

ENDURATHANE GP38M

PRODUCT DESCRIPTION

Endurathane GP38M is a fully formulated polyol blend designed to react with **Suprasec 5005** or **Endurathane Part A** isocyanate to make a general purpose rigid polyurethane foam.

Endurathane GP38M is formulated with HFC as the blowing agent which has zero ozone depleting potential, as well as below the "Greenstar" VOC threshold.

TYPICAL LABORATORY REACTION & PROPERTIES DATA

Mixing ratio :

Endurathane GP38M : 100 pbw
Isocyanate: 110 pbw

Laboratory reaction profile at 21°C :

Cream Time (sec) : 45
Gel Time (sec) : 190
Rise Time (sec) : 360
Free Rise Core Density (kg/m³) : 43

Typical liquid properties at 21°C :

Appearance : Clear coloured liquid
Viscosity (Brookfield) : 630 mPa s
Specific Gravity : 1.14

Typical properties as seen in laboratory samples:

Test	Result	Method
10% Compressive strength – parallel (50kg/m ³)	300 kPa	AS2498.3
10% Compressive strength – perpendicular (50kg/m ³)	300 kPa	AS2498.3
Fire Test	Self extinguishing after 0-3 secs	D1692/ISO3582
Dimensional stability 14 days @ -30°C 14 days @ 70°C with 100% humidity 14 days @ 100°C	% change -0.33 -0.44	D2126-66
Thermal conductivity (k-factor) @22.5°C	0.023 W/mK (R 1.09 m ² KW)	EKO machine
Closed cell content	>95%	Pycnometer
VOC emissions "Greenstar" limit = 0.5mg/m ² /hr	0.01 over 24 hrs	CETEC - D5116



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".

Component A [isocyanate] contains methylene bisphenyl di-isocyanate [MDI]. It is moderately toxic. **Avoid contact with skin or eyes, avoid breathing vapour** and use only in well ventilated areas.

Component B [polyol] contains HFC volatile blowing agent. It is a mild irritant. In confined spaces it may displace sufficient air to be hazardous. Provide ventilation or use only in well ventilated situations.



PACKAGING

Nett 220 kg per 200 litre drum.
Nett 22 kg per 20 litre pail.



STORAGE AND HANDLING PRECAUTIONS

ALL CHEMICALS MUST BE USED BY TRAINED PERSONNEL.

Component B [polyol] contains HFC which has a boiling point of 15°C. Storage at elevated temperatures will result in build up within the drums, and for this reason the product should be stored away from direct sunlight.

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

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

Always wear **eye protection** and suitable **protective clothing**.

Flush splashes to the skin or eyes with copious quantities of water.

Clean up:

Owing to the chemical resistance of polyurethane products it is important to clean up any overspray as quickly as possible. Methyl Proxitol is suitable for general cleaning and methylene chloride can be used as a line flush.

Wear suitable protective clothing, goggles and gloves at all times when cleaning.

Greasing components beforehand assists with contamination removal.

Storage Stability

Recommended storage temperature is 10-25°C in tightly closed containers to prevent moisture and other contamination. Under these conditions this product has a storage stability of at least 6 months.

Store out of direct sunlight and sources of heat. If exposed to moisture Component A will crystallise resulting in line blockages.

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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 CO₂ emissions.

The environmental impact Polyurethane offers is as follows:

- Excellent thermal efficiency – leading to optimum energy savings and reduced CO₂ 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 λ) 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.

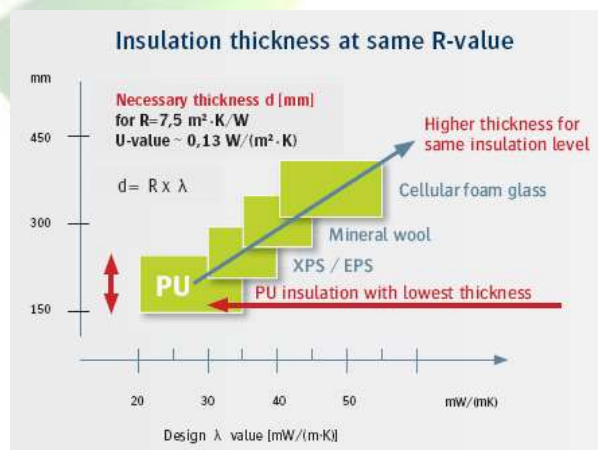
Typical values of insulating materials are:

Material	Density (kg/m ³)	k-factor (W/mK)
Polyurethane foam closed cell	32	0.017 initial 0.023 aged
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 GP38M with the above k-factor result would give an estimated R-value of 2.17 m² K/W @50mm thickness.

The following graph shows the thickness of insulation materials needed to get an R-value of 7.5 m² 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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