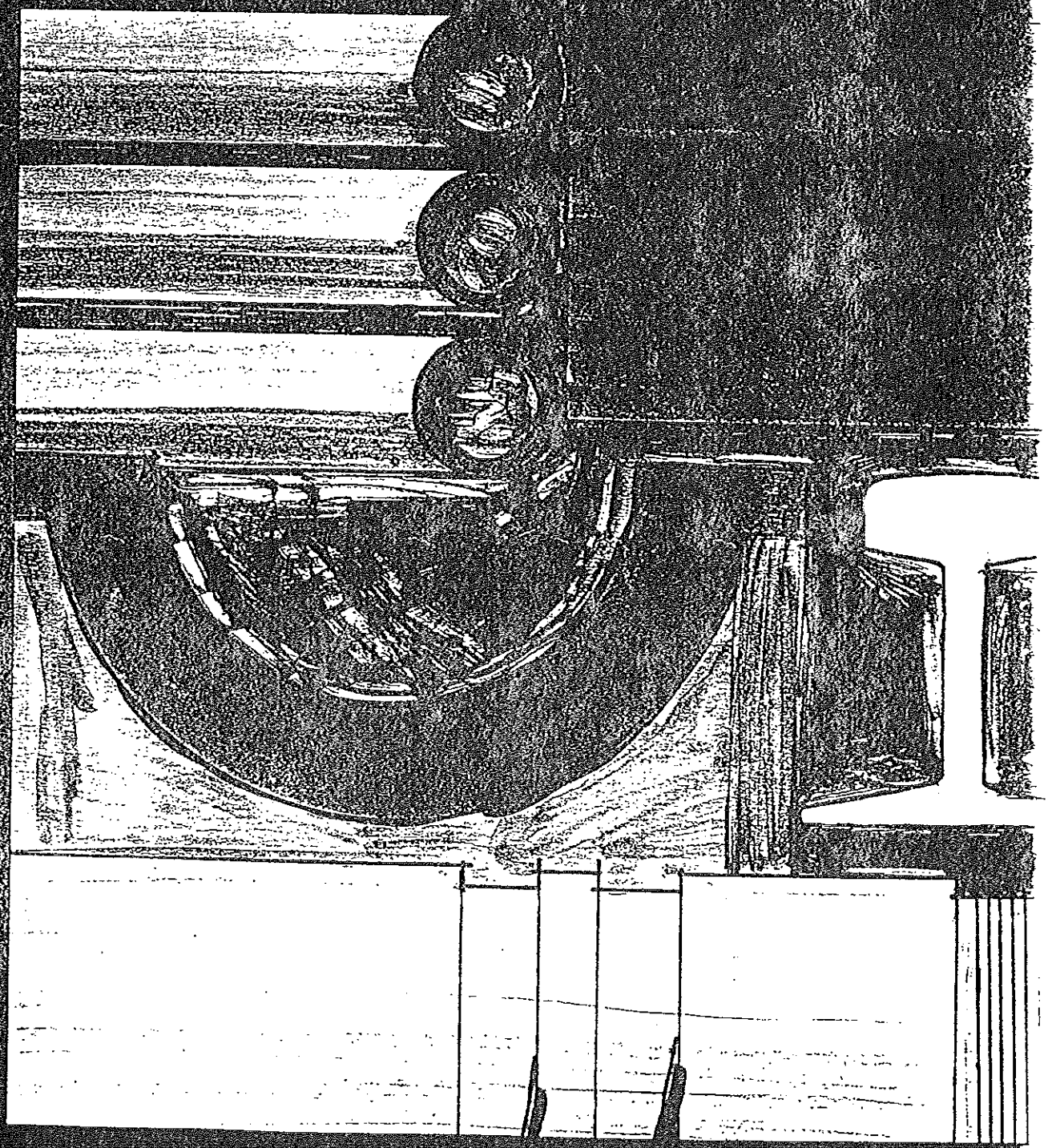
FORMICA®

industrial laminates

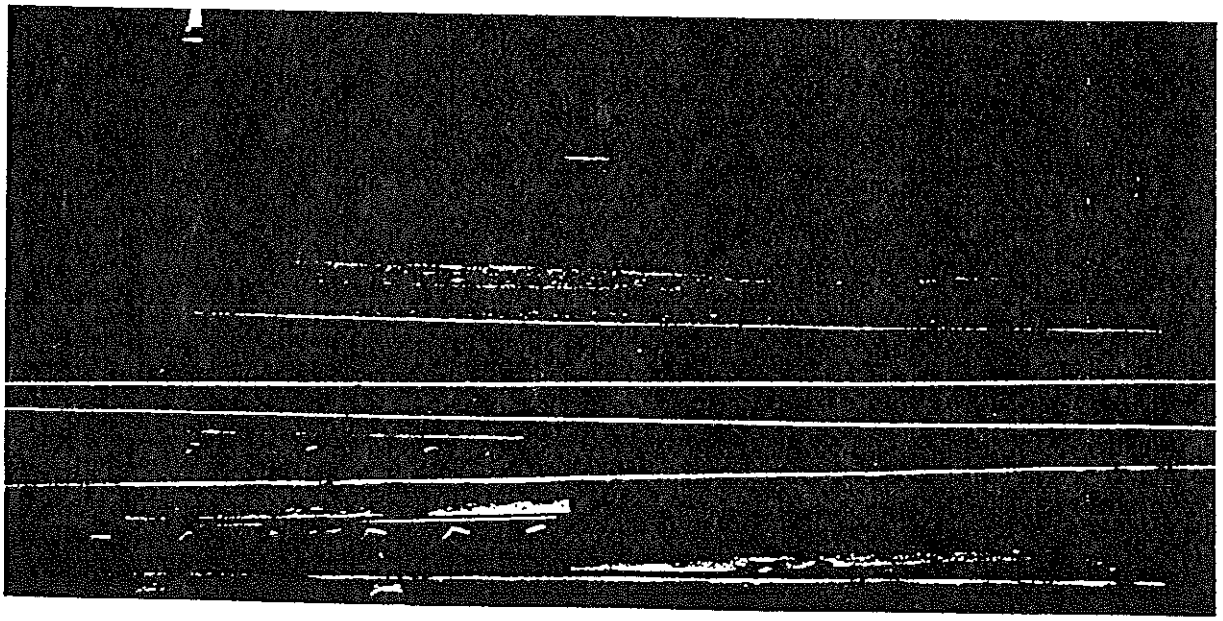


industrial laminates

	Product applications by industry
INDUSTRY	LAMINATE
Agriculture	F1 F3 MF1 MF3 A20
Chemical & Gas	PX1 F1 F3 MF1 MF3 A20 MG5 GPO3
Cranes, Lifts & Escalators	PX1 F1 F3 MF1 MF3 Permali GPO3
Electrical	P1 PX1 P3 Permali Permawood MG5 GPO3 Switchpanel*
Electric Furnaces & Electrolytic Smelters	MF1 MF3 A20 Permali GPO3
Film & Photographics	PX1 F1 A20
Food & Confectionery	F3 MF1 MF3
General Engineering	F1 F3 MF1 MF3 A20 A20W Permali Permawood MG5 GPO3
Mining	F1 F3 MP1* MF1* MF3* A20 A20W MG5 GPO3 Switchpanel*
Paper & Printing	PX1 F1 F3 MG5 GPO3
Railways	F1 F3 A20 A40 Permali Permawood
Shipping & Marine	F3 MF1 MF3 A20 Permali Permawood
Steel Mills & Metal Finishing	F1 F3 MF1 MF3 A20 A40 A20F Permali Permawood GPO3
Textiles	PX1 F3 MF1 Permali

Formica industrial grade laminates are also used in many other industries including the electronics, telecommunications and computer industries.

*These grades have NSW Department of Mineral Resources approval for use in mines (Approval No. MDCA 0649).

