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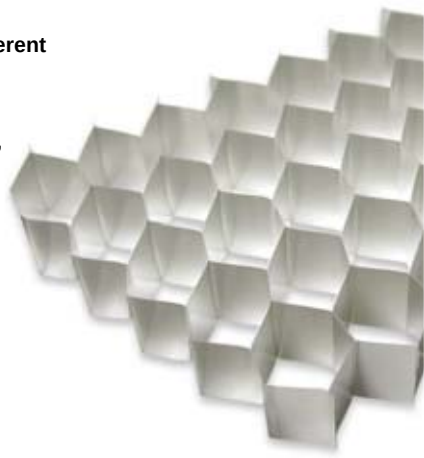
Aluminium honeycomb



Aluminium honeycomb is used for several of applications (i.e. for tool machines, for serigraphy..etc.) **and in different sectors** such as: public transport industry,nautical sector, building industry, etc...

As core material, aluminium honeycomb is used in sandwich panels and it is utilised in: floors, roofs, doors, partitions, facades, working surfaces for automatic machines and for all products which require an optimal stiffness-to-weight-ratio.

Aluminium honeycomb as panels' core has several advantages:
- lightweight
- stiffness
- fire resistance
- compression, shear and corrosion resistance
- flatness

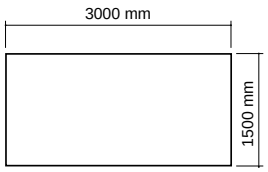
Aluminium honeycomb can be used as deflector for laminar flow-ventilation, and as crash-absorber for kinetic energy.
Our clients have the possibility to choose among: honeycomb thickness (from 3 to 300 mm), cell size (from 6 to 19 mm) and density (from 20kg/m^3 to 80kg/m^3). Honeycomb density depends on foil's thickness and on cell size.

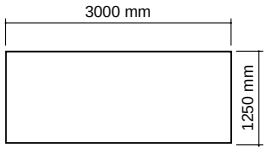
Honeycomb core's properties	50 Microns				
Type	**ALUMINIUM ALLOY 3000/3003/3103/3104**				
Ø honeycomb in mm ca.	3,2	6	9	12	19
Ø honeycomb in inches	1/8"	1/4"	3/8"	1/2"	3/4"
Density kg/m^3	116	56 - 59	39 - 40	29 - 30	20 - 21
Compressive stabilised strength MPa	6,5	3,0 - 3,5	1,4 - 1,95	0,8 - 0,95	0,4 - 0,6

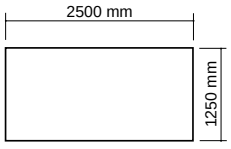
Honeycomb core's properties	70 Microns				
Type	**ALUMINIUM ALLOY 3000/3003/3103/3104**				
Ø honeycomb in mm ca.	3,2	6	9	12	19
Ø honeycomb in inches	1/8"	1/4"	3/8"	1/2"	3/4"
Density kg/m^3	163	80 - 83	54	40 - 42	27 - 29
Compressive stabilised strength MPa	10,2	4,3 - 46	2,5 - 2,6	1,41 - 1,5	0,85 - 0,9

Alloy 3000/3003/3103/3104 aluminium honeycomb is sold **perforated** or **non perforated** (the micro perforations allowing air flow between cells, for use under vacuum or decompression) in three forms: **unexpanded block non perforated, unexpanded slices, expanded sheets.**

Standard dimensions
(other dimensions available on request)







Aluminium

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

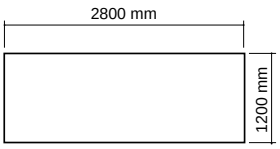
Polypropylene honeycomb core PP8.80 / PP8-80T30 / PP8-80T30F75

Polypropylene honeycomb is mainly used as core in composite panels, as reinforcement and as means to lighten structures. Polypropylene honeycomb can be closed on both faces with a laminated skin.
In case of bending the strain is transferred through the whole honeycomb core.
For this reason, the strain is re-distributed between shear and compression over laminates.

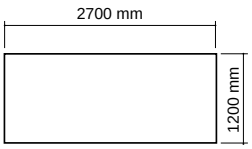
Polypropylene honeycomb can be thermo-welded or glued to a number of TNT or technical fabrics which make the production of composite panels easier.
Polypropylene honeycomb is also used as support for filters and it is applied to diminish **corrosive gas emissions**.
In fact, also the quality and the chemical-resistance of this product is also reliable in an aggressive environment.

Honeycomb core's properties			
Type	**8.80**	**T30***	**T30F75****
Cell size mm	8		
Colour	white		
Density kg/m³	80[1]		
Compressive strength MPa	1,50	1,60	1,60
Compressive modulus MPa	70		
Shear strength MPa	-	0,50	0,50
Shear modulus MPa	-	12	13
Effective temperature range °C	da -30 a +80		
Maximum width mm	1400	1500	1500
Minimum width mm	100[2]		
Maximum length mm	2950[2]	-	-
Width tolerance mm	+/- 4		
Tolerance length mm	+/- 4		
CORE'S thickness mm	6 - 10	7 - 65	6 - 65

Standard dimensions
(other dimensions available on request)



Type **8.80**



Type **T30 - T30F75**

* **T30**: - thermowelded foil 30gr/m³ for adhesion.

** **T30F75**: thermo-welded tissue for wet lay-up.

[1] Density referred to the block dimension

[2] on request

- Other dimensions, core heights and types upon request.
- Minimum order quality for each type: 10 pallets.

Polypropylene PP8.80 / PP8-80T30 / PP8-80T30F75

Last Revised: 11/11

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ENG

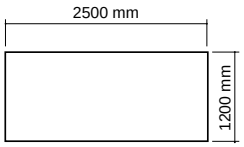
Polypropylene honeycomb core PP8 ES65 - PP8 ES52

Polypropylene honeycomb is mainly used as core in composite panels, as reinforcement and as means to lighten structures. Polypropylene honeycomb is closed on both faces with a thermo-welded tissue.
In case of bending the strain is transferred through the whole honeycomb core.
For this reason, the strain is re-distributed between shear and compression over laminates.

Polypropylene honeycomb can be thermo-welded or glued to a number of TNT or technical fabrics which make the production of composite panels easier.
Polypropylene honeycomb is also used as support for filters and it is applied to diminish **corrosive gas emissions.**
In fact, also the quality and the chemical-resistance of this product is also reliable in an aggressive environment.

Honeycomb core's properties		
Type	**PP8-ES65**	**PP8-ES52**
Cell size mm	8,0	
Colour	white	
Density kg/m³	65	52
Compressive strength MPa	1,2	0,8
Compressive modulus MPa	30	25
Shear strength MPa	0,3	0,25
Shear modulus MPa	4	4
Thickness mm	from 5 to 90 (tolerance ± 0,5)	

Standard dimensions
(other dimensions available on request)



Polypropylene PP8-ES65/PP8-ES52

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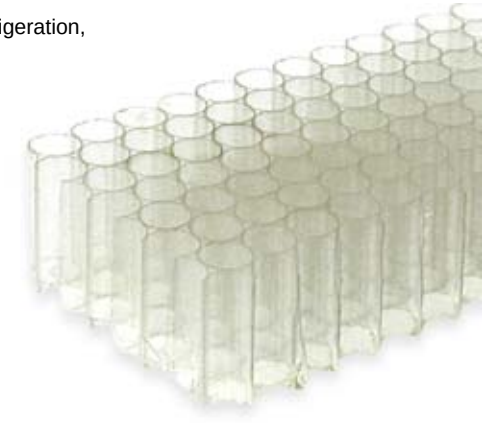
ENG

Polycarbonate honeycomb core

Polycarbonate honeycomb finds major applications in: deflectors for laminar-flow ventilation, in commercial refrigeration, sterilized rooms, wind tunnels and climatic chambers.



Honeycomb deflectors increase flow efficiency and efficacy. Moreover they eliminate turbulence, reduce the flow of impurity and humidity, as well as noise and energy consumption.

Polycarbonate honeycomb has the following characteristics:

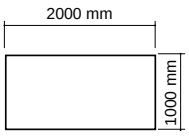
- easy application
- shapes according to customer specifications
- waterproof / washable
- suitable for food contact and non-toxic
- 100% recyclable

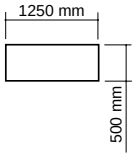
World-wide, all major commercial refrigeration companies use this kind of honeycomb.
The versatility of polycarbonate honeycomb is also demonstrated by the way it focuses light.

Polycarbonate honeycomb with density of 200kg/m^3 is also an **excellent crash-absorber**. Polycarbonate with inferior density is used for lightweight and transpiring structures.
Cel's polycarbonate honeycomb has established new standard as far as energy absorption is concerned. In fact, the uniform crushing of the cells absorbs kinetic energy at a constant compressive load until a 78% reduction of its initial volume. We supply special densities, according to the level of energy absorption required by the costumer.

