

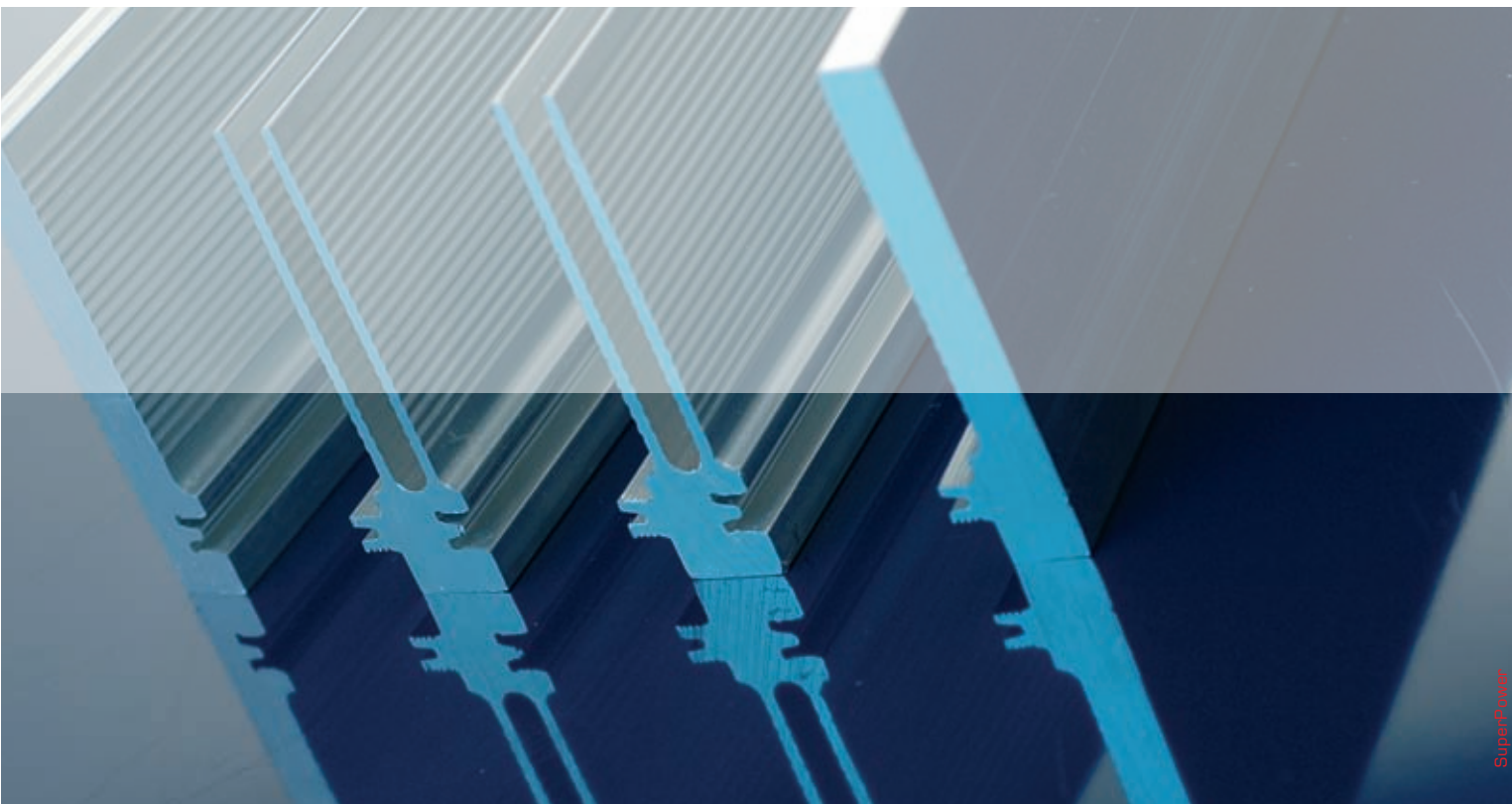


SuperPower



Developed in 1996 by our R & D, SuperPower is the solution for medium - high power electronic systems needs in forced air applications.

This modular technology ensures high performance and flexibility reducing weight and dimension in comparison with standard extruded heat sinks.





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# | SuperPower

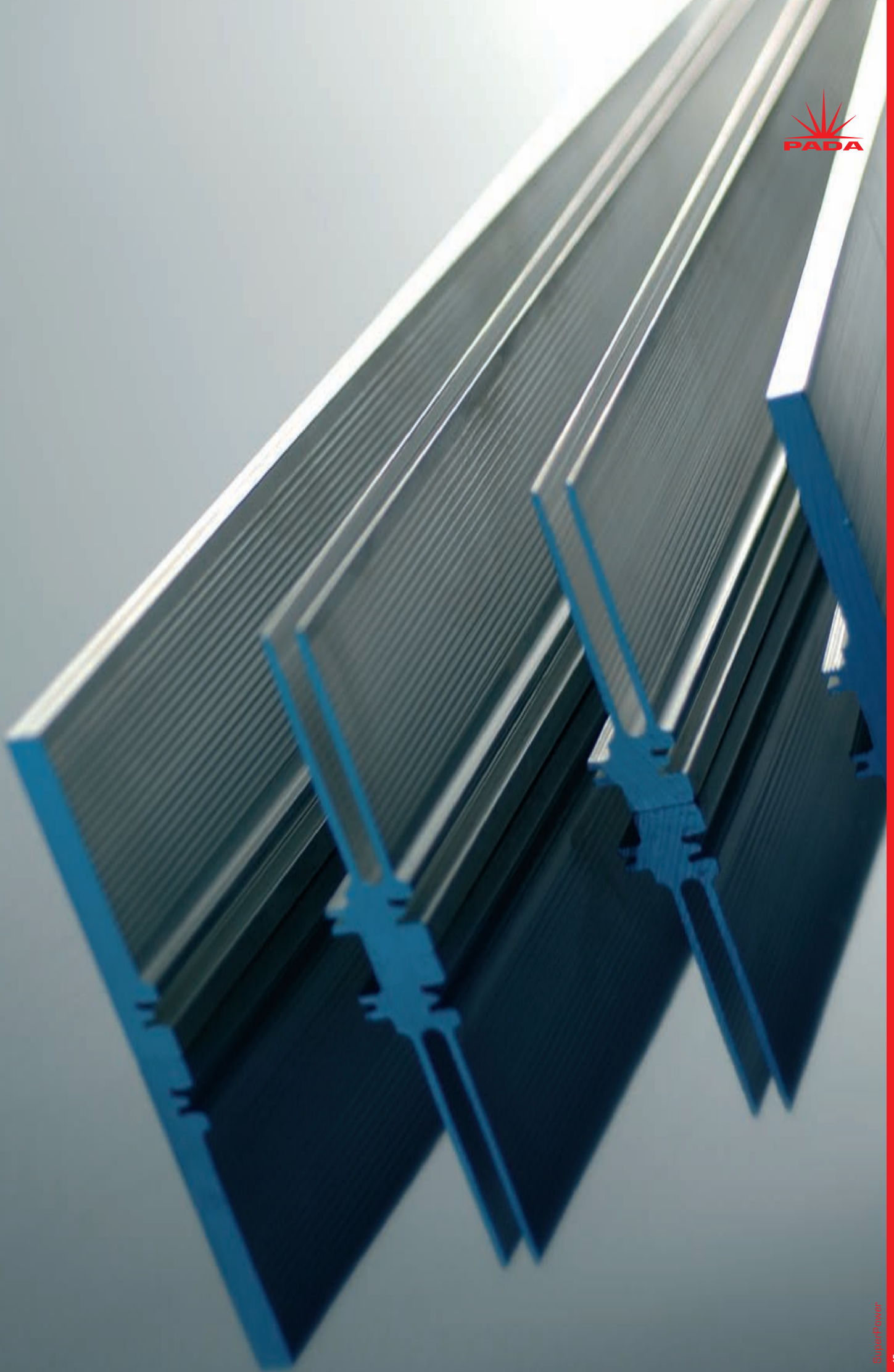
SuperPower is a new series of high performance heat sinks created by Pada Engineering in 1996.

This special technology has been designed aiming at the dissipation of heat in electronic systems of any size and type using forced air.

This hi-performance product has been studied by Pada Engineering R&D to design medium-high power electronic systems, considering that the extreme versatility of its performances allows to raise its efficiency, money-saving, thermal characteristics, flexibility and, at the same time, reduction of weight, volume and costs.

Our SuperPower range supplies excellent performances, better than any other device on the market and fits many fields of application such as:

- Big systems for data processing, power supply;
- Inverters for traction, telecom systems;
- UPS systems, medical instrumentation and military sector.



- 1) Modules are in aluminium alloy AW6060 as per standard EN 755 - 9.
- 2) The standard finishing is a simple washing (degreasing).
- 3) The flatness of the components assembling surfaces is of 0,01 mm/150 mm and the roughness  $R_a = 1.2 \mu\text{m}$ .

Dimensional tolerances:

in length	$\leq 300 \text{ mm}$	$\pm 0.5 \text{ mm}$
	$> 300 \text{ mm}$	$\pm 1 \text{ mm}$
in width	$\pm (\text{width of the narrowest module})/2 \text{ mm}$	
in height	Type T, Y, B, F, V, H, K, Z, M, R, J	$+0 \text{ mm}, -1.5 \text{ mm}$
	Type G, D, W, C, P	$+0 \text{ mm}, -3 \text{ mm}$

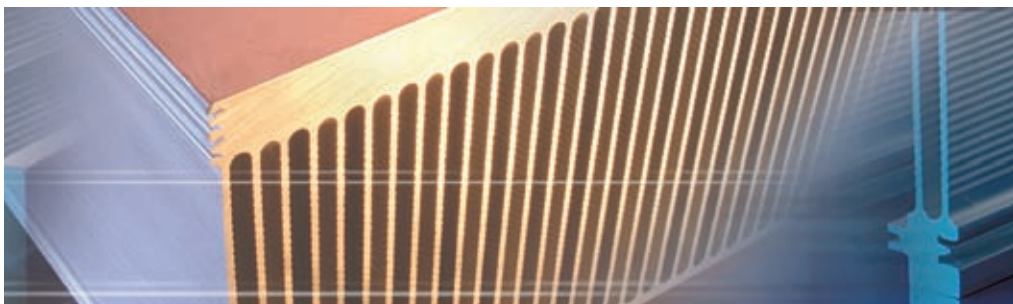
The distinguishing characteristic of SuperPower heatsink lies in the design. In fact, the SuperPower is made of different extruded fins which are assembled together according to specific customer requirements on sizes and thermal performances.

