CEL Components S.r.l.
Via Ca' dell'Orbo Sud 4 - 40055 Castenaso (Bologna) Italy
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P.IVA 04102600378 CCIAA BO 0339628
ALUMINIUM AND THERMOPLASTIC HONEYCOMBS, LAMINATES, SANDWICH PANELS

ENG

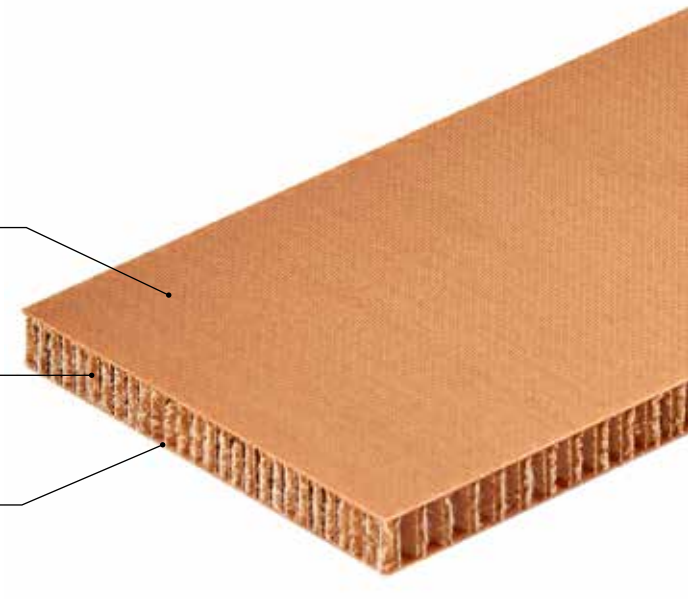
ALUSTEP®- FN

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



Technical data sheet for standard panels (dimensions, materials and special finishes on request)										
TECHNICAL CHARACTERISTICS OF PANEL	panel size		mm	standard 1250x2500						
	thickness' tolerance		mm	±0,4						
	dimension's tolerance		mm	±30						
	skins' thickness		mm	0,3						
	glass fiber skin type			satin 8/1 300 gr/m²						
	Impregnation			phenolic resin						
	honeycomb type			aramid paper, impregnated with phenolic resin						
	diameter of honeycomb		Ø = mm	3 and 4,8						
	honeycomb density		Kg/m³	48 and 32						
	adhesive for aluminum honeycomb			thermoplastic						
PANEL PHISIC AND MECHANIC PERFORMANCES	type panel (some examples)		mm	5	10	15	20	25	30	35
	panel weight ‡		Kg/m²	1,4±0,1	1,7±0,1	1,9±0,1	2,1±0,1	2,4±0,1	2,6±0,1	2,8±0,1
	compressive stabilised strength MPa ** ‡	ASTM C 365-365 M	Mpa	1,6±0,2						
	maximum load ** ‡	ASTM C 393 †	N	100±10	210±20	320±30	430±40	540±50	650±60	760±70
	deflection at maximum load ‡	ASTM C 393 †	mm	49±5	24±3	16±2	12±1	10±1	8±1	7±1
	skins E Elastic Modulus **		Mpa	22'000±1000						
	moment of inertia I **		mm⁴/m	3'300	14'120	32'400	58'200	91'600	132'000	181'000
	middle resistance to peeling ** ‡	ASTM D1781-98 (2012)		>450 N/76 mm or >45 Nmm/mm						
	maximum service temperature **		°C	- 50/ + 80						
	thermal expansion coefficient **		°C⁻¹	1,5 * 10^-5 / 1,5 mm for ΔT 100 °C for 1 meter length						

** Tested by Internal Laboratory
*** Approximate value
† Sample dimension with 4 support points (L, W) 540x540; distance among the lower points 500mm, distance among the upper points 250mm
‡ All values refer to a panel made of a honeycomb in nomex diameter 3mm mm 48 kg/m3 and two skins in fiberglass impregnated with phenolic resin and thermoplastic adhesive

Sandwich Panel ALUSTEP®- FN

Last Revised: 02/21_Rev.8

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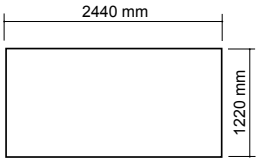
Standard dimensions (other dimensions available on request) - Dimension tolerance ±30mm



Tolerance - density +/- 16%

Nomex® honeycomb

Honeycomb core's properties

Nomenclature			Compression Strength	L-Shear	W-Shear
	Cell size mm	Density kg/m^3	N/mm^2	N/mm^2	N/mm^2
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

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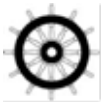
Certified version of ALUSTEP FN must be requested while asking for a quotation.
Certified products must be requested in advance and might have a price surcharge due to certified materials.

FIRE REACTION			
SECTOR	**NORM**	**CLASSIFICATION**	**DESCRIPTION**
SHIPBUILDING	FTP CODE 2010 3.18a  0407	**LOW FLAMESPREAD** **MOD. B.** Certification Nr. MED- 269 (IG-004-2019) REV.0 **MOD. D.** Certification Nr. MED- 154 (IG-178-2014) REV.16	**ALUSTEP FN** Aramid paper honeycomb panel with skins in fiberglass impregnated with phenolic resin complying with the MED directive for the application in ships registered or applied in the European Union. Item N. MED / 3.18a, IMO 2010 FTP Code, Annex 1
	U.S. Coast Guard 	**MOD. B.** USCG Approbation Nr. 164.112/0407 **MOD. D.** USCG Approbation Nr. 164.112/0407/MED000154	**ALUSTEP FN** Aramid paper panel with skins in fiberglass impregnated with phenolic resin
RAILWAY VEHICLES	UNI EN 45545-2	**HL2 (HAZARD LEVEL)** (10 - 25mm) Class certification Nr. 358634	**ALUSTEP FN** Aramid paper panel with skins in fiberglass impregnated with phenolic resin. Meets requirements for applications **R2** suspended ceilings, countertop **R1** partitions
RAILWAY VEHICLES	UNI EN 45545-2	**HL3 (HAZARD LEVEL)** (4-25mm) Class certification Nr. 355811	**ALUSTEP FN** Aramid paper panel with skins in fiberglass impregnated with phenolic resin. Meets requirements for applications **R10** floors

Last Revised: 02/21_Rev.8