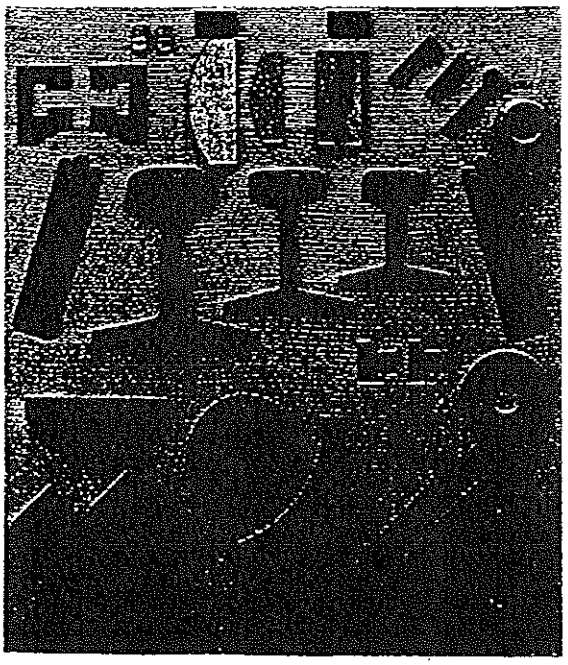


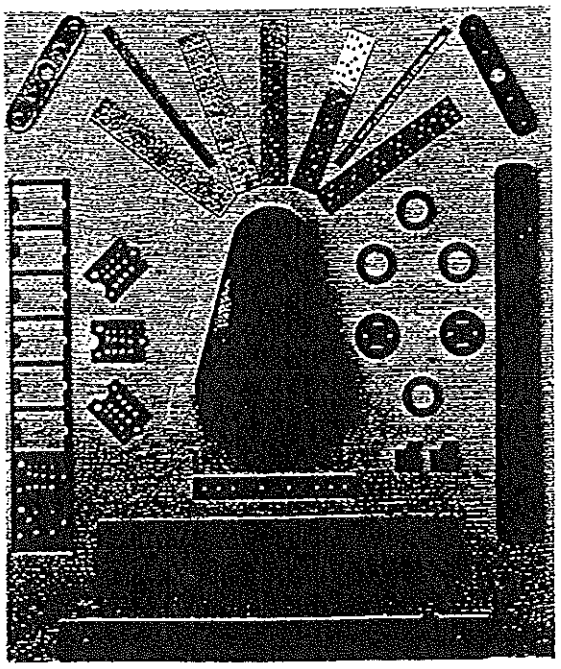
FORMICA

industrial laminates

Applications

Formica industrial grade laminates are widely used throughout industry in Australia and overseas. They have applications in areas of electrical engineering and supply, mechanical engineering, shipping, mining, in aluminium smelters, and in the electronics, telecommunications and computer industries. They are used in all branches of the electrical industry because they are strong, resistant to heat and moisture, have good electrical properties and can be machined readily.
in general engineering industries Formica industrial laminates are used because they are resilient, long wearing and quiet running. Gears cut from laminated sheet or moulded blanks, for example, have applications ranging from tiny instrument gears right up to the 250mm face gears in rolling mills.
Bearings in appropriate Formica grades have proved superior to conventional metal components. With their low coefficient of friction and smooth wearing characteristics, they absorb severe shocks without deformation or cracking.
Because laminated phenolics are corrosion resistant they have many applications in chemical industries, particularly when organic solvents, organic acids or diluted inorganic acids are involved.





