SANDWICH PANELS
AND HONEYCOMB

www.cel.eu
The company

CEL supplies honeycomb cores and sandwich panels with applications in many different sectors:

- Marine: Shipyards and yachts (furniture, floorings, bulkheads, etc.)
- Railway: Railcars (floorings, partitions, ceilings, etc.)
- Automotive: Crash absorbers
- Clean Rooms
- Buildings (continuous facades, elevator cabins, etc.)
- Interiors (furniture, walls, etc.)
- Support for natural and engineered stone (marbles, semi-precious stones, mosaics, etc.)
- Lighting: Anti-reflection and dimming systems
- Refrigeration and air deflection
- Vacuum tables
About us

In our 25 years of experience, we have developed high standards and technical expertise in international markets. The corporate organizational model is structured for autonomy and flexibility: from production to logistics, sales and purchasing.

Our team is dynamic, young, motivated, customer-oriented and diverse and we offer service in many languages.
Shipyards and Shipbuilding

Honeycomb cores and sandwich panels are used in shipyards to reduce the weight of structures, fixtures and furniture, while maintaining the integrity and mechanical properties. The panels can be used in many applications: partitions, interiors, furniture, ceilings, and floor systems for engine rooms. In particular, CEL’s aluminium honeycomb and COMPOCEL AL FR and ALUSTEP F sandwich panels have obtained IMO MED Certification Mod. B and D according to FTP Code 2010.
ALUSTEP F
Skins: fibreglass impregnated with phenolic resin.

ALUSTEP FN
Skins: fibreglass impregnated with phenolic resin.

COMPOCEL FLOOR
Upper face chosen among different antiskid/anti-slip coatings. Lower skin: raw aluminium.

ALUMINIUM

POLYPROPYLENE

ARAMID PAPER

PVC - PET - PIR

IMO MED CERTIFICATION
MOD. B and D

IMO MED CERTIFICATION
MOD. B and D

IMO MED CERTIFICATION
MOD. B and D
Railways

In the railway sector, CEL COMPONENTS’ lightweight panels are used as partitions, ceilings, floors, bulkheads, tables, etc. These lightweight panels are generally composed of three layers: a core in aluminium or aramid paper honeycomb bonded with two skins either in aluminium, high pressure laminate or fibreglass.

COMPOCEL SANDWICH PANELS:

COMPOCEL AL FR
Skins: aluminium.

ALUSTEP F
Skins: fibreglass impregnated with phenolic resin.

ALUSTEP FN
Skins: fibreglass impregnated with phenolic resin.

COMPOCEL H
Skins: high pressure laminate.

COMPOCEL ALH
Faced on one or both sides with decorative laminate. Upper and lower skin in raw aluminium.

ASSESSMENT OF RESISTANCE TO IMPACT ACCORDING TO THE NORM ISO 4211-4: 1988

HONEYCOMBS:

ALUMINIUM

ARAMID PAPER
Aluminium Sandwich panel COMPOCEL AL FR obtained Class HL3 (maximum safety limit set) for R1, R2, and R10 according to the norm UNI-EN 4545-2:2015.

The HL3 parameter ensures that the panels conform to the requirements for self-extinguishment of material, low fume toxicity and opacity. Therefore, the achievement of class HL3 permits COMPOCEL AL FR to be used in floors, ceilings, separating walls in railcars.
Automotive

Several CEL COMPONENTS’ products have applications in the automotive sector. As they absorb kinetic energy, both honeycomb cores and sandwich panels are used as shock absorbers. In particular, CEL COMPONENTS’ thick aluminium honeycomb, encapsulated in a metal box, is positioned either in the front or the back of vehicles and absorbs energy in case of a crash.
Aluminium and aramid paper honeycomb cores are also used in composite panels destined for use in the vehicle platform (e.g. the underside of the vehicle).
Cleanrooms

Cleanrooms are uncontaminated areas used for scientific purposes, such as laboratories of various kinds (chemical, mechanical, opto-electronical), where airborne micro particles, environmental pollutants and microbes must be greatly reduced. CEL COMPONENTS’ sandwich panels for clean rooms are generally made of an aluminium honeycomb core bonded with two skins of high pressure laminate or aluminium; they can be painted with anti-static ESD if specifically requested. These panels are normally used in walls, doors, floors, and ceilings.

