

Poliuretán[®] Spray

(Winter Formulation)

DIVISION: PU SYSTEMS

DESCRIPTION

Poliuretán[®] Spray are two-component polyurethane systems (polyol and isocyanate) formulated to obtain closed-cell rigid foams to be sprayed-in-place for thermal insulation.

Poliuretán[®] Spray systems contain approved ecological foaming agents (**HFCs**) that are not ODP (Ozone Depletion Potential) and are mainly used to obtain excellent thermal insulation.

AENOR N CERTIFICATION



Poliuretán[®] Spray systems, composed of **S-303E-W**, **S-353E-W**, **S-403E-W** and **S-503E-W**, have been awarded with the **AENOR N Certificate** to product quality for thermal insulation materials and their use in building, according to the certificate numbers: 020/002842, 020/002844, 020/002846 and 020/002848 valid until 27/01/2014.



DESCRIPTION OF THE COMPONENTS

COMPONENT A: Mixture of polyols containing catalysts, flame-retardants and foaming agents.

COMPONENT B: MDI (Methane diphenyl diisocyanate).

DENOMINATION OF COMPONENTS

COMPONENT A: POLYOLS **S-303E-W, S-353E-W,
S-403E-W, S-503E-W.**

COMPONENT B: ISOCYANATE H.

APLICACIONES

Poliuretán® Spray systems are applied by spraying with a high pressure equipment fitted with heating, with a mixing ration of 1:1 in volume. Their main applications are the thermal insulation of building closings, houses (partitioning), industrial buildings, farms, ships, tanks, cool stores, etc :

Applied Density (g/l)	System	Application type
33 – 37	S-303E-W	Building, Farms, etc.
37 – 43	S-353E-W	Tanks , Ships, etc
43 – 50	S-403E-W	Roofs, Flooring, etc.
50 – 60	S-503E-W	Roofs, Flooring, etc.

Advantages in Application:

- Total suppression of thermal bridges. The insulation presents neither joints nor cracks, since it is a continuous insulation.
- Good adherence to the substrate. No glues or adhesives are needed for the installation.
- Possibility of insulation and waterproofing in a single process. This characteristic is due to its closed-cell and watertight structure, as well as its continuous application, which means that no joints are formed.
- Mobility. It is possible to get to any site quickly without having to transport or store bulky products such as other insulating material.
- Cavity-sealing for sound insulation – absorption.
- Increase of the living area compared with other insulating material.

APPLICATION CONDITIONS

For the preparation and application of **Poliuretán® Spray** systems, the ATEPA Rules on the Application of Insulating Material should be taken into consideration. (www.atepa.org).

Cavitations of the pumps may cause a decompensation of the polyol mixture/isocyanate ratio producing a foam with poor quality. In order to avoid such a problem, equipment suppliers recommend the use of separate pumps.

The surfaces must be clean, dry and free of dust and grease to ensure good adherence of the foam to the substrate; if the substrate is metallic it must also be free of oxide and rust. A suitable primer is recommended to guarantee good adherence on metal substrates as well as a minimum applied density of 40 Kg/m³.

The foam performance is influenced by a great number of factors which are listed below:

- Weather conditions: temperature and humidity of the atmosphere and the substrate surface, as well as other environmental factors (wind, etc.)
- Adjustment of the machinery, a proper ratio.
- Application type: vertical, horizontal, roofs.
- Application process: coat thickness, varnish application.

GENERAL INSTRUCTIONS

Coat thickness is perfectly controllable and can be modified by varying the speed of application and/or the gun mixing chamber; thickness should be between 10 and 20mm.

It must be taken into account that the foam performance is greater the lower the number of coats applied for the same thickness. Nevertheless, it is not convenient to apply thicknesses above 20 mm, in order to avoid blistering and problems that may take place due a high exothermic reaction.

