

AUSTHANE PIR45

Rigid Cellular Polyisocyanurate Foam System

AUSTHANE PIR45 is a Rigid Cellular Polyisocyanurate Foam product which due to its chemical formulation provides significantly better Fire Resistance properties than standard Flame-Retarded Polyurethane Foam Systems and can also be used in a wider exposure temperature range than Polyurethane Foam Systems.

AUSTHANE PIR45 achieves a **GROUP 1** Classification in accordance with Specification A2.4 of the Building Code of Australia when tested under the AS/NZS 3837 Standard - Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, at 50 kW/m². [**CSIRO Test Report FNK 10180-July 2011**].

AUSTHANE PIR45 is formulated with **ecomate**[®] Blowing Agent, an “environmentally friendly” blowing agent with Zero **ODP** [Ozone Depleting Potential], Zero **GWP** [Global Warming Potential] and is **VOC** exempt.. This product forms the major component of the "cell" gas and results in the **AUSTHANE PIR45** product having excellent thermal insulation properties. The Thermal Conductivity k factor is 0.0215 W/m.K at 23.1 °C. [**AWTA Test Report 187912 – 5 July 2011**].

AUSTHANE PIR45 is suitable for use for insulating applications in hot or cold environments, with contact side temperatures ranging from a minimum of **- 50 °C** to a maximum of **+ 130 °C**.

[Refer to the Limitations of Use on Page 2 of this Product Bulletin].

Table 1: Typical Physical Properties of AUSTHANE PIR45 Rigid Polyisocyanurate Foam

Property	AS Test Method	Results for AUSTHANE PIR45	AS 1366.2-1992 Australian Standard Test Requirements
Density	Not specified	45 kg/m ³ nominal Typical Result: 42 – 49 kg/m ³	No specification
Compressive Stress at 10 % deformation	AS 2498.3	Parallel to Rise: > 300 kPa Perpendicular to Rise: > 175 kPa	Results to Pass AS Standard Parallel to Rise: > 140 kPa Perpendicular To Rise: > 80 kPa
Closed Cell Content	AS 2498.7	> 95 %	Minimum of 85%
Thermal Resistance at a mean temperature of 23.1°C [Guarded Hot Plate Apparatus]	ISO 8302 - AS/NZS 4859.1:2002 AWTA Test Certificate 187912 [5 July 2011]	R = 2.33 m ² .K/W @ 50 mm [Equivalent to a k factor of 0.0215 W/m.K]	Minimum Required Value: R = 1.85m².K/W [at 50 mm] [Equivalent to a k factor of 0.027 W/m.K]

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Dimensional Stability at 90°C and at – 20°C 72 hours Exposure Time	Based on AS 2498.6	Dimension	90°C	– 20°C	Test Sample Nominal Size: 100 mm x 100 mm x 25 mm Note: Measurement Limit for Dimensional Change is < 0.5%
		Length	< 0.5%	< 0.5%	
		Width	< 0.5%	< 0.5%	
		Thickness	< 0.5%	< 0.5%	
Fire Resistance to AS/ NZS 3837: 1998 Refer to the Building Code of Australia (BCA)	AS / NZS 3837: 1998	Group Number		Average Specific Extinction Area	
	CSIRO Test Report FNK 10180 26 July 2011	1 In accordance with Specification A 2.4 of the Building Code of Australia		31.1 m² / kg Refer to Specification C1.10a Section 3(c) of the Building Code of Australia	

FIRE HAZARD – Use of Product

It should be noted that while **AUSTHANE PIR45** product exhibits good flame/ fire retardant characteristics, it will burn under contact / exposure conditions with flame under typical high temperature flame/fire conditions.

The Building Code of Australia sets out the legislative requirements / use conditions and guidelines for the use of materials in commercial and industrial building applications.

AMENDMENT 13 covers the requirements under Clause C1.10 – Fire Hazard Properties.

Particular reference should be made to SECTION C1.10a section 3[c].