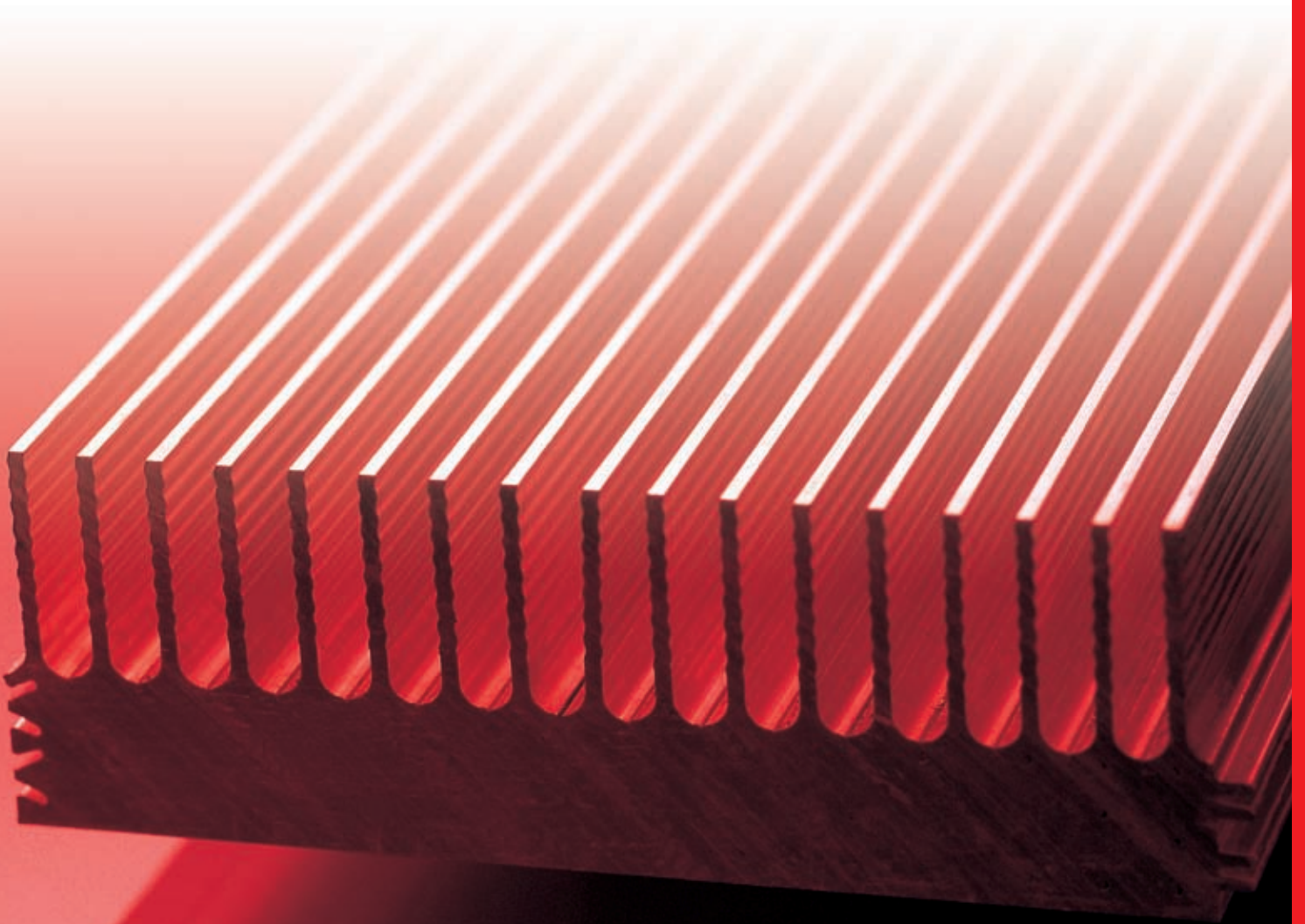
Thanks to our special assembling technology – geometries and manufacturing processes are covered by an International Patent – fins form a reliable and compact unit whose high performances have been tested by many specialized laboratories.

In particular, exhaustive cyclic tests under temperature and vibration, in full compliance with the IEC 77 standard regulations, have pointed out excellent results. In fact, using a special resin, which is put between each fin base before assembling, an optimum mechanical resistance on the finished product is granted.

The torsional stress of each fin, after its assembling, has turned out to be of a resistance power equal to 12 kg/mm, while the maximum bearable load of the surface has turned out to be of 1,8 kg/mm<sup>2</sup> with no permanent damage.

These values are absolutely equivalent to the ones of the extruded profiles. Therefore SuperPower have the same mechanical features of traditional heat sinks assuring even better thermal performances.







SuperPower are characterized by the bearing surface, the fins shape, their relative distance and the ventilation system.

The bearing surface has been optimized for mechanical, thermal and economic purposes. For this reason the fins shape (height, thickness and geometry) has been designed to meet every requirement.

Fins are available having pitches of 4 or 6 mm, both implying different features and solving different problems. The 4 mm pitch has higher thermal performances (+ 20%) than the 6 mm type, but the following points have to be taken into account:

- higher air flow pressure drops
- higher heatsink weight

Due to these reasons, we suggest to use the 4 mm pitch only when the application of the 6 mm pitch does not comply with the thermal requirements.

Processure drop can be reduced/avoided through:

- perpendicular not longitudinal [fig. 1] air flow to fin axis [pressure drop reduction of 50% - see fig.2]
- double thrust - suction systems

These are not recommended for their efficiency and are used to obtain redundant systems. It's possible to use indifferently an air thrusting or sucking system, considering that the suction system operates at an higher temperature (therefore it's less reliable) but it's noiseless.

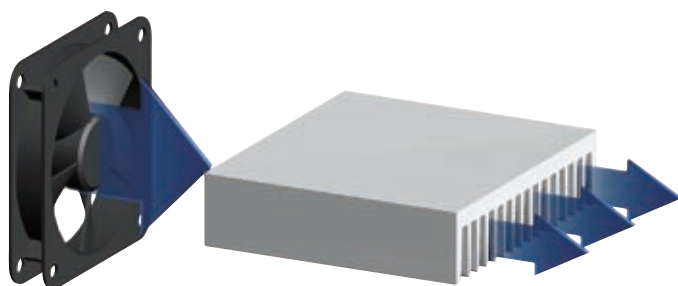


Fig.1

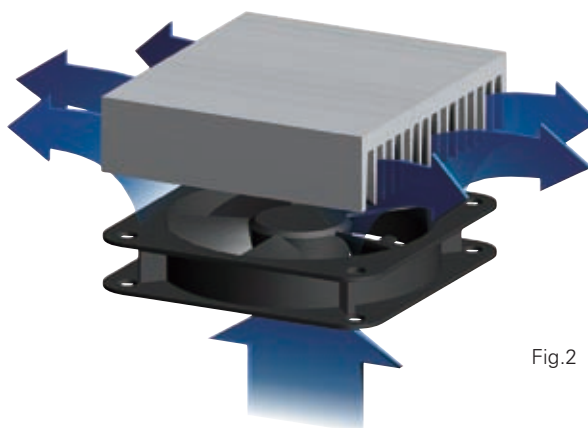


Fig.2

SuperPower can be assembled up to a maximum length and width of 600mm.

We're continuously developing the SuperPower concept; please contact us directly for any updating. All the specifications and characteristics mentioned above are subject to changes without notice.

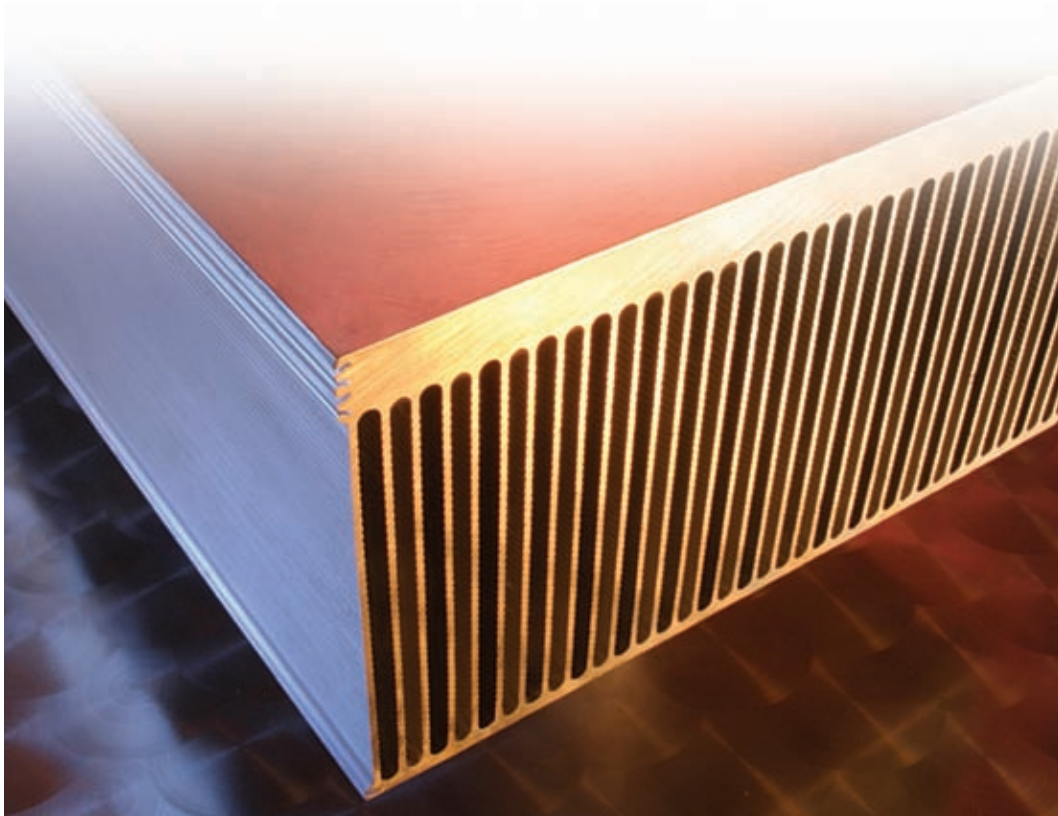
If tight tolerances on the width are requested, side walls for the series "T", "G", "D", "H", "C", "M" and "P" can be assembled in the extremities, allowing the side milling to achieve the required width.

The models of the SuperPower series, thanks to the above mentioned "assembling patented system" of the components - also thanks to their special design - can undergo any classical machining such as milling, drilling, screw thread with no problem at all.

Machining is carried out in compliance with the EN 22768 /1- m regulations.

All the assembling surfaces of the components are always milled so as to create a perfect assembling plane.

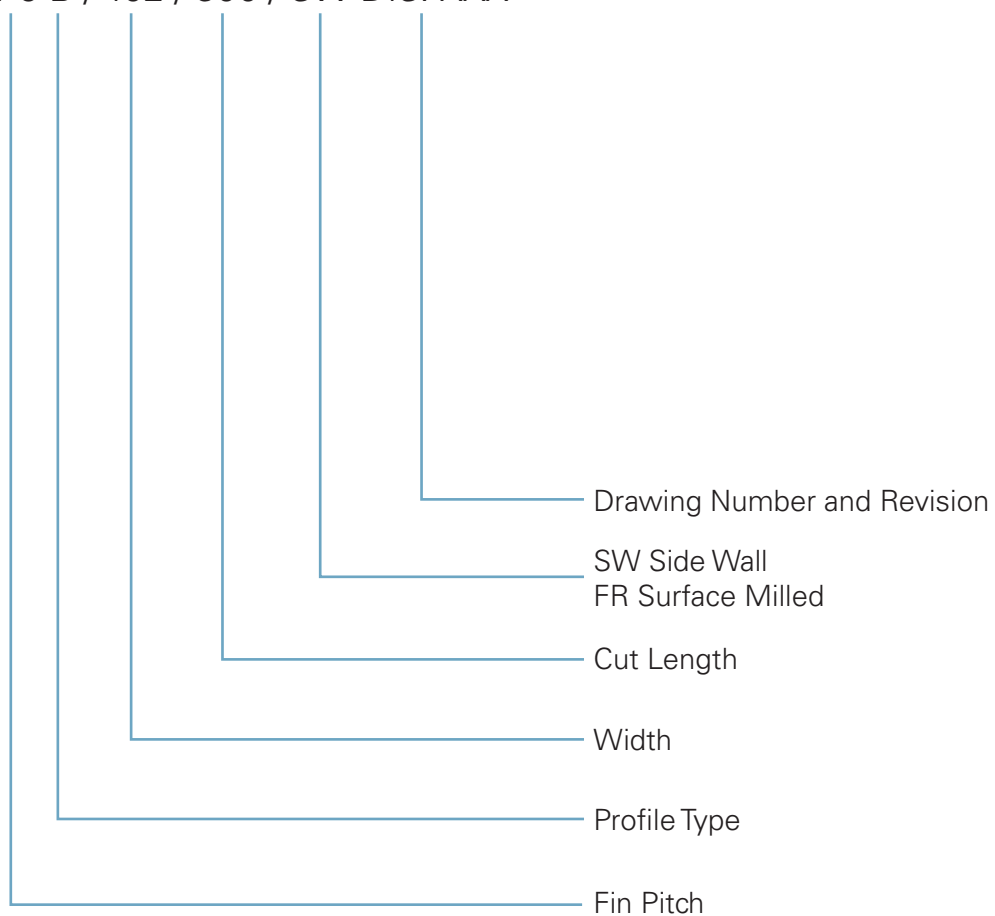
Galvanic treatments such as anodizing are not recommended on SuperPower.