Honeycomb core's properties	standard		on request		
Type	**3,5-90**	**6,0-70**	**2,5-110**	**4,0-80**	**7,0-70**
Cell size mm	3,5	6,0	2,5	4,0	7,0
Colour	grey • white • trasparent • black				
Density kg/m^3	90	70	110	80	70
Compressive strength MPa	2,8	1,9	3,6	2,2	1,8
Compressive modulus MPa	115	95	155	106	95
Shear strength MPa	1,3	1,0	1,5	1,1	1,0
Shear modulus MPa	22	19	25	21	19
Effective temperature range °C	from -40 to +110				
Thickness mm	from 1 to 300				
Maximum length mm	3000				
Maximum Width mm	1350				

Standard dimensions
(other dimensions available on request)





Polycarbonate

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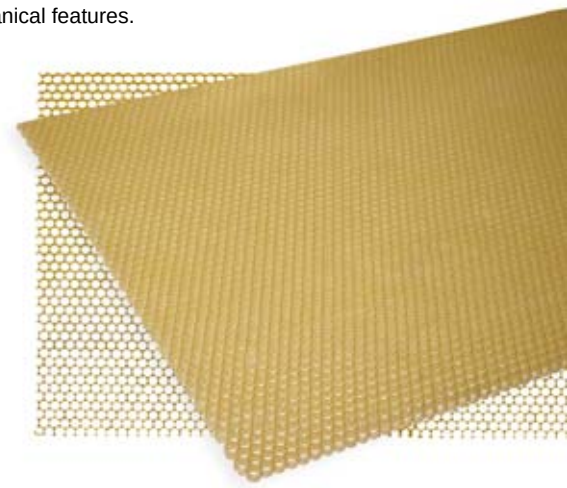
ENG

Polyetherimide honeycomb core

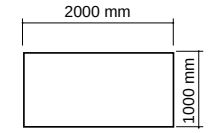
This polymer differs from other polymers because of its better high temperature-resistance and mechanical features.

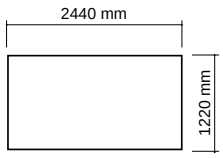
It is employed, for example, to produce stealth panels for military use, for hi-tech panels and as core material for snow boards.



Honeycomb core's properties					
Type	**4,0-48C**	**4,0-75C**	**4,0-100C**	**4,0-120C**	**4,0-144C**
Cell size mm	4,2				
Colour	amber				
Density kg/m³	48	75	100	120	144
Compressive strength MPa	0,83	3,00	4,16	6,34	10,67
Shear strenght MPa	0,63	1,35	1,60	2,10	3,30
Shear modulus MPa	12,2	25,2	26,4	32	40
Effective temperature range °C	da -40 a +170				
Flammability	low / self-extinguishing				
Thickness mm	da 5 a 300				
Maximum length mm	3000				
Maximum width mm	1350				

Standard dimensions
(other dimensions available on request)





Polyetherimide

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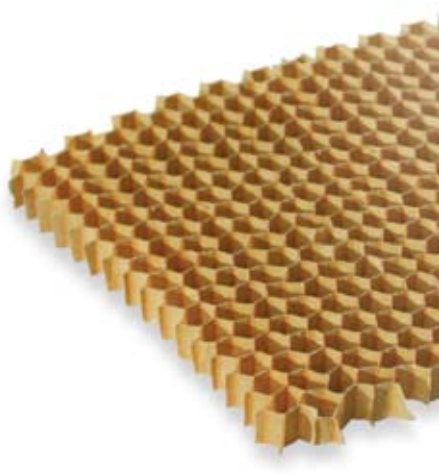
ENG

Nomex honeycomb - commercial

Nomex honeycomb core is an extremely lightweight, high strength, non metallic product manufactured with aramid fiber paper impregnated with a heat resistant phenolic resin. This core material offers unique combination of properties which allows superior electrical insulation. Aramid paper is used in boat hulls, auto racing bodies and military shelters. Furthermore it's very appreciated by the aeronautical, railway and shipyard industry.

Our clients can choose between industrial and aeronautical grade.

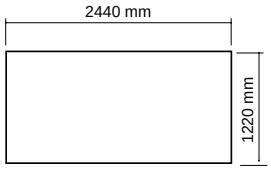


Honeycomb core's properties

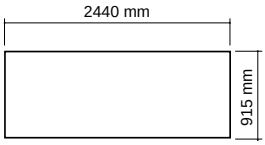
Nomenclature			Compression Strength	L-Shear	W-Shear
	Cell size mm	Density kg/m³	N/mm²	N/mm²	N/mm²
Hexagonal	3,2	48	1,90	1,16	0,62
Hexagonal	3,2	64	3,10	1,48	0,82
Hexagonal	3,2	80	4,70	1,95	1,05
Hexagonal	3,2	96	6,60	2,45	1,42
Hexagonal	3,2	128	11,30	2,95	1,78
Hexagonal	3,2	144	13,20	3,05	1,90
Hexagonal	4,0	29	0,60	0,45	0,26
Hexagonal	4,0	80	5,10	1,90	0,98
Hexagonal	4,8	32	0,90	0,58	0,36
Hexagonal	4,8	48	2,60	0,98	0,56
Hexagonal	4,8	64	3,40	1,70	0,92
Hexagonal	4,8	80	6,00	1,95	1,10
Hexagonal	4,8	96	7,30	2,26	1,32
Hexagonal	6,4	24	0,54	0,34	0,18
Hexagonal	6,4	32	0,80	0,54	0,30
Hexagonal	6,4	48	2,05	1,00	0,56
Hexagonal	6,4	64	3,40	1,54	0,79
Hexagonal	9,6	24	0,52	0,32	0,16
Hexagonal	9,6	32	0,68	0,56	0,29
Hexagonal	9,6	48	1,80	1,15	0,66
Over expanded	4,8	29	0,60	0,31	0,32
Over expanded	4,8	48	2,30	0,60	0,72
Over expanded	4,8	64	3,80	0,72	0,90
Over expanded	4,8	72	4,00	0,75	0,92
Over expanded	4,8	80	5,30	0,88	1,17
Over expanded	4,8	96	6,70	0,92	1,28
Over expanded	6,4	48	2,30	0,60	0,72
Over expanded	6,4	64	3,20	0,72	0,90

Tolerance - density +/- 16%

Standard dimensions
(other dimensions available on request)



Hexagonal cell sizes



Rectangular cell sizes

NOMEX - COMMERCIAL

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PVC Foam

PVC foam offers an optimal stiffness-to-weight-ratio, compression, water resistance and thermo insulation. It is compatible with polyester, viniliester and epoxy resin. PVC foam is easy to work: it can be rolled, cut etc.

PVC foam core's properties						
Type	**MC 40**	**MC 50**	**MC 80**	**MC 100**	**MC 130**	**MC 200**
Density kg/m³	from 36 to 46	from 54 to 69	from 72 to 92	from 90 to 115	from 120 to 150	from 180 to 250
Fire resting property	reaction to fire class RF2/75/A RF3/77					
Compressive strength MPa	0,46	0,61	1,44	1,91	2,79	5,19
Tension strength MPa	0,71	0,96	2,02	2,71	3,79	5,95
Thickness mm	different thicknesses available					
Dimension mm	depends on density					

PVC foam cores

Last Revised: 12/11

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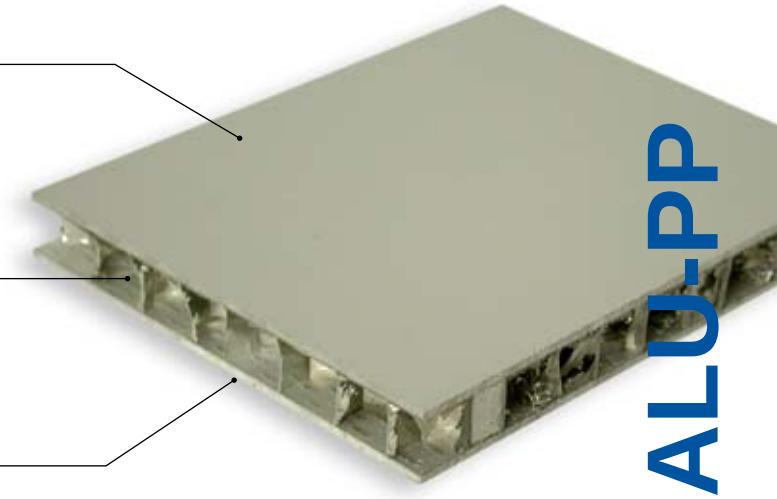
ENG

ALU - ALU

Panel's composition

ALUMINIUM SKINS
Thickness mm: 0,5 - 0,8 - 1 (standard)

CORE (for more information see data sheet)
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8", Ø1/2", Ø3/4"
Thickness Foil: from 50 to 70 microns

