

## AUSTHANE BF35 Rigid Polyurethane Foam

**AUSTHANE BF35** is a Flame Retarded Rigid Cellular Polyurethane general purpose PU foam of nominal product density 35 kg/m<sup>3</sup>.

**AUSTHANE BF35** is formulated using the HCFC Blowing Agent 141B. This results in the product having high thermal insulation properties, with a typical **k** factor of 0.021 – 0.023 W/m.K.

**AUSTHANE BF35** contains a chemical Flame Retardant additive. The product has been tested according to AS / NZS 1530.3 –1999 – Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release – Test Certificate Number: 7- 501491 -CN. Results are reported below.

**AUSTHANE BF35** is suitable for use in thermal insulating applications in hot or cold environments, with contact side temperatures ranging from a **minimum** of - 50°C to a **maximum** of + 85°C.

It is also suitable for use in marine buoyancy applications, and in conjunction with fibreglass (polyester resin / glass reinforcement) lay-ups in NON-structural marine applications.

### Typical Physical Properties of AUSTHANE BF35 Rigid Polyurethane Foam

Property	AS Test Method	Results for BF35	AS 1366.1992 Australian Standard Test Requirements
Density	Not specified	<b>37 kg/m<sup>3</sup> nominal</b> <b>Typical Result: 36-38 kg/m<sup>3</sup></b>	No specification
Compressive Stress at 10% deformation	AS 2498.3	<b>Parallel to Rise: 263 kPa</b> <b>Perpendicular to Rise: 144 kPa</b>	<b>Results to Pass AS Standard</b> Parallel to Rise: > 175 kPa Perpendicular To Rise: > 100 kPa
Closed Cell Content	AS 2498.7	<b>92.6%</b>	Minimum of 85%
Thermal Resistance (55mm sample) at a mean temperature of 25°C (aged for 28 days at 70°C)	AS 2464.6	<b>R = 2.38 m<sup>2</sup>.K/W</b> <b>(Equivalent to a k factor of 0.021 W/m.K)</b>	<b>Minimum Required Value:</b> R = 1.8m <sup>2</sup> .K/W (at 50mm) (Equivalent to a k factor = 0.027 W/m.K)
Rate of Water Vapour Transmission – Measured Parallel to Rise	AS 2498.5	<b>588 ug/m<sup>2</sup>s</b>	<b>Maximum allowable: 1300 ug/m<sup>2</sup>s</b>
Flame Propagation Characteristics	AS 2122.1 – Method C	<b>Median Flame Duration: 2.55 sec.</b> <b>Median Mass Retained: 75.7%</b>	<b>Maximum Allowed Value: 8 sec.</b> <b>Minimum Allowed Value: 55%</b>
Water Absorption	AS 2498.8	<b>4.1 % by volume</b> <b>[Exposure Time: 96 hours]</b>	No specification

**Product Bulletin**  
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Property	AS Test Method	Results			Comments / Test Method
Dimensional Stability at 95° C and at - 30° C	AUS Internal Method	Dimension	at 95° C	at - 30° C	Time of Exposure: 168 hours Sample Size: 100 mm x 100 mm x 50 mm Sample Test Density: average: 38.5 kg/m <sup>3</sup>
		Length	+ 1.8%	- 0.01%	
		Width	+ 2.1%	0.0%	
		Thickness	- 0.7%	- 0.5%	

**Fire Test Information – Results / Test Methods**

Simultaneous Determination of - Ignitability - Flame Propagation - Heat Release - Smoke Release	Test Certificate Number: 7 - 501491 - CN	Test Method - AS / NZS 1530.3 - 1999
	Ignition Time: 2.00 minutes	
	Flame Propagation Time: 4.3 s	
	Heat Release Integral: 105.7 kJ/m <sup>2</sup>	
	Smoke Release, Log D: - 0.0249	
	Optical Density: 0.9463 / m	

The Regulatory Indices as per the AS/NZS 1530.3 – 1999 as per Test Certificate Number: 7 – 501491 – CN based on the test results above are:

Index	Actual Results	Range
IGNITABILITY INDEX	18	0 - 20
SPREAD OF FLAME INDEX	10	0 - 10
HEAT EVOLVED INDEX	4	0 - 10
SMOKE DEVELOPED INDEX	7	0 - 10

**Fire Hazard – Use of Product**

It should be noted that while **AUSTHANE BF35** contains a chemical flame retardant additive, the product will burn while in contact with a flame and/or under typical flame temperature / fire conditions.

The **Building Code of Australia** sets out the requirements / use conditions and guidelines for the use of Rigid Cellular Polyurethane Products in commercial and industrial building applications.

The use of Polyurethane and Polyisocyanurate Foams 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 for specific direction and approved areas of use.

**Use of Product in MARINE BUOYANCY APPLICATIONS**

**AUSTHANE BF35** is suitable for use as a buoyancy product in boat manufacture.

Physical test properties related to this application are set out in the Table below.

Property	Test Method	Results for BF35	Comments
Water Absorption	AS 2498.8	4.1 % by volume [Exposure Time: 96 hours]	No specification under AS 1366.1992 Australian Standard Requirements
Water Absorption	AUS Test # LWR-15.6.05	Water Uptake % volume Water Up-take: 1.50%	Water Temperature: 22 °C Exposure Time: 48 hours Sample Density: 35..3 kg / m <sup>3</sup>
Immersion in 5% Trisodium Phosphate Solution	ABYC Standard Test Method – Section 8.10 - Materials	Change in Buoyancy Effect - 2.1%	Solution Temperature: 29 °C Exposure Time: 30 days Sample Density: 35..3 kg / m <sup>3</sup>
		% change in Total Volume of Immersed Test Sample No change [ ABYC Standard test requirement = < 5 % change ]	
		Solution absorption rate per square metre of surface area 387 cc	

**General Technical Data on THERMAL CONDUCTIVITY**

In applications where impermeable facings are in place or are applied to both faces of the **AUSTHANE BF35** PU 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 -0.023 W / m.K.

The **R value – Thermal Resistance** on this basis is set out below *for k factor = 0.022 W/m.K*

AUSTHANE BF35 Foam Thickness	R value - m <sup>2</sup> K / W
100mm	4.55
50mm	2.27
25mm	1.13

### Effect of Product Density on Thermal Conductivity of PU Foams

Technical data on PU systems blown with 141b Blowing Agent indicates that at normal exposure temperature conditions,

*“variations in thermal conductivity cannot be detected experimentally between (foam densities of) 30 and 60 kg/m<sup>3</sup>. The variations due to differences in density are less than those caused by variations in the composition of the cell gas”.*

#### Comparison of Thermal Conductivity Units – k value

<b>W/m.K</b>	<b>0.020</b>	<b>0.025</b>	<b>0.030</b>
<i>kcal/(mh°C)</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 <sup>2</sup> h°F
1 Btu.in/ft <sup>2</sup> h°F	=	0.1442 W/m.K
1 kcal/mh°C	=	1.163 W/m.K

### Limitations and Hazards

- In all external exposure and some internal applications the PU foam surface must be protected from weathering / physical deterioration by:
  - the application of a selected elastomeric membrane coating – typically acrylic, polyurea, polyurethane or bituminous types.
  - 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 **+ 85°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, the use of vapour barrier coatings / systems, and their application requirements.
- Special precautions need to be taken in regard to system design and specification under possible water vapour condensation temperature conditions, or in conditions of 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 i.e. air.

### Product Safety Precautions

Please refer to **MATERIAL SAFETY DATA SHEET** for precautions covering the 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 and 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.