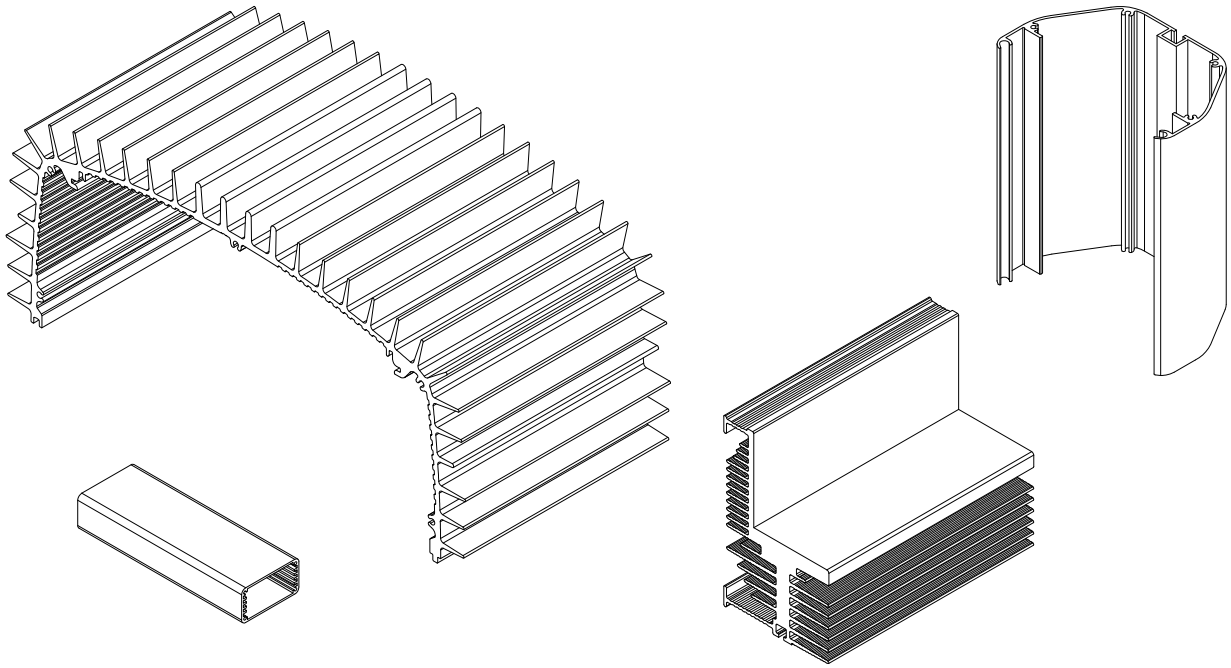
Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

Heatsinks made completely in copper, are used if aluminum heatsinks are not enough efficient.
The procedure is to solder on a copper basis the copper fins designed to meet the best result.
Being manufacturing process more complex and the copper much heavier, expensive and more difficult to work, we recommend to use these products only when traditional heatsinks do not grant the required performance.
Tecnoal is able to provide copper heatsinks inclusive of all working and any surface treatments.
For quotations please provide the following informations:

1 - Size of heatsink, size of the base, size of fins and distance between themselves (step).
2 - Quantity of batch production.
3 - Any machining, preferably accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats can be imported directly into our system CAD-CAM allowing a shorter time. Please provide drawings always where dimensions have not been forced.
4 - Specify any surface treatments such nikel/tim plating, tinning etc...

Our commercial and technical office is at your disposal for any clarification.

PROFILI A DISEGNO RISERVATI
RESERVED DRAWING PROFILES



La tecnologia dell'estrusione, consente di ottenere profili in alluminio di forme anche molto complesse, che ne consentono l'impiego in moltissimi settori oltre a quello elettronico.
Tecnoal progetta e realizza profili su specifiche esigenze del cliente. Tali profili sono riservati ai rispettivi clienti.
I profili evidenziati sono solo alcuni di quelli effettivamente realizzati e vogliono solo fornire un' idea di cosa può essere ottenuto mediante l' estrusione.
Tecnoal è in grado di fornire il particolare finale comprensivo di tutte le lavorazioni e di eventuali trattamenti superficiali.
Qualora voleste richiederci una qualsiasi quotazione vi preghiamo di fornirci le seguenti informazioni:

1 - Indicazioni sul nuovo profilo da realizzare, meglio se corredate da un file contenente un disegno tecnico nei formati pdf, dwg, dxf. Questi ultimi due sono preferibili in quanto possono essere modificati, correggendo eventuali dettagli che possono rendere il profilo inestrudibile.
2 - Consumo annuo previsto.

Il nostro ufficio commerciale e tecnico è a Vostra completa disposizione per qualsiasi chiarimento.

The extrusion technology gives aluminum profiles of very complex forms for applications in many areas besides electronics.
Tecnoal designs and manufactures profiles on specific customer request and therefore not available for other customers.
The profiles on catalogue are only an example of what can be obtained by extrusion.
Tecnoal is able to supply the final products inclusive of all machining and any surface treatments.
For quotations please provide the following informations:

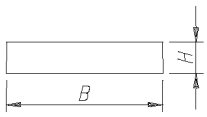
1 - All informations on the new profile to achieve better if accompanied by a file containing a technical drawing in pdf, dwg, dxf format. Dwg and dxf formats are preferable because they can be modified, correcting any details that could make inestrudibile profile.
2 - Yearly quantity required.

Our commercial and technical office is at your disposal for any clarification.

