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Product Description

Composition

Both thin or Compact OPAK high pressure laminate HPL are made of high tech decorative papers and Electron-beam cured (hardened) resins, producing materials with surface design and high performance properties. Its core is composed of several layers of phenolic resin impregnated papers that are consolidated under processing conditions of 70 to90 kg/cm^2 of pressure and temperature about 135°C (275°F). After pressed, OPAK laminates are sized to its final dimensions. Thin laminates are back sanded to allow optimal gluing and adhesion on substrates.

Applications And Recommendations

OPAK is specially formulated to provide a high performance surface.

Main Features	Property	Result
Very low light reflectivity.	Gloss	3-4 units
Extremely matte surface	Gloss	3-4 units
Micro scratch resistance.	Scrub resistance	10% loss of shine
Anti-fingerprints, soft touch and haptics.	Anti-fingerprint	No effect
Wear and impact resistant.	Abrasion resistance	cycles minimum
Dry heat resistant.	Dry heat resistance	160°C maximum
Highly resistant to domestic acids, solvents and reactive	Staining resistance	Rating < 10 points
Superb antibacterial properties.	Antibacterial property	No effect (reduces 99.99% in 24 hours)
Highly closed surfaces, ideal for hospitality projects	Resistance to immersion in boiling water	Less than 2% increase in weight and size

Designed for projects in institutional, commercial and home applications for both, horizontal and vertical use, it is recommended for kitchen and office worktops (radius ≥ 12.5mm). OPAK high pressure laminate (HPL) are only for indoor use, it does not allow extreme humidity or temperatures above 135°C (275°F), and it should not be exposed to continuous direct sunlight. OPAK is sold as a decorative laminate, available in the following references: Black 2260, White 2261, Gray 2262, Titan 2263 and Sand 2267. Only ultra-matte finish and Post-formable quality in radius of 12.5mm or more in longitudinal direction. Colour-matched edgebands available. For additional information, please contact our sales representatives or email us to customerservice@surfacematerials.com

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Applications

Thanks to its special features, OPAK can be used for both horizontal and vertical surfaces, as well as in a wide range of typical interior design applications, for residential and corporate applications: kitchens, bathrooms, countertops, siding blinds, doors and walls; offices, transportation, elevators, hospitals, health care, furniture and accessories such as tables, bookcases, chairs, partitions, between others.

Its surface characteristics make it a high-performance material and can also represent a valid alternative to other materials such as solid surfaces or glass, with the additional advantage of ease of work.

Transport & Transfer

The Compact OPAK panels must be transported in a horizontal position, perfectly aligned one above the other, without exceeding 10 height modules. It is recommended to protect the perimeter with cardboard to prevent them from being knocked out on contact and should preferably be transported on pallets.

The manipulation of the modules on site must always be done with gloves to avoid cuts by the edges of the panels. Manual transfer must be performed in a horizontal position. If vertical transport devices are required, they should be designed with the same dimension of the panels. Despite the excellent hardness of the surface and the protective film for assembly, the weight of the stack of panels can be a possible cause of damage. Therefore, always avoid any kind of dirt or dust between the panels.

The OPAK panels must be secured against slipping during transport, when loading or unloading, the panels must be lifted. Do not push or drag them around the edges. The transport protection film must not be exposed to heat or direct sunshine.

Storage

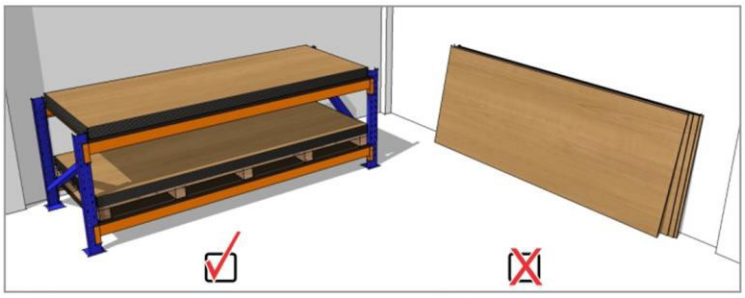
Storage of the panels must always follow the following recommendations, independent from their modulation:

The OPAK should be conditioned in a dry and ventilated place, never outdoors. It must be stowed horizontally and stored as much as possible at ambient temperature of less than 30°C and relative humidity less than 60%. Avoid differences in temperature on the two surfaces of the panel, for no reason should the panels be supported on walls or placed in vertical position, because, due to the force of gravity and frequent changes in temperature, the panels can lose their dimensional stability. The excess of humidity can damage the dimensional stability of the panels, they should never be stored outdoors because the horizontality of the storage, the modules can be affected by water stagnation. It must be verified that the modules are one on top of the other in a continuous manner, without corbelled panel areas on other panels. A maximum of 10 continuous

modules should be stored. It is advisable to place the panels on pallets or any other type of platform that allows the lower circulation of air and protect from possible water deposits. Always place the protective laminate above and below the panels and put a weight on top. After removing the panels, the protective laminate must be closed over the stack of panels. The same will have to be done with stacks of cut panels. Improper storage can cause permanent deformation of the panel.

