

Product Data Sheet for Decorative High Pressure Laminates (HPL) July 2005

Preface

This information describes the composition of HPL and gives advice for their handling, processing, use, and disposal. It covers all HPL grades as described in EN 438. HPL are not classified as hazardous substances and therefore they do not require a special marking nor a description by a safety data sheet.

Contents

| | |
|---|---|
| 1 | Description |
| 2 | Storage and Transportation |
| 3 | Handling and Machining of HPL |
| 4 | Environmental and Health Aspects in Use |
| 5 | Maintenance |
| 6 | HPL in Fire Situations |
| 7 | Energy Recovery |
| 8 | Waste Disposal |
| 9 | Technical Data |

ICDLI

International Committee of the Decorative Laminates
Industry

1. Description

The materials referred to are high pressure decorative laminates (HPL) according to the European Standard EN 438 and to ISO 4586.

HPL are sheets consisting of layers of cellulose fibrous material (normally paper) impregnated with thermosetting resins and bonded together in a high pressure process. The process, defined as a simultaneous application of heat (≥ 120 °C) and high specific pressure (≥ 5 Mpa), provides flowing and subsequent curing of the thermosetting resins to obtain a homogenous non-porous material ($\geq 1,35$ g/cm³) with the required surface finish.

Basically more than 60 % of the HPL consist of paper and the remaining 30 to 40 % consist of cured phenol-formaldehyde resin for core layers and melamine-formaldehyde resin for the surface layer.

Both resins belonging to the group of thermosetting resins are irreversibly interreacted through cross linked chemical bonds formed during the curing process producing a non-reactive, stable material with characteristics which are totally different from those of its component parts.

HPL are supplied in sheet form in a variety of sizes, thicknesses and surface finishes.

Where improved fire retardance is required, the laminate core may be treated with an additive which does not contain halogens.

2. Storage and Transportation

Storage and transportation should be carried out in accordance with the General Processing Recommendations for HPL; no special precautions need to be taken.

For transportation, HPL is classified as a non-hazardous product; no labelling is required.

3. Handling and Machining of HPL

The usual safety requirements of fabrication and machining should be observed with regard to dust extraction, dust collection, and fire precautions.

Because of the possibility of sharp edges protective gloves should always be worn when handling laminates. The contact with dust from HPL does not present any special problems, however a small percentage of personnel may be sensitive or even allergic to machining dust in general.

4. Environmental and Health Aspects in Use

Decorative laminates are cured and therefore chemically inert.

HPL formaldehyde emission level is far below the limit for wood based materials. Due to their very low permeability HPL bonded to wood based substrates act as a barrier against possible formaldehyde emissions coming from the substrates.

There is no migration affecting foodstuffs and, consequently, HPL are approved for contact with foodstuffs.

The decorative surfaces are resistant to common household solvents and chemicals and have therefore been used for many years in applications where cleanliness and hygiene are important.

The non-porous HPL surface and edges are easy to disinfect with hot water, steam and all types of disinfectants used in hospitals and other commercial facilities.

5. Maintenance

As HPL do not suffer from corrosion and oxidation, they do not need any further surface protection (laquers or paints).

6. HPL in Fire Situations

Laminates are difficult to ignite and have properties that retard "spread of flame", thus prolonging evacuating time.

Due to incomplete burning, as with many organic material, hazardous substances are to be found in the smoke. However, HPL are capable of meeting the best performance for organic surfacing materials specified in the French standard NFF 16101 (= at least class F2 for smoke density and toxicity).

In dealing with fires involving laminates the same fire fighting techniques should be employed as with other wood based building materials.

7. Energy Recovery

On account of their high calorific value (18 - 20 MJ/kg)¹ HPL are ideal for thermal recycling. When burnt completely at 700 °C, HPL produce water, carbon dioxide and oxides of nitrogen. Therefore HPL comply e. g. with paragraph 6 of the economic law of circular flow (Kreislaufwirtschaftsgesetz).

Well controlled burning processes are achieved in modern, officially approved industrial incinerators. Ashes of this process can be brought to controlled waste disposal sites.

8. Waste Disposal

HPL can be brought to controlled waste disposal sites according to current national and/or regional regulations.