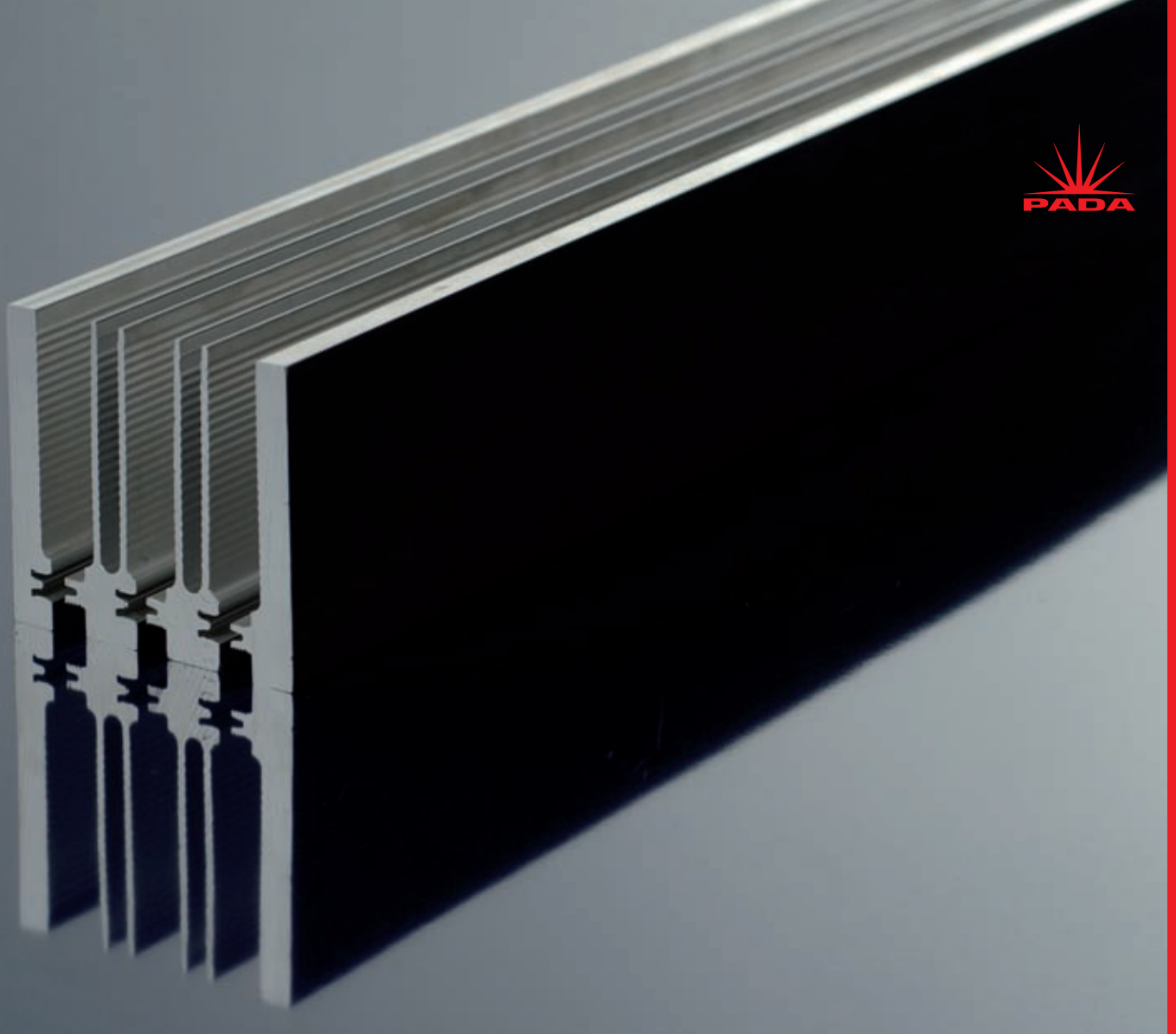




# Nomenclature

LP6 B / 102 / 300 / SW DIS. XXX





## SuperPower Profiles

Description SuperPower

S - Single base profile

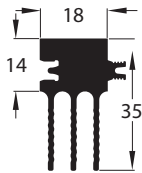
D - Double base profile

SWR - Right side wall

SWL - Left side wall

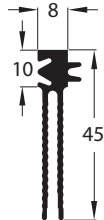
**V**

**8755**  
0.953 kg/m

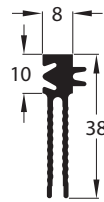


**F**

**8528**  
0.508 kg/m

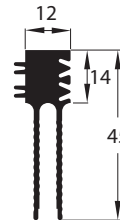


**8535**  
0.450 kg/m

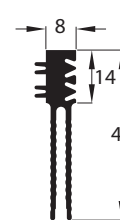


**B**

**8516**  
0.735 kg/m



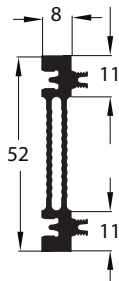
**8515**  
0.564 kg/m



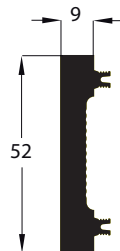
Type	Component Code	Description	Height	Fin pitch	Width
V	8755	S	35	6	18
F	8528	S	45	4	8
F	8535	S	38	4	8
B	8516	S	45	6	12
B	8515	S	45	4	8

**P**

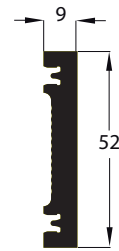
**8746**  
0.714 kg/m



**8747**  
1.177 kg/m



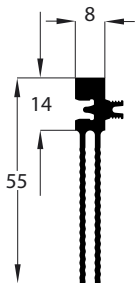
**8748**  
1.012 kg/m



Type	Component Code	Description	Height	Fin pitch	Width
P	8746	D	52	4	8
P	8747	SWL	52		9
P	8748	SWR	52		9

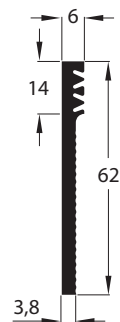
**J**

**8739**  
0.630 kg/m

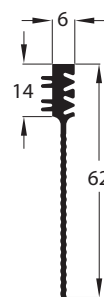


**T**

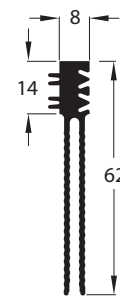
**8471**  
0.680 kg/m



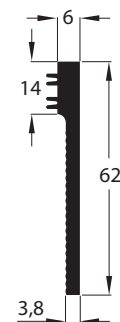
**8399**  
0.425 kg/m



**8473**  
0.710 kg/m

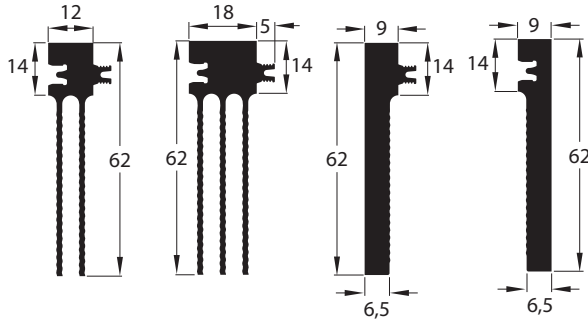


**8472**  
0.750 kg/m



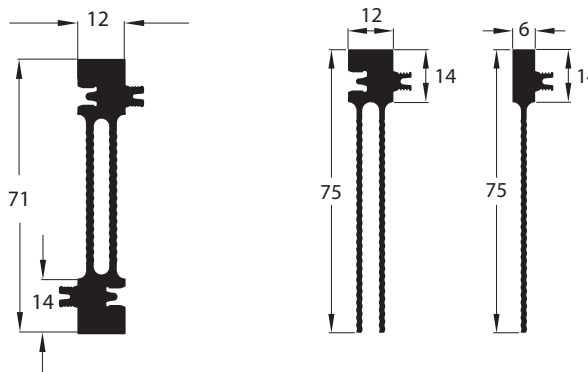
Type	Component Code	Description	Height	Fin Pitch	Width
J	8739	S	55	4	8
T	8471	SWL	62		6
T	8399	S	62	6	6
T	8473	S	62	4	8
T	8472	SWR	62		6

**H** **8667** 0.847 kg/m    **8668** 1.247 kg/m    **8669** 1.264 kg/m    **8670** 1.163 kg/m



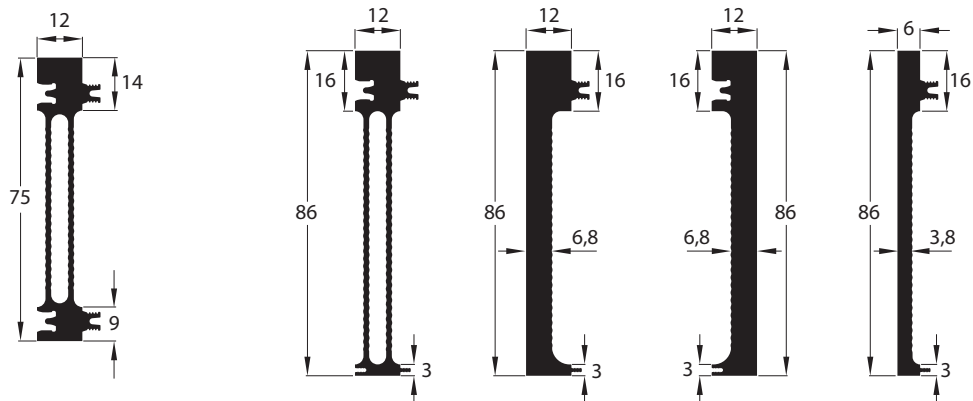
Type	Component Code	Description	Height	Fin pitch	Width
H	8667	S	62	6	12
H	8668	S	62	6	18
H	8669	SWL	62		9
H	8670	SWR	62		9

**W** **8722** 1.290 kg/m    **R** **8713** 0.953 kg/m    **8714** 0.527 kg/m



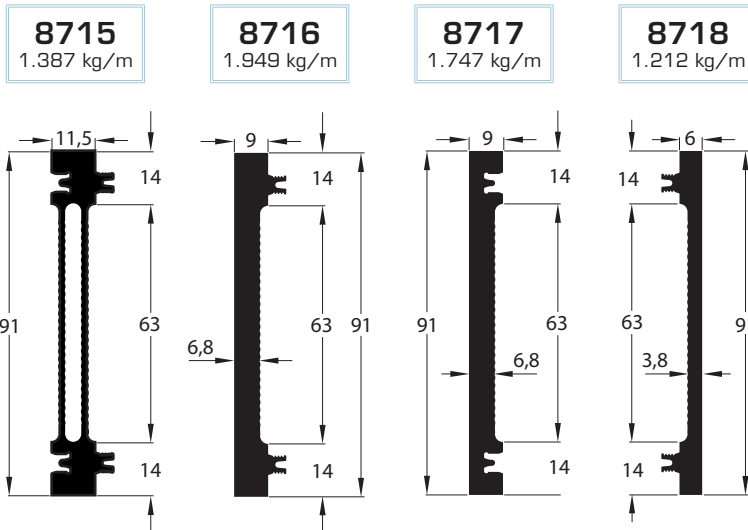
Type	Component Code	Description	Height	Fin pitch	Width
W	8722	D	71	6	12
R	8713	S	75	6	12
R	8714	S	75	6	6