TECNOAL
BOLOGNA - ITALY

PROFILI COMMERCIALI IN ALLUMINIO
ALUMINIUM PROFILES FOR COMMERCIAL USE

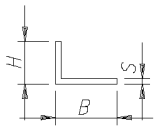
BARRE PIATTE
FLAT BARS



BxH - Peso gr/m/Weight gr/m

BxH	gr/m	BxH	gr/m	BxH	gr/m
10x2	54	40x20	2160	80x30	6480
10x3	81	40x25	2700	80x40	8640
10x5	135	40x30	3240	80x50	10800
10x6	162	45x3	346	80x60	12960
12x3	95	45x5	607	90x4	975
15x2	81	50x2	270	90x30	7290
15x3	122	50x3	405	100x3	810
15x4	162	50x4	540	100x4	1080
15x5	203	50x5	675	100x5	1350
15x6	243	50x6	810	100x6	1620
15x8	324	50x8	1080	100x8	2160
15x10	405	50x10	1350	100x10	2700
20x2	118	50x12	1620	100x12	3240
20x3	162	50x15	2025	100x15	4050
20x4	216	50x20	2700	100x20	5400
20x5	270	50x25	3375	100x25	6750
20x6	324	50x30	4050	100x30	8100
20x8	434	50x35	4725	100x35	9450
20x10	542	50x40	5400	100x40	10800
20x12	648	55x5	743	100x50	13500
20x15	810	55x12	4620	100x60	16200
25x2	135	60x2	324	120x5	1620
25x3	203	60x3	486	120x6	1945
25x4	270	60x4	648	120x8	2529
25x5	338	60x5	820	120x10	3240
25x6	405	60x6	972	120x12	3890
25x8	540	60x8	1296	120x15	4860
25x10	675	60x10	1620	120x20	6480
25x12	810	60x12	1944	120x30	9720
25x15	1013	60x15	2430	120x40	12960
25x20	1350	60x20	3240	120x50	16200
30x2	162	60x25	4050	120x60	19450
30x3	243	60x30	4860	130x20	7020
30x4	324	60x35	5670	130x30	10530
30x5	405	60x40	6480	130x50	17550
30x6	486	60x50	8190	130x60	21026
30x8	648	70x3	567	150x5	2025
30x10	810	70x4	756	150x6	2430
30x12	972	70x5	945	150x8	3240
30x15	1215	70x6	1135	150x10	4050
30x20	1620	70x8	1512	150x12	4860
35x3	280	70x10	1890	150x15	6075
35x4	378	70x15	2835	150x20	8100
35x5	472	70x20	3780	150x30	12150
35x6	576	70x25	4725	150x50	20250
35x8	756	70x30	5670	150x60	24300
35x10	946	70x35	6615	200x10	5400
35x12	1134	70x40	7560	200x15	8100
35x15	1417	70x50	9440	200x20	10800
35x20	1890	70x60	11340	200x25	13500
40x2	216	80x3	648	200x30	16200
40x3	324	80x4	846	200x40	21600
40x4	432	80x5	1080	250x10	6750
40x5	540	80x6	1290	300x10	8100
40x6	648	80x8	1728	300x30	24300
40x8	864	80x10	2150	310x10	8765
40x10	1080	80x15	3240		
40x12	1296	80x20	4320		
40x15	1620	80x25	5400		

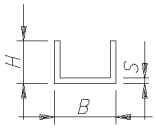
ANGOLARI A LATI DISUGUALI
UNEQUAL ANGLES



BxHxS - Peso gr/m/Weight gr/m

BxHxS	gr/m	BxHxS	gr/m
15x10x1,5	96	40x30x2	370
15x10x2	125	40x30x3	542
20x10x2	154	50x15x2	351
20x15x1,5	135	50x20x2	367
20x15x2	181	50x20x3	542
25x10x2	181	50x25x2	394
20x15x2	208	50x30x2	421
25x15x3	300	50x30x3	629
30x10x2	208	50x30x5	1013
30x15x2	235	60x15x2	394
30x15x3	316	60x20x2	424
30x20x2	262	60x25x5	1080
30x20x3	360	60x30x2	468
35x10x2	235	60x30x3	729
35x15x2	262	60x40x2	529
35x20x2	286	68x36x4	1080
35x25x3	461	80x20x2	529
40x10x2	258	100x20x2	637
40x15x2	289	100x30x2	691
40x20x2	316	100x50x5	1957
40x20x4	605	100x65x6	2576
40x25x2	340	120x20x2	745

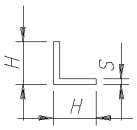
PROFILATI AD U
U PROFILES



BxHxS - Peso gr/m/Weight gr/m

BxHxS	gr/m	BxHxS	gr/m
0,8x0,8x1	59	35x15x2	329
10x10x1	75	35x20x2	388
10x10x1,5	112	35x35x2	545
10x10x2	140	40x10x2	307
10x15x1,5	150	40x15x2	361
10x15x2	194	40x20x2	415
12x12x1,5	134	40x40x2	684
12x15x1,5	158	45x20x2	438
15x10x1,5	121	45x30x2	545
15x13x2	200	50x10x2	356
15x15x1,5	170	50x15x2	410
15x15x2	221	50x20x2	469
15x20x1,5	211	50x25x2	518
15x20x2	275	50x30x2	572
20x10x1,5	150	50x50x2	788
20x10x2	199	55x20x2	518
20x15x1,5	190	55x30x2	599
20x15x2	253	55x50x2	816
20x20x1,5	231	60x20x2	518
20x20x2	302	60x30x2	626
25x25x2	338	70x20x2	572
30x10x2	259	73,4x13x1,2	314
30x15x2	334	80x20x2	627
30x20x2	357	100x20x2	734
30x30x2	464	120x20x2	842

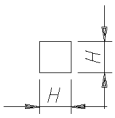
ANGOLARI A LATI UGUALI
EQUAL ANGLES



BxHxS - Peso gr/m/Weight gr/m

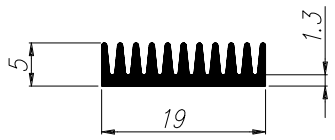
BxHxS	gr/m	BxHxS	gr/m
10x10x1	52	30x30x3	467
10x10x1,5	76	35x35x2	370
10x10x2	97	35x35x3	543
12x12x2	119	40x40x2	424
15x15x1	79	40x40x3	629
15x15x1,5	117	40x40x4	821
15x15x2	151	40x40x5	1012
20x20x1,5	162	50x50x2	529
20x20x2	205	50x50x4	1037
20x20x3	300	50x50x5	1297
25x25x2	262	60x60x2	637
30x30x1,5	237	60x60x3	948
30x30x2	316	60x60x6	1847

BARRE QUADRATE
SQUARE BARS

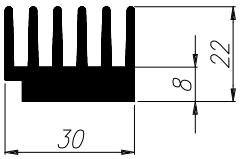


H - Peso gr/m/Weight gr/m

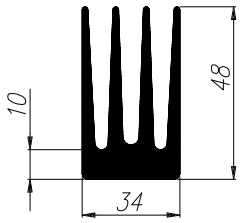
H	gr/m	H	gr/m
6	97	40	4320
7	132	45	5468
8	173	50	6750
10	270	55	8167
12	389	60	9720
14	529	65	11407
15	607	70	13230
18	875	80	17280
20	1080	90	21870
22	1307	100	27000
25	1687	110	32670
28	2117	120	38280
30	2430	130	45630
35	3307	140	52920