HONEYCOMBS:

ALUMINIUM

COMPOCEL SANDWICH PANELS:

COMPOCEL AL FR
Skins: aluminium.

COMPOCEL H
Skins: high pressure laminate.
**Interiors**

CEL COMPONENTS’ sandwich panels are highly appreciated by designers. Ultralight, with outstanding dimensional stability and available in a variety of coatings, they allow unlimited creativity in design. They have multiple applications (tables, seats, countertops, separating walls, etc.) according to the sector, from shipyards, yachts, and railways, to shops’ interiors, etc.

**COMPOCEL SANDWICH PANELS:**

- **COMPOCEL AL FR**
  Skins: aluminium.

- **COMPOCEL H**
  Skins: high pressure laminate.

- **ALUSTEP INOX**
  Skins: inox + fibreglass impregnated with phenolic resin.

- **COMPOCEL HP**
  Skins: high pressure laminate.

- **COMPOCEL W**
  Skins: plywood.

- **COMPOCEL WP**
  Skins: plywood.

**SERIE ALUSTEP**

Skins: fibreglass impregnated with epoxy resin.

**ALU/POLISTEP PANELS:**

- **COMPOCEL SANDWICH PANELS:**

- **COMPOCEL AL FR**
  Skins: aluminium.

- **COMPOCEL H**
  Skins: high pressure laminate.

- **ALUSTEP INOX**
  Skins: inox + fibreglass impregnated with phenolic resin.

- **COMPOCEL HP**
  Skins: high pressure laminate.

- **COMPOCEL W**
  Skins: plywood.

- **COMPOCEL WP**
  Skins: plywood.

**SERIE ALUSTEP**

Skins: fibreglass impregnated with epoxy resin.
Skins: fibreglass impregnated with phenolic resin.

FLOOR PANELS:

Upper face chosen among different antiskid/anti-slip coatings. Lower skin: raw aluminium.

HONEYCOMBS AND FOAMS:

Skins: fibreglass impregnated with epoxy resin.
Stone reinforcement

CEL COMPONENTS’ lightweight sandwich panels with honeycomb cores faced with various sheets of fibreglass impregnated with epoxy or phenolic resin (Alustep Series) are used to reinforce marble and semi-precious stones. By applying the panels to natural stones, the thickness of the slabs can be halved, greatly reducing the material weight and cost. This application is not only limited to marble and precious stones, but it can be also used with any natural or engineered stone or porcelain material.

COMPOCEL SANDWICH PANELS:

ALUSTEP 500
Skins: fibreglass impregnated with epoxy resin.

ALUSTEP 500 LIGHT
Skins: fibreglass impregnated with epoxy resin.

ALUSTEP 500 SL
Skins: fibreglass impregnated with epoxy resin.

ALUSTEP 300 LIGHT
Skins: fibreglass impregnated with epoxy resin.

ALUSTEP 300 D
Skins: 2-layers fibreglass impregnated with epoxy resin.

COMPOCEL AL FR
Skins: aluminium.

ALUSTEP F
Skins: fibreglass impregnated with phenolic resin.
**POLISTEP**
Skins: fibreglass impregnated with epoxy resin.