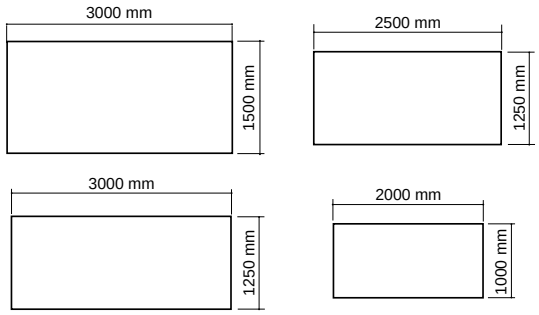


On request: • other thicknesses,
• special alloys, treatments and pre paint with ral colors

Honeycomb core's properties	50 Microns			
Type	**ALUMINIUM ALLOY 3003/3103/3104**			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	56 - 59	39 - 40	29 - 30	20 - 21
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95	0,8 - 0,95	0,4 - 0,6

Honeycomb core's properties	70 Microns			
Type	**ALUMINIUM ALLOY 3003/3103/3104**			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	80 - 83	54	40 - 42	27 - 29
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6	1,41 - 1,5	0,85 - 0,9

Standard dimensions (other dimensions available on request)
Dimension tolerance ± 30mm

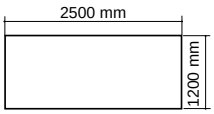


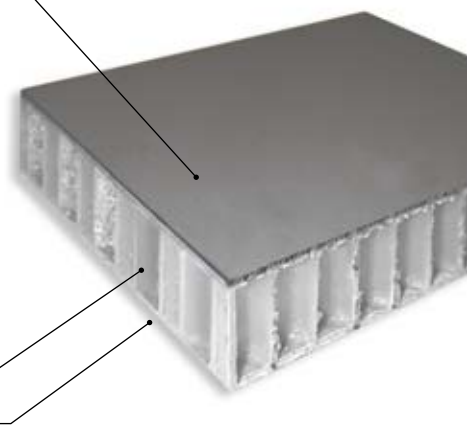
ALU - PP (on request)

ALUMINIUM SKINS
Thickness mm: 0,5 - 0,8 - 1 (standard)

CORE
(for more information see data sheet)
Polypropylene honeycomb

Standard dimensions
Dimension tolerance ± 30mm





On request: • other thicknesses,
• special alloys, treatments and pre paint with ral colors

Sandwich Panel ALU-ALU / ALU-PP

Last Revised: 03/12

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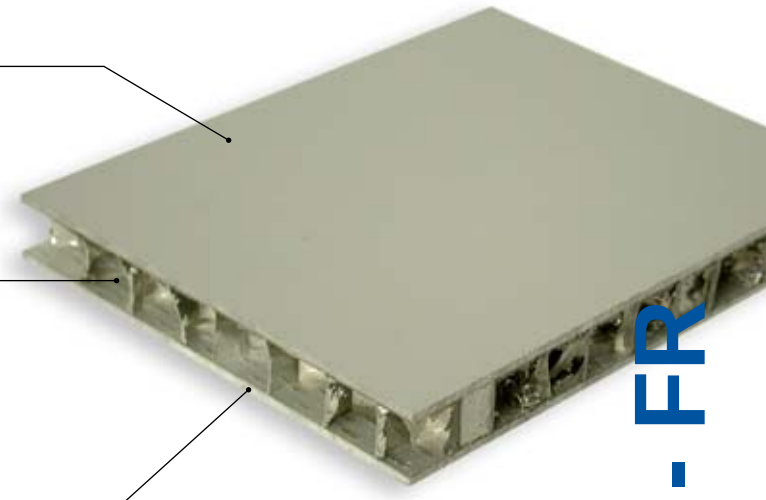
ENG

ALU - ALU - FR

Panel's composition

ALUMINIUM SKINS
Thickness mm: 0,5 - 0,8 - 1 (standard)

CORE
Aluminium honeycomb (Alloy 3003/ 3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8", Ø1/2", Ø3/4"
Thickness Foil: from 50 to 70 microns



On request:
- other thicknesses,
- alloys and RAL-colours,
- ESD dissipant painting,
- stainless steel skins.

EXAMPLE

Panel's weight Ø6 56kg/m³ (Ø 1/4")

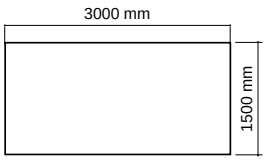
- Thickness starting from 4 mm to 150 mm
- Thickness' tolerance ± 0,3 mm
- Dimension's tolerance ± 30 mm

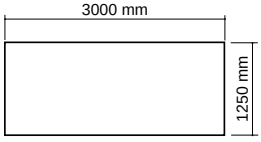
Total thickness mm	6	15	10	15	20	25
SKINS' thickness mm	0,5 + 0,5		1 + 1			
CORE'S thickness mm	5	14	8	13	18	23
Weight kg/m²	3,2	3,8	6,25	6,53	6,81	7,09

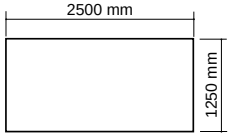
Honeycomb core's properties	**50 Microns**			
Type	**ALUMINIUM ALLOY 3003/3103/3104**			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	56 - 59	39 - 40	29 - 30	20 - 21
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95	0,8 - 0,95	0,4 - 0,6

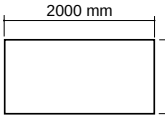
Honeycomb core's properties	**70 Microns**			
Type	**ALUMINIUM ALLOY 3003/3103/3104**			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	80 - 83	54	40 - 42	27 - 29
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6	1,41 - 1,5	0,85 - 0,9

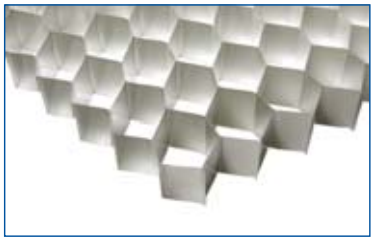
Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm










Aluminium honeycomb

Sandwich Panel ALU - ALU - FR

Last Revised: 03/12

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

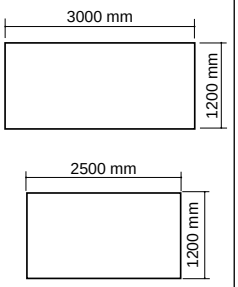
ALUSTEP 500

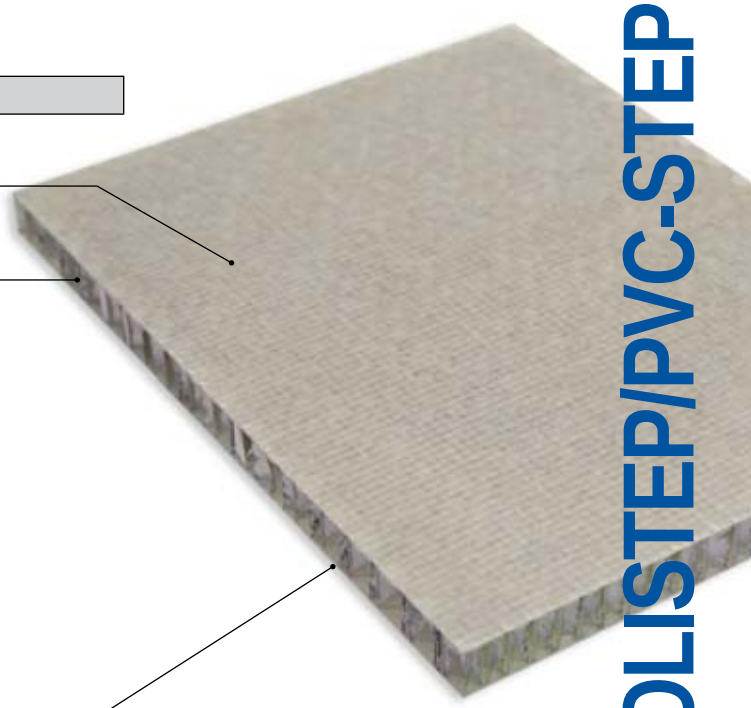
Panel's composition

SKINS IN GLASSFIBER FABRIC
Impregnated with epoxy resin - **Thickness mm:** 0,5

CORE (for more information see data sheet)
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8"
Thickness Foil: from 50 to 70 micron

Standard dimensions
Dimension tolerance ±30mm



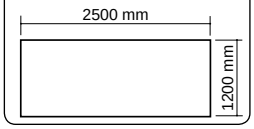


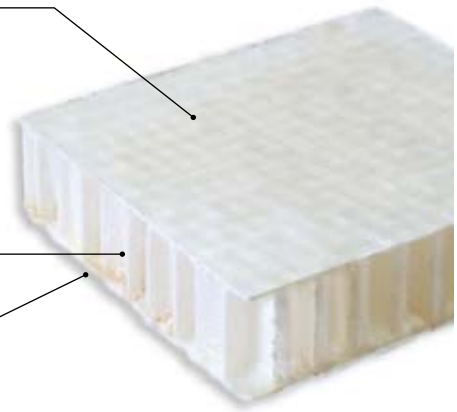
POLISTEP (on request)