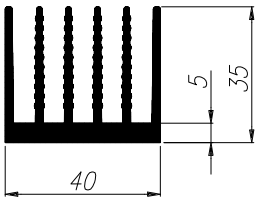
K19	Peso Kg/m	0.15



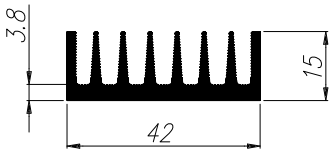
K30	Peso Kg/m	1.04



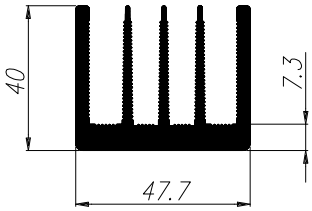
K34	Peso Kg/m	2.85



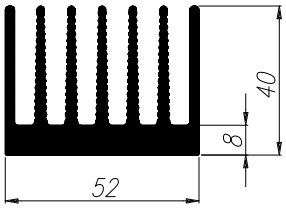
K40	Peso Kg/m	1.53



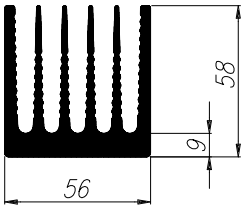
K42	Peso Kg/m	0.95



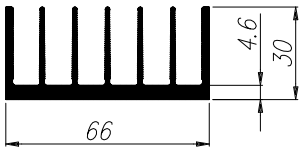
K48	Peso Kg/m	2.00



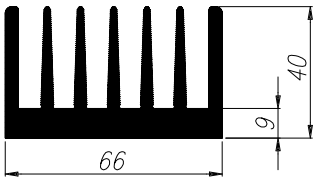
K52	Peso Kg/m	2.50



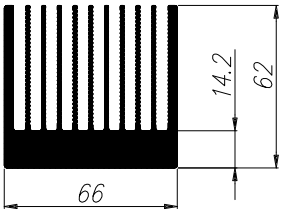
K56	Peso Kg/m	3.90



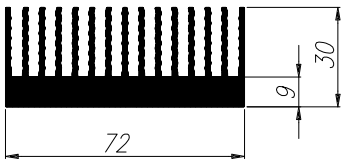
K65	Peso Kg/m	1.70



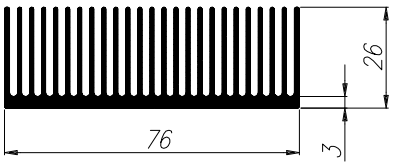
K66B	Peso Kg/m	3.30



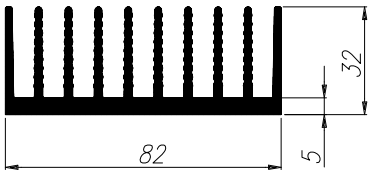
KA66	Peso Kg/m	5.10



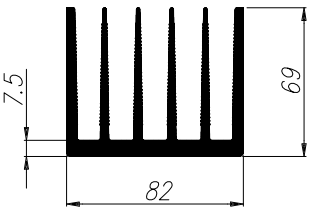
K72	Peso Kg/m	3.10



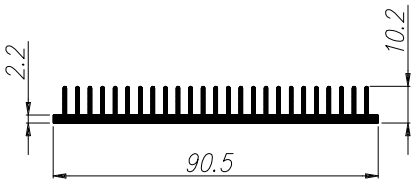
K76	Peso Kg/m	2.30



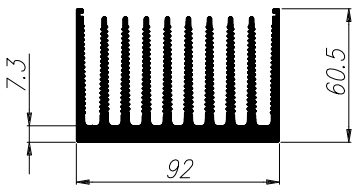
KE82	Peso Kg/m	2.74



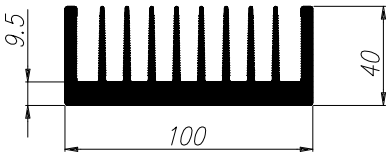
KEA82	Peso Kg/m	5.00



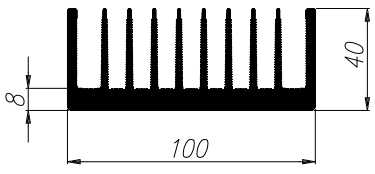
K91	Peso Kg/m	1.07



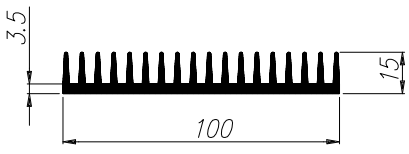
K92	Peso Kg/m	5.58



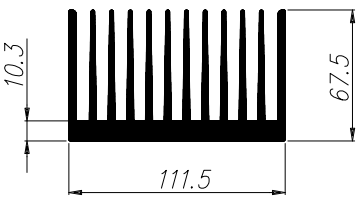
K100	Peso Kg/m	4.70



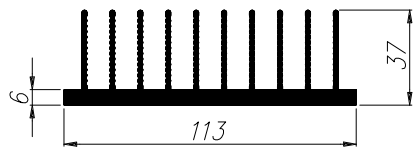
K100A	Peso Kg/m	4.20



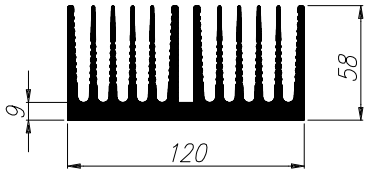
KE100	Peso Kg/m	2.15



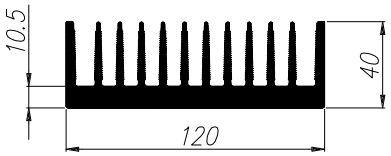
K112	Peso Kg/m	8.70



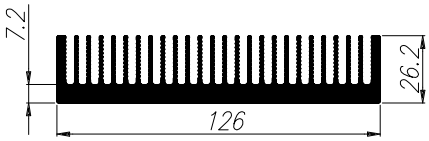
K113 | Peso Kg/m 3.40



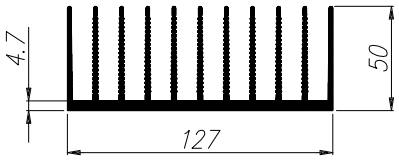
K120 | Peso Kg/m 8.10



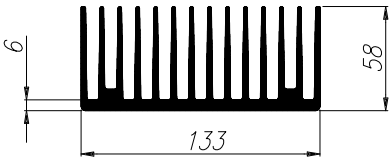
KA120 | Peso Kg/m 6.00



