

# Endurathane HW29P

## PRODUCT DESCRIPTION

**Endurathane HW29P** is a fully formulated polyol blend designed to react with Endurathane Part A to make a polyurethane foam primarily used in insulating hot water appliances.

**Endurathane HW29P** is formulated with Pentane as the blowing agent which has zero ozone depleting potential and zero global warming potential.

## TYPICAL LABORATORY REACTION & PROPERTIES DATA

### Mixing ratio :

**Endurathane HW29P:** 100 pbw  
Isocyanate: 124 pbw

### Laboratory reaction profile at 21°C :

Cream Time (sec) : 17-20  
Gel Time (sec) : 77-87  
Rise Time (sec) : 120-130  
Free Rise Core Density (kg/m<sup>3</sup>) : 31-32

### Typical liquid properties at 21°C :

Appearance : Clear coloured liquid  
Viscosity (Brookfield) : 300 mPa s  
Specific Gravity : 1.08

### Typical properties as seen in laboratory samples:

Test	Result	Method
Compressive strength – parallel (34kg/m <sup>3</sup> )	155 kPa	AS2498.3
Compressive strength – perpendicular (34kg/m <sup>3</sup> )	120 kPa	AS2498.3
Fire test	Self-extinguishing after 0-30 secs	D1692/ ISO3582
Dimensional stability 14 days @ -30°C 14 days @ 70°C with 100% humidity 14 days @ 100°C	% change -0.06 1.20 0.27	D2126-66
Thermal conductivity (k-factor) @22.5°C	0.02041W/mK	EKO machine
Closed cell content	>95%	Pycnometer
VOC emissions “Greenstar” limit = 0.5mg/m <sup>2</sup> /hr	<0.01 over 24 hrs	CETEC - D5116



## STORAGE AND HANDLING PRECAUTIONS

This product contains pentane which has a boiling point of 49°C. Storage at elevated temperature will result in pressure build up within the drums, and for this reason product should be stored away from direct sunlight.

Pentane is highly flammable and can form an explosive mixture in air, but with correct controls applied can be handled safely. Naked flames, smoking or any potential sources of ignition should not be permitted in the working area. Refer to Material Safety Data Sheet for pentane or **Endurathane HW29P**.

When opening a container, care must be taken to release any internal pressure slowly.

To prevent loss of pentane by evaporation, and to prevent ingress of moisture, drums must be kept tightly sealed when not in use.

### Storage Stability

Recommended storage temp: 10-25°C  
Under these conditions this product has a storage stability of at least 6 months.



## PACKAGING

Nett 210 kg per 200 litre drum.



## HEALTH AND SAFETY ADVICE

Refer to Polymer Group Safety Data Sheets for individual products. Also refer to technical Information PU193-IE “MDI-Based Compositions: Hazards and Safe handling Procedures”.

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## PROPERTIES AND SUSTAINABILITY OF POLYURETHANE FOAM

Polyurethane rigid foams have a closed cell structure and high cross-linking density give them the characteristics of good heat stability, high compressive strength and excellent insulation properties.

PU insulation has a very low thermal conductivity, starting from as low as 0.017 W/m.K, making it one of the most effective insulants available today for a wide range of applications.

All types of insulation can also play a role in improving the energy efficiency of buildings and reducing CO<sub>2</sub> emissions.

The environmental impact Polyurethane offers is as follows:

- Excellent thermal efficiency – leading to optimum energy savings and reduced CO<sub>2</sub> emissions.
- Relatively low environmental impact at the building level – the product saves more than 100 times the energy than is used in its manufacture.
- Durability – leading to long term performance and reducing the need for replacement, therefore saving energy.

The economic impact from polyurethane is:

- Increased energy efficiency – leading to immediate savings for the end user.

Ref: PU Europe Sustainability and polyurethane insulation.

## INFORMATION ON THERMAL CONDUCTIVITY (K-FACTORY OR $\lambda$ ) TESTING

To test the insulation properties of foam we test the thermal conductivity or K-factor, which is a measure of a materials ability to transfer heat through conduction and therefore is the principle property of an insulation material.

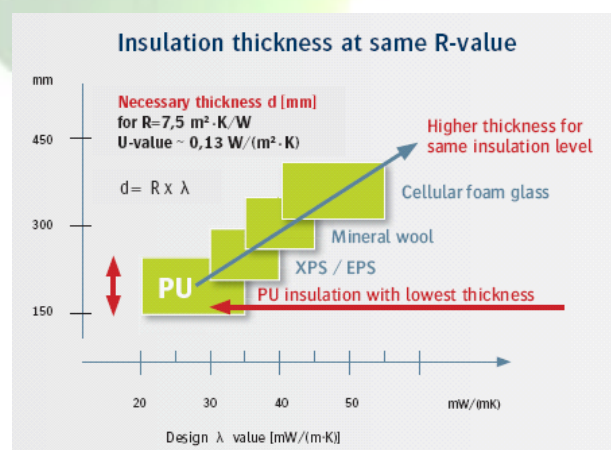
Typical values of insulating materials are:

Material	Density (kg/m <sup>3</sup> )	k-factor (W/mK)
Polyurethane foam closed cell	32	0.017
Polyurethane foam open cell	10-12	0.035
Polystyrene foam	16	0.035
Rockwool	100	0.037
Glasswool	65-160	0.041
Timber – white pine	350-500	0.112

Insulation materials are then normally reported in terms of their R-value, which is a measure of the thermal resistance.

**Endurathane HW29P** with a k-factor of 0.02041W/mK would give an estimated R-value of 2.45 m<sup>2</sup> K/W @ 50mm thickness.

The following graph shows the thickness of insulation materials needed to get an R-value of 7.5 m<sup>2</sup> K/W with standard PU foam. As seen, PU offers the best insulation at lowest thickness.



Reference: Insulation for sustainability: A guide, XCO2 Conisbee 2002

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