**Z** **8684** 1.200 kg/m    **M** **8697** 1.174 kg/m    **8698** 1.933 kg/m    **8699** 1.817 kg/m    **8700** 1.074 kg/m



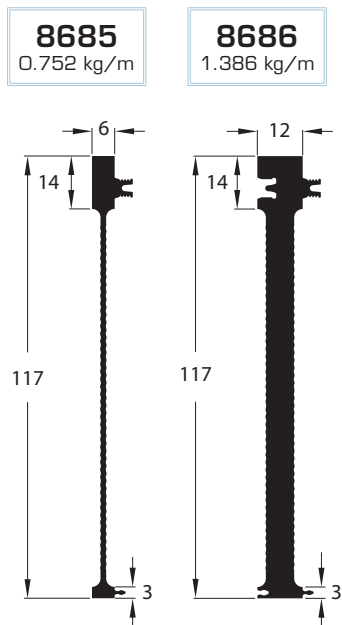
Type	Component Code	Description	Height	Fin pitch	Width
Z	8684	D	75	6	12
M	8697	S	86	6	12
M	8698	SWL	86		12
M	8699	SWR	86		12
M	8700	SWL	86		6

**G**

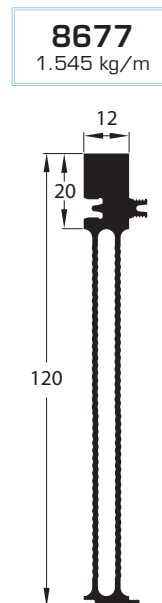


Type	Component Code	Description	Height	Fin pitch	Width
G	8715	D	91	5,75	11,5
G	8716	SWL	91		9
G	8717	SWR	91		9
G	8718	SWL	91		6

**Y**



**K**

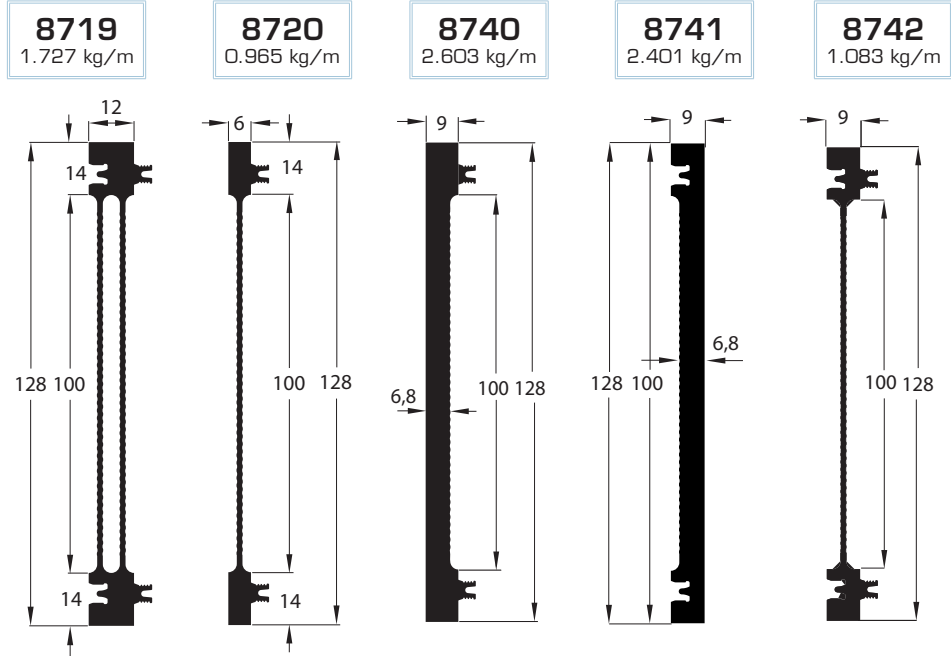


Type	Component Code	Description	Height	Fin pitch	Width
Y	8685	S	117	6	6
Y	8686	S	117	6	12
K	8677	S	120	6	12

Drawings scale 1:2

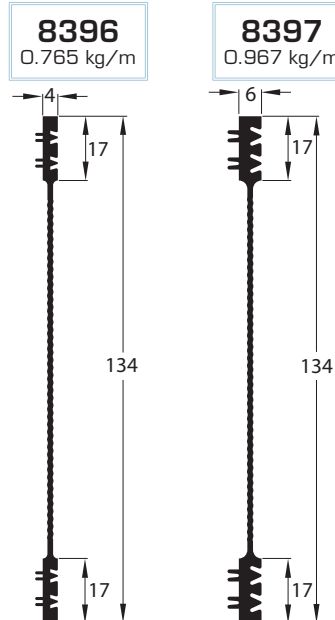
Dimensions are subject to extrusion tolerances EN 755 - 9 (Aluminium and aluminium alloys)

**C**



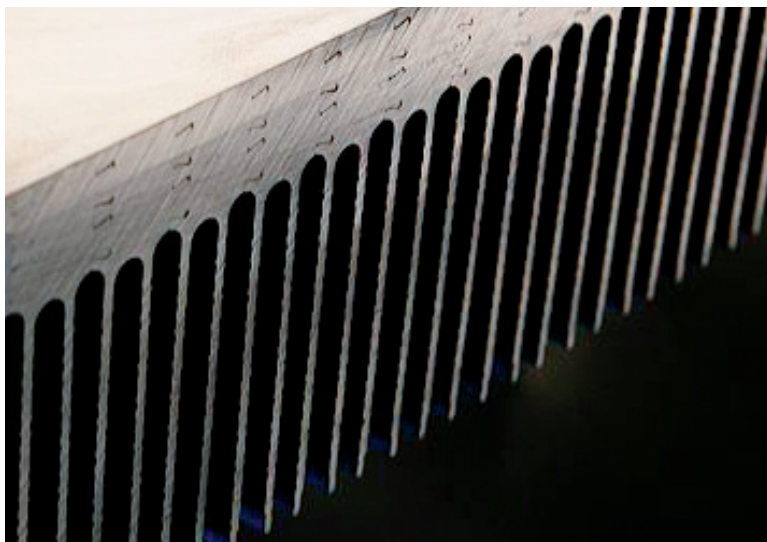
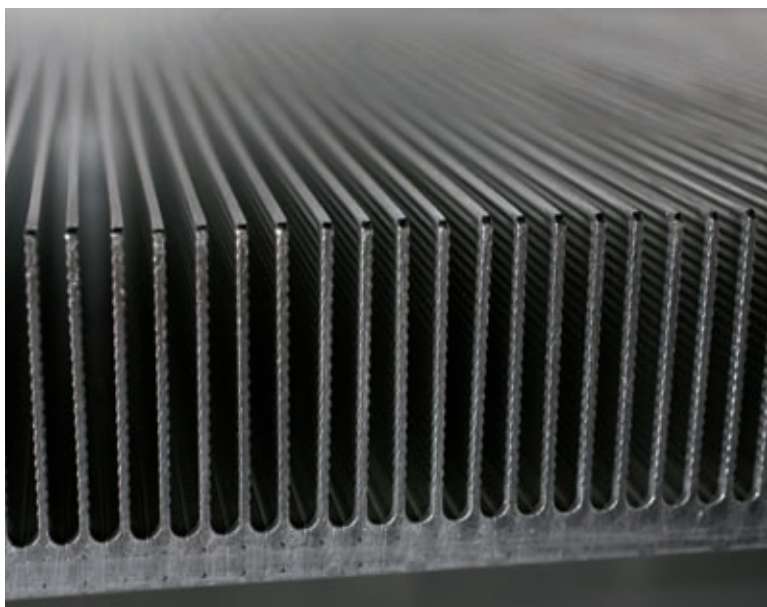
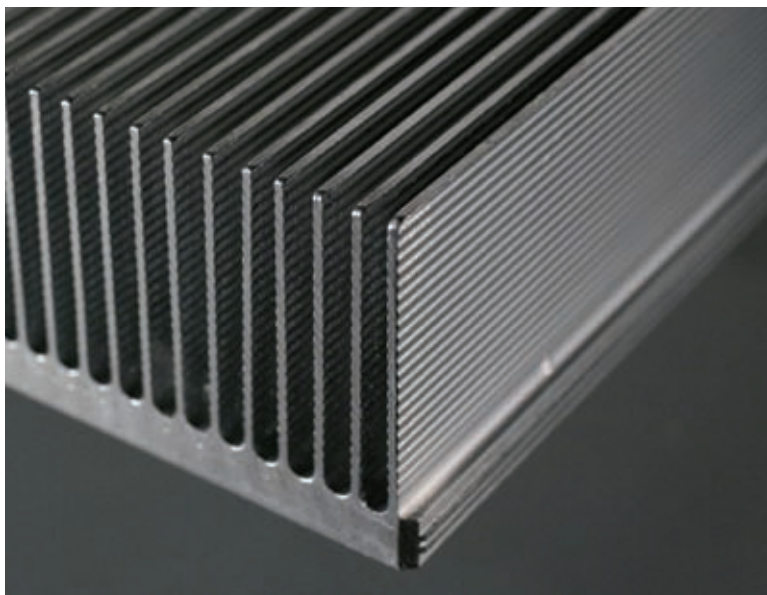
Type	Component Code	Description	Height	Fin pitch	Width
C	8719	D	128	6	12
C	8720	D	128	6	6
C	8740	SWL	128		9
C	8741	SWR	128		9
C	8742	D	128	9	9

**D**



Type	Component Code	Description	Height	Fin pitch	Width
D	8396	D	134	4	4
D	8397	D	134	6	6









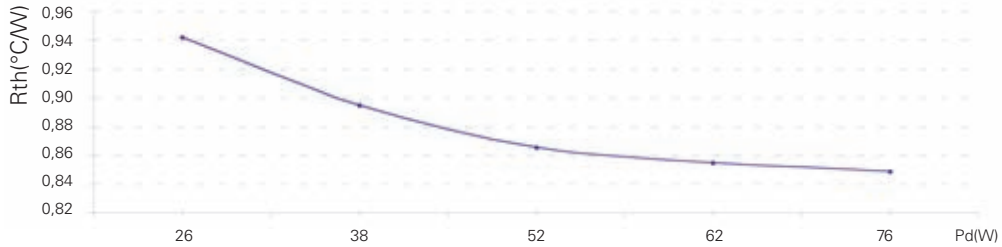
# SuperPower Features Table

## LP6H

Width 24 mm  
Length 100 mm

### Air speed 3 m/s - 17 m<sup>3</sup>/h

P6H 24/100 SuperPower

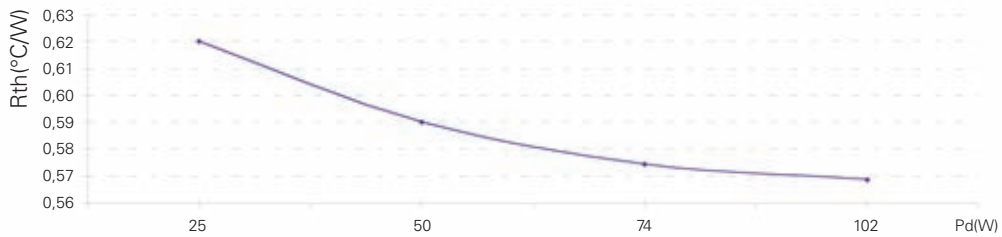


Pd	Ts	$\Delta T$	Ta	Rth
26	47,5	24,5	23,0	0,942
38	57,0	34,0	23,0	0,895
52	68,0	45,0	23,0	0,865
62	76,0	53,0	23,0	0,855
76	87,5	64,5	23,0	0,849
153	87,0	64,5	22,5	0,422