The frontal protective film with which the panels of Compact OPAK are delivered should only be removed once the OPAK installed, as it protects it from the friction to which it is exposed during transport, storage and installation, however, the protective film backup must be removed before installation to avoid unbalance of the installed product. As soon as the protective film is removed, the first cleaning process must be done to remove any trace or residue of the adhesive from the film completely, the longer the product installed with the protective film passes, the more difficult it is to remove the residue from the adhesive. With pre-installed fastening elements, therefore, care is to be taken that the climatic effect is uniform on all sides. Use intermediate layers of wood or plastic.

Note that contaminants (for example, waste from the oil of the cutting or drilling machine, grease, adhesive residue, construction mortars, sunscreens, chemicals in general, etc.), which are placed on the surface of the OPAK during storage or assembly should be removed immediately, leaving no residue. In case of disregarding this recommendation, claims related to color, finish and surface will not be accepted / recognized. Refer to the Maintenance and Cleaning Instructions chapter.



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How to Cut OPAK

The following general guidelines apply to cuts made onto OPAK high pressure laminate (HPL) using circular saws.

- Feed: 7 - 22m/min (23 - 72ft/min).
- Teeth: alternate or flat-top V-shaped teeth.
- Positioning: always position the teeth on the decorative side of the panel.
- Edge cutting: best results are obtained using bench machinery. Sharp edges can be rounded by means of sandpaper or a milling machine.
- Rake angle: best performance are obtained with a 45° rake angle. Use rubbers shims to prevent the panels from sliding in case the machine is not equipped with a mobile work top.

Hand-Held Circular Saw

When using a hand-held circular saw, the panel side with no decorative should be turned upwards.

Bench Circular Saw

- Keep decorative side facing upwards when saw cutting, drilling and milling.
- When a decorative side must be slid over the machine's worktop while machining, it is recommended to place a protective panel on the worktop (E.g. hardwood).

Diameter		Teeth	RPM	Thickness of the blade		Blade height adjustment	
mm	In	N°	1/min	mm	In	mm	In
150	6	36	4000	2.5	7/64	15	5/8
200	8	36	4000	3	1/8	20	3/4

Jig Saw

Carbide-tipped, interior corners of cut-outs should be drilled first with 8 - 10mm (≈5/16 - 3/8in) hole diameter. Consider the use of a specific jig saw blade for decorative surfaces.

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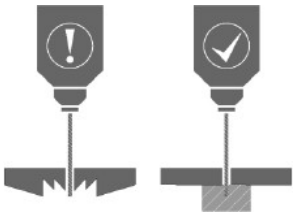
Drilling

The use of carbide-tipped HSS-drill bits with 60-80° angle is recommended. OPAK high pressure laminate (HPL) should be drilled using support sheets. Large holes, such as those for suspension and locking equipment, should be drilled using combination drill bits. The exit speed of the drill bit must be carefully selected so as not to damage the product surface. Shortly before the drill bit exits the work piece in full diameter, the feed rate must be reduced by 50%.

During drilling operations, the counter-pressure should be increased using hardwood or equivalent material to prevent the surface from breaking.



Milling

Milling shapes:
- Straight and slanted bits for cutting edges and beveling.
- Hollow or round ground bits for rounded edges.
- Diamond circular saw blades for grooves.

Material:

Hard metal or diamond cutters manually operated milling cutter or spindle moulder:

Diameter		RPM	Speed		Feed	
mm	In	1/min	m/s	Ft/s	m/min	ft/min
20-25	1	18000-24000	20-30	65-100	5	16
125	5	6000-9000	40-60	130-200	5-15	16-50

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Gluing

For thin OPAK high pressure laminates (HPL) the selection of the adhesive to be used there are several alternatives, the most common is solvent-neoprene based contact cement, which is recommended for manual applications where the pressure exerted is low. When it comes to industrial applications we recommend PVA (polyvinyl acetate) adhesives, which are not reactivatable with heat and have high resistance to moisture. For a good adhesion of the high pressure laminate (HPL) OPAK, we recommend using between 80 and 140g/m^2 of PVA adhesive and exert a pressure of 2 to 3kg/cm^2. At the end of the application, in case of residues of adhesive in the high pressure laminate (HPL) OPAK clean the surface with a soft cloth moistened with organic solvent or with a 50:50 mixture of alcohol-organic solvent. It should be rinsed with mild temperature water.