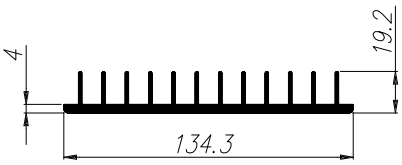
KF126 | Peso Kg/m 4.38



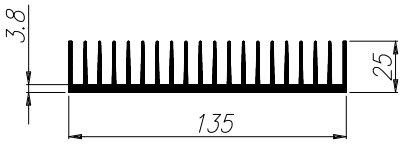
K127 | Peso Kg/m 4.60



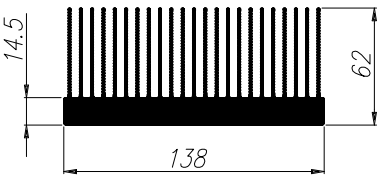
K133 | Peso Kg/m 7.53



K134 | Peso Kg/m 2.40

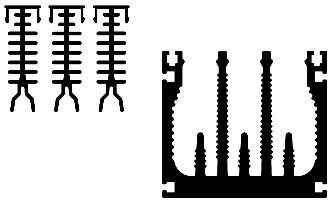


K135 | Peso Kg/m 3.10

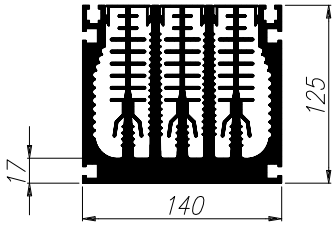


K138 | Peso Kg/m 9.60

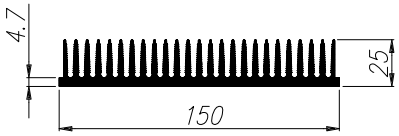
KXC140 | Peso Kg/m 1.95



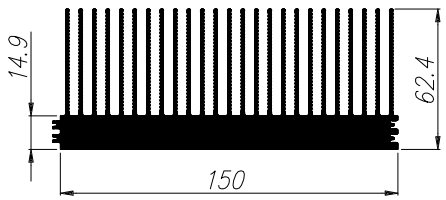
KX140 | Peso Kg/m 17.85



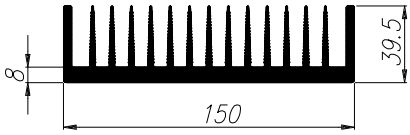
KXH140 | Peso Kg/m 23.7



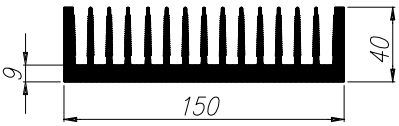
K150 | Peso Kg/m 4.90



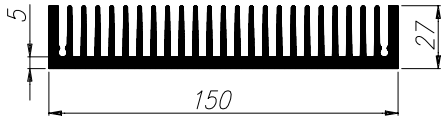
I150 | Peso Kg/m 10.50



KE150 | Peso Kg/m 6.50

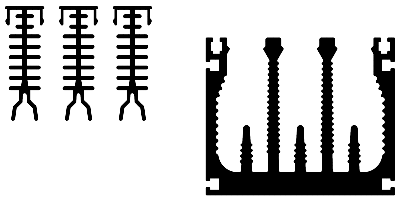


KE150A | Peso Kg/m 7.42

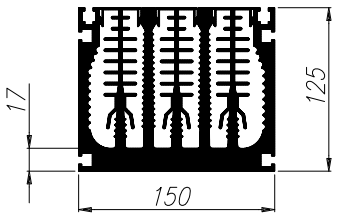


KK150 | Peso Kg/m 5.30

KXC140 | Peso Kg/m 1.95

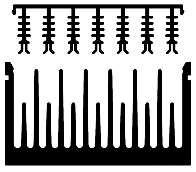


KX150 | Peso Kg/m 18.20

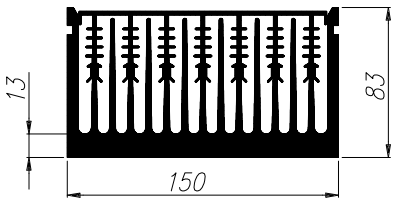


KXH150 | Peso Kg/m 24.1

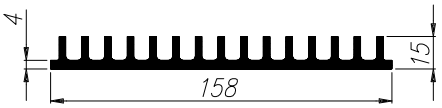
KEAC150 | Peso Kg/m 3.20



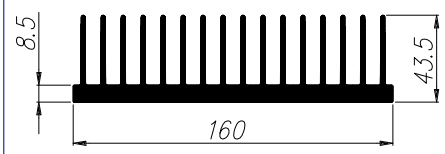
KEA150 | Peso Kg/m 12.60



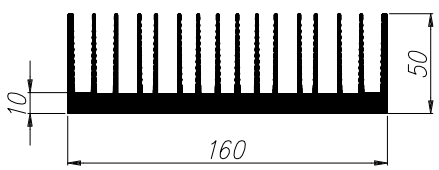
KEAH150 | Peso Kg/m 15.28



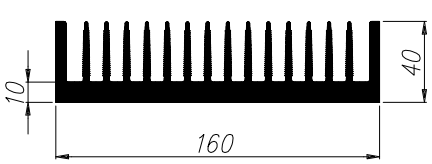
K158 | Peso Kg/m 3.20



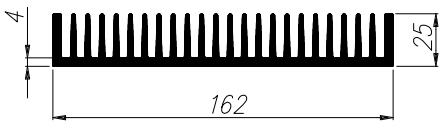
K160	Peso Kg/m	7.23



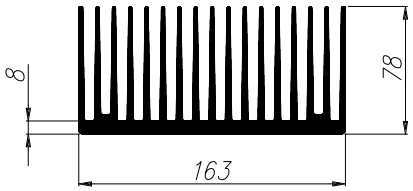
KA160	Peso Kg/m	7.70



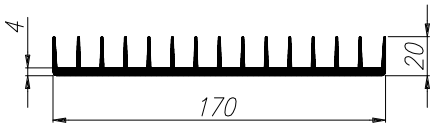
KE160A	Peso Kg/m	8.10



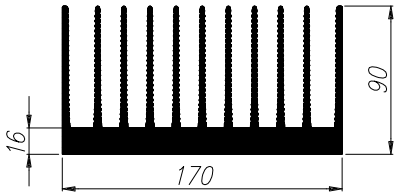