**PVC-STEP**
Skins: fibreglass impregnated with epoxy resin.
Core: foam.

**ALUMINIUM**

**POLYPROPYLENE**

**POLYCARBONATE**

**HONEYCOMBS:**
Building Industry

In the building industry, CEL COMPONENTS’ sandwich panels are used for claddings, floors and ventilated facades in addition to decorative uses. The customer is able to determine the skin (finishing) for the panels. Therefore, our lightweight panels are produced in compliance with the specifications of the customer. CEL supplies a wide variety of panels faced with different materials: aluminium and stainless steel are just two examples. CEL COMPONENTS’ aluminium honeycomb is classified A1 while COMPOCEL AL FR A2 and B according to the UNI EN 13501-1.

COMPOCEL SANDWICH PANELS:

- **COMPOCEL AL FR**
  Skins: aluminium.

- **COMPOCEL LZ**
  Skins: galvanised steel on both sides.

- **ALUSTEP INOX**
  Skins: inox + fibreglass impregnated with phenolic resin.

- **COMPOCEL FLOOR**
  Upper face chosen among different antiskid/anti-slip coatings. Lower skin: raw aluminium.

- **ALUSTEP 500**
  Skins: fibreglass impregnated with epoxy resin.

- **ALUSTEP 500 LIGHT**
  Skins: fibreglass impregnated with epoxy resin.

- **ALUSTEP 500 SL**
  Skins: fibreglass impregnated with epoxy resin.
ALUMINIUM CLASSIFICATION

A1 ACCORDING
UNI EN 13501 - 1

HONEYCOMBS:

ALUSTEP F
Skins: fibreglass impregnated with phenolic resin.

COMPOCEL H
Skins: high pressure laminate.

ALUSTEP 300 D
Skins: fibreglass impregnated with epoxy resin.

ALUMINIUM

CLASSIFICATION
A1 ACCORDING
UNI EN 13501 - 1
Refrigeration and air deflection

Polycarbonate honeycomb is a clean thermoplastic material that is highly valued in the production of refrigerating devices, wind tunnels ventilating plants, sterilized rooms, silencers and climatic chambers. The application of polycarbonate sheets on air diffusers does not only eliminate turbulence, but it also reduces the transport of impurities and humidity, as well as reducing noise and energy consumption.
Lighting sector

CEL COMPONENTS’ aluminium and polycarbonate honeycomb cores are used as grids in front of spotlights to trap the peripheral light in all directions and limit glare. On request, the honeycombs can be painted and cut in circles of different diameters.
Wind energy sector

In the wind energy sector, aluminium honeycomb, foams, and sandwich panels can be used in and for rotor blades, nacelles and turbine generator housings.

**HONEYCOMBS AND FOAMS:**

| DRILLED ALUMINIUM HONEYCOMB | PVC - PET - PIR |

**DRILLED ALUMINIUM HONEYCOMB**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALLOY</td>
<td>SERIES 3000</td>
</tr>
<tr>
<td>CELL DIAMETER</td>
<td>Ø 3/8” +/-10%</td>
</tr>
<tr>
<td>PERFORATION</td>
<td>YES</td>
</tr>
<tr>
<td>FOIL THICKNESS</td>
<td>70 MICRON +/-8 MICRON</td>
</tr>
<tr>
<td>DENSITY</td>
<td>54 KG/M³ +/-10%</td>
</tr>
<tr>
<td>TOTAL THICKNESS</td>
<td>60MM +/- 0.05</td>
</tr>
<tr>
<td>DIMENSIONS</td>
<td>L-1250 MM (-0/+50 MM) X W-2500 (-0/+50 MM) EXPANDED L-8500 MM (-0/+100 MM) X W-3000 (-0/+100 MM) OVEREXPANDED.</td>
</tr>
</tbody>
</table>
Honeycomb for Laser and Waterjet Cutting Machines

Water and Laser jet cutting machines are machines capable of slicing different materials using either a jet of water at high speed and pressure or a laser beam.