Width 24 mm  
Length 200 mm

### Air speed 3 m/s - 17 m<sup>3</sup>/h

P6H 24/200 SuperPower

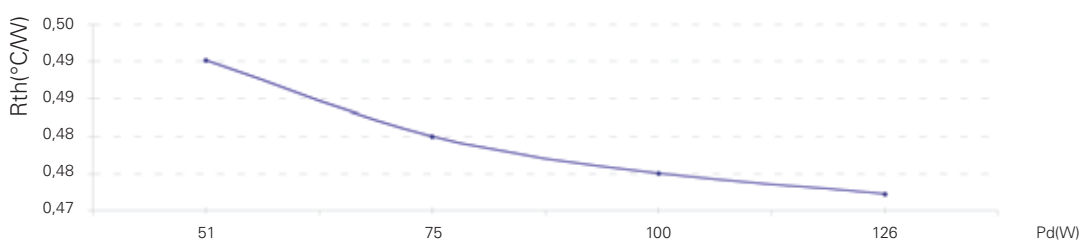


Pd	Ts	$\Delta T$	Ta	Rth
25	37,5	15,5	22,0	0,620
50	51,5	29,5	22,0	0,590
74	64,5	42,5	22,0	0,574
102	80,0	58,0	22,0	0,569

Width 24 mm  
Length 300 mm

### Air speed 3 m/s - 17 m<sup>3</sup>/h

P6H 24/300 SuperPower



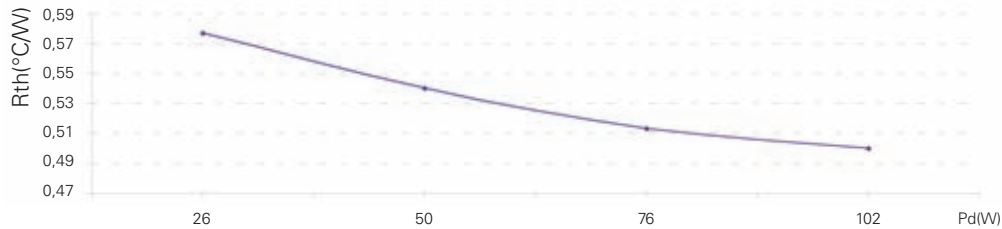
Pd	Ts	$\Delta T$	Ta	Rth
51	48,0	25,0	23,0	0,490
75	59,0	36,0	23,0	0,480
100	70,5	47,5	23,0	0,475
126	82,5	59,5	23,0	0,472

## LP6H

Width 24 mm  
Length 100 mm

Air speed 6 m/s - 33 m<sup>3</sup>/h

P6H 24/100 SuperPower

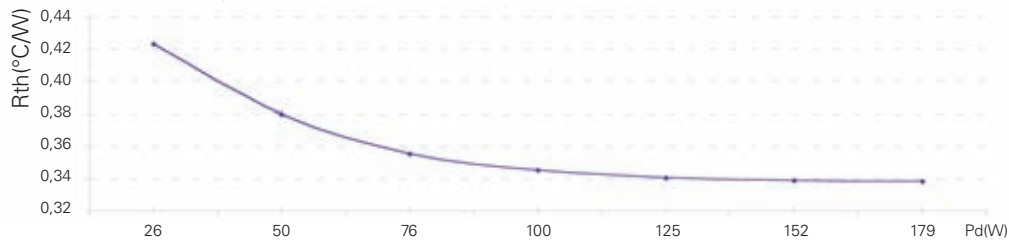


Pd	Ts	$\Delta T$	Ta	Rth
26	38,0	15,0	23,0	0,577
50	50,0	27,5	23,0	0,540
76	62,0	39,5	23,0	0,513
102	74,0	51,5	23,0	0,500

Width 24 mm  
Length 200 mm

Air speed 6 m/s - 33 m<sup>3</sup>/h

P6H 24/200 SuperPower

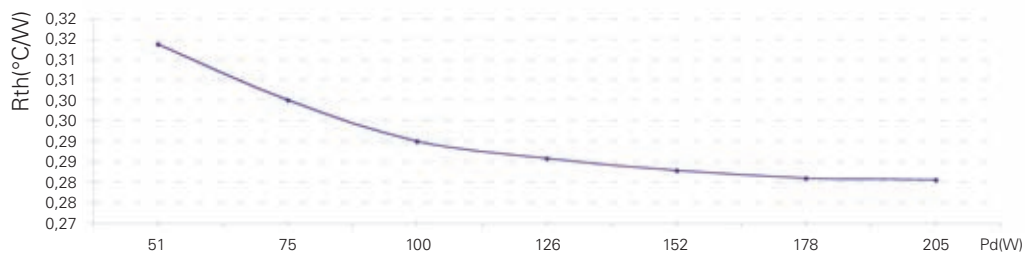


Pd	Ts	$\Delta T$	Ta	Rth
26	33,0	11,0	22,0	0,423
50	41,0	19,0	22,0	0,380
76	49,0	27,0	22,0	0,355
100	56,5	34,5	22,0	0,345
125	64,5	42,5	22,0	0,340
152	73,5	51,5	22,0	0,339
179	82,5	60,5	22,0	0,338

Width 24 mm  
Length 300 mm

Air speed 6 m/s - 33 m<sup>3</sup>/h

P6H 24/300 SuperPower



Pd	Ts	$\Delta T$	Ta	Rth
51	35,0	16,0	19,0	0,314
75	41,5	22,5	19,0	0,300
100	49,0	29,0	20,0	0,290
126	57,0	36,0	21,0	0,286
152	64,0	43,0	21,0	0,283
178	71,0	50,0	21,0	0,281
205	79,0	57,5	21,5	0,280



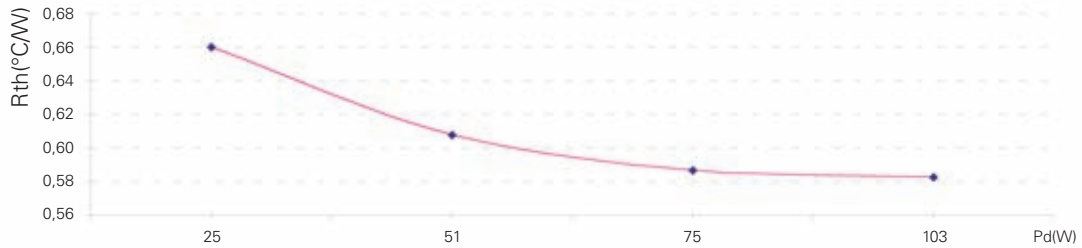
## SuperPower Features Table

### LP6G

Width 23 mm  
Length 100 mm

#### Air speed 3 m/s - 23 m<sup>3</sup>/h

P6G 23/100 SuperPower

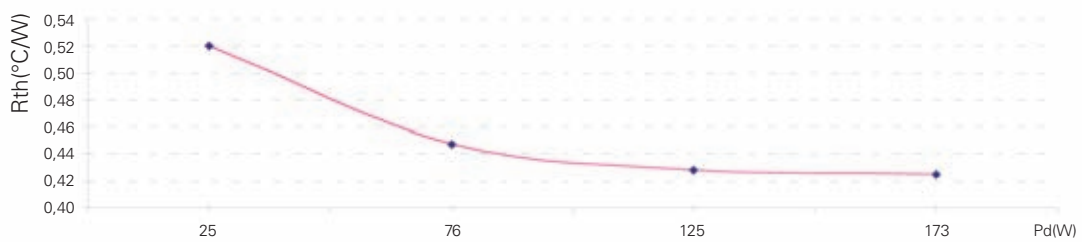


Pd	Ts	$\Delta T$	Ta	Rth
25	37,5	16,5	20,5	0,660
51	51,5	31,0	20,5	0,608
75	65,0	44,0	21,0	0,587
103	81,0	60,0	21,0	0,583

Width 23 mm  
Length 200 mm

#### Air speed 3 m/s - 23 m<sup>3</sup>/h

P6G 23/200 SuperPower

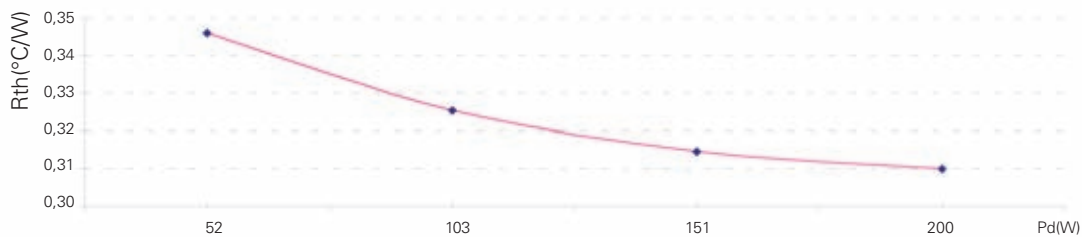


Pd	Ts	$\Delta T$	Ta	Rth
25	35,0	13,0	22,0	0,520
76	56,0	34,0	22,0	0,447
125	75,5	53,5	22,0	0,428
173	96,0	73,5	22,5	0,425

Width 23 mm  
Length 300 mm

#### Air speed 3 m/s - 23 m<sup>3</sup>/h

P6G 23/300 SuperPower

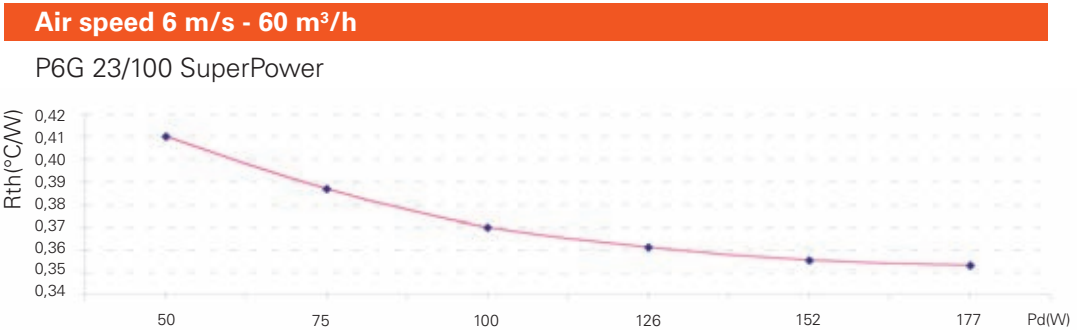


Pd	Ts	$\Delta T$	Ta	Rth
52	39,0	18,0	21,0	0,346
103	55,0	33,5	21,5	0,325
151	69,0	47,5	21,5	0,315
200	84,0	62,0	22,0	0,310



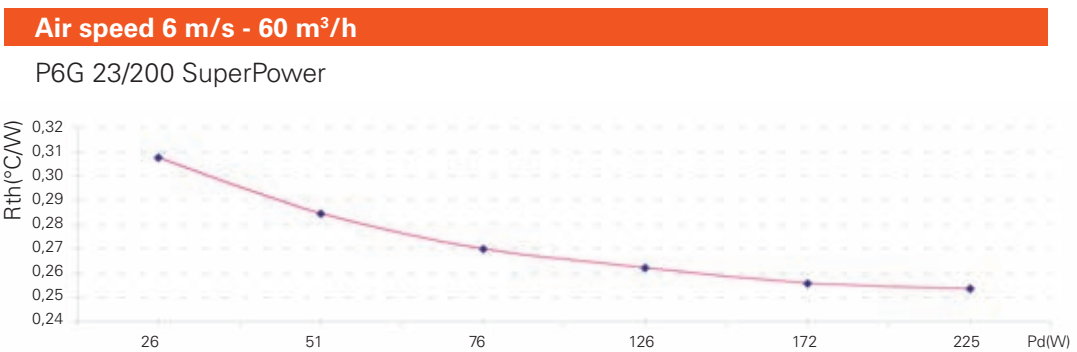
LP6G

Width 23 mm  
Length 100 mm



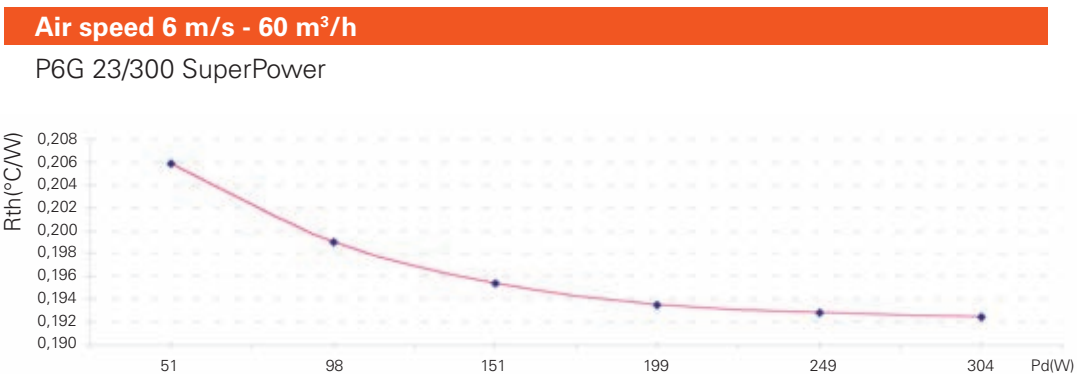
Pd	Ts	ΔT	Ta	Rth
50	42,0	20,5	21,5	0,410
75	50,5	29	21,5	0,387
100	58,5	37	21,5	0,370
126	67,5	45,5	22,0	0,361
152	76,0	54	22,0	0,355
177	84,5	62,5	22,0	0,353