To prevent the plating surface with high pressure laminate (HPL) OPAK from buckling or warping, we suggest applying the laminate balance to the back face of the veneer in order to obtain the optimum balance in the moisture absorbed by the layer of the substrate.

Compact OPAK high pressure laminate (HPL) panels can be glued to each other and onto many materials using one or two component adhesives, such as epoxy or polyurethane adhesive systems.

Gluing is in many cases carried out together with a mechanical joint to provide sufficient pressure during drying.

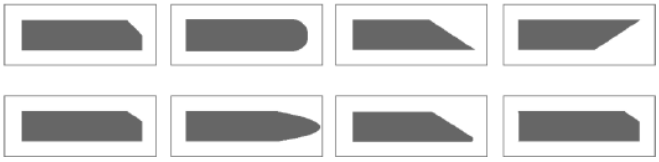
Please follow the instructions below for edge thickening with OPAK Compact Strips:

1. Make sure panels and strips have the same "grain direction".
2. Pre-condition panels, strips and adhesive in the same way (temperature and humidity preferably adjusted as for future conditions of use).
3. Remove grease from surfaces to be glued, slightly roughen them and ensure they are dust- free.
4. Strictly follow the instructions provided by the adhesive manufacturer.

Edges / Milling Templates

Edges should be safe, free from saw marks and jagged edges. For better appearance it is advised to polish edges. There are several edge treatments for both functional and aesthetic consideration.

Some examples follows:



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General Installation Guidelines

There are two major installation systems for OPAK Compact

• Mechanical (screws and rivets)
• Chemical (glue)

OPAK can be used as so-called suspended cladding elements. This means that the material is assembled on a supporting sub frame. The panel can be fixed visibly or invisibly. It is important when determining the sub frame to take the following points into account:

Load-bearing requirements:
• Maximum fixing distances for the panels.
• The necessary ventilation or moisture regulating provisions.
• The possibility for panels to move.
• The available panel sizes.
• The thickness of any insulating layer.
• The anchoring options in the building (wall) construction.
• The legal requirements.

Corner Solutions

To join two OPAK Compact in one corner, it is important to take the panel movement into account. To avoid tension at the joint it is advisable to keep the leg length of the corner element as small as possible (max 400mm).

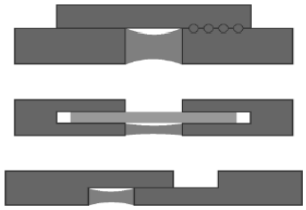
Compact panels can be joined together in corners in various ways:

• Glued aluminum or plastic corner profile.
• Glued aluminum or plastic tongue.
• Built-in tongue and groove joint with support.

Joints and Connections
Solutions for vertical joints include:
• Expansion joint.
• Built-in Groove.
• Rebated joint.

In view of possible changes in size as a result of moisture and temperature changes, joints should be left free both for vertical and horizontal connections in such a way that the panel can move by a maximum of 2.5mm/m. Thanks to the excellent workability of the material, it is possible to accurately seal vertical and horizontal joints without auxiliary profiles.

For panel thicknesses from 8mm upwards it is possible to make connections in the form of rebated joints or as built-in groove connections.



Horizontal joints: either built-in groove or rebated joint connections can be used for horizontal joints.

Joints must be made in such a way that the panels can move by 2.5mm/m maximum. The recess in the rebated joint must measure at least twice the width of the joint itself.

Vertical joints: built-in groove connections can be used for vertical joints. Panel thickness on each side of the groove must be at least 2.9mm. In case aluminum grooves are used, a panel thickness of 8mm is sufficient.

Joint Sealing Using Mastic

When OPAK Compact are used for interior applications where high standards of hygiene are require, wall constructions with airtight seals are often preferred. The joints are then sealed with an elastic mastic.

This sealing material must be mould repellent (ISO 846) and resistant to disinfectants, if it is used in the aforementioned applications. Furthermore, for maximum bond between the sealing material and the panel, it is necessary to avoid draughts, damp, dust and dirt. It is recommended to use OPAK Compact in combination with silicone or polyurethane mastic.