ALUMINIUM
POLYPROPYLENE

The working tables of the jet cutting machines are made of aluminium honeycomb and in the case of waterjet cutting machines, polypropylene honeycomb is also an option. Honeycomb sheets are a cost-effective consumable working platform.
Vacuum Tables

CEL has recently acquired the newest generation 9-axis CNC machine. This state-of-the-art machine enables the production of large scale panels in a variety of different materials (wood, plywood, aluminium, plastic, laminate, etc.).

The honeycomb that constitutes the core of vacuum table is perforated according to the specifications of our customers. This procedure allows the flat part or panel to be held tightly during cutting and plotting, allowing surfaces to be worked with uninterrupted passes.

The tables are available in a wide range of sizes and configurations.
Glues and Adhesives

Cel Components also offers two-component polyurethane and epoxy adhesives. Used in the production of sandwich panels from a variety of different core materials (aluminium or thermoplastic honeycomb, PIR, PVC, PET, etc.), their adhesive properties, water resistance and ability to withstand mechanical stress allow them to be used to bond different materials - metals (aluminium, tinplate, etc.), fibreglass, high pressure laminate, wood, plywood, etc. Sandwich panels glued with polyurethane or epoxy adhesives have applications in many sectors from shipyards and building, to stone support and railways.

In particular, COMPOCEL AL, composed of structural adhesive CPB001, has the fire certifications and classifications as required by the different sectors: Class A2 and B according to the norm UNI EN 13501-1, Class HL3 for R1, R2, R10 according to the norm UNI EN 45545-2 and IMO MED Mod. B and D according to FTP CODE 2010.
Aluminium honeycomb

Aluminium honeycomb is a lightweight, environmentally friendly (recyclable) material with good mechanical properties: lightweight, stiffness, fire resistance, compression, shear and corrosion resistance, flatness. Aluminium honeycomb has applications (e.g. for tool machines, serigraphy, etc.) in different sectors: public transport (shipyards, railcars, automotive), building industry, stone supports and coverings, etc. As core material, aluminium honeycomb is the central layer of sandwich panels. Sandwich panels with aluminium honeycomb core can be used as floors, ceilings, doors, partitions, facades, working surfaces for automatic machines and for all products that require an optimal stiffness-to-weight-ratio. Aluminium honeycomb can also be used as deflection for laminar flow-ventilation and for crash-absorption for kinetic energy.

<table>
<thead>
<tr>
<th>Fire Classification/Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Non-combustible</td>
</tr>
<tr>
<td>A1</td>
</tr>
</tbody>
</table>

Polypropylene honeycomb

Thanks to its chemical-resistance and its reliability in aggressive environments, polypropylene honeycomb can be used as support for filters to reduce corrosive gas emissions. Cel supplies different types of polypropylene honeycomb:
- Polypropylene honeycomb without TNT (PP 8.80)
- Polypropylene honeycomb with TNT (a thin thermo-welded sheet on both sides; PP 8-80 T30, PP8-120 T30)
- Polypropylene honeycomb with TNT and a plastic film (thermos-welded on both sides; PP 8-80 T30 F75)

Polypropylene honeycomb, one of the core materials in sandwich panels, is bonded to different materials (aluminium sheets, high pressure laminate skins, marine plywood, fibreglass, etc.), and can be thermo-welded or glued to TNT or technical fabrics, which makes the production of sandwich and lightweight panels easier.

Polypropylene honeycomb is also used as flat surface for cutting tools (waterjet cutting machines).
Polycarbonate honeycomb

Polycarbonate honeycomb is a thermoplastic material available in different sizes, thicknesses, colours and cells diameter. It’s used mainly for laminar-flow ventilation, commercial refrigeration, sterilized rooms, wind tunnels, and climatic chambers.

Honeycomb deflectors increase air flow efficiency and efficacy. Moreover, they eliminate turbulence, reduce impurity, humidity, and noise and energy consumption.

In lighting industry, black polycarbonate honeycomb is used as grids in front of led lamps to trap the peripheral light.