Width 23 mm  
Length 200 mm



Pd	Ts	ΔT	Ta	Rth
26	30,5	8,0	22,5	0,308
51	37,0	14,5	22,5	0,284
76	40,5	20,5	20,0	0,270
126	53,0	33,0	20,0	0,262
172	64,0	44,0	20,0	0,262
225	77,0	57,0	20,0	0,253

Width 23 mm  
Length 300 mm



Pd	Ts	ΔT	Ta	Rth
51	32,5	10,5	22,0	0,206
98	41,5	19,5	22,0	0,199
151	51,5	29,5	22,0	0,195
199	60,5	38,5	22,0	0,193
249	70,0	48,0	22,0	0,193
304	80,5	58,5	22,0	0,192



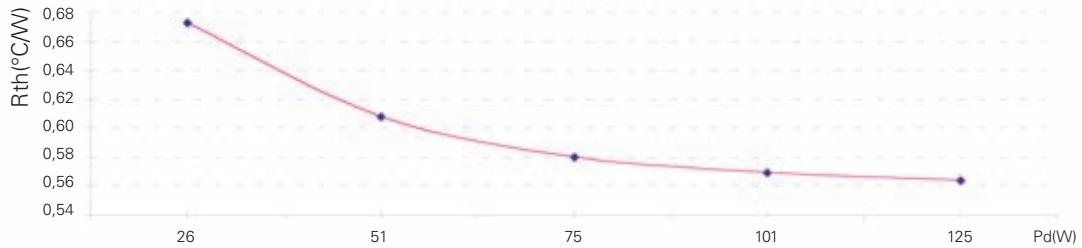
## SuperPower Features Table

### LP6Y

Width 24 mm  
Length 100 mm

#### Air speed 3 m/s - 30 m<sup>3</sup>/h

P6Y 24/100 SuperPower

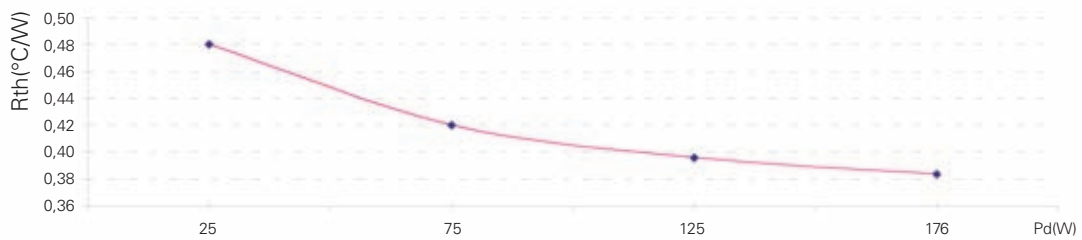


Pd	Ts	$\Delta T$	Ta	Rth
26	37	17,5	19,5	0,673
51	51,0	31,0	20,0	0,608
75	64,0	43,5	20,5	0,580
101	78,5	57,5	21,0	0,569
125	91,5	70,5	21,0	0,564

Width 24 mm  
Length 200 mm

#### Air speed 3 m/s - 30 m<sup>3</sup>/h

P6Y 24/200 SuperPower

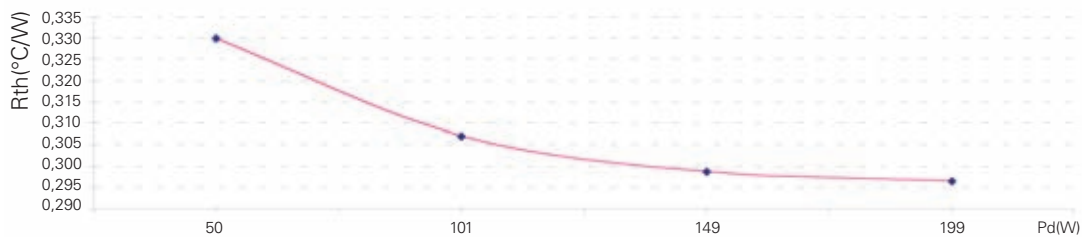


Pd	Ts	$\Delta T$	Ta	Rth
25	33,5	12,0	21,5	0,480
75	53,0	31,5	21,5	0,420
125	71,0	49,5	21,5	0,396
176	89,5	67,5	22,0	0,384

Width 24 mm  
Length 300 mm

#### Air speed 3 m/s - 30 m<sup>3</sup>/h

P6Y 24/300 SuperPower

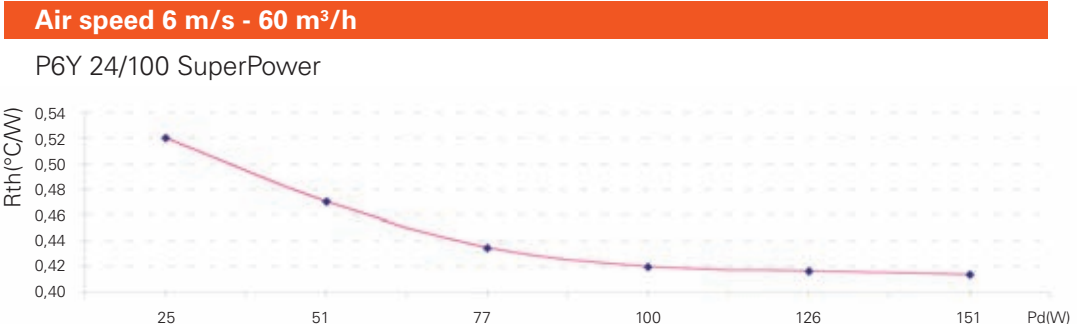


Pd	Ts	$\Delta T$	Ta	Rth
50	37,0	16,5	20,5	0,330
101	51,5	31,0	20,5	0,307
149	65,5	44,5	21,0	0,299
199	80,0	59,0	21,0	0,296



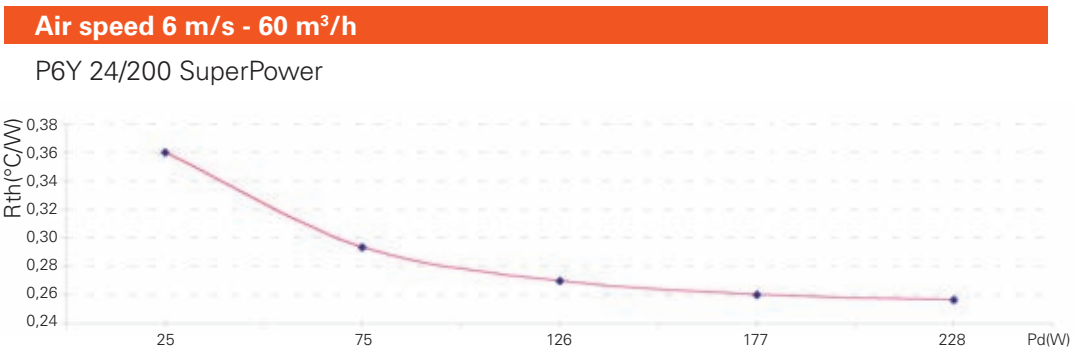
LP6Y

Width 24 mm  
Length 100 mm



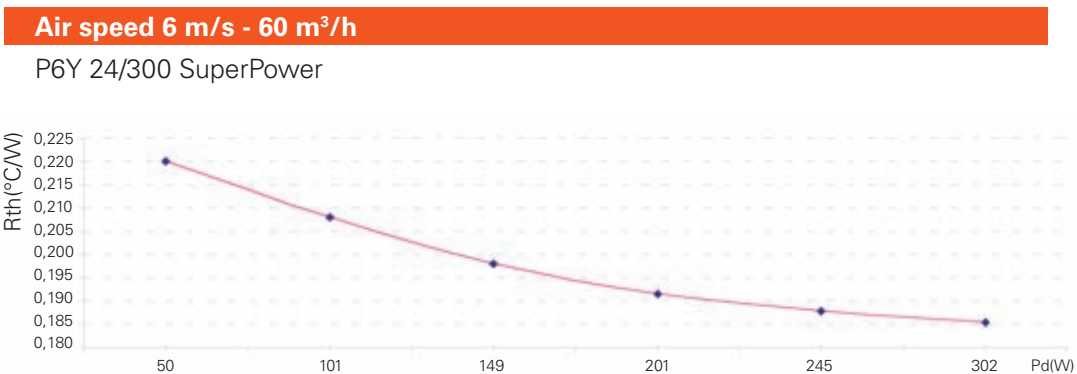
Pd	Ts	ΔT	Ta	Rth
25	34,0	13,0	21,0	0,520
51	45,0	24,0	21,0	0,471
77	54,5	33,5	21,0	0,471
100	63,0	42,0	21,0	0,420
126	73,5	52,5	21,0	0,417
151	84,0	62,5	21,5	0,414

Width 24 mm  
Length 200 mm



Pd	Ts	ΔT	Ta	Rth
25	30,5	9,0	21,5	0,360
75	43,5	22,0	21,5	0,293
126	56,5	34,0	22,5	0,270
177	69,0	46,0	23,0	0,260
228	81,5	58,5	23,0	0,257

Width 24 mm  
Length 300 mm



Pd	Ts	ΔT	Ta	Rth
50	33,5	11,0	22,0	0,220
101	43,0	21,0	22,0	0,208
149	52,0	29,5	22,5	0,198
201	61,0	38,5	22,5	0,192
245	69,0	46,0	23,0	0,188
302	79,0	56,0	23,0	0,185