SKINS IN GLASSFIBER FABRIC
Impregnated with epoxy resin - **Thickness mm: 0,5**

CORE (for more information see data sheet)
Polypropylene honeycomb

Standard dimensions
Dimension tolerance ±30mm



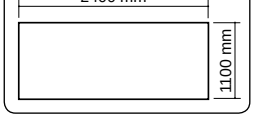


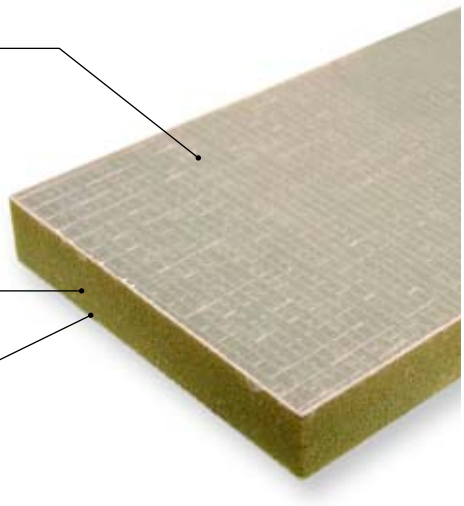
PVC-STEP (on request)

SKINS IN GLASSFIBER FABRIC
Impregnated with epoxy resin - **Thickness mm: 0,5**

CORE (for more information see data sheet)
PVC foam
Density: from 50 to 60 kg/m³

Standard dimensions
Dimension tolerance ±30mm





Sandwich Panel ALUSTEP 500/POLISTEP/PVC-STEP

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

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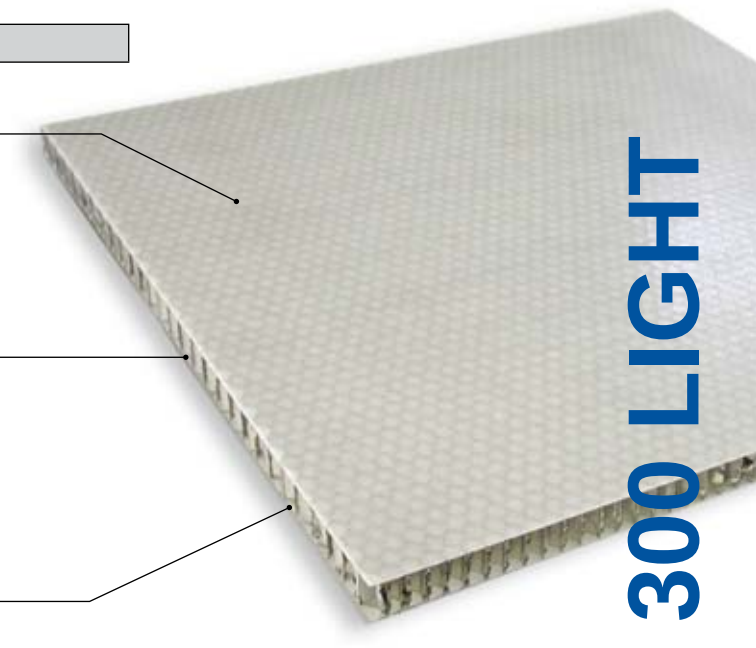
ALUSTEP 300 - LIGHT

Panel's composition

SKIN IN BIDIRECTIONAL GLASSFIBER FABRIC
impregnated with epoxy resin 290g/m²

CORE
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8"
Thickness Foil: from 50 to 70 microns

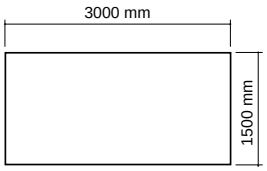


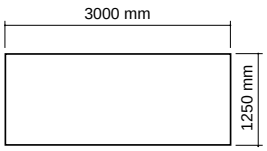
Sandwich Panel ALUSTEP 300 LIGHT

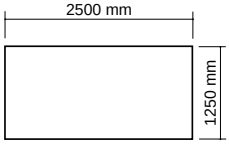
EXAMPLE

Panel's weight Ø6 56kg/m³ (Ø 1/4")		
• Thickness starting from 5 mm to 80 mm		
Total thickness mm	10	15
SKINS' thickness mm	0,15 + 0,15	
CORE'S thickness mm	9,7	14,7
Weight kg/m²	1,64	1,92

Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm

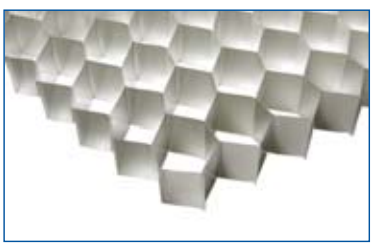






Honeycomb core's properties	50 Microns	
Type	ALUMINIUM ALLOY 3003/3103/3104	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	56 - 59	39 - 40
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95

Honeycomb core's properties	70 Microns	
Type	ALUMINIUM ALLOY 3003/3103/3104	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	80 - 83	54
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6



Aluminium honeycomb

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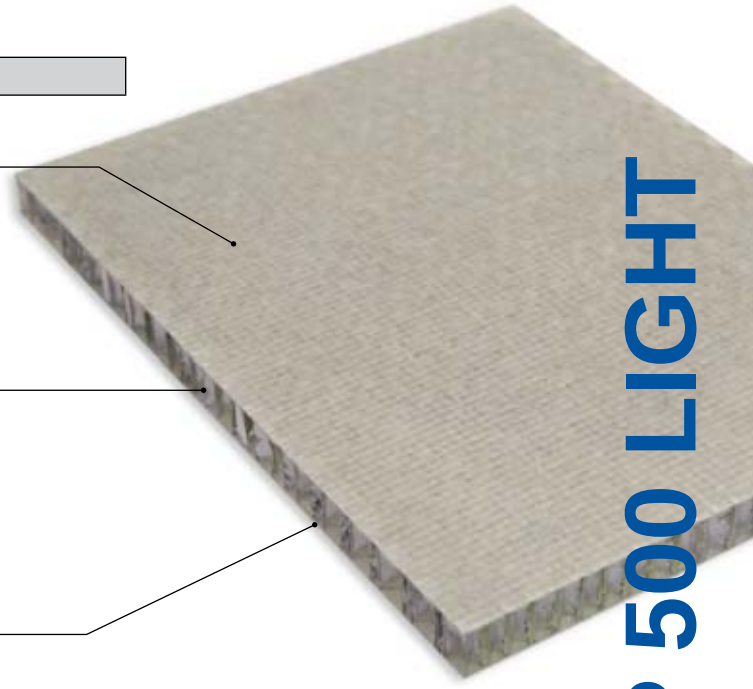
ALUSTEP 500 LIGHT

Panel's composition

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC
490g/m² impregnated with epoxy resin

CORE
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8"
Thickness Foil: from 50 to 70 microns



Sandwich Panel ALUSTEP 500 LIGHT

EXAMPLE

Panel's weight Ø6 56kg/m³ (Ø 1/4")

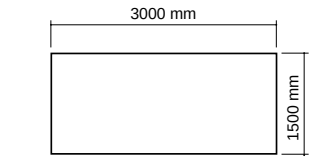
- Thickness starting from 4 mm to 100 mm
- Thickness' tolerance ± 0,3 mm
- Dimension's tolerance ± 30 mm

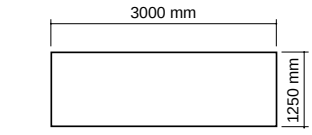
Total thickness mm	10	15	20	25	30
SKINS' thickness mm	0,4 + 0,4				
CORE'S thickness mm	9,2	14,2	19,2	24,2	29,2
Weight kg/m²	3,38	3,71	4,03	4,36	4,68

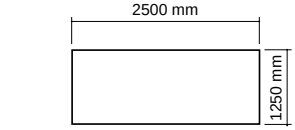
Honeycomb core's properties	50 Microns	
Type	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	56 - 59	39 - 40
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95

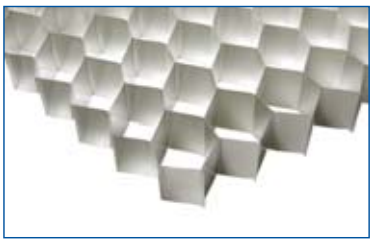
Honeycomb core's properties	70 Microns	
Type	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	80 - 83	54
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6

Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm









Aluminium honeycomb

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ALUSTEP 300 - LIGHT - LZ

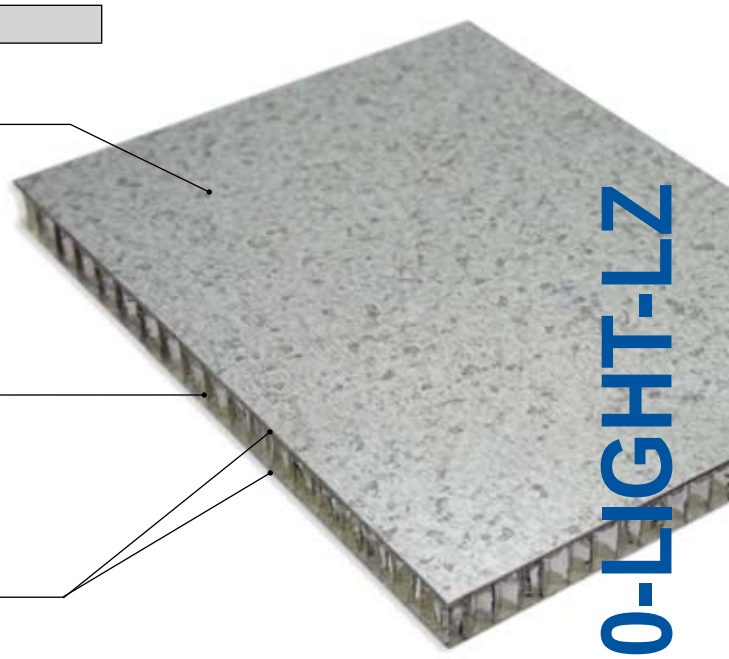
Panel's composition

SKIN OF GALVANIZED steel on one side
Thickness mm: 0,35/0,6[x1]
Other thicknesses on request with minimum order quantity

[x1] for width 1250 = thick steel 0,35 mm
for width 1500 = thick steel 0,6 mm

CORE
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8"
Thickness Foil: from 50 to 70 microns

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC
300 gr/m² impregnated with epoxy resin
Thickness mm: 0,3



Sandwich Panel ALUSTEP 300-LIGHT-LZ

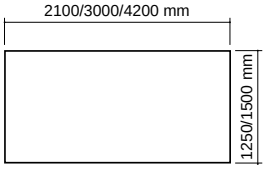
EXAMPLE	Panel's weight				
	• Thickness' tolerance ± 0,5mm • Dimension's tolerance ± 30mm				
	Total thickness mm	5,35	10,35	15,35	20,35
	SKINS' thickness mm	0,3 + 0,3			
	Galvanized steel's thickness mm	0,35			
	CORE'S thickness mm	4,4	9,4	14,4	19,4
	Weight kg/m²	5,27	5,59	5,92	6,24

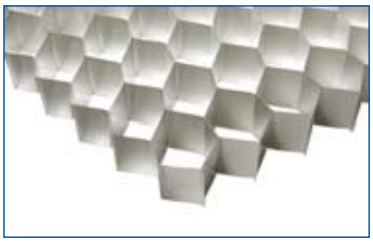
EXAMPLE	Panel's weight				
	• Thickness' tolerance ± 0,5mm • Dimension's tolerance ± 30mm				
	Total thickness mm	5,60	13,60	15,60	20,60
	SKINS' thickness mm	0,3 + 0,3			
	Galvanized steel's thickness mm	0,6			
	CORE'S thickness mm	4,4	12,4	14,4	19,4
	Weight kg/m²	6,46	6,98	7,11	7,44

Honeycomb core's properties	50 Microns	
Type	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	56 - 59	39 - 40
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95

Honeycomb core's properties	70 Microns	
Type	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density Kg/m³	80 - 83	54
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6

Standard dimensions
(other dimensions available on request)
Dimension tolerance ±30mm





Aluminium honeycomb

Last Revised: 03/12

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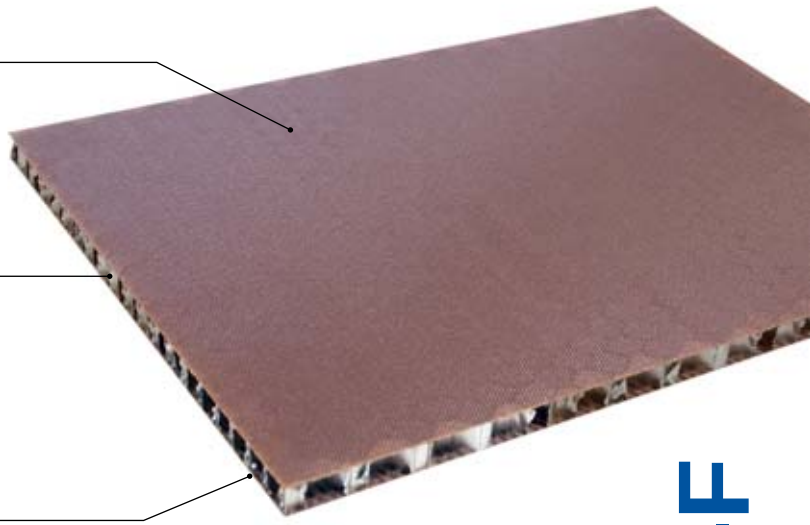
ALUSTEP - F

Panel's composition

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC impregnated with phenolic resin 290 g/m³

CORE
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø3/8", Ø1/4", X_1
Thickness Foil: from 50 to 70 microns

X_1 = other diameters on request



EXAMPLE

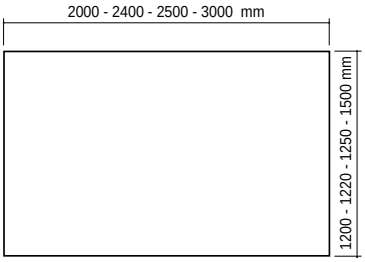
Panel's weight

- X_1 Panel with cores ALU Ø 3/8"
- Thickness starting from 4 mm to 150 mm
- Thickness' tolerance ± 0,5 mm
- Dimension's tolerance ± 30 mm

X_2 Panel with cores ALU Ø1/4"

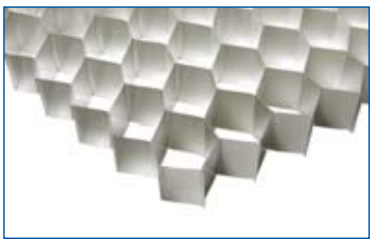
Total thickness mm	6	15	6	15
SKINS' thickness mm	0,3 + 0,3		0,3 + 0,3	
CORE'S thickness mm	5,4	14,4	5,4	14,4
Weight kg/m²	1,4	1,8	2,07	2,58

Standard dimensions
(other dimensions available on request)
Dimension tolerance ±30mm



Honeycomb core's properties	50 Microns			
Type	ALUMINIUM ALLOY 3003/3103/3104			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	56 - 59	39 - 40	29 - 30	20 - 21
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95	0,8 - 0,95	0,4 - 0,6

Honeycomb core's properties	70 Microns			
Type	ALUMINIUM ALLOY 3003/3103/3104			
Ø honeycomb in mm	6	9	12	19
Ø honeycomb in inches	1/4"	3/8"	1/2"	3/4"
Density Kg/m³	80 - 83	54	40 - 42	27 - 29
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6	1,41 - 1,5	0,85 - 0,9



Aluminium honeycomb

Sandwich Panel ALUSTEP-F

Last Revised: 03/12

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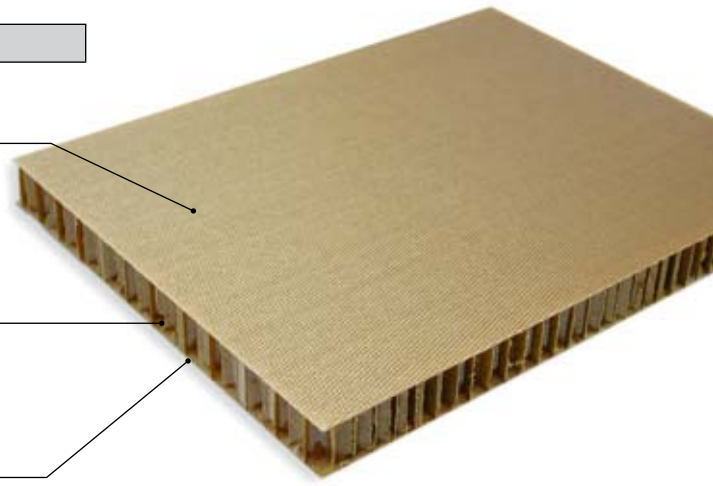
ALUSTEP - FN

Panel's composition

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC impregnated with phenolic resin
Thickness mm: 0,25÷0,3

CORE
Nomex honeycomb core
Diameter: from Ø1/8" to Ø3/16", X_1

X_1 = other diameters on request



EXAMPLE

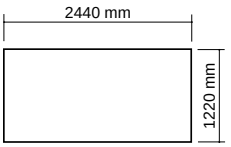
Panel's weight

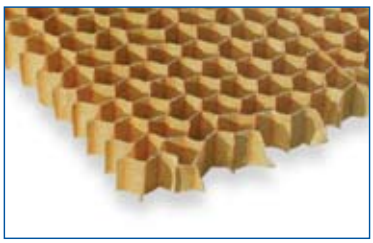
- Available with honeycomb core
- Thickness standard: 6, 10, 12.7, 15, X_2 mm

Ø honeycomb in inches	1/8"	3/16"
Total thickness mm	10	12,7
SKINS' thickness mm	0,3+0,3	0,6+0,6
CORE'S thickness mm	9,4	11,5
Weight kg/m²	2	2,8