Polyetherimide honeycomb

Polyetherimide is a thermoplastic material. This polymer differs from other thermoplastics because of its high temperature resistance and its capacity to reflect radar.

It is used for the production of stealth panels for military use, for hi-tech panels and as the core material for snow boards.

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### Technical features

<table>
<thead>
<tr>
<th>Honeycomb core’s properties</th>
<th>standard</th>
<th>on request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>3, 5-90</td>
<td>6, 0-70</td>
</tr>
<tr>
<td>Cell size mm</td>
<td>3, 5</td>
<td>6, 0</td>
</tr>
<tr>
<td>Colour</td>
<td>grey</td>
<td>white</td>
</tr>
<tr>
<td>Density kg/m3</td>
<td>90</td>
<td>70</td>
</tr>
<tr>
<td>Compressive strength MPa</td>
<td>2, 8</td>
<td>1, 9</td>
</tr>
<tr>
<td>Compressive modulus MPa</td>
<td>115</td>
<td>95</td>
</tr>
<tr>
<td>Shear strength MPa</td>
<td>1, 3</td>
<td>1, 0</td>
</tr>
<tr>
<td>Shear modulus MPa</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>Effective temperature range °C</td>
<td>from -40 a +110</td>
<td></td>
</tr>
<tr>
<td>Thickness mm</td>
<td>from 3 a 300</td>
<td></td>
</tr>
<tr>
<td>Maximum length mm</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Maximum Width mm</td>
<td>1350</td>
<td></td>
</tr>
</tbody>
</table>
Commercial and Aeronautical grade aramid paper

Aramid paper impregnated with a heat resistant phenolic resin is an extremely lightweight, strong, non-metallic product. As a core material, aramid paper offers a unique combination of properties that allows for superior electrical insulation. Used in boat hulls, auto racing bodies and military shelters, aramid paper honeycomb cores also have many applications in the aeronautical, railway and shipyard industries.

Foams

PVC, PET and PIR foams offer optimal stiffness-to-weight-ratio, impact resistance, water resistance, thermal insulation, low resin absorption and high fatigue resistance. PVC foam is also self-extinguishing therefore it has good fire ratings. It is compatible with polyester, vinyl ester and epoxy resin. CEL COMPONENTS’ foams are easy to work, they can be rolled, cut, etc.

CEL’s foams have applications in many sectors, from marine applications (decks, bulkheads, interiors, hulls, etc.), to public vehicles (floors, interiors, partition walls, roof panels, front ends), wind energy (rotor blades, turbine generator housings), and sports (skis, snowboard, kayaks etc.); the applications are endless.

<table>
<thead>
<tr>
<th>Technical features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nomex Honeycomb-Commercial Grade</strong></td>
</tr>
<tr>
<td><strong>Nomenclature</strong></td>
</tr>
<tr>
<td>Ø Cell size mm</td>
</tr>
<tr>
<td>Hexagonal 3,2</td>
</tr>
<tr>
<td>Hexagonal 3,2</td>
</tr>
<tr>
<td>Hexagonal 3,2</td>
</tr>
<tr>
<td>Hexagonal 3,2</td>
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<td>Hexagonal 3,2</td>
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<td>Hexagonal 3,2</td>
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<tr>
<td>Hexagonal 4,0</td>
</tr>
<tr>
<td>Hexagonal 4,0</td>
</tr>
<tr>
<td>Hexagonal 4,8</td>
</tr>
<tr>
<td>Hexagonal 4,8</td>
</tr>
<tr>
<td>Hexagonal 4,8</td>
</tr>
<tr>
<td>Hexagonal 4,8</td>
</tr>
</tbody>
</table>

| **Nomex Honeycomb-Commercial Grade** |
| **Nomenclature** | **Compression Strength** | **L Shear** | **W Shear** |
| Ø Cell size mm | Density kg/m³ | N/mm² | N/ mm² | N/mm² |
| 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 6,4 | 96 | 4,0 | 0,54 | 0,16 |
| Hexagonal 6,4 | 32 | 0,68 | 0,56 | 0,29 |
| Hexagonal 6,4 | 96 | 4,6 | 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 | 86 | 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 |