K163	Peso Kg/m	5.20



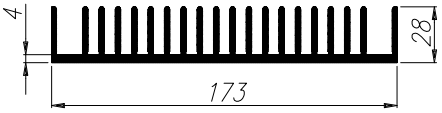
KF163	Peso Kg/m	12.90



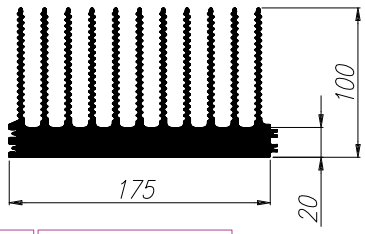
K170	Peso Kg/m	2.83



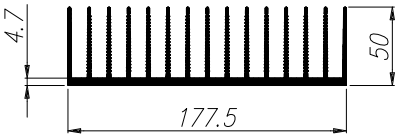
KE170	Peso Kg/m	14.90



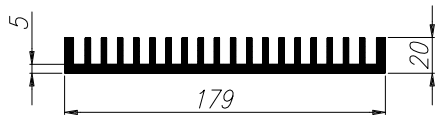
K173	Peso Kg/m	4.60



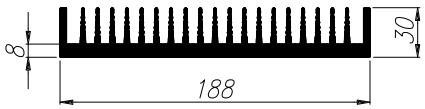
I 100	Peso Kg/m	17.1



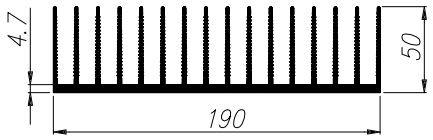
K177	Peso Kg/m	6.13



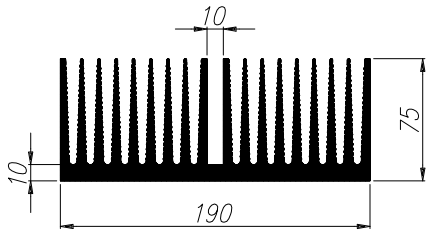
K180	Peso Kg/m	5.40



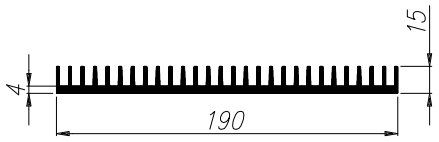
K188	Peso Kg/m	7.34



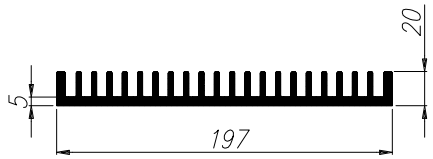
K190	Peso Kg/m	6.80



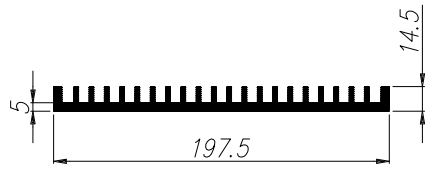
KE190	Peso Kg/m	16.50



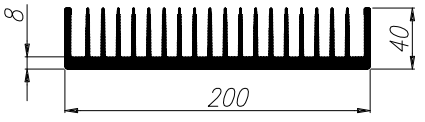
KK190	Peso Kg/m	3.64



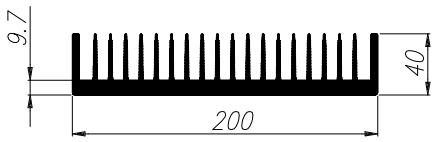
K197	Peso Kg/m	5.80



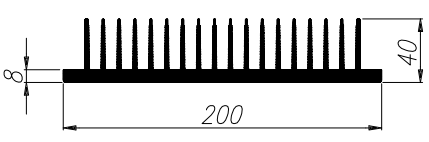
KE197	Peso Kg/m	4.30



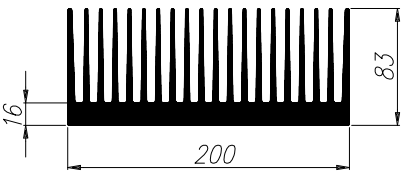
K200	Peso Kg/m	8.20



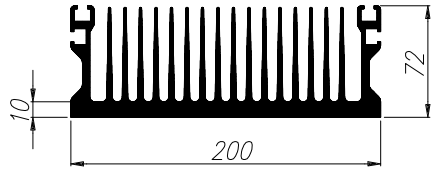
K200B	Peso Kg/m	8.70



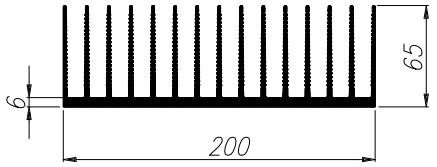
KL200	Peso Kg/m	7.60



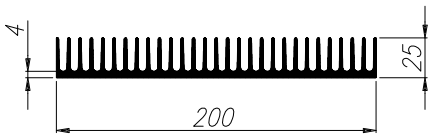
KA200	Peso Kg/m	19.90



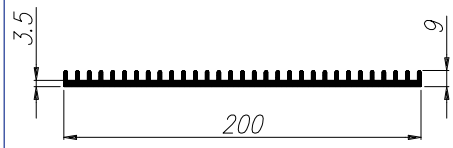
KE200 | Peso Kg/m 15.00



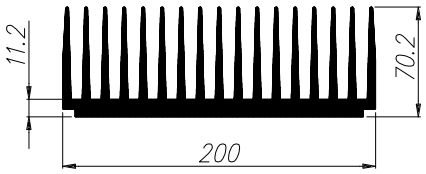
KEA200 | Peso Kg/m 8.90



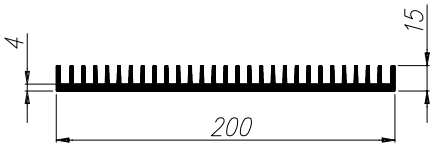
KEAH200 | Peso Kg/m 5.50



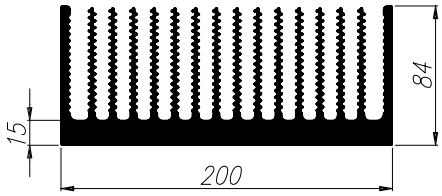
KEI200 | Peso Kg/m 2.84



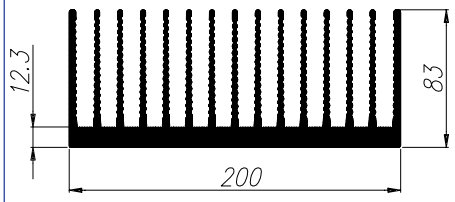
KEIA200 | Peso Kg/m 15.60



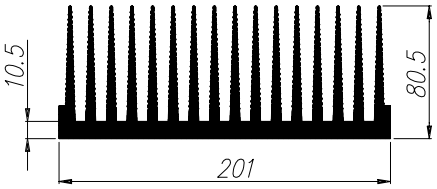
KK200 | Peso Kg/m 4.00



