



International Committee of the Decorative Laminates Industry

Technical Leaflet

Laboratory furnishings with HPL

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This document makes no claim of completion regarding listing the full details of any standards referred to in the text.

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

For more than 50 years the ICDLI has been the international representative of the interests of European laminate manufacturers. Further information about the ICDLI and the data sheets published up to now can be found at www.icdli.com.

This application was compiled by the International Committee of the Decorative Laminates Industry. It considers the conditions of application technology in the European countries. If you have further questions, please contact us:

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1. General information

Laboratories are not a homogeneous group but rather a generic term for workspaces with very different and usually high requirements for the materials used.

Due to their performance and material characteristics, decorative laminates – HPL in line with EN 438 – have the prerequisites for meeting those requirements. As decorative design elements they can additionally cater to individual demands for the design of the laboratories.

These are described in the following sections.

2. Suitability of HPL for individual laboratory areas

2.1 Types of laboratories and typical requirements

HPL have proven particularly suitable for the following laboratory types:

- medical and biological laboratories
- chemical laboratories
- physical and technical laboratories
- isotope and cleanroom laboratories
- food laboratories
- laboratories in schools and technical colleges

The following properties are important in these areas:

- hygienic and suitable for disinfection
- highly resistant to chemicals
- corrosion resistant
- highly resistant to mechanical impacts
- moisture resistant
- suitable for decontamination
- high transmission of x-rays
- no static charging
- very easy to clean
- suitable for direct contact with food
- styling/design

As different as laboratories are in their equipment, they all have work tables, desks, furniture and interior fittings in common. For all these, HPL has proven to be a highly suitable material for surfaces as well as in the form of compact sheets. Beyond this, there are specific furnishings and fittings which differ between the individual laboratories.

2.2 HPL sheet types

HPL are decorative laminates in line with EN 438 with a highly resistant melamine resin surface. They are manufactured as sheets of different sizes, thicknesses, colours and surface textures. They are available as standard, postformed and flame retardant versions for bonding to substrates or as self-supporting compact sheets, ≥ 5 mm thick, in large sizes.

They require no protective coating or sealing. HPL do not corrode and emit no harmful gases or dust. Due to their specific material properties and processing options they meet the requirement profiles for furnishing the different laboratories.

2.3 Resistance to chemicals and liquids

In laboratories, HPL surfaces on furniture often come into direct contact with chemicals. They feature excellent resistance to organic solvents such as acetone, chloroform, toluene and xylene. If the exposure time is not exceeded, HPL are resistant to diluted alkali substances and acids.

Mineral acids, strongly staining or strongly oxidising substances leave stains on HPL worktops as well as on other surface materials used in laboratory furnishing. This usually has no negative impact on the practical value of these items.

The resistance of HPL surfaces to chemicals is described in detail in the technical bulletin by the ICDLI "Chemical resistance and hygienic properties of decorative laminates (HPL)".

Note: Some decorative colours are sensitive to acid due to their pigment composition which can lead to discolourations. We therefore recommend coordinating the selected colours and surface textures with the HPL manufacturer.

2.4 Resistance to water and moisture

Water as a cooling medium and as steam from water baths is omnipresent in laboratories. HPL are resistant to water, moisture and even steam. Their large sizes allow joints to be reduced to a minimum, preventing the ingress of water into the substrate (usually wood materials).

HPL allow round edges without joints; self-supporting compact sheets require no edge protection against moisture and dampness.

2.5 Resistance to temperature influences

Laboratories are often subject to extreme temperature influences, e.g. Bunsen burners or liquid nitrogen, which affect the surface. HPL are resistant to brief temperature stress up to 180 °C. The thermosetting resins used for HPL cannot melt or soften. No changes will occur even upon direct contact with an open flame, except for a slowly progressing colour change. Nevertheless, hot objects should always be placed on a base or in a special fixture, e.g. cork rings.

HPL show excellent resistance to cold. They do not become brittle even at very low temperatures. This also makes them highly suitable for use in cold stores, e.g. for food testing.

2.6 Resistance to mechanical impact

Worktops and doors in laboratories are subject to high mechanical impact.

HPL are highly scratch resistant, abrasion resistant and shock proof and the combination of these properties makes them a material of choice for laboratory furnishings.

2.7 Suitability for disinfection and hygiene properties

Many laboratories require clean to sterile conditions. HPL meet these requirements with their closed surfaces without pores. Together with the option of large, joint-free units they have advantages over materials with more joints.

They are easy to clean, disinfect and decontaminate if required. Flat and rounded surface structures have proven most practical for these cases.

2.8 Electrostatic behaviour

Static charging and the subsequent discharge pose a substantial operational and safety hazard for electronic devices and when handling flammable, combustible or explosive substances.

Static charges also create a detrimental accumulation of dust.

HPL are not subject to static charging. As standard versions they have a surface resistance of 10^9 to 10^{12} Ohm measured according to EN 61340-4-1. Electrostatically discharging HPL as special versions reach 10^5 to 10^9 Ohm.