<table>
<thead>
<tr>
<th>Honeycomb core’s properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>PVC</strong></td>
</tr>
<tr>
<td><strong>Density kg/m³</strong></td>
</tr>
<tr>
<td><strong>ASTM D1622 kg/m³</strong></td>
</tr>
<tr>
<td><strong>Compressive strength</strong></td>
</tr>
<tr>
<td><strong>ASTM D1621-10 MPa</strong></td>
</tr>
<tr>
<td><strong>Compressive modulus</strong></td>
</tr>
<tr>
<td><strong>ASTM D1621-10 MPa</strong></td>
</tr>
<tr>
<td><strong>Tensile strength</strong></td>
</tr>
<tr>
<td><strong>ASTM D1623 MPa</strong></td>
</tr>
<tr>
<td><strong>Tensile modulus</strong></td>
</tr>
<tr>
<td><strong>ASTM D1623 MPa</strong></td>
</tr>
<tr>
<td><strong>Shear strength</strong></td>
</tr>
<tr>
<td><strong>ASTM C273 MPa</strong></td>
</tr>
<tr>
<td><strong>Shear modulus</strong></td>
</tr>
<tr>
<td><strong>ASTM C273 MPa</strong></td>
</tr>
<tr>
<td><strong>Shear elongation at break</strong></td>
</tr>
<tr>
<td><strong>ASTM C273 % average</strong></td>
</tr>
<tr>
<td><strong>Dimensions: l-w-t</strong></td>
</tr>
</tbody>
</table>
| **Length** | 1330 | 84 | 2850 | 80 | 2730 | 78 | 1150 | 72 | 2450 | 68 | 1020 | 58 | 850 | 38 | 1600 | 48
Perforated aluminium honeycomb

Perforated aluminium honeycomb is normally used as core for vacuum tables and as core for moulds in the wind blade industry. The honeycomb is normally perforated longitudinally to permit the correct air flow. Perforations are implemented in compliance with our customers’ needs although 6 hole-perforation is standard.

Vacuum Tables

- Aluminium honeycomb core
- Outstanding planarity
- Lightness
- Resistance to cleaning solvents
- Aluminium surfaces and profiles
- Special dimensions on request

CEL COMPONENTS’ Vacuum Tables are made of a core in perforated aluminium honeycomb bonded to two aluminium layers, one of which is perforated according to the customers’ specifications. Vacuum tables are used in different sectors: serigraphy, electronic, modelling and engraving industry. High planarity is one of the main characteristics of CEL’s vacuum tables. Customers can also choose the profiles and coating characteristics.

Technical properties

<table>
<thead>
<tr>
<th>Honeycomb core’s properties</th>
<th>70 Microns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Aluminium Alloy 3003/3005/3103/3104</td>
</tr>
<tr>
<td>Grade</td>
<td>Aluminium Commercial</td>
</tr>
<tr>
<td>Cell size</td>
<td>on request +/-10%</td>
</tr>
<tr>
<td>Perforation</td>
<td>Yes</td>
</tr>
<tr>
<td>Foil thickness</td>
<td>70 Micron +16/-8 Microns</td>
</tr>
<tr>
<td>Density</td>
<td>It depends on the cell +/- 10%</td>
</tr>
<tr>
<td>Thickness of slices</td>
<td>On request</td>
</tr>
</tbody>
</table>

Dimensions

L-1250 mm (-0/+50 mm) x W-2500 (-0/+50 mm) expanded
L-6500 mm (-0/+100 mm) x W-3000 (-0/+100 mm) overexpanded. The regularity of the cell is not guaranteed.

