

FIRE

A FAITHFUL SERVANT OR A DEADLY ENEMY !!

Accidental FIRE spreads, destroys and kills. It can consume all that lies within its reach converting natural and synthetic materials into poisonous FUMES and blinding SMOKE - often producing deadlier effects than its flames.

We are surrounded in our every day lives by potentially combustible materials - safe and essential in their own respect until transformed by accidental fire into fatal sources of HEAT, SMOKE and TOXIC FUMES.

However, some of these dangers can be minimised.

A new product - designed and manufactured using novel techniques and processes - can limit the risk of fire and related damage.

This product is:

PHENCLAD

FIBRE REINFORCED PHENOLIC SHEET



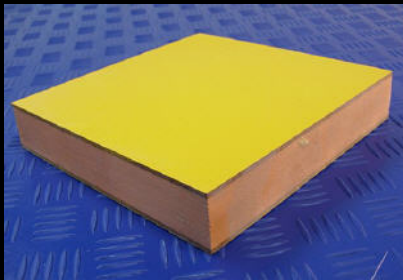
Prospective application include:

- **Offshore industry**
- **Mass transit
(Road - Rail - Air)**
- **Underground installations
(Rail, mining)**
- **Building & Construction**
- **Defence projects**

PHENCLAD is a composite sheet product consisting mainly of cured phenolic resin and glass fibre.

PHENCLAD is one of the most effective cosmetic FIRE RESISTANT sheet materials available producing comparatively minute quantities of smoke and toxic fumes when exposed to fire - well within the most stringent limits of any international fire standard - while still retaining excellent physical properties at high temperatures.

PHENCLAD is ideal for cladding, lining, panelling and many other applications. It is available in a wide range of colours and has a smooth or embossed surface finish. (Gritted Non-Slip panels are also available)



TECHNICAL INFORMATION

Phenol Formaldehyde (Phenolic) resins have been in commercial use for just under 100 years. Recent advances in resin / catalyst technology and continuing improvements in glass fibre production techniques combined with unique processing methods have made the manufacture of **PHENCLAD** possible.

The product has undergone relevant tests by an internationally recognized Fire Research Centre. Copies of the results can be made available on request by interested parties. Details of the tests are as follows:

STANDARD	GENERAL DESCRIPTION	LIMITS	TEST RESULT	REMARKS
BS 476 Pt. 7. 1987	"Surface Spread of Flame"	165 mm in 1.5 mins	NIL SPREAD	CLASS 1
BS 476 Pt. 6. 1989	"Fire Propagation"	I < 12	I = 6.1	CLASS 0 overall with Pt. 7
BS 6853 1987, B.5.2	"Smoke density"	Ao(on) < 1 Ao(off) < 1.5	Ao(on) = 0.86 Ao(off) = 1.15	Cat. 1 - suitable for high risk railway rolling stock
NES 713	"Toxicity Index"	-	2.02	Cat. A - suitable for high risk areas.

PHENCLAD is relatively easy to handle and install, and can be manufactured in either "natural" (reddish / brown colour), or to any B.S. Or RAL colour, using specialist coating systems. Panels and sheets are available in either standard sheets sizes or manufactured to size, and can be produced in a variety of thicknesses from 3mm upwards.

		Polyester GRP	Polyester GRP		
Property	*Phenclad	Unfilled	Filled	Mild Steel	Aluminium
Density (g/cc)	1.4-1.5	1.4-1.5	1.6-2.3	7.8	2.7
Tensile Strength(MPa)	100-150	100-150	30-75	410-480	80-430
Tensile Modulus(GPa)	5.5-7.5	6-7.5	7-19	210	70
Elongation at Break %	1.8-2.5	1.8-2.5	0.4-1.7	20-35	3-18
Flexural Strength(MPa)	150-200	150-200	100-125	200(yield)	65-220(yield)
Flexural Modulus (GPa)	6-8	6-8	6-15	210	70
1ZOD Impact Strength notched KJ / m ²	65-75	50-60	20-50	-	-
Coeff. Thermal Exp. (°Cx10 ^{^-6})	10-15	25-35	18-25	11-14	22-24
Coeff. Thermal Conduct. (W/m°C)	0.20-0.24	0.2-0.23	0.22-0.3	46	140-190
Temperature Index (BS 6853)	>420 degC	-	<365 degC	<420 degC (Painted)	>420 degC (Painted)
Building Regulations (BS 476)	Class 1/0	Class 1/0	Class 1/0	Class 0 (Painted)	Class 0 (Painted)
3 Metre Cube Smoke Test (BS 6853)	Cat. 1	Fail	Cat.2	Cat.1 (Painted)	Cat.1 (Painted)

Health & Safety : As with other sheet products, careful handling and lifting, using gloves, will minimise accidents. Good workshop practices should be in place when machining, i.e. Proper ventilation, extraction, dust masks, visor / glasses and gloves. In food processing areas, damaged or scuffed sheets exposing fibres below the surface coating should be replaced or sealed using materials as advised by the manufacturer.

PHENCLAD and the ENVIRONMENT: As stated throughout this brochure, PHENCLAD will not contribute significant amounts of smoke or toxic fumes into the atmosphere as a result of fire. It will also replace many materials which are in dwindling supply (e.g. hardwoods) and others which consume high amounts of energy during manufacture (e.g. aluminium, steel). On completion of its useful life - for whatever - reason PHENCLAD can be crushed and recycled as a filler for a variety of purposes.

QUALITY STATEMENT: Quality controls are in place in the procurement and storage of materials, throughout the process operation and at packing and dispatch. Staff are employed on work of which they have full understanding and which falls within their known capabilities. Materials are purchased on the 'most suitable for the job' principle with non-conforming materials stored remotely and returned to the supplier. Intermittent quality audits are carried out by the management who are fully committed to the installation of quality control systems that comply with recognised international standards.

NOTE: All information provided in this brochure is believed to be accurate and is given in good faith. Customers should, however, satisfy themselves as to the suitability of any PHENCLAD product as The Phenclad Corporation can give no warranty as to the fitness of such products for particular purposes. Any implied warranty or conditions (statutory or otherwise) is excluded except to the extent that such exclusion is prevented by law.

**SMYTH
COMPOSITES**



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PHENOLIC SHEET PRODUCTS