These HPL allow any charges to be discharged continuously if they are grounded. This gives them an advantage over materials with a high surface resistance of $R_o > 10^{12}$ Ohm. The technical bulletin of the ICDLI "Electrical properties of high pressure laminates (HPL)" provides more details.

2.9 Reaction to fire

HPL are difficult to set on fire and they have the property of delaying the spreading of flames. They generate only little smoke and no corrosive vapours; they do not melt or drip. This means they help to limit risk and damage in case of fire.

HPL can also be manufactured as flame retardant versions.

2.10 Typical applications

HPL are particularly suitable for the following areas of application:

- worktops
- cabinet doors
- shelf systems
- wall coverings

- splash guard systems
- drawer fronts
- fume hood connections
- cold store doors
- cold store walls
- fume hood coverings
- window ledges
- worktops with HPL surface or compact sheets
- test tables
- cable ducts
- covers for supply lines
- furniture fronts
- interior coverings
- microbiological and medical laboratories
- machine tables
- computer tables
- floors in cleanroom laboratories
- electrics and electronics laboratories
- doors and wall coverings

3. Applications in laboratories

3.1 Worktops and fume hoods

The highest requirements apply here. Due to their favourable combination of properties from chemical, mechanical and thermal resistance, HPL and particularly compact sheets are suitable for manufacturing worktops and fume hoods for many types of laboratories.

3.2 Interior furnishings

Numerous documentation and measuring tasks have to be carried out in laboratories using different tools. This requires a facility that can satisfy the highest requirements for hygiene, wear resistance and safety.

HPL with their design variety and sturdiness provide excellent solutions for these applications, e.g. as desks or built-in work stations, shelf systems, machine tables, desk tops, cupboards or hanging cabinets.

3.3 Walls

Wall coverings, dividing walls and window ledges are an essential part of interior furnishings, e.g. for all types of cleanrooms and hygiene laboratories.

As HPL elements or as compact sheets they offer the added benefit of easy and fast mounting over large areas.



Wall coverings with HPL allow a high level of prefabrication and therefore fast and cost-effective refurbishment. Supply lines can simply be housed behind the wall coverings if the appropriate safety regulations are complied with. There is no need to remove old wall coverings.

3.4 Doors

Doors are an essential part of room design. Laboratory doors are often also complicated special structures, e.g. for fire protection, radiation protection, sound protection and security.

HPL sheets are ideal as surface coverings for these door types due to their high practical value. In addition to meeting technical requirements, they also offer numerous design benefits such as light cut-outs or adaptation to the interior design concept.

3.5 Miscellaneous

HPL also offer attractive solutions for covering supply shafts, pipe and cable ducts or for machine coverings or housings, particularly as postforming elements, compact sheets or compact form parts. Other proven HPL applications are buffer panels and splash guard installations.

4. Processing and structural information

HPL, wood based HPL elements and compact panels can easily be processed with wood machining tools.

The adhesives used for the HPL elements comply with the requirements for laboratories. Silicone or polyurethane based sealants have proven successful for use on sealing joints, seams and edges. HPL can be combined with different substrates to meet special requirements for laboratories with regard to fire protection, sound protection, thermal insulation and load capacity.

5. Cleaning and maintenance

HPL sheets require no special care. The bulletin "Cleaning of HPL surfaces" provides details about cleaning and care.

6. Disposal

Disposal has to comply with the applicable national and regional regulations.

Appendix

Table - Overview of the most important properties according to EN 438:2005 for laboratory environments

Property	Property or attribute	Unit (max. or min.)	Laminate grade		
			HGS HGF HGP	CGS CGF	HDS HDF HDP
Resistance to surface wear	Wear resistance	Revolutions (min.) Initial Point Wear value	150 350	150 350	350 1000
Resistance to water vapour	Appearance	Rating ^{*)} (min.) (no gloss finish)	4	4	4
Resistance to dry heat	Appearance	Rating ^{*)} (min.) (no gloss finish)	4	4	4
Resistance to wet heat (100 °C)	Appearance	Rating ^{*)} (min.) (no gloss finish)	4	4	4
Resistance to impact by small diameter ball	Spring force ^{g)}	N (min.)	20	not applicable	25
Resistance to scratching	Force	Rating (min.) (no gloss finish)	3	3	4
Resistance to staining	see Technical bulletin of ICDLI "Chemical resistance of HPL"				

*) Explanation for Rating:

Rating 5: No visible change.

Rating 4: Slight change of gloss and/or colour, only visible at certain viewing angles.

Rating 3: Moderate change of gloss and/or colour.

Rating 2: Marked change of gloss and/or colour.

Rating 1: Blistering and/or delamination.

Explanation for Laminate grade codes:

HGS – Horizontal use for General purposes in Standard quality

HGF – Horizontal use for General purposes in Flame retardant quality

HGP – Horizontal use for General purposes in Postforming quality

CGS – Compact Laminate for General purposes in Standard quality

CGF - Compact Laminate for General purposes in Flame retardant quality

HDS – Horizontal use for heavy Duty purposes in Standard quality

HDF – Horizontal use for heavy Duty purposes in Flame retardant quality

HDP – Horizontal use for heavy Duty purposes in Postforming quality