Number of holes and their diameter

<table>
<thead>
<tr>
<th>Honeycomb core’s properties</th>
<th>Ø honeycomb in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3,2</td>
</tr>
<tr>
<td>Ø honeycomb in inches</td>
<td>1/8”</td>
</tr>
<tr>
<td>Density kg/m3</td>
<td>163</td>
</tr>
<tr>
<td>Compressive stabilised</td>
<td>10,2</td>
</tr>
</tbody>
</table>

The regularity of the cell is not guaranteed.

A = RAW ALUMINIUM SKINS. Thickness: from 1,5 to 3 mm.
B = Structural adhesive
C = PERFORATED ALUMINIUM HONEYCOMB
Ø 19 mm, 2 holes Ø 7mm
**Compocel AL (FR)**

COMPOCEL® AL (FR) is a sandwich panel with a core in aluminium honeycomb bonded with two skins of aluminium. It offers superior mechanical properties and excellent fire ratings. COMPOCEL® AL FR has passed the most stringent tests of European Regulation in shipbuilding, building and railway sectors.

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

B = Structural adhesive

C = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

<table>
<thead>
<tr>
<th>Fire Classification/Certification</th>
<th>Type</th>
<th>Norm</th>
<th>Sector</th>
<th>Certification/Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Flame Spread</td>
<td>IMO MED FTP Code 2010</td>
<td>Shipbuilding</td>
<td>Mod B e D</td>
<td></td>
</tr>
<tr>
<td>Fumes, droplets and calorific</td>
<td>UNI EN 13501-1</td>
<td>Building</td>
<td>Class A2 S1 D0</td>
<td></td>
</tr>
<tr>
<td>Floors, Separating Walls, ceilings</td>
<td>UNI EN 45545-2</td>
<td>Railway</td>
<td>Class R1, R2, R10</td>
<td></td>
</tr>
</tbody>
</table>

**Compocel H (FR)**

COMPOCEL® H (FR) is a sandwich panel with a core in aluminium honeycomb bonded with high pressure laminate face material. The external layer in laminate can have various finishes and colours. Lightweight panel COMPOCEL® H (FR) have different applications (partitions, interiors, furniture, ceilings and floors).

A = SKINS IN HIGH PRESSURE LAMINATE - Thickness: from 0,7 to 4 mm

B = Structural adhesive

C = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

**Compocel ALP**

With a polypropylene honeycomb core.

**Compocel ALF**

With a foam core.

**Compocel LZ**

With an aluminium honeycomb core.

**Compocel Inox**

With an aluminium honeycomb core.
**Compocel W**

*COMPOCEL® W* is a sandwich panel with an aluminium honeycomb core and plywood skins. All our products are produced according to our customers’ needs, and therefore the customer chooses the main characteristics of the panel, such as the type of coating, sizes, and finishes. *COMPOCEL® W* is normally used for interior design and furniture in various sectors.

**A** = SKINS IN MARINE PLYWOOD quality Okoumé
Thickness: from 1.5 to 8 mm
**B** = Structural adhesive
**C** = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

**Compocel FLOOR**

*COMPOCEL® FLOOR ALU-RIS, ALU-MAN* is an aluminium honeycomb core bonded with two aluminium skins. The upper face (thickness from 2mm) can be chosen among different antiskid/anti-slip coatings (almond pattern, rice corn pattern, etc.). As this panels is often used as flooring, where superior mechanical properties are required, the preferred thickness of the aluminium foil is 70 microns (high density), bringing the total thickness of the panel up to 20mm.