KH200 | Peso Kg/m 17.70

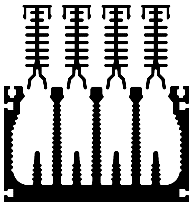


KS200 | Peso Kg/m 15.00

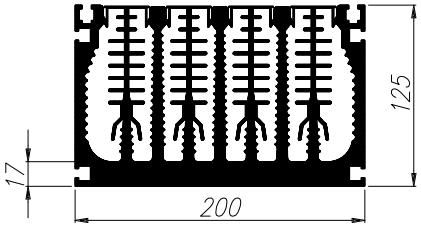


KX200 | Peso Kg/m 17.40

KEAC140 | Peso Kg/m 1.95

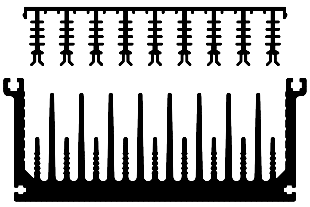


KXE200 | Peso Kg/m 23.20

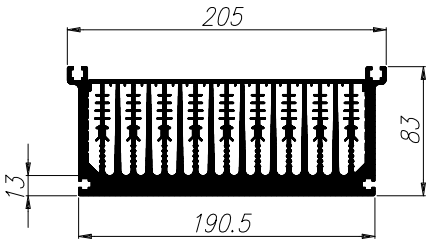


KXH200 | Peso Kg/m 31.10

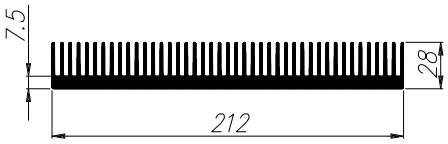
KC205 | Peso Kg/m 4.30



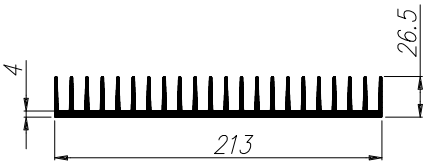
KE205 | Peso Kg/m 15.50



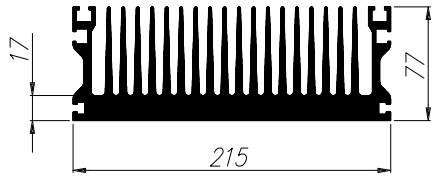
K205 | Peso Kg/m 20.20



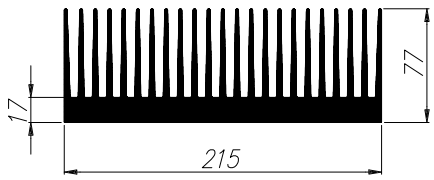
KF212 | Peso Kg/m 8.20



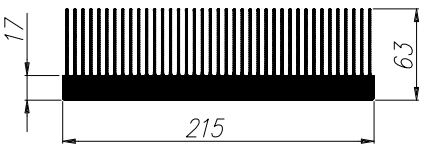
K213 | Peso Kg/m 5.00



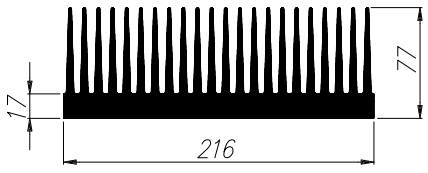
K215 | Peso Kg/m 22.40



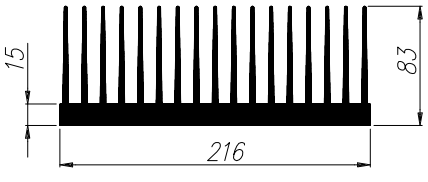
KE215 | Peso Kg/m 20.90



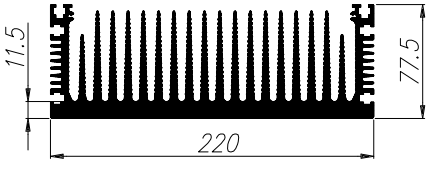
KF215 | Peso Kg/m 16.75



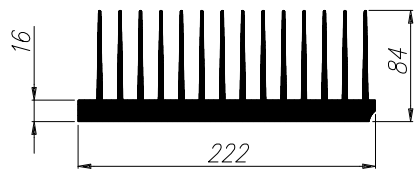
K216 | Peso Kg/m 24.00



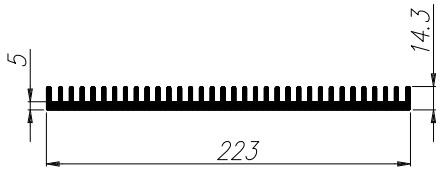
KX216 | Peso Kg/m 18.50



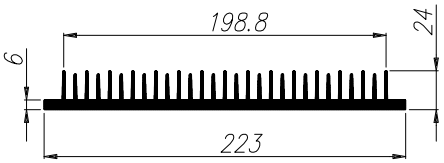
K220 | Peso Kg/m 18.80



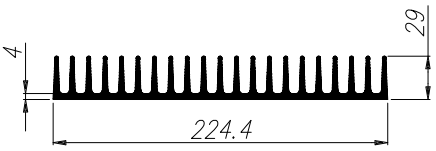
K222	Peso Kg/m	17.00



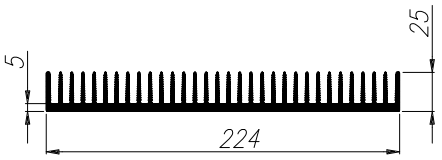
K223	Peso Kg/m	5.14



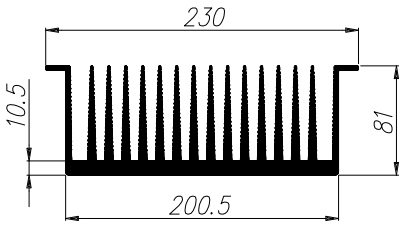
KE223	Peso Kg/m	5.90



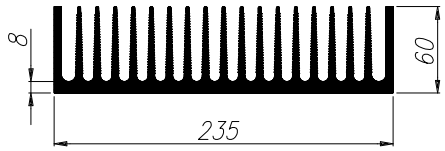
K224	Peso Kg/m	6.70



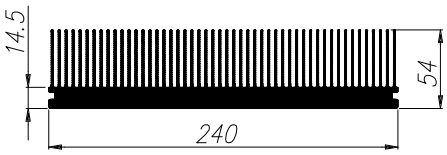
KE224	Peso Kg/m	6.70



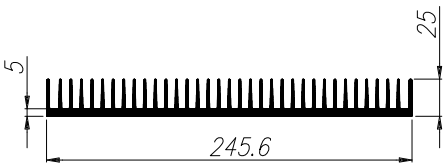
K230	Peso Kg/m	17.50



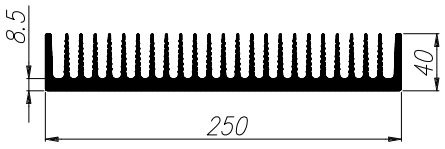
K235	Peso Kg/m	14.70