X_2 = other diameters on request

Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm





Nomex honeycomb

Sandwich Panel ALUSTEP-FN

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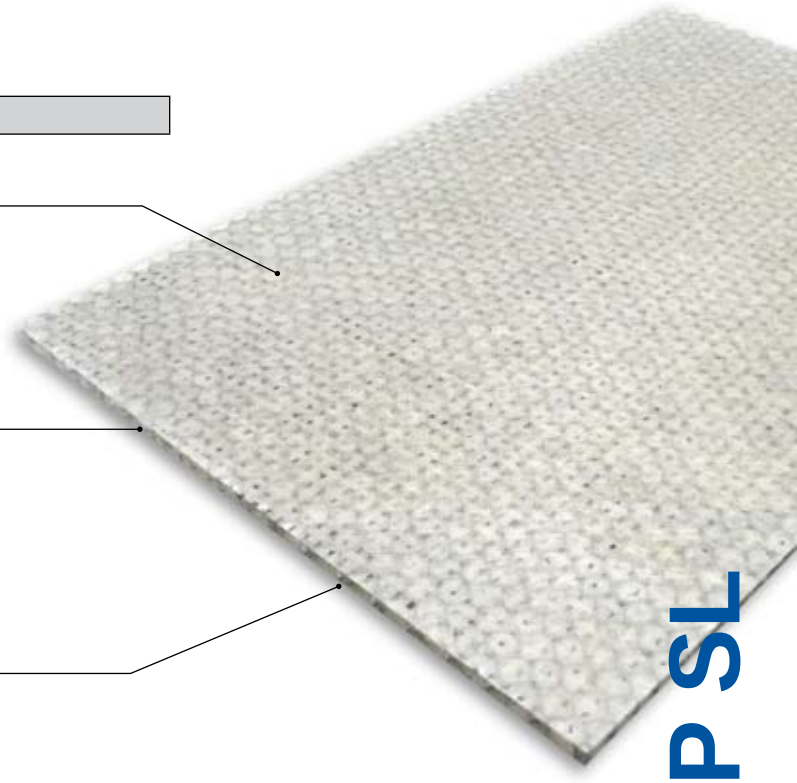
ALUSTEP SL

Panel's composition

SKIN IN BIDIRECTIONAL GLASSFIBER FABRIC
impregnated with epoxy resin 300g/m²

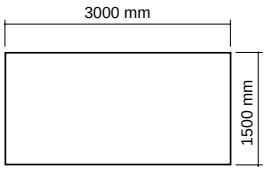
CORE
Aluminium honeycomb (Alloy 3003/3103/3104) with hexagonal cells
Diameter: Ø1/4", Ø3/8"
Thickness Foil: from 50 to 70 microns

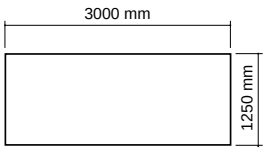


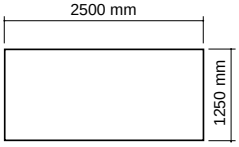
EXAMPLE

Panel's weight Ø6 56kg/m³ (Ø 1/4")				
• Standard Thickness: 5, 10, 15, 20 mm (others on request)				
Total thickness mm	5	10	15	20
SKINS' thickness mm	0,3 + 0,3			
CORE'S thickness mm	4,4	9,4	14,4	19,4
Weight kg/m²	2,29	2,61	2,94	3,26

Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm

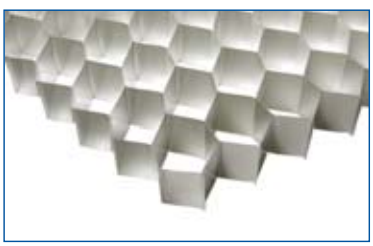






Honeycomb core's properties	50 Microns	
Typ	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density kg/m³	56 - 59	39 - 40
Compressive stabilised strength MPa	3,0 - 3,5	1,4 - 1,95

Honeycomb core's properties	70 Microns	
Typ	**ALUMINIUM ALLOY 3003/3103/3104**	
Ø honeycomb in mm	6	9
Ø honeycomb in inches	1/4"	3/8"
Density kg/m³	80 - 83	54
Compressive stabilised strength MPa	4,3 - 4,6	2,5 - 2,6


Aluminium honeycomb

Sandwich Panel ALUSTEP SL

Last Revised: 03/12

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

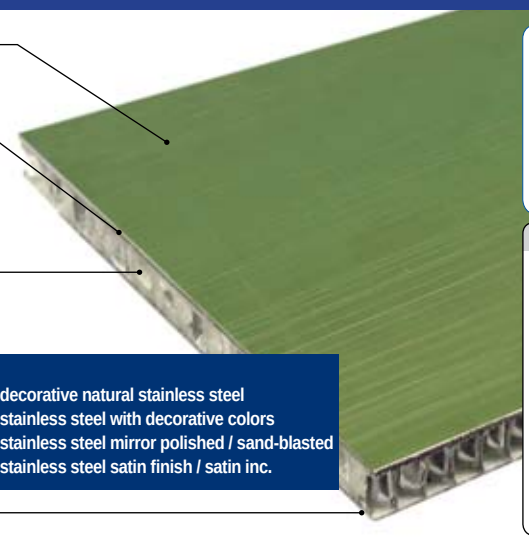
ALUSTEP INOX / POLISTEP INOX / ALUSTEP FLOOR

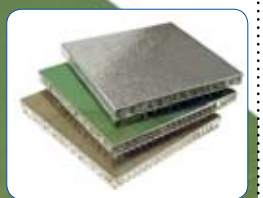
ALUSTEP INOX Panel's composition

STAINLESS STEEL - SATIN FINISH INC

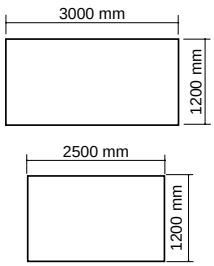
SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC impregnated with epoxy resin
Thickness mm: 0,15

CORE (for more information see data sheet)
Aluminium honeycomb with hexagonal cells
Diameter: Ø1/4"
Thickness Foil: from 50 to 70 microns





Standard dimensions



On request:
- Different types of decorative natural stainless steel
- Different types of stainless steel with decorative colors
- Different types of stainless steel mirror polished / sand-blasted
- Different types of stainless steel satin finish / satin inc.

POLISTEP INOX Panel's composition

DECORATIVE STAINLESS STEEL - ICE GREY

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC impregnated with epoxy resin
Thickness mm: 0,5

CORE (for more information see data sheet)
Polypropylene honeycomb

Standard dimensions

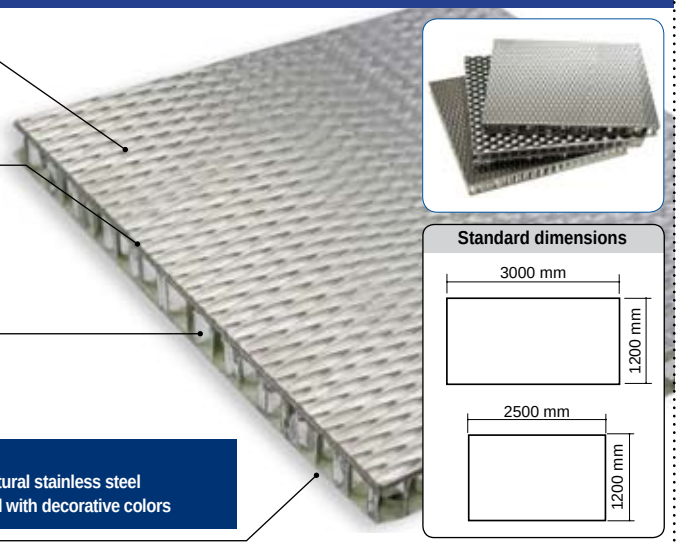
On request:
- Different types of decorative natural stainless steel
- Different types of stainless steel with decorative colors
- Different types of stainless steel mirror polished / sand-blasted
- Different types of stainless steel satin finish / satin inc.