General Technical Data on THERMAL CONDUCTIVITY

In applications where impermeable facings are in place or are applied to both faces of the **AUSTHANE PIR45** product, e.g. metal sheeting, metal foils, fibreglass lay-up construction, and is adhered firmly over the whole surface of both sides of the foam, the foam will retain its **Initial k factor** of typically 0.021 - 0.022 W / m.K.

Table 2: R value - Thermal Resistance on this basis is set out below *for k factor = 0.022 W/m.K*

Sheet Thickness	15 mm	20 mm	30mm	50 mm	60 mm	75mm	100 mm	200 mm
R value - m² K / W	0.68	0.91	1.36	2.27	2.73	3.41	4.55	9.09
Note: The R value of AUSTHANE PIR45 is directly proportional to the sheet thickness in the recommended range of exposure temperatures as detailed – contact side temperatures of a minimum of – 50 °C to a maximum of + 130 °C within the normal variation in k factor that occurs in the actual manufacturing process.								

Note re Available Sheet Thickness: This product is made in ‘block’ format at 650 mm high. It can be cut to any nominated Sheet Thickness.

Comparison of Thermal Conductivity Units - k value

W/m.K	0.020	0.025	0.030
<i>kcal/(mh^oC)</i>	<i>0.017</i>	<i>0.0215</i>	<i>0.026</i>

Comparison of Thermal Conductivity Units

1 W/m.K	=	6.933 Btu.in/ft ² h ^o F
1 Btu.in/ft ² h ^o F	=	0.1442 W/m.K
1 kcal/mh ^o C	=	1.163 W/m.K

LIMITATIONS and HAZARDS

- In all external exposure and some internal applications the foam surface must be protected from weathering / physical deterioration by:
 - application of a fibreglass/polyester resin FRP 'skin'.
 - application of metal sheeting or other weatherproof treatment.
- Use foam only in temperature conditions where the **maximum** continuous contact surface temperature is **130°C** and the **minimum** continuous contact surface temperature is **- 50°C**.
- In specific temperature and humidity conditions the effects of water vapour 'drive' must be considered in system design and application requirements.
- Special precautions need to be taken in regard to system design and specification under possible water vapour condensation temperature and Relative Humidity conditions, or in conditions of exposure to high levels of water vapour / high humidity conditions.
- All polyurethane & polyisocyanurate foams may present a Fire Hazard in certain applications if exposed to fire and/or excessive heat e.g. welding, and cutting torches, in the presence of oxygen or air.
- The use of polyurethane and polyisocyanurate foam in interior applications may present an unreasonable fire hazard unless an approved fire-resistive thermal barrier protects the foam.

Consult the Building Code of Australia - BCA Clause C1.10 - Fire Hazard Properties, for approved areas of use, specific applications and installation requirements.

SAFETY PRECAUTIONS

Please refer to Material Safety Data Sheet for precautions for safe handling and working with this product. It is abrasive and particulate in nature when cut and handled.

Proper protective equipment as recommended for Use in the Personal Protection Section of the Material Safety Data Sheet should be worn when handling / using this product.

EXCLUSION OF WARRANTIES

These systems are not intended for use by non-professional or inexperienced designers and applicators.

The information presented in this bulletin requires experience and background knowledge for correct interpretation and application.

The potential user must perform any pertinent tests in order to determine the product's performance and suitability in the intended application since determination of fitness of the product for any particular use is the responsibility of the buyer. The data, information and suggestions covered in this data sheet, are given on the basis that the materials will be used correctly and professionally and at the sole risk of the user. No liability is accepted by AUSTRALIAN URETHANE SYSTEMS PTY LTD, for any loss, damage arising from the use of the within information or materials described, no warranty, with expressed or implied, is given as to the exclusion from any patents or as to the fitness of the goods described for any particular purpose and each application should be fully evaluated to the satisfaction and acceptance of the user, in particular as to the combustibility or flammability or toxicity of material generated by combustion of the products herein described or materials produced from these products.