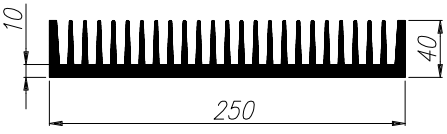
KF240	Peso Kg/m	16.50



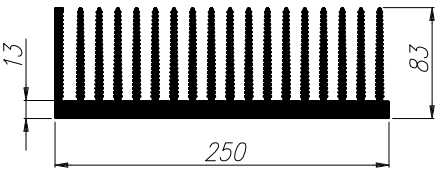
K245	Peso Kg/m	6.60



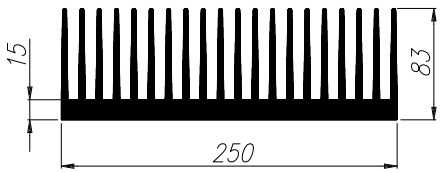
K250	Peso Kg/m	12.50



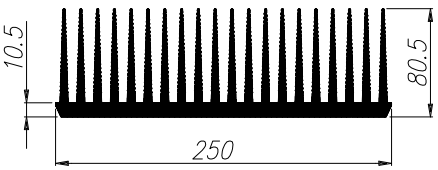
K250E	Peso Kg/m	13.25



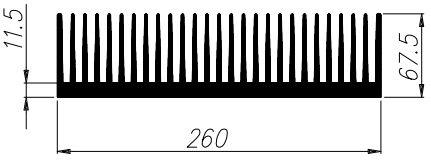
KE250	Peso Kg/m	22.05



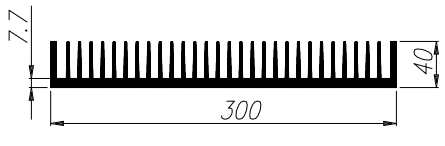
KX250	Peso Kg/m	25.10



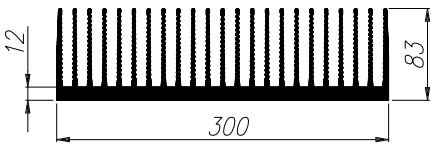
KK250	Peso Kg/m	21.40



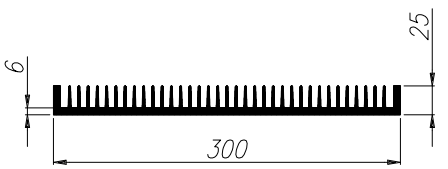
K260	Peso Kg/m	20.65



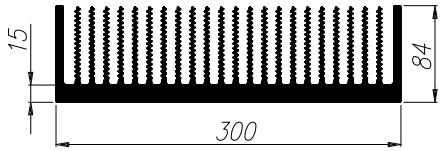
K300	Peso Kg/m	12.80



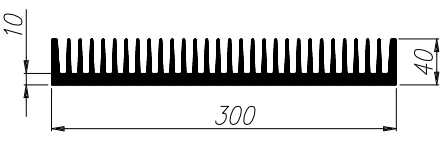
KE300	Peso Kg/m	22.70



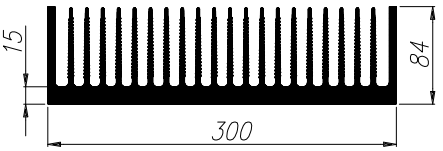
KEA300	Peso Kg/m	9.10



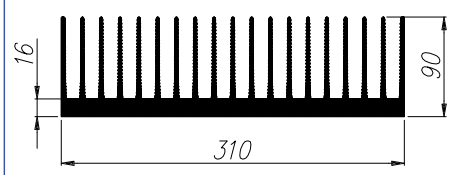
KH300	Peso Kg/m	26.60



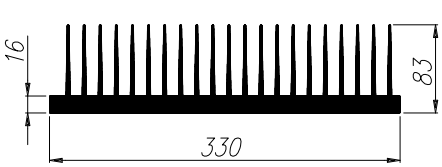
KK300	Peso Kg/m	15.75



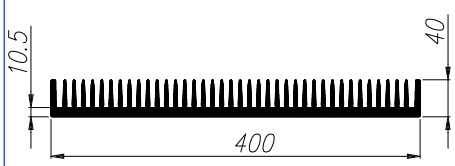
KX300	Peso Kg/m	28.45



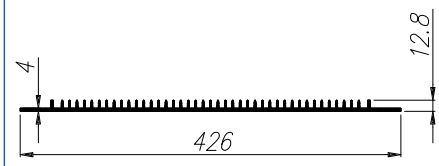
K310 Peso Kg/m 25.95



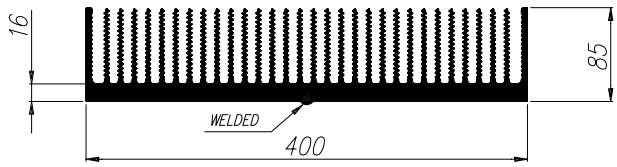
K330 Peso Kg/m 25.20



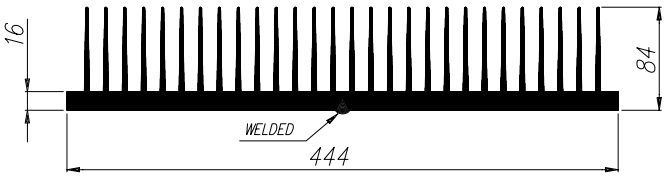
K400 Peso Kg/m 21.03



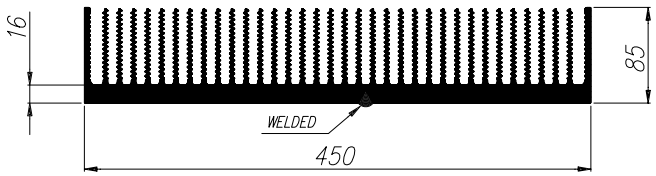
K310 Peso Kg/m 6.80



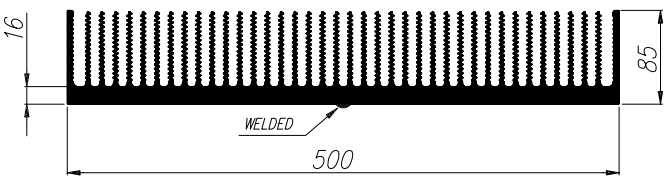
KE400 Peso Kg/m 35.77



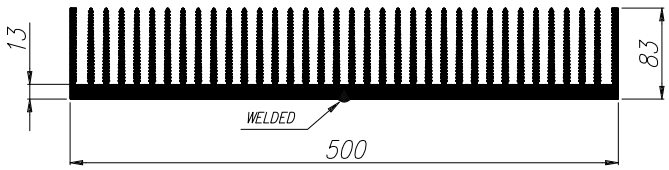
K444 Peso Kg/m 34.00



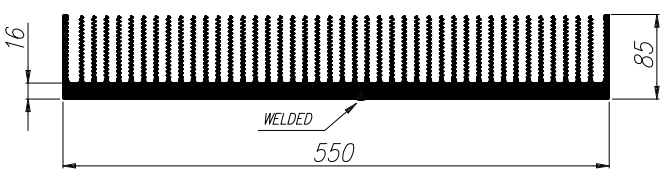
K450 Peso Kg/m 40.15



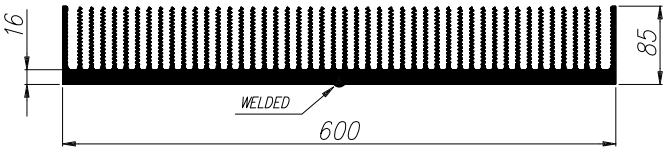
K500 Peso Kg/m 44.55



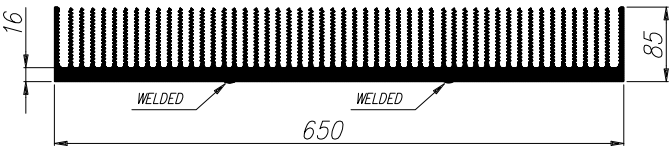
K500A Peso Kg/m 44.10



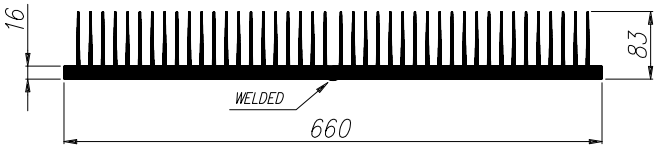