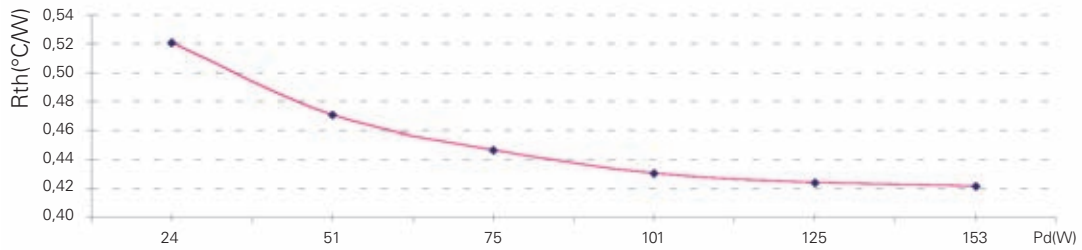
## SuperPower Features Table

### LP6C

Width 24 mm  
Length 100 mm

#### Air speed 3 m/s - 33 m<sup>3</sup>/h

P6C 24/100 SuperPower

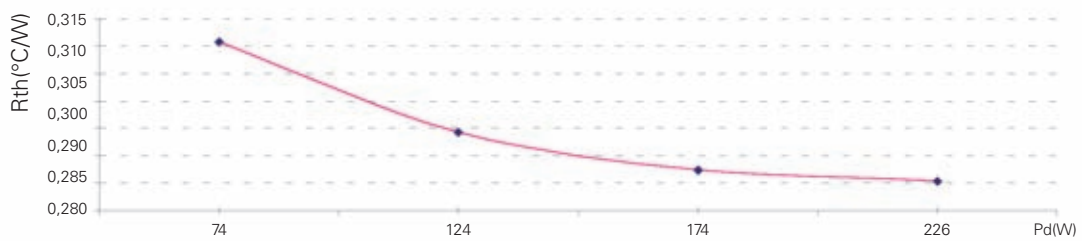


51	45,5	24,0	21,5	0,471
75	55,5	33,5	22,0	0,447
101	65,5	43,5	22,0	0,431
125	75,0	53,0	22,0	0,424
153	87,0	64,5	22,5	0,422

Width 24 mm  
Length 200 mm

#### Air speed 3 m/s - 33 m<sup>3</sup>/h

P6C 24/200 SuperPower

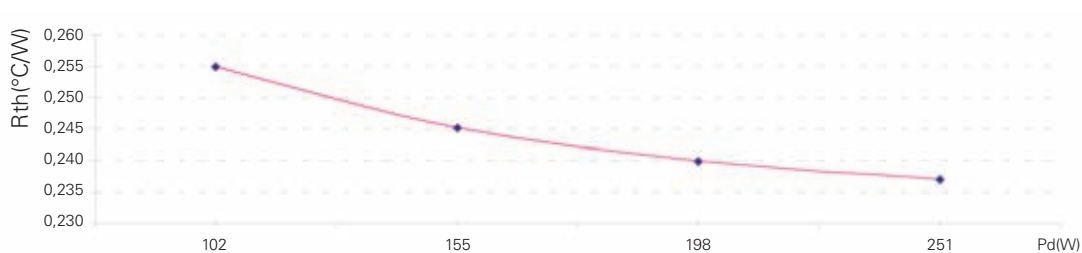


Pd	Ts	ΔT	Ta	Rth
74	45,0	23,0	22,0	0,311
124	58,5	36,5	22,0	0,294
174	72,0	50,0	22,0	0,287
226	86,5	64,5	22,0	0,285

Width 24 mm  
Length 300 mm

#### Air speed 3 m/s - 33 m<sup>3</sup>/h

P6C 24/300 SuperPower

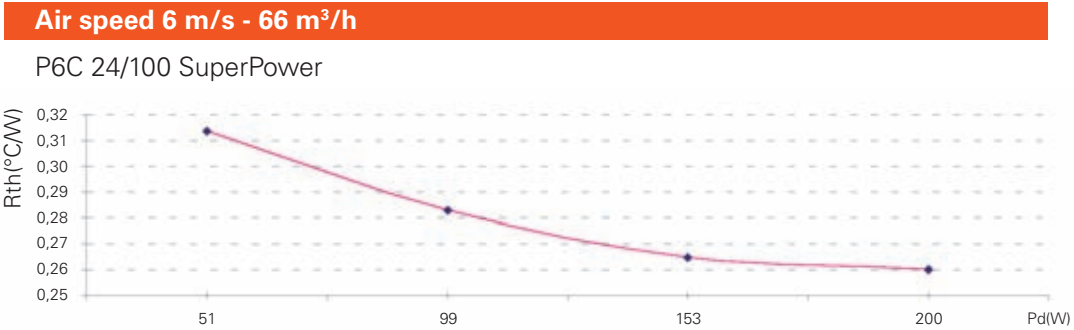


Pd	Ts	ΔT	Ta	Rth
102	47,0	26,0	21,0	0,255
155	59,0	38,0	21,0	0,245
198	69,5	47,5	22,0	0,240
251	81,5	59,5	22,0	0,237



LP6C

Width 24 mm  
Length 100 mm



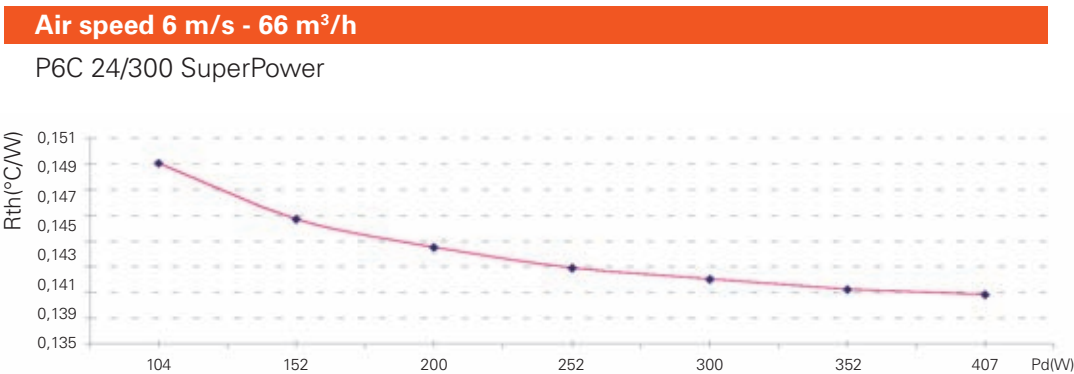
Pd	Ts	$\Delta T$	Ta	Rth
51	38,0	16,0	22,0	0,314
99	50,0	28,0	22,0	0,283
153	62,5	40,5	22,0	0,265
200	74,0	52,0	22,0	0,260

Width 24 mm  
Length 200 mm

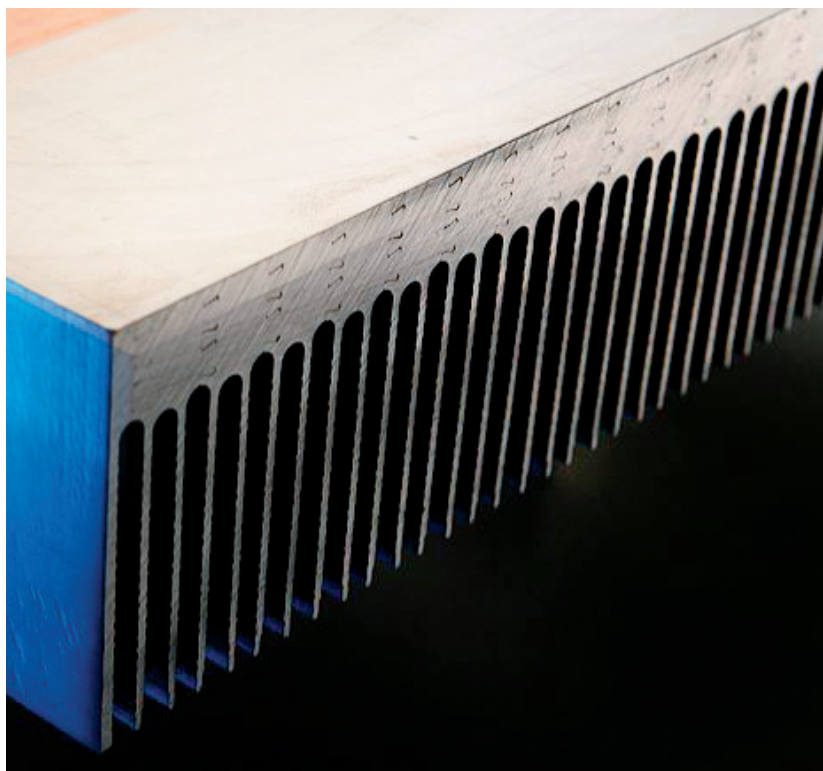
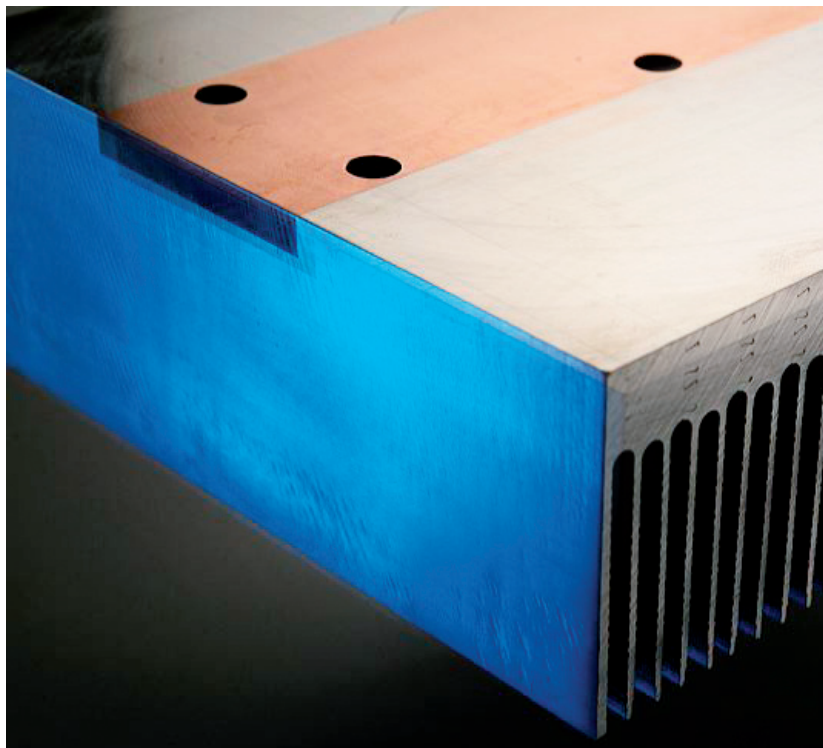