ALUSTEP FLOOR Panel's composition

DECORATIVE NATURAL STAINLESS STEEL - SATIN FINISH 5WL

SKINS IN BIDIRECTIONAL GLASSFIBER FABRIC impregnated with epoxy resin
Thickness mm: 0,15

CORE (for more information see data sheet)
Aluminium honeycomb with hexagonal cells
Diameter: Ø1/4"
Thickness Foil: from 50 to 70 microns



Standard dimensions

On request:
- Different types of decorative natural stainless steel
- Different types of stainless steel with decorative colors

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

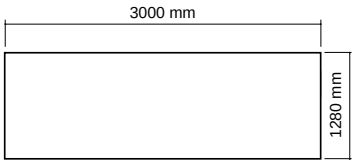
HPL - ALU

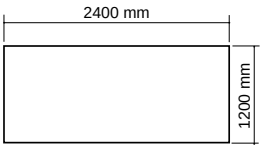
Panel's composition

SKINS OF HIGH PRESSURE LAMINATE
Thickness: from 0,7 to 4 mm
- Other thicknesses on request
- Colors on request

CORE
Aluminium honeycomb (Alloy 3003/3103/3104)
with hexagonal cells
Diameter: Ø 1/4", Ø 3/8", Ø 3/4"
Thickness Foil: from 50 to 70 microns

Standard dimensions (other dimensions available on request)
Dimension tolerance ±30mm





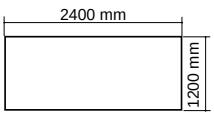
Aluminium honeycomb

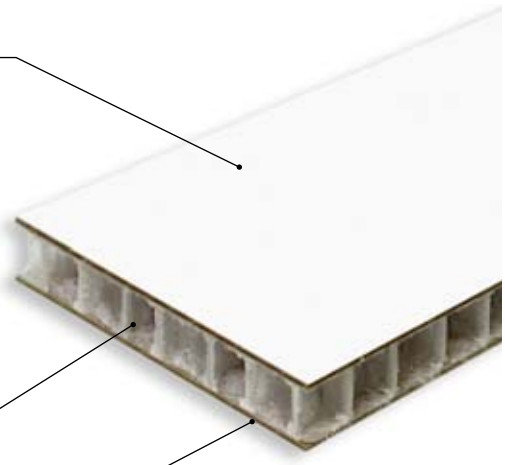
HPL - PP (on request)

SKINS OF HIGH PRESSURE LAMINATE
- **Thickness**: from 0,7 to 4 mm
- Other thicknesses on request
- Colors on request

CORE (for more information see data sheet)
Polypropylene honeycomb

Standard dimensions*
Dimension tolerance ±30mm





* Special sizes on request

Sandwich Panel HPL-ALU / HPL-PP

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

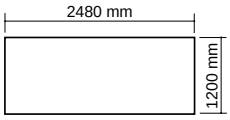
Sandwich Panel OKU-PP / OKU-ALU / OKU-PVC

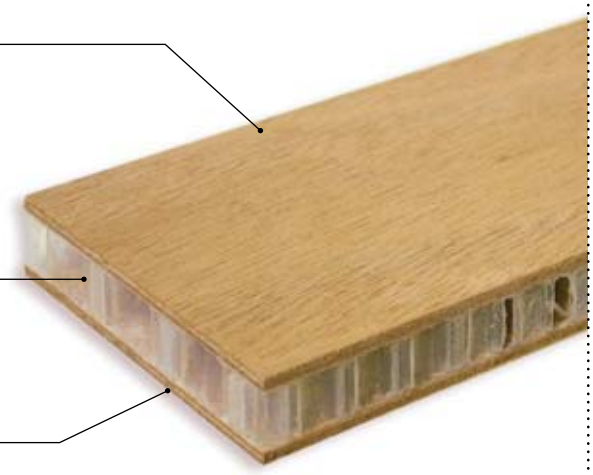
OKU - PP Panel's composition

SKINS IN MARINE PLYWOOD* quality Okoumè
Thickness: from 1,5 to 8 mm

CORE (for more information see data sheet)
Polypropylene honeycomb

Standard dimensions**
Dimension tolerance ±30mm



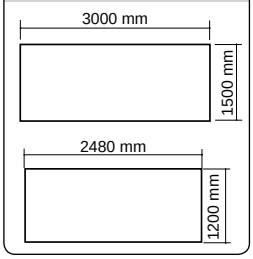


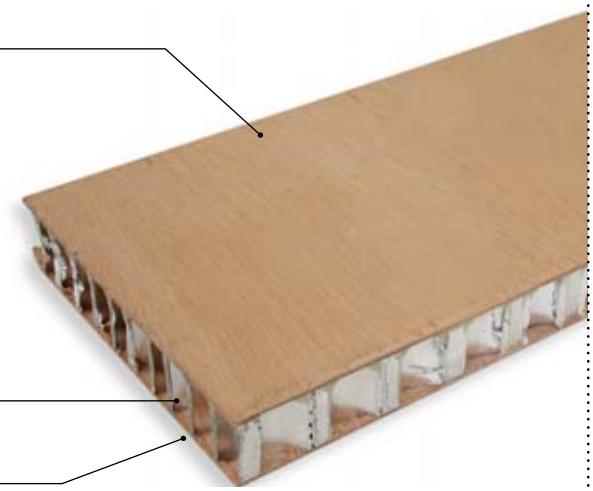
OKU - ALU Panel's composition

SKINS IN MARINE PLYWOOD* quality Okoumè
Thickness: from 1,5 to 8 mm

CORE (for more information see data sheet)
Aluminium honeycomb with hexagonal cells
Diameter: Ø1/4", Ø3/8", Ø1/2", Ø3/4"
Thickness Foil: from 50 to 70 microns

Standard dimensions**
Dimension tolerance ±30mm



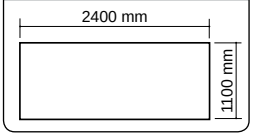


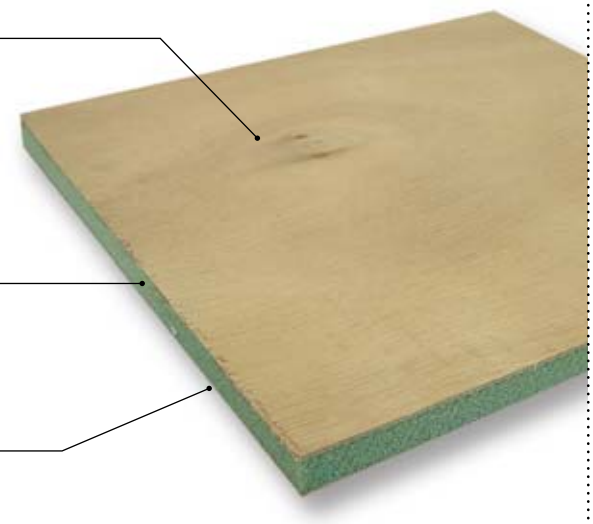
OKU - PVC Panel's composition

SKINS IN MARINE PLYWOOD* quality Okoumè
Thickness: from 1,5 to 8 mm

CORE (for more information see data sheet)
PVC foam
Density: from 50 to 60 kg/m^3

Standard dimensions**
Dimension tolerance ±30mm





* Other qualities of plywood on request
** Other dimensions available on request

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

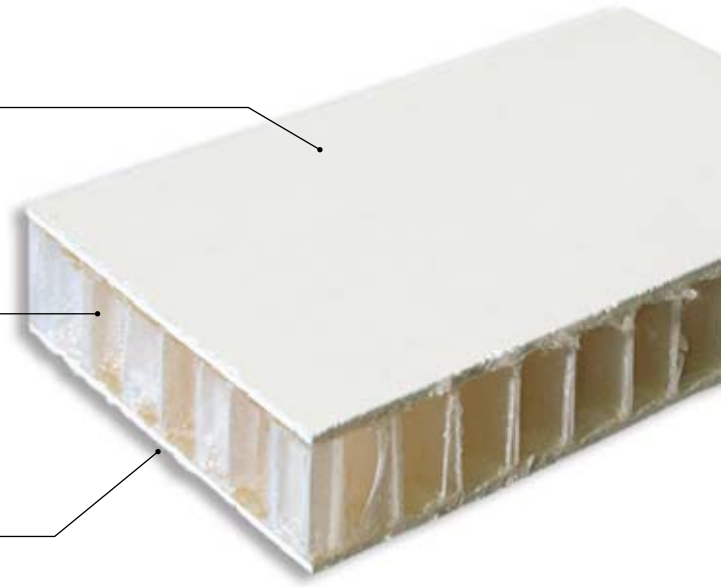
ENG

VTR - PP

Panel's composition

SKIN OF POLYESTER GRP with white gel coat and protective film on gelcoat side
Thickness: from 1,1 mm to 3 mm
suitable for contact with food products

CORE
Polypropylene honeycomb



On request: • RAL colours

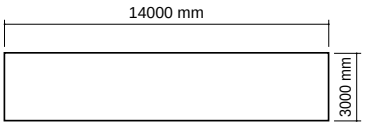
EXAMPLE

Panel's weight

- Polypropylene honeycomb panel
- Thickness starting from 10 mm to 70 mm
- Thickness' tolerance +0/-1 mm
- Dimension's tolerance +/- 30 mm
- Temperature of utilisation from -30°C to +70°C

Total thickness mm	10	24	34
SKINS' thickness mm	1,6 + 1,6		
CORE'S thickness mm	6,8	20,8	30,8
Weight kg/m²	6	7	7,8

Standard dimensions (max)
(other dimensions available on request)
Dimension tolerance ±30mm



Polypropylene honeycomb

Sandwich Panel VTR - PP

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ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