- The joint must be absolutely clean, dry and free of grease.
- If necessary, a primer should be applied to facilitate bonding.
- The sealing material must on no account adhere to the reverse side (bonding on three x sides) because this can cause breakage of the panel. It is advisable to use a separating film or a polyethylene tongue.
- To ensure that the sealing material is not under excessive strain, grout joints should be wide enough, and their depth should not be greater than their width.

Visible Fixing With Screws Or Rivets

OPAK Compact panels can be fixed to a timber sub-frame structure using fast fix screws or they can be fixed to a metal sub-frame structure using aluminum rivets.

The sub-frame structure must be assembled in such a way that the area behind the panel is ventilated. In this way, the temperature and humidity rate will be the same on both sides of the panel.

When fixing panels with screws or rivets, it is important to ensure that panels can move freely and evenly. The diameter of all pre-drilled holes in the panels must be 8mm when using fast fix screws that have a diameter of 4mm. When using rivets with a 5mm diameter, one hole - centrally positioned in the panel - must be pre-drilled with a 5.1mm diameter and all other holes must be pre-drilled with a 10mm diameter. A special nosepiece must be used on the riveting tool to keep the head of the rivet 0.3mm away from the panel surface.

All joints must be at least 8mm wide. Panel thickness: from 6mm upward (For efficiency and performance purposes, a minimum thickness of 8mm is recommended).

Maintaining And Cleaning Instructions

Daily Maintaining

As many other interiors design materials OPAK Surfaces should be cleaned regularly.

Clean out only by using a wet soft cloth, with mild temperature water and, if necessary, use soft detergent. Almost all common non-abrasive household cleaning and disinfection products can be used.

For common blemishes, simply clean the surface with mild temperature water by using a non-abrasive cloth, harder stains can be eliminated aided with non-abrasives domestic solvents and cleaners.

When old stains, dry and accumulate, use a magic sponge or soft cloth to take them out. After using any solvent it is mandatory to rinse the surface with warm water and a mild detergent and repeat the rinse with water.

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Maintenance Instructions With Magic Sponge

OPAK by having an outer layer of closed porosity allows it to be kept clean with daily care in case of persistent stains the use of a specific cleaning product is recommended to remove any trace of stain. In case of micro scratches, follow the following surface maintenance instructions. After cleaning or after using the magic sponge, rinse thoroughly with clean water, preferably warm, to remove any detergent, solvent or any other residual cleaning agent.

1. Superficial defects caused by micro-scratches

2. Rub the magic sponge over the area where the micro-scratches can be seen. The sponge can be used dry or slightly moistened.

3. The surface should now be repaired

Useful Cleaning Tips

To obtain the best results when clean OPAK surfaces, it is very important to remind the following tips:

An OPAK Surface should NEVER be cleaned with products containing abrasives, metal sponges, sanding paper or Steel wool.

Avoid strong acid or alkaline substances because the surface can be irreversibly stained. Chlorinated substances can degrade and discolor the surface. Sodium hypochlorite must be used at concentrations under 5% allowing continuous contact not more than 5 minutes and, after cleaning, surfaces must be rinsed by using enough mild temperature water and soft clothes.

Hydrogen peroxide must be used at concentrations under 3% allowing continuous contact not more than 10 minutes and, after cleaning, surfaces must be rinsed by using enough mild temperature water and soft clothes.

When solvents are used, cloth should be very clean to avoid residual marks on the OPAK surface. It is recommended to wash out and rinse with mild temperature water.

Do not use furniture restoration products or wax-based cleaning products because they tend to leave residual grease on the surface that traps dirty particles.

Lamitech

Do not use metallic scrapers, metallic brushes or any other metallic tool to remove residuals from OPAK surfaces, like gypsum or dry paint because surface can irreversibly damaged.

Cleaning Tips

At the beginning, use a dry cloth or paper towel, then use water between 35-40°C (95-105°F) with domestic soft soap or detergent, allowing to act until dirt starts to soften.

If dirty and blemishes remain, use a solvent like white spirit and, then use water between 35-40°C (95-105°F) with domestic soft soap or detergent, permitting to act until dirt starts to soften.

If dirty and blemishes remain, clean the surface with a soft cloth or use a 50:50 mixture of alcohol and organic solvent, so as not to affect its original tone and design. The resistance to staining is high however we DO NOT recommend its use on lab type work surfaces where they use oxidizing chemicals, alkalis and strong acids in their daily work.

Instructions For Removing Difficult Stains

Acetone or nail remover, alcohol, gasoline, turpentine, White spirit, trichloroethylene, perchloroethylene and thrichloroethane are suitable to remove neoprene residues.