**A** = SKINS IN ALUMINIUM WITH ANTI-SLIP COATING
**B** = Structural adhesive
**C** = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells
**D** = RAW ALUMINIUM SKINS

**Fire Classification/Certification**

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<thead>
<tr>
<th>Type</th>
<th>Norm</th>
<th>Sector</th>
<th>Certification/Class</th>
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<td>Shipbuilding</td>
<td>Mod B + D</td>
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<td>Floors, Separating</td>
<td>UNI EN 45545-2</td>
<td>Railway</td>
<td>Class R1, R2, R10</td>
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<td>Walls, ceilings</td>
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**Compocel WP**

*With a polypropylene honeycomb core.*

**Compocel WF**

*With a foam core.*

**Other Compocel Panels with plywood**

**Compocel WP**

*With a polypropylene honeycomb core.*

**Compocel WF**

*With a foam core.*

**Alustep FLOOR**

*ALUSTEP® FLOOR* is a lightweight sandwich panel with a core in aluminium honeycomb bonded to two layers of fibreglass reinforced with epoxy resin. One side has an additional skin in satin finished stainless steel. This panel is normally used as decorative finishing for interiors. It is also used in architecture and design as it combines decorative and mechanical properties. These panels can be used for floors, ramps, lifts, engine and technical rooms and in general where anti-slip properties are required.

**A** = SKIN IN INOX - DECORATIVE NATURAL STAINLESS STEEL
**B** = Structural adhesive
**C** = SKINS IN GLASSFIBER FABRIC impregnated with epoxy resin
**D** = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells
Alustep 500
ALUSTEP® 500 is a sandwich panel with a core in aluminum honeycomb faced with fibreglass impregnated with epoxy resin. The application of ALUSTEP SERIES’ panels permits huge savings as far as weight and thickness of slabs of natural stones, such as marbles and granite and mosaics are concerned. With the reduction of material and weight, material, logistics and installation costs can be significantly reduced.

A = SKINS IN FIBREGLASS impregnated with epoxy resin 500g/m2
B = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

Alustep 300 Light
ALUSTEP® 300 LIGHT is a lightweight composite panel with an aluminum honeycomb core faced with fibreglass impregnated with 290 gram epoxy resin. This panel offers unique characteristics as it combines lightweight with superior mechanical properties. This is the lightest panel of Alustep series.

A = SKINS IN FIBREGLASS impregnated with epoxy resin 290g/m2
B = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

Alustep 300 D
Skins: 2-layers fibreglass impregnated with epoxy resin + aluminium honeycomb.

Also available as:

Alustep 500 Light
With an aluminium honeycomb core.

Alustep 500 SL
With an aluminium honeycomb core.

Polistep
With a polypropylene honeycomb core.
**Alustep F**

ALUSTEP® F is a lightweight sandwich panel with a core in aluminum honeycomb and two external layers in fiberglass reinforced with phenolic resin. Thanks to the low flammability of phenolic resin, this panel can be used in shipyards, trains and transport in general. Alustep F has obtained the IMO MED certification Mod. B and D for shipbuilding sector.

A = SKINS IN FIBREGLASS impregnated with phenolic resin 290g/m²
B = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells

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**Compocel VP**

COMPOCEL® VP is a sandwich panel with a core in polypropylene honeycomb and two external skins in polyester GRP with white gelcoat. This panel can be used either for insulation of vehicles or for exterior furniture and coatings.

A = SKIN OF POLYESTER GRP with white gel coat and protective film on gelcoat side - Thickness: from 1,1 mm to 3 mm
B = Structural adhesive
C = CORE IN POLYPROPYLENE HONEYCOMB

**Alustep o Polistep Inox**

ALUSTEP® INOX is a lightweight composite panel with an aluminum honeycomb core faced with fiberglass impregnated with epoxy resin and coated with a skin in satin finished stainless steel. This panel is normally used as decorative part for interiors. It is also used in architecture and design as it combines decorative and mechanical properties. Polystep Inox is the same panel with a core in polypropylene honeycomb.

A = INOX - STAINLESS STEEL - SATIN FINISH INC
B = Structural adhesive
C = FIBREGLASS impregnated with epoxy resin
D = CORE IN ALUMINIUM HONEYCOMB with hexagonal cells
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