On cold surfaces, the first coat takes longer to react and growth is not usually 100%. Whereby, in these cases, the first coat should be a varnish for a heat development, which should heat the substrate providing a proper foaming of the second coat.

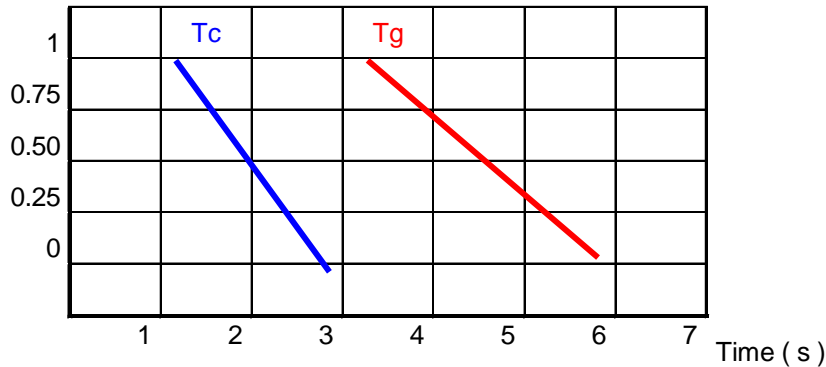
The recommended temperature in hoses is 30 to 50°C, depending on the weather conditions. The minimum recommended substrate temperature during spraying is 5°C.

In certain unfavourable atmospheric conditions (cold substrates, low temperature, high humidity, etc.) it is advisable and approved the addition of about 0.5% to 1% of **Activator 2421*** in the polyol, in this case the drum must be mechanically agitated to provide an appropriate homogenisation.

*(varying the cream time **-tc-** and gel time **-tg-** according to the % of activator added, see attached graphic)

The addition of any type of catalyst other than the catalyst approved by **Synthesia Internacional, S.L.U.** is neither recommended nor authorised since it may affect the characteristics of the foam and produce unevenness in the process.

% Activador



PROTECTION OF THE FOAM

Rigid PUR foams applied outdoors are darkened and brittle by the action of UV radiation. Thus, all foams that are to be used in these conditions must be protected with a suitable coating (acrylics, butyl rubber, vinyl, asphalt, mono and bi-component polyurethanes, etc.) **Synthesia Internacional, S.L.U.**, supplies an acrylic coating (**AQ 3300**), a urethane mono-component (**MU 7950**), and urethane bi-components **POLIURETAN® URE SPRAY (System F-75)**. The ideal coating is one which meets the following requirements:

- a.- Physical properties:
 - Resistance to atmospheric and chemical agents.
 - Good tensile strength.
 - Good foam adherence.
 - Resistance to UV radiation.
- b.- Regarding the application:
 - Fast drying.
 - Possibility of spray gun application.

COMPONENT CHARACTERISTICS

CHARACTERISTICS	UNIT	H	S-303E-W	S-353E-W	S-403E-W	S-503E-W
Specific weight at 25°C	g/cm ³	1,23	1,17	1,17	1,17	1,17
Viscosity at 25°C	mPa.s	230	300	325	350	375
NCO Content	%	31	-	-	-	-

THERMAL CONDUCTIVITY

CHARACTERISTICS	UNIT	S-303E-W	S-353E-W	S-403E-W	S-503E-W
Closed cell content ISO-4590	%	>90	>90	>90	>90
Thermal Conductivity coefficient of calculation	W/m°C	0.028	0.028	0.028	0.028
* Thermal Conductivity UNE-12667:2002	W/m°C	0.021	0.021	0.020	0.021

* Certificate issued by CEIS Laboratory included in file references: LAT0126/2008

FIRE REACTION TEST

CHARACTERISTICS	UNIT	S-303E-W	S-353E-W	S-403E-W	S-503E-W
FIRE reaction UNE 23727	Class	M3	M3	M3	M3
	Thickness	60 mm with 7 mm naturvex support			
*FIRE reaction UNE EN ISO 13501-1:2002	Euroclass	E	E	E	E
	Thickness	Valid for any thickness			

*Certificates issued by GAIKER included in report references: P-08-10347, P-08-10347/1, P-08-10347/2 and P-08-10347/3.