3M Graffiti Remover, paint diluent or Hauser Vandal are some commercial substances that can be used. Remember to always rinse by using enough water.

Note: Product Brand names are only suggestions and its effectivity is not guaranteed.

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Technical specifications					
TEST	**TEST METHOD**	**PROPERTY**	**UNIT**	**COMPACT OPAK**	**THIN OPAK**
Surface quality	EN 438 2-4	Spots, dirt, similar surface defects	mm² / m²	≤ 2	≤ 2
			in² / ft²	≤ 0.0003	≤ 0.0003
		Fibers, hairs & scratches	mm / m²	≤ 20	≤ 20
			in / ft²	≤ 0.07320	≤ 0.07320
Dimensional tolerances	EN 438 2-5	Thickness	mm	2.0 ± 0.2 mm 4.0 ± 0.3 mm 6.0 ± 0.4 mm 8.0 ± 0.5 mm 12.0 ± 0.6 mm 18.0 ± 0.7 mm 20.0 ± 0.8 mm	0.70 ± 0.10 mm 1.0 ± 0.15 mm
			in	0.0787 ± 0.0079 in 0.1575 ± 0.0118 in 0.2362 ± 0.0157 in 0.3150 ± 0.0197 in 0.4724 ± 0.0236 in 0.7087 ± 0.0276 in 0.7874 ± 0.0315 in	0.0275 ± 0.0039 in 0.0394 ± 0.0059 in
	EN 438 2 -9	Flatness	mm / m	≤ 2	≤60
			in / ft	≤ 0.024	≤2.362
	EN 438 2-6	Length & width	mm	+1/-0	+5/-0
			in	+0.0394/-0	+0.1968/-0
	EN 438 2-7	Straightness of edges	mm / m	≤ 1.0	≤ 1.0
			in / ft	≤ 0.012	≤ 0.012
	EN 438 2-8	Squareness	mm / m	1220 x 2440 mm difference between diagonals +/-2 mm	
				1220 x 3060 mm difference between diagonals +/-3 mm	
				1530 x 3660 mm difference between diagonals +/ -4mm	
				1530 x 2440 mm difference between diagonals +/-3 mm	
			in / ft	48.03 x 96.06 in. difference between diagonals +/- 0.024 in	
				48.03 x 120.47 in. difference between diagonals +/- 0.036 in	
				60.24 x 144.09 in. difference between diagonals +/- 0.048 in	
				60.24 x 96.06 in. difference between diagonals +/- 0.036 in	
Resistance to Impact (Small diameter ball)	EN 438 2-20	Force	N	-	>25
			lbf	-	>5.62
Impact Resistance (Large diameter ball)	EN 438 2-21	Indentation diameter - 6 ≤ t mm with drop height 1.8 m	mm	≤ 8.0	-
			in	≤ 0.315	-
EDimensional stability at elevated temperature	EN 438 2-17	Cumulative dimensional change	Longitudinal%	≤ 0.25	≤ 0.75
			Transversal%	≤ 0.25	≤ 1.25
Resistance to wet conditions	EN 438 2 -15	Mass increase	%	≤ 3	-
		Appearance	Grade	≥ 4	-
Modulus of elasticity	EN ISO 178	Longitudinal	MPa	>9820	-
		Transversal	MPa	>9820	-
Flexural strength	EN ISO 178	Longitudinal	MPa	>133	-
		Transversal	MPa	>133	-
Tensile strength	EN-ISO 527-2	Longitudinal	MPa	>70	-
		Transversal	MPa	>70	-
Density	ISO 1183	Density	g/cm3	≥ 1.40	≥ 1.40
Resistance to fixings	ISO 13894 -1	6mmThikness	N	>3000	-
		8mmThikness	N	>3000	-
		10mmThikness	N	>3000	-
Resistance to climate shock	EN 438 2-19	Index R. to Flex	Index	1.02	-
		Flexion Module Index	Index	0.97	-
		Appearance	Grade	≥ 4	-
Formaldehyde Emissions	UL2818 -2013	Formaldehyde	ppm	<0.005	<0.005
	EN 438-7-2015			E1	E1
Thermal conductivity	EN1254	-	W/mK	0.3	-
Thermic dilatation coefficient	ISO 10545 - 8	Longitudinal	1/K	$1.6x10^{-5}$	-
		Transversal	1/K	$3.4x10^{-5}$	-
	ASTM E84			Standard Compact B, Fire Rated Compact A	A