Fire Rated HPL
Technical Bulletin

Product Description

Composition

Both thin or Compact Fire Rated high-pressure laminate (HPL) are made of melamine resin, special decorative papers, kraft papers with phenolic resin and fire retardant agents that make up the support of the laminate. This set is subjected to a specific pressure of 90kg / cm2 and a temperature of 135 ° C (275 ° F). Once pressed, the thin fire Rated laminate is cut in nominal dimensions and sanded on its back to provide greater adhesion when applied with adhesive on the wood substrate.

Recommended Uses

Fire Rated laminate is recommended for standard interior applications of horizontal and / or vertical surfaces that are specified with fire retardant property and that minimize smoke emission. The degree of fire Rated in a laminate is evaluated by compliance with ASTM E84 (analysis method to determine fire retardant characteristics in construction materials), CAN ULC S102 and EN 13501-1 (classification according to fire behavior) as well as certifications under UL-723 for compliance with military codes MIL-P-17171E (SH), LP-508-H, MIL-STD -1623D (SH) or IMO part 2.5 and 6 of the US Coast Guard in interior finishes for warships, merchant ships and military equipment in the United States, only at the express request of the client.

Fire Rated laminate is specially designed for surface coating in public spaces such as hospitals, elevators, hotels, airports, confined areas, schools and institutional buildings.

Basic Limitations

The Fire Rated laminate is a surface for indoor use, it is not structural material, it does not admit extreme humidity or temperature above 135°C (275°F) should not be exposed to direct and continuous sunlight, it should not be post- form, should be used in normal or straight applications. Fire Rated laminate is marketed in any design of our approved line.

The customer must be clear that, in order for a piece of furniture or accessory coated with our laminate to be considered Fire Rated, all the constituent parts thereof (wood substrate, adhesive, hardware and others) must comply with the specified fire retardant standards For each type of material. Any additional guidance please consult our commercial representative.

Useful Information

1. Both the adhesive and the wood substrate used in Fire Rated laminate applications must comply with ASTM E-84, CAN ULC S102 or EN 13501-1 as appropriate. Together they must have the same classification given by NFPA 101. Consult your supplier of adhesives and wood so that the furniture or final accessory apply to this type of use. For more information on alternatives in this regard please consult our commercial representative.

2. In order to prevent the veneered surface with Fire Rated Laminate from buckling or deforming, we suggest applying the Backer laminate or Fire Rated balance on the back of the veneer, in order to obtain the optimum balance in the moisture absorbed by the wood layer It is recommended that the Fire Rated Laminate and its backer be the same thickness.

3. Fire Rated laminate provides a long lasting and easy to maintain surface. Stain resistance is high, however, we do not recommend its use on laboratory work surfaces where they use oxidizing chemicals, alkalis and strong acids in their daily work.

Typical Fire Test Data

Typical data for Fire Rated laminate are obtained from the Stenier Tunnel Test, under the method of the American Society for Material Testing (ASTM E-84, Methods of Analysis to determine the fire resistance characteristics in materials for construction), certified by the Intertek laboratory, from the CAN / ULC-S102 test certified by the Exova Warringtonfire North America laboratory and by the UNE- EN ISO 11925: 2011 tests as indicated by reference standard UNE-EN 13501-1 : 2007 + A1: 2010 certified by Applus laboratories, member of the ILAC.

Purpose

ASTM E84: The purpose of the analysis is to determine the relative performance of the test material under fire exposure. The results are given by the spread of the flame and the generation of smoke. The result of the test is due to a comparison of the values thrown by the analyzed samples and the materials that are considered as standard, asbestos with a flame spread of zero (0) and the oak that presents a flame spread of one hundred 100).

- **CLASS A** 0-25 FLAME PROPAGATION 0-450 SMOKE GENERATION
- **CLASS B** 26-75 FLAME PROPAGATION 0-450 SMOKE GENERATION
- **CLASS C** 76-200 FLAME PROPAGATION 0-450 SMOKE GENERATION

Results Under ASTM E84				
NEMA TYPE	**LAMITECH**	**INTERTEK CERTIFICATE**	**NFPA CLASS 101**	**PROPAGATION OF THE FLAME SMOKE GENERATION**
VGF	**VGF**	**10323933SAT-002A**	**A**	**20/654**

CAN / ULC-S102: This test is designed to determine the surface burn characteristics related to materials under specific conditions. The results are expressed in terms of the Flame Scattering Value (FSV) and the Smoke Development Value (SDV)

The results according to the Exova Warringtonfire North America 18-002-315 report

are: FSV: 33
SDV: 104

EN 13501-1: Test that seeks to understand the fire behavior of construction products according to UNE-EN ISO 11925-2: 2011 standards: Reaction to fire by measuring the ignition of products under direct flame and UNE-EN 13823: 2012+ A1: 2016: Reaction to fire for construction products exposed to thermal attack by a single burning unit.

Results Under EN 13501-1			
NEMA TYPE	LAMITECH	APPLUS CERTIFICATE	CLASS
VGF	VGF	17/13495-44	C-s2, d0
Compact	Compact	17/13495-314	B-s1, d0

Fire-Covered General Codes And Certificates

The purpose of the analysis is to determine the relative performance of the test material under fire exposure. The results are given by the spread of the flame and the generation of smoke. The result of the test is due to a comparison of the values thrown by the analyzed samples and the materials that are considered as standard, asbestos with a flame spread of zero (0) and the oak that presents a flame spread of one hundred 100).