FORMICA

industrial laminates

General description

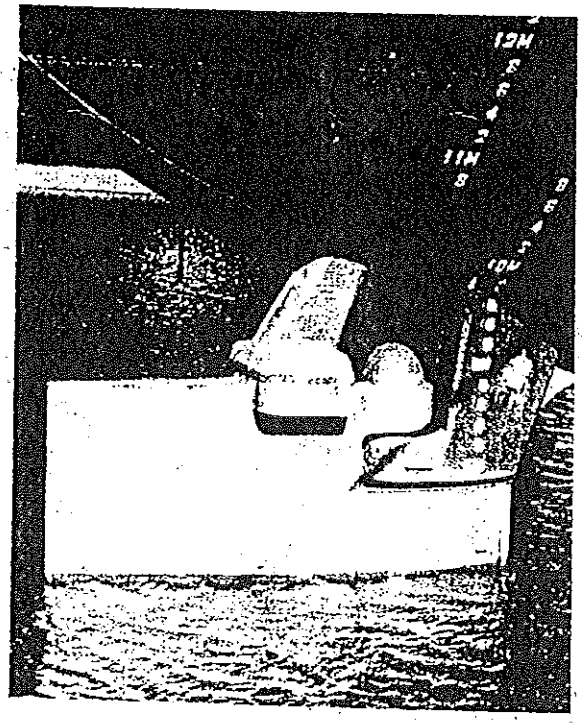
Formica Plastics Pty Limited manufacture a wide range of synthetic resin bonded industrial grade laminates from paper, fabric, asbestos cloth, glass and wood veneers.
These electrical insulating and mechanically strong products are available in sheets, rods and tubes. They can be machined to customer requirements.
Industrial grade laminates are manufactured to the stringent specifications of Australian and British Standards and have the following properties:

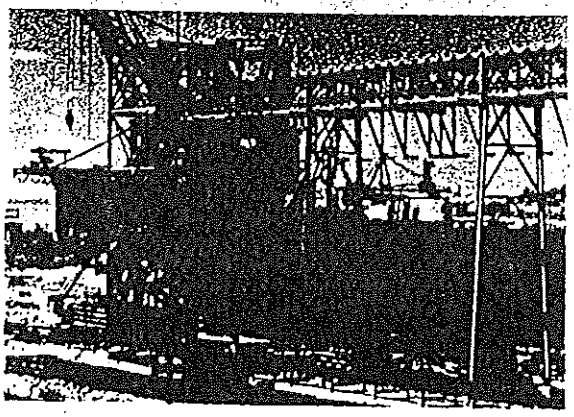
- High strength in proportion to weight;
- Excellent resistance to moisture and heat;
- Resistance to corrosion;
- Excellent dimensional stability;
- Good electrical insulation properties.

Formica Plastics Pty Limited is the sole Australian manufacturer of Novasteen®, Novabestos®, and Permali® products as well as the complete range of Formica® paper and glass industrial grade laminates.
Formica Industrial Division also manufactures Engraving grade laminate — a high pressure laminate with contrasting underlay material for clear line, readable signage when engraved — and Formboard Overlay, a treated industrial paper which is bonded under heat and pressure to plywood for concrete formboard release work.

Advisory service

Intending users of Formica industrial grade laminates are invited to discuss their product applications with Formica's technical advisers.





FORMICA

industrial laminates

Research and development

Formica Plastics Pty Limited carries out a continuing programme of research and development to provide industries in Australia and overseas with laminate materials that will best suit their needs.

New products are frequently the result of a combination of factors including the latest developments in laminate technology plus the constant challenge to produce laminates with particular properties for specific industrial applications. Formica are proud of their ability to develop materials to suit customer requirements. By discussing new projects at the product development stage, engineers and product designers can draw on the experience of Formica's technical experts to select the appropriate grade of material for particular components in their product.

Formica's research and development programme is carried out in their NATA registered laboratories in Sydney.

These laboratories conform to the stringent requirements of Australia's National Association of Testing Authorities and are registered to carry out specific tests in the fields of electrical and mechanical testing. Registration by NATA provides an international reference to the standards of expertise available from these laboratories.

Because Formica reserves the right to update the product range, specifications for industrial grade laminates are subject to change without notice.

