

ENDURATHANE SR43M Spray Foam System

PRODUCT DESCRIPTION

Endurathane SR43M is a fully formulated polyol blend designed to react with **Suprasec 5005 or Endurathane Part A** isocyanate to produce a polyurethane foam system suitable for structural applications. The two components are processed using plural airless spray equipment. **Endurathane SR43M** is formulated with HFC as the blowing agent which has zero ozone depleting potential, as well as below the "Greenstar" VOC threshold.

Energy Saving

Polyurethane provides the most efficient thermal insulation value of any building material. Because it is sprayed-in-place, there are no gaps, seams or fasteners to act as thermal bridges.

Structural Strength

The high compressive strength of this product is designed for roofing applications to support foot traffic. It also adheres strongly to the prepared substrate, improving structural integrity of fragile substrates.

Waterproofing Integrity

Sprayed-in-place this product creates a one piece, seamless, self-flashing barrier which is fully bonded to the substrate. Closed cell construction prevents the passage of liquid water. This product is formulated to provide an ideal, uniform prepared surface to accept a liquid-applied waterproofing membrane.

Improved Productivity and Economy

This product may be rapidly installed to large areas of roofing by high productivity spray equipment. Labour costs are minimised as the liquid applied system conforms and adheres to complex roof shapes and details with no need for mechanical flashings, fasteners or fittings.

TYPICAL LABORATORY REACTION & PROPERTIES DATA

Mixing ratio:

Endurathane SR43M	100 pbv
Isocyanate	100 pbv

Laboratory reaction profile at 21°C:

Cream time (sec):	4-7
Gel time (sec):	10-14
Rise time (sec):	24-29
Free Rise core Density (kg/m ³):	44-46

Typical liquid properties at 21°C:

Appearance:	Clear coloured liquid
Viscosity (Brookfield):	630 mPa's
Specific Gravity:	1.11

Service Temperature

For hot applications such as heated tanks, the cured insulation may be used at continuous service temperatures of up to 85°C.

Typical properties as seen in laboratory samples:

Test	Result	Method
10% Compressive strength – parallel (48kg/m ³)	300 kPa	AS2498.3
Thermal conductivity (k-factor) @ 22.5°C	0.0225 W/mK (R = 2.13 m ² K/W)	EKO machine
Closed cell content	> 90%	Pycnometer

LIMITATIONS

Although **Endurathane SR43M** contains fire retardant, all polyurethane insulation will burn when exposed to fire. For interior building applications, a protective thermal barrier equal in resistance to 13mm gypsum board should be used over the insulation.



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.

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

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



PACKAGING

Nett 220 kg per 200 litre drum.



STORAGE AND HANDLING PRECAUTIONS

ALL CHEMICALS MUST BE USED BY TRAINED PERSONNEL.

Endurathane SR42M contains HFC which has an initial 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 drums, 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.

Suprasec 5005 or Endurathane Part A

isocyanate will react with water to produce carbon dioxide gas. As a result drums contaminated with water should not be sealed.

Materials Protection System

Spray foam chemicals are either hygroscopic or reactive to moisture and a nitrogen gas purge of desiccant dryer system should be used to prevent moisture vapour entering the drums through the small bung holes.

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 (initial k factor), 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.

λ 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.

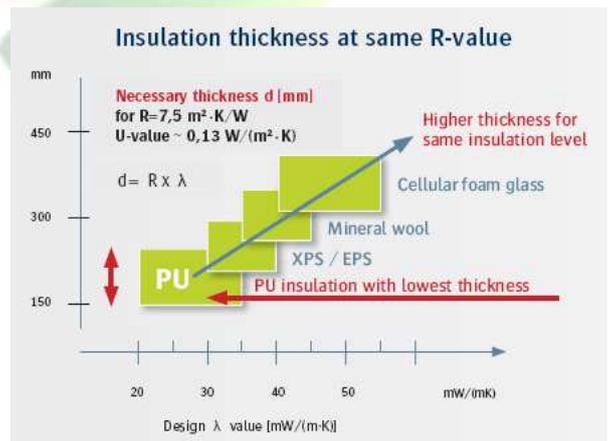
Typical values of insulating materials are:

Material	Density (kg/m ³)	k-factor (W/mK)
Polyurethane foam closed cell	32	0.017 initial 0.0225 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 SR43M with the a k-factor of 0.0225 W/m.K would give an estimated R-value of 2.22 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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