The data of the ASTM E-84 analyzes have been approved under the following international standards:

- American National Standards Institute: ANSI No. 2.5
- National Fire Protection Association: NFPA No. 225
- Assurance Laboratories: No. 723
- Uniform Building Code (UBC): No. 42 - 1

The test is the database for fire codes written by several responsible groups, including:

- **BBC:** Basic Construction Code (Official Construction Conference of America. Used in the Middle East and Northeast).
- NFPA: National Fire Protection Agency (Base Construction Code, Section # 101).
- SSBC: Southern Stándar Building Code (Southern Building Code Assembly. Used mainly in the south).
- UBC: Uniform Construction Code (International Conference of Building Officials, or ICBO. Used in Western States).

Transport & Transfer

The Compact Fire-Rated HPL 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 Fire-Rated HPL 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 Fire-Rated HPL 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 30ºC 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.

In the event that the material is requested with protective films, the front protective film with which the Compact Fire Rated HPL panels are delivered should only be removed once the Fire Rated HPL is installed, as it protects it from friction. which are exposed during transport, storage and installation, however, the protective backing film must be removed before installation to avoid imbalance of the installed product. As soon as the protective film is removed, the first cleaning process that removes any trace or residue of the adhesive from the film must be done completely, the longer the product installed with the protective film passes, the more difficult it is to remove the residue from the adhesive. In the case of previously mounted fasteners, keep in mind that the effect of temperature is the same on all sides. You have to 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 HPL Fire Rated sheets 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.

How To Cut Fire Retardant

The following general guidelines apply to cuts made onto Fire Rated 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

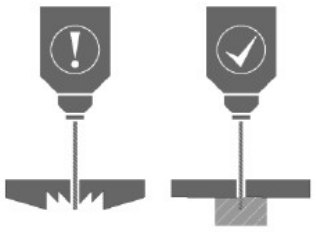
Jig Saw

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.

Drilling

The use of carbide-tipped HSS-drill bits with 60-80° angle is recommended. Fire Rated 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

Gluing

Both the adhesive and the wood substrate used in Fire Rated laminate applications must comply with ASTM E-84, CAN ULC S102 or EN 13501-1 as appropriate. Together they must have the same classification given by NFPA 101. Consult your supplier of adhesives and wood so that the furniture or final accessory apply to this type of use.

To prevent the veneered surface with thin high pressure laminate (HPL) Fire Rated from buckling or deforming, we suggest applying, on the back face of the veneer, the balance laminate, in order to obtain the optimum balance in the absorbed moisture by the substrate layer.

High-pressure Fire Rated (HPL) laminates Compact can be glued together and in many materials using one or two component adhesives, such as epoxy or polyurethane adhesive systems that meet the classification given by NFPA 101.

Gluing is performed in many cases together with a mechanical seal to provide sufficient pressure during drying.

Follow the instructions below for thickening edges with strips Compact Fire Rated:

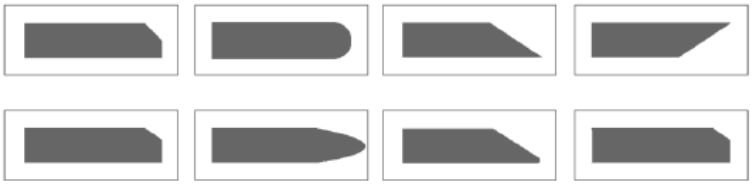
1. Make sure the panels and strips have the same "grain direction".
2. Pre-condition panels, strips and adhesive in the same way (temperature and humidity preferably adjusted for future conditions of use).
3. Remove grease from the surfaces to be glued, scrape lightly and make sure they are free of dust.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

Type of glue	Application	Open Time	Pressure	Set time/Temperature
Epoxy Adhesive	100 - 250 g/m2	Depending on the type	0.2 N/mm2	4-8 Hrs - 68 °F
Polyurethane	101 - 250 g/m2	Depending on the type	0.2 N/mm2	4-8 Hrs - 68 °F

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:



Corner Solutions

When joining two Fire Rated Compact in a 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).

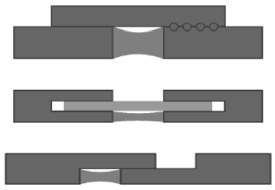
Compact panels can be joined together in corners in various ways:

- 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 2.5 mm/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 Compact Fire Rated is used for indoor applications where high standards of hygiene are required, wall constructions with airtight seals are often preferred. The joints are sealed with an elastic mastic that meets the classification given by NFPA 101.

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 a good retardant. 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.

Maintaining And Cleaning Instructions

Daily Maintaining

As many other interiors design materials the Fire Rated laminate 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.

Useful Cleaning Tips

For best results when cleaning Fire Rated laminates, it is very important to remember the following tips:

A Fire Ratedlaminate should NEVER be cleaned with products containing abrasives, metal sponges, sandpaper or steel wool. Avoid strong acids 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, the fabric must be very clean to avoid residual marks on the Fire Rated laminate. It is recommended to wash out and rinse with mild temperature water.

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

Do not use metal scrapers, metal brushes or any other metal tool to remove debris from Fire Rated laminate, like gypsum or dry paint because surface can irreversibly damage.

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.

(440) 248-0000
6655 parkland boulevard
solon, ohio 44139
(440) 519-1950 fax
www.surfacematerials.com