FORMICA

industrial laminates

PAPER GRADE
P1

PAPER GRADE P1

General description	A general purpose laminate with low electrical and good mechanical properties.
Applications	Suitable for low voltage applications in air or immersed in oil in the electrical industries.
Sheet size	1220mm x 915mm *(4ft x 3ft)* 1220mm x 1220mm *(4ft x 4ft)* 2440mm x 1220mm *(8ft x 4ft)* 3660mm x 1220mm *(12ft x 4ft)*
Rods	Not available
Tubes	10mm to 180mm diameters x 900mm long in Natural *(⅜in to 7in x 36in)*
Thickness	3.2mm to 50mm *(⅛ to 2in)*. See Standard Range Chart
Colour	Natural and Black
Finish	Glossy (Satin on request 1220mm x 915mm only)
Specifications	Complies with the following specifications ASK. 118-1960 Type P1 BS 2572: 1976 Type P1 ISO 1642-1979 Type PFCP1

FORMICA PLASTICS PTY LIMITED Industrial Products Division
106 Old Pittwater Road Brookvale NSW 2100 Australia Telex AA71119
Telephone 938 3544

PAPER GRADE

P1

PHYSICAL PROPERTIES

PROPERTY		UNITS	VALUES Typical	Minimum	TEST METHOD
Tensile strength	L	MPa	130	—	ASK94/BS2782/301C
	T	MPa	100	—	
Crossbreak strength	L	MPa	180	135	ASK94/BS2782/304E
	T	MPa	140	135	
Impact strength (12.7mm)					
parallel		joules	0.7	0.4	ASK94/BS2782/306A
Shear strength		MPa	85	75	ASK94/BS2782/305B
Compressive strength					
perpendicular		MPa	350	—	ASK94/BS2782/303B
parallel		MPa	190	—	
Modulus of elasticity					
in tension	L	MPa	13000	—	ASK94/BS2782/302D
	T	MPa	10000	—	
in flexure	L	MPa	12000	—	
	T	MPa	9000	—	
Water absorption (6.4mm)		mg	210	688 (max)	ASK94/BS2782/502F
Insulation resistance		Megohms	50	1.0	ASK94/BS2782/204C
Electric strength in oil					BS2572:1976
flatwise (9.5mm)		kV	10	—	App. G
edgewise		kV	8	—	App. H
Thermal conductivity		$Wm^{-1}K^{-1}$	0.2	—	
Coefficient of friction (surface)			0.17	—	ASTM D1894 (against mild steel)
Specific gravity			1.4	—	
Machinability		Pass	Pass	Pass	BS2572:1976/Para 11

STANDARD RANGE

Other thicknesses available by negotiation.

	THICKNESS mm	*(in)*	TOLERANCE ± mm	*(± in)*	WEIGHT kg/m²	*(lb/ft²)*
Thickness, Tolerance and Approximate Weight	3.2	*0.128*	0.20	*0.008*	4.33	*0.89*
	4.0	*0.156*	0.23	*0.009*	5.45	*1.12*
	4.8	*0.187*	0.25	*0.010*	6.52	*1.34*
	5.5	*0.219*	0.28	*0.011*	7.62	*1.58*
	6.4	*0.250*	0.30	*0.012*	8.71	*1.79*
	7.9	*0.312*	0.36	*0.014*	10.86	*2.23*
	9.5	*0.375*	0.42	*0.017*	13.05	*2.68*
	11.1	*0.438*	0.46	*0.018*	15.24	*3.13*
	12.7	*0.500*	0.51	*0.020*	17.43	*3.58*
	14.3	*0.562*	0.53	*0.021*	19.60	*4.02*
	15.9	*0.625*	0.58	*0.023*	21.76	*4.47*
	17.5	*0.689*	0.69	*0.027*	23.93	*4.92*
	19.0	*0.750*	0.69	*0.027*	26.10	*5.36*
	25.4	*1.000*	0.86	*0.034*	34.81	*7.15*
	31.8	*1.250*	1.20	*0.047*	43.52	*8.94*
	38.1	*1.500*	1.20	*0.047*	52.24	*10.73*
	50.8	*2.000*	1.45	*0.057*	70.40	*14.46*