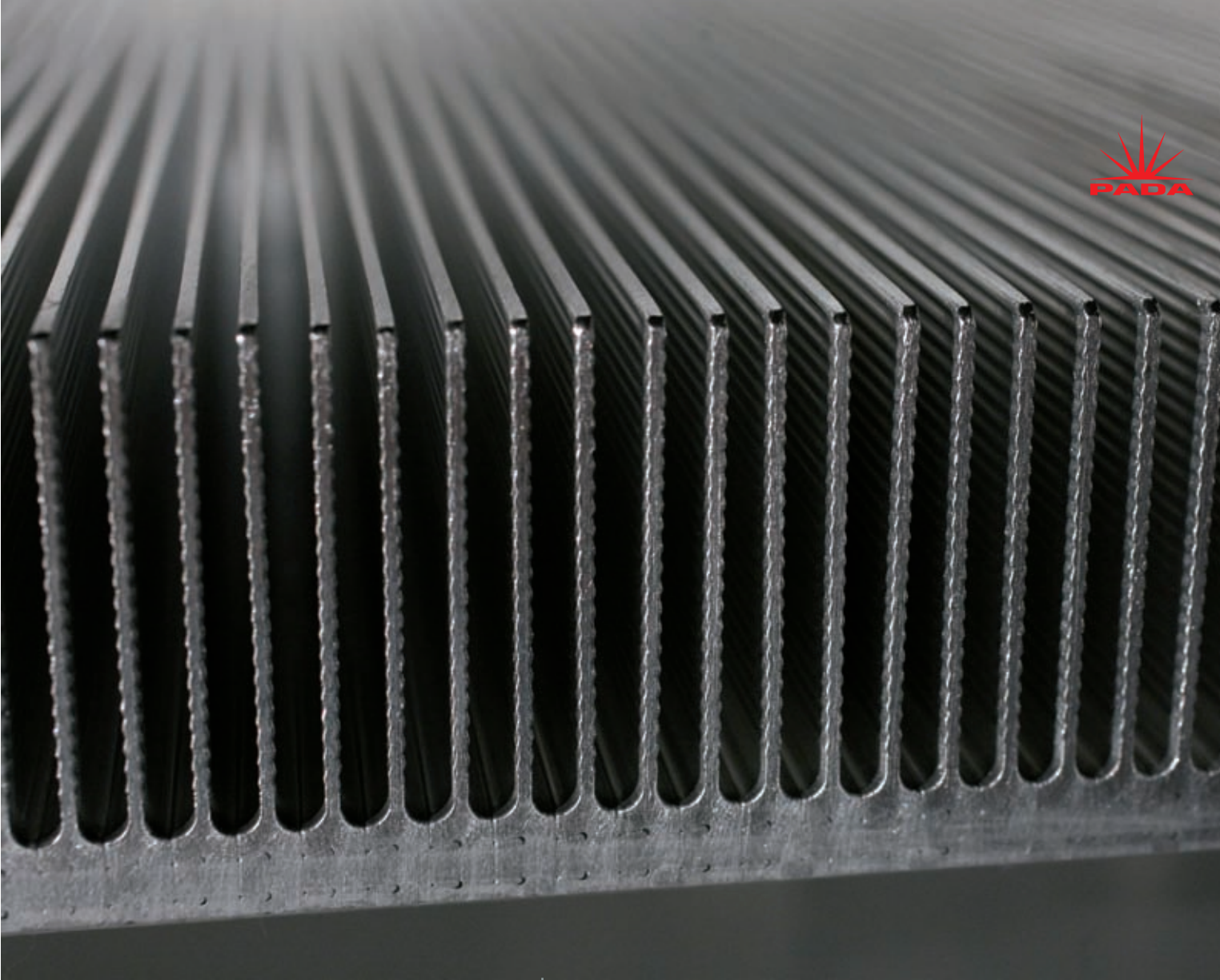
Pd	Ts	$\Delta T$	Ta	Rth
74	36,5	14,5	22,0	0,196
123	44,5	22,5	22,0	0,183
173	53,0	30,5	22,5	0,176
227	62,5	39,5	23,0	0,174
278	71,0	48,0	23,0	0,173
329	79,5	56,5	23,0	0,172

Width 24 mm  
Length 300 mm



Pd	Ts	$\Delta T$	Ta	Rth
102	47,0	26,0	21,0	0,255
155	59,0	38,0	21,0	0,245
198	69,5	47,5	22,0	0,240
251	81,5	59,5	22,0	0,237



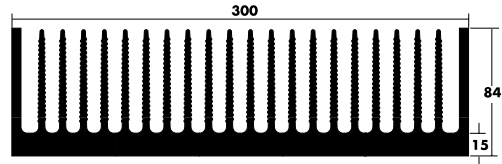
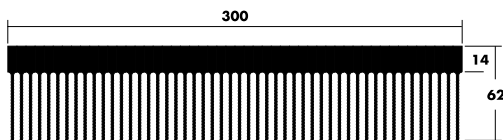


## SuperPower vs. Extruded Thermal Analysis

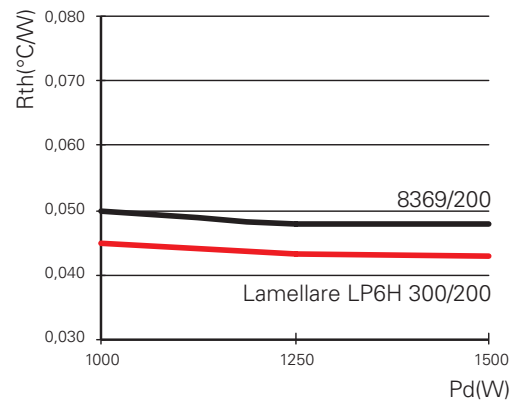
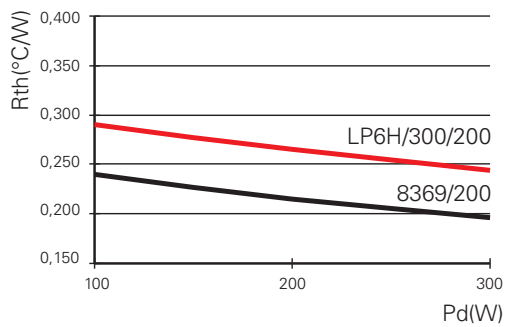
## SuperPower vs. extruded heat sink

Comparison between SuperPower and extruded profiles

LP6H/300/200 vs. 8369/200 in and natural air convection and forced air.



Natural Air convection

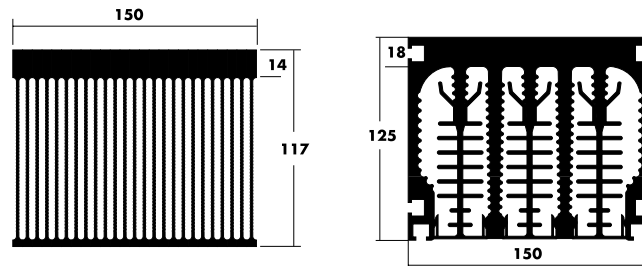


Forced Air

	LP6H/300/200	8369/200	Δ SuperPower vs. Extruded
Weight (kg)	4.31	5.76	- 33%
Rth (°C/W)	0.042	0.049	- 18%

Fan: 2x axial fans  
 Dimensions: 119x119 / 38mm  
 Air Flow: 100m<sup>3</sup>/h  
 Static Pressure: Dp=0.32hPa

LP6Y/150/300 vs. 8256/300 in forced air



	LP6Y/150/300	8256/300	Δ SuperPower vs. Extruded
Weight (kg)	5.33	7.42	- 39%
Rth (°C/W)	0.039	0.050	- 28%
Fans:	1x axial fan	1x axial fan	
Dimensions:	119x119 / 38mm		
Air Flow:	100m³/h		
Static Pressure:	Dp=0.32hPa		

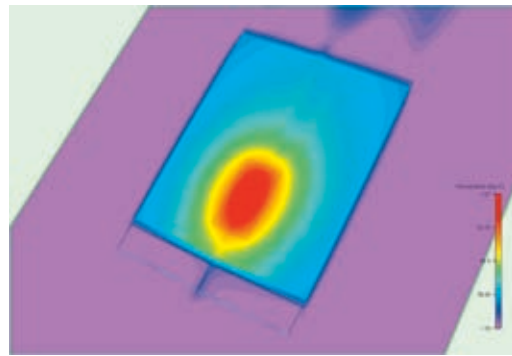
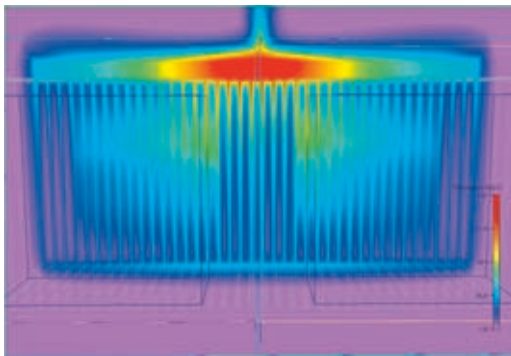
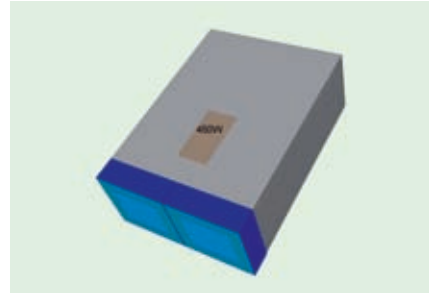
Fan: 1x axial fan  
 Dimensions: 119x119 / 38mm  
 Air Flow: 100m³/h  
 Static Pressure: Dp=0.32hPa

## Thermal Analysis

Herebelow some SuperPower thermal simulations carried out by Flotherm.

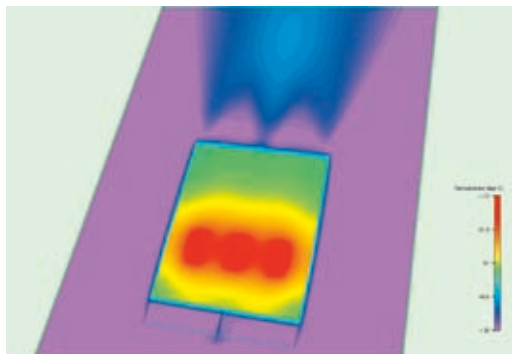
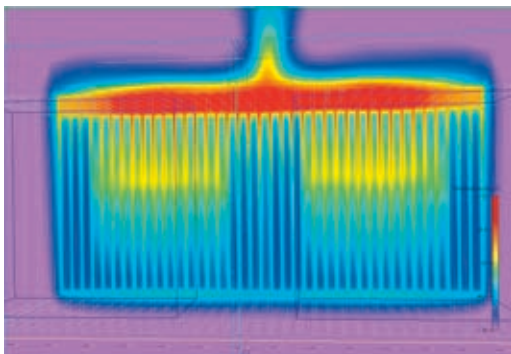
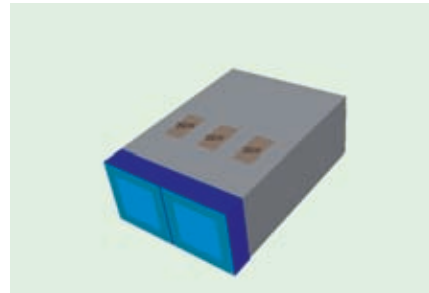
### Aluminium heatsinks LP6Y/240

L = 300mm (20 x 8507)
Total power is Pd = 450 W
T amb. = 30 °C
N°2 fans PAPST 4212NN (163 m³/h)
Maximum temperature on heatsink = 67 °C
Rth = 0.082 °C/W



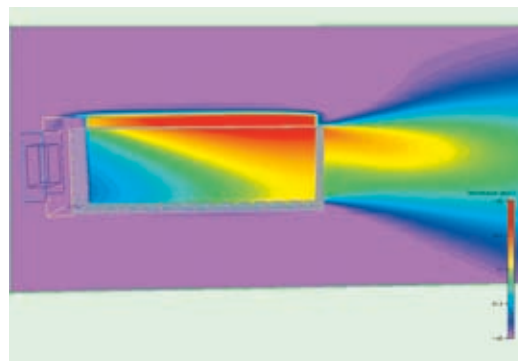
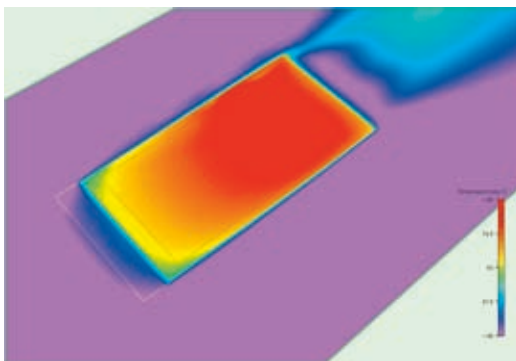
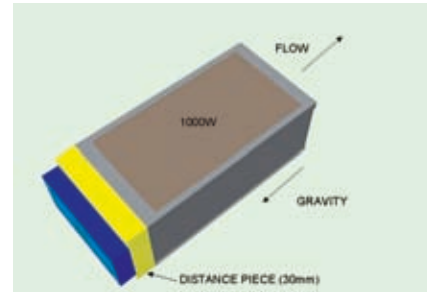
### Aluminium heatsinks LP6Y/240

L = 300mm (20 x 8507)
Total power is Pd = 750 W
T amb. = 30 °C
N°2 fans PAPST 4212NN (163 m³/h)
Maximum temperature on heatsink = 72 °C
Rth = 0.056 °C/W



Aluminium heatsinks LP6Y/160

L = 300mm
Total power is Pd = 1000 W
T amb. = 40 °C
N°2 fans PAPST 4212NN (79 m³/h)
Maximum temperature on heatsink = 86 °C
Rth = 0.046 °C/W







Notes

pada  
superpower



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