ACOUSTIC INSULATION OF CLOSED CELL FOAM

The contribution of the sprayed polyurethane rigid foam to the acoustic insulation of perforated brickwork is the following:

S1. ½ ft perforated brick	R= 40dB
S2. ½ ft perforated brick + 2 sprayed polyurethane	R= 47dB
S3. ½ ft perforated brick +3 cm sprayed polyurethane	R= 47 dB
S4 ½ ft perforated brick + 4 cm sprayed polyurethane	R= 49 dB
S6. ½ ft perforated brick + 5 cm sprayed polyurethane + plasterboard	R= 52 dB

Data from “ Instituto de la Contrucción Eduardo Torroja”, report nº: 17.691

When the projected thickness is between 2 or 3 cm, the improvement of the acoustic insulation is observed in the whole frequencies of the spectrum. The big growth is produced from frequency 315 Hz. A maximum of 9 dB has been observed, added to R_w value to ½ ft perforated brickwork.

It barely contributes to the acoustic insulation according to The Law of Mass, for that reason the improvement of the insulation must be produced by the sealing of the loopholes at the work and in the connexion sides with the frame of the test.

SAFETY RECOMMENDATIONS

Poliuretán[®] Spray system does not represent significant risks if handled properly. Avoid contact with eyes and skin. The instruction given in the Safety Data Sheet must be followed during the manufacturing and handling of the system.

SUPPLY OF THE PRODUCT

Normally, the product is supplied in non-returnable steel drums of 220 litres (blue for Component A and black for Component B).

STORAGE RECOMMENDATIONS

VERY IMPORTANT: Poliuretán® Spray system components are sensitive to humidity and must be stored in hermetically sealed drums or containers. **The storage temperature must be kept between +15 and +25°C.** Lower temperatures considerably increase the polyol viscosity, rendering it difficult to apply, and may build up crystallizations in the isocyanate. Higher temperatures may cause alterations in the polyol, loss of blowing agent, greater consumption and swelling of the drum, as well as uncontrolled foaming when the pump nozzle is placed into the drum. In order to avoid the latter, it is recommended to have the drums set-down for a certain period in a ventilated and fresh place before using them.

In case the drums are supplied with white plastic caps, special care should be taken during the handling of these caps as they are more fragile than the metallic ones and could be deformed.

To maintain the aforementioned characteristics of the systems, the drums should be hermetically sealed when not in use.

Properly stored, the self life is 3 months for Component A (polyol) and 9 months for Component B (isocyanate).

ANNEX : APPLICATION TROUBLESHOOTING

Our Technical and Commercial service will provide you with guidance in any queries you may have on the preparation of this product. Nevertheless, some problems that may appear during the process are outlined below.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Uneven atomisation.	Gun needle wrongly adjusted or dirt in the mixing chamber.	Adjust the position. Clean the chamber.
Atomisation with colour streaks.	Bad mixing due to obstruction of components or differences in viscosity.	Check pressures, fix obstruction. Adjust and increase temperatures.
Poor and closed atomisation.	High component viscosities. Cold atmosphere.	Increase temperatures and pressures.
Atomisation too open and forming mist.	Too much air in gun tip. Excessive mixing pressure.	Reduce air passage. Reduce the pressure a little.
The material takes too long to react, it falls off.	Cold surface.	Increase hose heating.
Material too fast, uneven finishing with mist.	Pressure excess.	Reduce air pressure in the gun and mixture.
The material is granulated as it gets on the surface and it is obstructing the gun.	Temperature excess.	Reduce hose heating.
Blistering.	Coatings thickness higher than 20mm.	Apply thinner coatings.