

Ureflute

versatile composite panels

Ureflute utilises polypropylene, fibre board and polycarbonate panels to create new and unique panels by injecting liquid polyurethane into the flutes of the panels. Ureflute™, (patented), has vastly superior properties to the starting raw material sheet and is a versatile, flexible construction material.

The resulting panel can be laminated, cut and routed.

KEY FEATURES

- Lightweight and durable
- Strong and rigid
- Insulating and impact absorbing qualities
- Multi-Use
- Can be laminated
- Water Proof
- Non-toxic, non carcinogenic
- Acoustic properties

APPLICATIONS INCLUDE

- Wet area linings
- Wall partition substrate
- Caravan flooring
- Truck and trailer flooring
- Packaging
- Signage
- General building
- Furniture, office partitions
- House boat interior panels, doors and floors

MARKET SECTORS

Building; Wood based products are being replaced with “eco” friendly alternatives; Ureflute™ is well positioned to consolidate opportunities in this sector. Applications include;

- Lightweight wall panel substrate
- Folding doors and wall substrates; partitioning
- Deployable homes and transportable housing
- Emergency housing
- Formwork (re-useable)
- Specialty panel products
- Wet area cladding and thermal barriers

Marine; Ureflute™ offers an affordable solution to many existing marine construction materials with intrinsic benefits of water proofing, thermal, acoustic, light weight, strength and ability to fabricate and laminate. Applications include;

- Flooring
- Cabinets and furniture
- House boat interior panels, doors and floors

Caravan/Mobile Homes; Ureflute™ has many applications in the caravan industry. With the intrinsic benefits of lightweight, thermal, acoustic, water proofing and the ability to laminate and fabricate. Applications include;

- Cabinets
- Table tops
- Doors
- Flooring

Signage/Screen Printing; Ureflute™ has been used successfully in the signage and screen printing industries. The ability to screen print, and the long lasting qualities and strength of Ureflute™ represent a strong and rigid alternative to existing materials. Applications include;

- Real estate signage
- General signage

Truck Building/Transport; Ureflute™ has an excellent application for truck walls and floors. Key benefits are; light weight, chemical resistance, strength, impact resistance, and water proof.

Case and Box Manufacturing/Packaging;

A market exists to replace ply and other imported wood casing materials. Ureflute™ is impact strong, resistant, light weight, with thermal and acoustic qualities.

- Tote and freight crating
- Thermal packaging
- Specialised re-usable cases; transit and instrument cases, flat packed boxes
- Boxes requiring impact and chemical resistant qualities, e.g. chemical industry
- Packaging groups using wood and ply for export
- Fruit and meat boxes
- Bulk bins

Furniture: Ureflute™ has an excellent application in the furniture industry. Ureflute™ can be laminated, welded and routed. Applications include;

- Furniture
- Office partitions
- Shelving
- Cabinets
- Table tops

TECHNICAL DATA

Structural Testing;

ASTM C170 – Dry Testing 10mm Ureflute
CSIRO technical assessment number 3823

10mm UREFLUTE: COMPRESSIVE STRENGTH		
Sample No.	Peak Force (N)	Compressive Strength (MPa)
1	5140	2.05
2	5067	2.02
3	6320	2.52
4	6123	2.44
5	5300	2.12
MEAN		2.23

AS4459 PART 4 (UREFLUTE TESTED ALONG RIBS) – 10MM
CSIRO technical assessment number 3823

10mm UREFLUTE (ALONG RIBS): MODULUS OF RUPTURE			
Sample No.	Deflection (mm)	Peak Force (N)	Modulus of Rupture (N/mm ₂)
1	60.01	456	6.78
2	59.60	480	7.14
3	60.00	411	6.12
4	58.60	431	6.41
5	58.30	462	6.87
6	56.30	470	6.99
7	57.80	465	6.92
MEAN		453	6.75

Comments: The Ureflute product did not break when tested with or across ribs. The Ureflute product has a rebound deflection above 50%.

AS4459 PART 4 (UREFLUTE TESTED ACROSS RIBS) – 10MM
CSIRO technical assessment number 3823

10mm UREFLUTE (ACROSS RIBS): MODULUS OF RUPTURE			
Sample No.	Deflection (mm)	Peak Force (N)	Modulus of Rupture (N/mm ₂)
1	66.90	1169	17.39
2	59.60	1142	16.99
3	54.30	1110	16.52
4	60.90	1143	17.01
5	61.60	1052	15.65
6	62.40	1158	17.23
7	61.10	1134	16.87
MEAN		1129	16.81

Comments: The Ureflute product did not break when tested with or across ribs. The Ureflute product has a rebound deflection above 50%.

Fire Testing;

* BS 4735/ISO 3582; LABORATORY ASSESSMENT OF HORIZONTAL BURNING CHARACTERISTICS OF SMALL SPECIMENS OF APTANE P279/B900 (Polyurethane Foam) SUBJECTED TO A SMALL FLAME. Tests completed by Ariel Industries Pty Ltd.

Samples used were 14.0mm thick with densities from 33.0kg/m³ to 34.5kg/m³ and all five samples were tested with the skin removed and conditioned at 55% relative humidity at 22C.