K550 Peso Kg/m 48.90



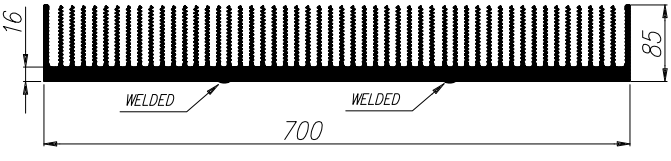
K600 Peso Kg/m 53.24



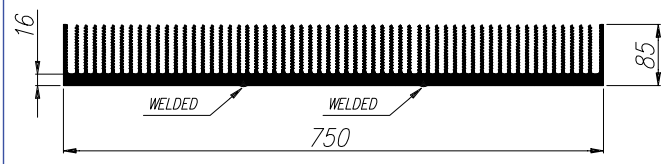
K650 Peso Kg/m 57.65



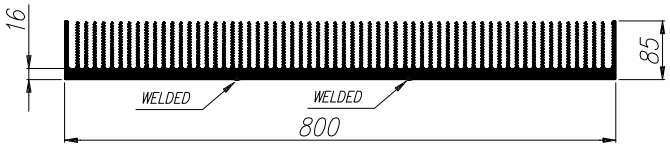
K660 Peso Kg/m 50.40



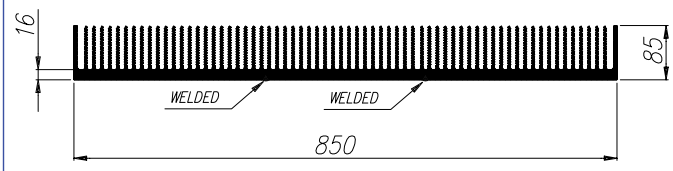
K700 Peso Kg/m 62.00



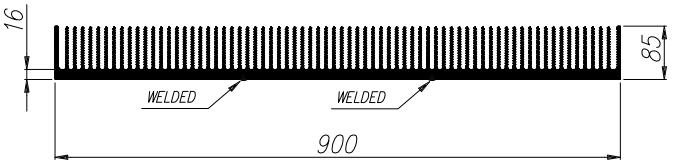
K750 | Peso Kg/m 66.38



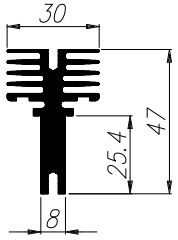
K800 | Peso Kg/m 70.75



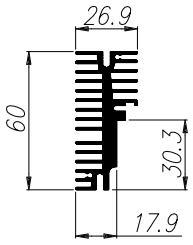
K850 | Peso Kg/m 75.15



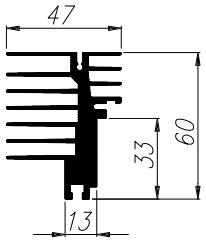
K900 | Peso Kg/m 79.50



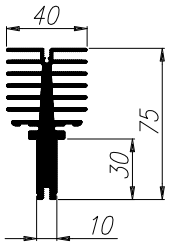
A47M | Peso Kg/m 1.30



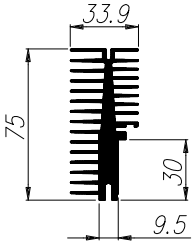
A60M | Peso Kg/m 1.54



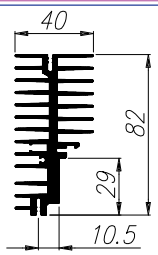
AX60M | Peso Kg/m 2.15



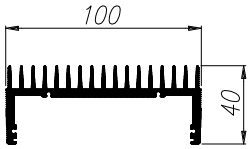
A75M | Peso Kg/m 2.55



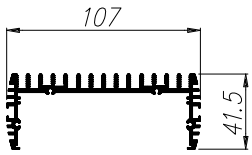
AX75M | Peso Kg/m 2.52



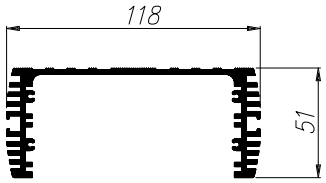
A82M | Peso Kg/m 2.55



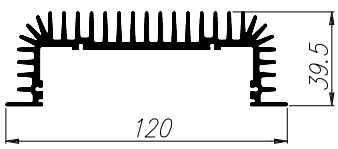
C100 | Peso Kg/m 2.40



C107 | Peso Kg/m 1.96

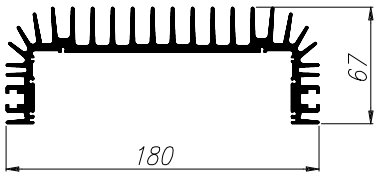


C118 | Peso Kg/m 2.40

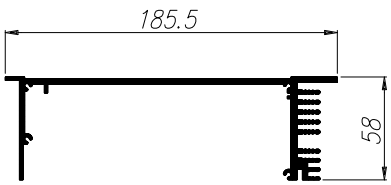


C120 | Peso Kg/m 2.25

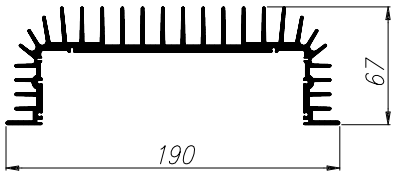
C170 | Peso Kg/m 4.48



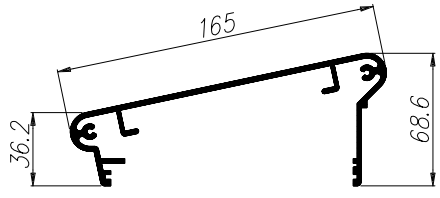
C180 | Peso Kg/m 5.60



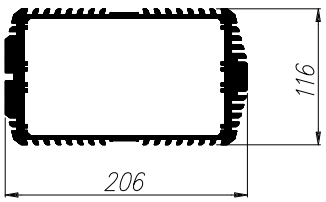
C185 | Peso Kg/m 3.30



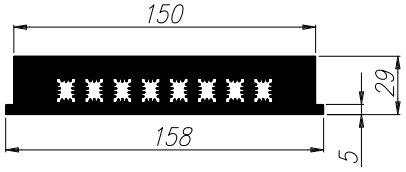
C190 | Peso Kg/m 4.95



CONSL | Peso Kg/m 2.36



SCS206 | Peso Kg/m 12.70



ASI 158 | Peso Kg/m 10.00