9. Technical Data

9.1 Physical/chemical characteristics

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| 9.1.1 | Physical state | Solid sheets |
| 9.1.2 | Density | ≥ 1,35 g/cm ³ |
| 9.1.3 | Solubility | Insoluble in water, oil, methanol, diethyl ether, n-octanol, acetone |
| 9.1.4 | Boiling point | None |
| 9.1.5 | Evaporation rate | None |

¹ For comparison: Calorific value of oil - 37 - 41 MJ/kg, of hard coal - 28 - 31 MJ/kg

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| 9.1.6 | Melting point | HPL do not melt |
| 9.1.7 | Calorific value | 18 - 20 MJ/kg |
| 9.1.8 | Heavy Metals ium, | HPL do not contain toxic compounds of antimony, Heavy metals bar- cadmium, chromium ^{III} , chromium ^{VI} , lead, mercury, selenium. |
| 9.2 | Stability and reactivity data | |
| 9.2.1 | Stability | HPL are stable; they are not considered to be reactive or corrosive. |
| 9.2.2 | Hazardous reactions | None |
| 9.2.3 | Material incompatibility | Strong acids or alkaline solutions will stain the surface |
| 9.3 | Fire and explosion data | |
| 9.3.1 | Ignition temperature | Approx. 400 °C |
| 9.3.2 | Flash point | None |
| 9.3.3 | Thermal decomposition | Possible above 250 °C. Depending on the burning conditions (tem- perature, amount of oxygen, etc.) toxic gases may be emitted, e. g. carbon monoxide, carbon dioxide, ammonia. HPL are classified safe when tested according to NF F 16 101 |
| 9.3.4 | Smoke and Toxicity | HPL are classified F2 when tested according NF F 16 101. |
| 9.3.5 | Flammability | HPL are not considered to be flammable. They will burn only in a fire situation, in presence of open flames. |
| 9.3.6 | Extinguishing media | HPL are considered as class A material. Carbon dioxide, water spray, dry chemical foam can be used to extinguish flames. Water dampens and prevents rekindling. Persons in fire situations should wear self breathing apparatus and fire protective clothing. |
| 9.3.7 | Explosion hazards | The machining, sawing, sanding and routing of HPL produce class ST-1 dust. Safety precautions and adequate ventilation must be ob- served to avoid airborne dust concentration. |
| 9.3.8 | Explosion limits | Dust levels should be kept below 60 mg/m ³ |
| 9.3.9 | Protection explosion and fire | against In the case of fire HPL shall be treated as wood based materials. |
| 9.4. | Electrostatic behavior | It minimizes the generation of charge by contact-separation or rubbing with another material. It does not need to be earthed. Surface resistiv- ity is between 10 ⁹ – 10 ¹² ohms and a chargeability of V ≤ 2 kV accord- ing to CEI IEC 1340-4-1 so that HPL are antistatic material. |
| 9.5 | Storage and transport | HPL are classified as non-hazardous for transportation purposes and there are no specific requirements. |

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| 9.6 | Machining | Use gloves to protect from sharp edges and safety glasses to prevent eye injuries. No special working equipment is necessary, except protections to minimize dust exposure in case of sheet machining. |
| 9.7 | Disposal considerations | Waste material should be handled according to local regulations. Burning is permitted in approved industrial incinerators. |
| 9.8 | Health information | HPL are not considered to be dangerous for humans and animals. There is no evidence of HPL toxicological effects and eco-toxicity. HPL surfaces are physiologically safe and approved for use in contact with foodstuffs according to EN 1186. |
| 9.8.1 | Working areas | General dust regulations are applicable. |
| 9.8.2 | Formaldehyde emission | < 0.4 mg/h m ² (tested according to EN 717-2) < 0.05 ppm (tested according to the WKI chamber method) |
| 9.8.3 | Pentachlorophenol | HPL do not contain PCP (Pentachlorophenol). |
| 9.8 | Additional remarks | HPL as received are solid sheets and there would not be any health hazards associated with them. |

All information is based on the current state of technical knowledge, but it does not constitute any form of guarantee. It is the personal responsibility of the user of the products described in this information leaflet to comply with the appropriate laws and regulations.