RESULTS	1	2	3	4	5
Extent of Burning	13	22	17	26	19
Extinguishing Time (sec.)	30*	34*	27*	32*	34*
Rate of Burning (mm/sec.)	0.50	0.347	0.629	0.812	0.559
Self Extinguishing	Yes	Yes	Yes	Yes	Yes

Comments: *All five samples self extinguished before the end of the standard burning time (60 seconds) All five samples showed no evidence of melting or dripping during burning, all samples formed a char on the surface during combustion with noticeable shrinkage and distortion of the test pieces throughout the duration of burning.

AS/NZS 1530.3:1999 SIMULTANEOUS DETERMINATION OF IGNITABILITY, FLAME PROPAGATION, HEAT RELEASE AND SMOKE RELEASE.

The following test was completed by CSIRO Manufacturing & Infrastructure Technology. The tests were conducted in a laboratory accredited by the National Association of Testing Authorities, Australia.

Parameter	Mean	Standard Error
Ignition Time (min)	2.5	>0.1
Flame Spread Time (s)	41.7	2.4
Heat Release Integral (kJ/m ₂)	227.0	13.1
Smoke Release (log10D)	-0.064	0.039

For regulatory purposes these figures respond to the indices;

Ignitability	Spread of Flame Index	Heat Evolved Index	Smoke Developed Index
(0-20)	(0-10)	(0-10)	(0-10)
17	8	9	7

BS 5659 IMO Resolution MSC 61(67); Annex 1, Part 2.
TOXICITY AND SMOKE OBSCURATION

The following test was completed by CSIRO. A complete formal test was not possible to complete however the results indicate the material would pass the toxicity requirements but would fail the smoke optical density requirements for surface of bulkheads, linings or ceilings. Ureflute Australia Pty Ltd is still determining what products to submit for final smoke obscuration and flashover (calorimeter) testing.

Material	SOD (ppm)	CO (ppm)	HCl (ppm)	HBr (ppm)	HF (ppm)	HCN (ppm)	NO (ppm)	SO (ppm)
Sample	491	1400	ND	ND	ND	36	113	ND
IMO Acceptance Criteria	200	1450	600	600	600	140	350	120

AS/NZS 3837 CONE CALORIMETER TEST

(This test was undertaken to determine the base characteristics of Ureflute to establish its application in the building industry. Further testing will be conducted when product applications requiring group 3 or 2 under the BCA are identified.) CSIRO Technical assessment CMMT, 2007-123. The formulation of Ureflute (polypropylene and polyurethane composite) and the polyurethane core material in isolation were both tested to AS NZS 3837 and were predicted to be a Group 4 material under the BCA.

LAP SHEAR STRENGTH TEST

Test undertaken by Sika Australia Pty Ltd

Adhesion of Sikaforce 7710 L35 to Ureflute	
System A	
Surface Preparation	Nil
Cleaner Used	Nil
Adhesive Used	Sikaforce 7710 L35
Substrates (Ureflute)	GRP/ Polypropylene
RESULTS:	
Lap Shear St (Mpa)	
7 days@23C & 50% RH	1.78-SF
7 days water	1.80-SF
24hrs@80C	1.78-SF
Cataplasma	1.73-SF

Comments - System A: Failure of the polypropylene was observed at the early stages of the lap shear test. No adhesive failure was observed at this stage.

SF - Substrate Failure

Thermal Resistance (R Rating);

AS/NZS 4859.1.2002. TEST METHOD: ISO8302:1991

Test completed on Ureflute sample 7mm. Tests completed by Australian Wool Testing Authority 1st Floor, 191 Racecourse Road Flemington Victoria.

7mm UREFLUTE (POLYPROPYLENE) - 7MM	
MEAN RATING	R.214

PRODUCT DESCRIPTION

- Colours: Polypropylene; White, black, red, blue, yellow and grey
- Sheet thickness: 5,6,7,8,9,10 & 16mm
- Sheet size: 2440mm x 1220mm, up to 3600mm x 2400mm.
- Urethane foam: Ureflute foam is manufactured from polyol and isocyanate.

Ureflute™ is strong, water proof, impact absorbing, light weight, and has acoustic, chemical resistant and thermal qualities. Ureflute™ can be laminated and fabricated. Laminates include vinyl, styrene, solid polypropylene, carbon fibre, Kevlar, aluminium, Colour Bond®, plywood, fibreboard, carpet and office partition materials.

BASE MATERIALS

The base panel material is polypropylene, fibre board and fluted panels. The liquid resin injected into the flutes of the panels is a blend of polyol and isocyanate. The resulting panel has vastly superior properties to the original raw material.

HOW TO USE UREFLUTE

Routing & Cutting

Ureflute is easy to cut with a standard wood working saw. Routing should be through to the base surface. For example, if a 90° rout is required, use a 90° router bit.

Sheet joining and Adhesives

Ureflute sheets up to 10mm in thickness are corona treated to assist with laminating and screen printing.

Use a contact glue adhesive for joining sheets and laminating wood veneer, fibre glass, vinyl, aluminium and solid polypropylene. It is recommended that the reverse side of the Ureflute sheet be laminated with a thin sheet of solid polypropylene to avoid warping. Use an expanding glue when laminating materials to Ureflute.

Ureflute sheets can be joined with standard capping and "h" channels. In a flooring situation, the ends of the panel can be cut to allow the ends to overlap to form a flat surface.

Solvents

Prior to laminating Ureflute, clean the surface with a rubbing alcohol.

Fixing

To fix Ureflute panels, either use double sided tape, adhesive or corrosion resistant large head nails, screws or bolts.

Storing panels

Panels should be stored flat, out of direct sunlight and kept dry and clean.

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