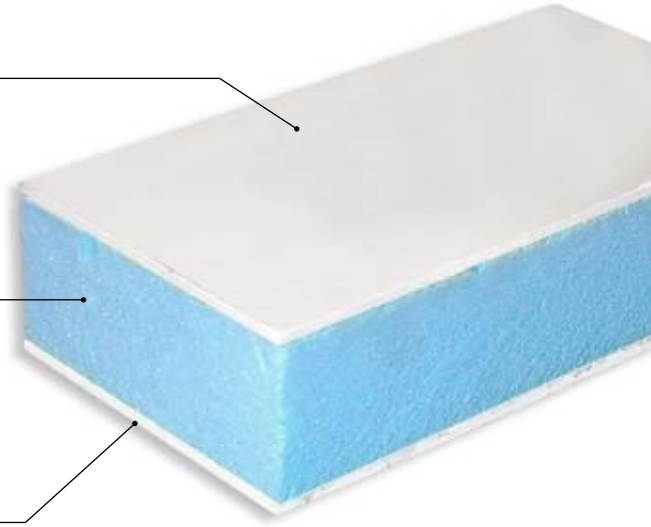
ENG

VTR - STY

Panel's composition

SKIN OF POLYESTER GRP with white gelcoat and protective film on gelcoat side
Thickness: from 1,1 mm to 3 mm
suitable for contact with food products

CORE
extruded Polystyrene foam
Density: 30 - 40 - 45 Kg/m³



On request: • RAL colours

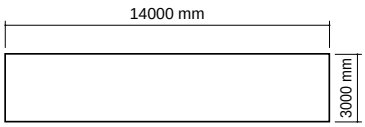
EXAMPLE

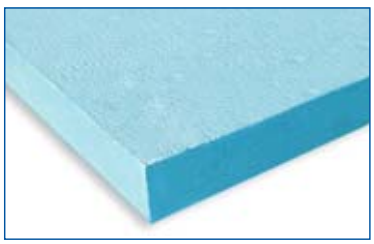
Panel's weight

- Polystyrene foam core, density 30 kg/m³
- Thickness starting from 20 mm to 104 mm
- Thickness tolerance + 0/-1 mm
- Dimension tolerance +/-30 mm

Total thickness mm	24	34	44
SKIN thickness mm	1,6 - 1,6		
CORE thickness mm	20,8	30,8	40,8
Weight kg/m²	6	6,3	6,6

Standard dimensions (max) (other dimensions available on request)
Dimension tolerance ±30mm





Polystyrene foam core

Sandwich Panel VTR - STY

Last Revised: 11/11

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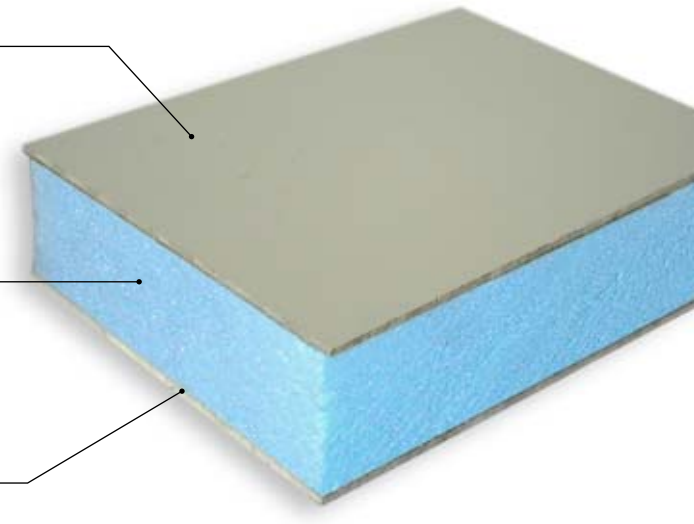
ENG

ALU - STY

Panel's composition

SKINS OF ALUMINIUM prepainted in white
Thickness mm: 1,0

CORE
extruded Polystyrene foam
Density: 30 - 40 - 45 kg/m³



On request: • skin in different colours

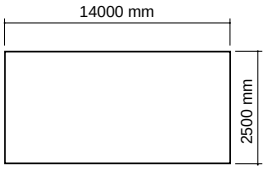
EXAMPLE

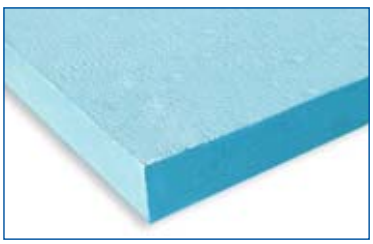
Panel's weight

- Polystyrene foam core STY, density 30 kg/m³
- Thickness starting from 20 mm to 100 mm
- Thickness' tolerance +0/-1 mm
- Dimension's tolerance ± 30 mm

Total thickness mm	22	32	42
SKINS' thickness mm	1,0 + 1,0		
CORE'S thickness mm	20	30	40
Weight kg/m²	7	7,3	7,6

Standard dimensions (max)
(other dimensions available on request)
Dimension tolerance ±30mm




Polystyrene foam

Sandwich Panel ALU - STY

Last Revised: 11/11

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SOUNDSTOP

Panel's composition

SKINS OF ALUMINIUM - **visible**
Varnished with RAL colors on request
Thickness mm: 0,5
Strata sequence: Primer-Pretraitment-aluminium foil-pretraitment-rustproof paint.

CORE
Non-combustible material with a low content of polyolefin

SKINS OF ALUMINIUM - Inferior skin
Strata sequence: antirust paint, pretraitment, protection foil in polyestere

On request: milling, cut and fold.

Panel's weight			
Thickness panel mm	3	4	6
Standard dimensions mm (4 mm x H x L)	965, 1270, 1575 x 3200, 3550, 4000, 4500		
Aluminium thickness mm	0,5	0,5	0,5
Weight kg/m²	6	7,6	10,9
Standard height mm	965	1270	1575
Standard length mm	3099		
Maximum length mm	7200		

Dimensional tolerances	
Thickness mm	± 0,2
Width mm	± 30
Length mm	± 30

Panels SOUNDSTOP

Last Revised: 11/11

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TWO-COMPONENT POLYURETHANE ADHESIVE

1. Description:

Two-component polyurethane, filled, semi rigid, low viscosity, one-hundred percent free of solvents. Good adhesive properties, waterproof and resistant to mechanical stress.

2. Applications:

Adhesive for materials of differing or similar properties.
Suitable in the construction of honeycomb sandwich panels, and in expanding materials such as polyurethane, foam, etc; skin material can be metal, glass, laminated plastic, wood, fiberglass, aluminum...

3. Use

3.1. Packaging

A: Container/small metal container	**kg 250/ 25**
B: Container/small metal container	**kg 250/ 14**

Note - Different amounts per container can be supplied upon request

⇨*The mixing ratio between the components must be followed as specified.*

3.2. Mix

Until perfectly homogenous

3.3. Mixing Ratio

A : B = 100 : 20 by weight
A : B = 100 : 25 ÷ 27 by volume

3.4. Temperature Range for application

+10 / +35°C
At lower temperatures and at high humidity levels the curing of the product will not be optimal.

3.5. Storage

In hermetic bins at a temperature of 23°C, 6 months
It is recommended to check for sedimentation in the containers before use, in case of sedimentation, remix.
Avoid exposing to moisture and to prolonged contact with the air.

3.6. Equipment cleaning

Tools/Equipment can be cleaned with suitable solvent, turpentine, nitric thinner or varnish remover.

4. Warnings

The surface must be free of moisture, dust, grease, or oils.

TWO-COMPONENT POLYURETHANE ADHESIVE

Last Revised: 11/11

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5. Properties

Component A

Characteristics	*Method*	*Units*	*Value*
Specific weight at 23 ± 2°C	ASTM D 1475/60	g/ml	1,62 ÷ 1,65
Viscosity at 25 ± 2°C	ASTM D 2393	mPa·s	15.000 ÷ 25.000
Color	-	-	beige
Appearance	-	-	liquid paste

Component B

Characteristics	*Method*	*Units*	*Value*
Specific weight at 23 ± 2°C	ASTM D 1475/60	g/ml	1,20 ÷ 1,25
Viscosity at 25 ± 2°C	ASTM D 2393	mPa·s	350 ± 50
Color	-	-	Dark brown
Appearance	-	-	liquid

Components A and B Mixed

Characteristics	*Method*	*Units*	*Value*
Pot life at 25 ± 2°C (200 cc A+B)	-	minutes	30 ÷ 35
Open time at 25 ± 2°C (thickness 1mm)	-	minutes	75 ÷ 95
Gel Time at 25 ± 2°C thickness 1mm)	-	minutes	170 ÷ 200
Minimum Temperature Application	-	°C	+10
Initial Hardening at 25°C	-	hours	8 ÷ 10
Time to reach full cure, 25 °C	-	days	5 ÷ 7
Coverage	-	g/sqm	150 ÷ 350

Components A and B, final characteristics after full cure hasbeen reached

Characteristics	*Method*	*Units*	*Value*
Color	-	-	beige
Density at 20°C	ASTM D 792	g/ml	1,56 ÷ 1,58

6. Hygiene

When working with polyurethane resins and other isocyanate hardeners, all regulations regarding hygiene and safety, glove use, safety goggles, and suitable clothing must be strictly followed. Dispose of waste materials in accordance with the laws in force.
Do not release waste materials into the storm sewers. For further information, please see the material safety data sheet.