Issue date: April-2024
Version: v03

Poliuretan Spray S-303 HFO Isocianato H

DESCRIPTION

Two-component polyurethane system, polyol and isocyanate, applied by "in situ" spraying to obtain rigid closed-cell foams for thermal insulation.

Poliuretan Spray S-303 HFO has been developed using 4th generation foaming agents, which leads to a very low global warming.

The component **Poliuretan Spray S-303 HFO** is manufactured with a:

23% of *Recycled PET**

17% of *Products of renewable origin*

*Equivalent to 54 PET bottles** per m^2 for applied foam**

* *100% Post-consumer according to UNE-EN ISO 14021:2017*
** *Based on a weight of 8,6 g per PET bottle, and a thickness of 10cm with an applied density of 40 kg/m^3*

At Synthesia Technology we are using recycled PET from plastic bottles in the production of polyols, a key raw material used in the manufacturing of high-performance insulation. We are demonstrating that it is possible to use plastic waste responsibly, upcycling it into brand-new products that help to reduce energy consumption and CO_2 emissions, for the benefit of all. In this way, we promote the development of a circular and sustainable economy.

AENOR N MARK

AENOR has certified our **Poliuretan Spray S-303 HFO** spray system with its product-quality N Mark under standard EN 14315-1 as a thermal insulation material for buildings.

AENOR AISLANTE TÉRMICO
Certificate Nber: 020/003894
This component (A) is certified as a complete system with the component B ISOCIANATO H

AENOR AISLANTE TÉRMICO
Certificate Nber: 020/003892
This component (A) is certified as a complete system with the component B ISOCIANATO H

Contract No 020/003894 for **Poliuretan Spray S-303 HFO-W**

Contract No 020/003892 for **Poliuretan Spray S-303 HFO-S**

Synthesia Technology Europe Tel. +34 936 821 300 | cservice@synthesia.com | infoeurope@synthesia.com
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KEYMARK

The **Poliuretan Spray S-303 HFO** spray system is CEN KEYMARK SCHEME-certified as a thermal insulation product that is compliant with standard EN 14315-1.

Contract No 020/003903 for **Poliuretan Spray S-303 HFO-W**

Contract No 020/003902 for **Poliuretan Spray S-303 HFO-S**

NSAI Agrément

NSAI Agrément certifies that the **Poliuretan Spray S-303 HFO** spray system meets the requirements of the **"Building Regulations 1997 to 2019"** if applied as per the instructions set forth in Certificate 19/0414.

BBA Agrément

In the opinion of the BBA, **Poliuretan Spray S-303 HFO** projection system for suspended floors, pitched roofs and external walls if installed, used and maintained in accordance with certificates 22/6098 Product Sheet 1, 2 and 3, it can satisfy or contribute to satisfying the relevant requirements of the Building Regulations in the different regions of the UK.

COMPONENTS

COMPONENT A: **Isocianato H**

Polymeric methylene diphenyl diisocyanate (MDI).

COMPONENT B: **Poliuretan Spray S-303 HFO**

A mixture of polyols containing catalysts, flame-retardants and foaming agents.

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APPLICATIONS

The **Poliuretan Spray** system is sprayed according to a mixing ratio of 1:1 by volume using heated, high-pressure equipment. Its main applications are the external thermal insulation of façades and the internal thermal insulation of ceilings. Once it has been sprayed on, its density ranges from 35 to 45 g/L.

Application advantages:

- Complete suppression of thermal bridges. Since it is continuous, the insulation does not have any joints or cracks.
- Good adhesion to the substrate. No glues or adhesives need to be used for installation.
- Possibility of insulating and waterproofing in the same process. This is due, on the one hand, to its watertight-, closed-cell structure and, on the other, to the continuous manner in which it is applied, which allows doing away with joints.
- Mobility. It can be taken to construction sites in no time, there being no need to haul to or store on the site bulky products as in the case of other insulating materials.
- Sealing of gaps, thus muffling the passage of sound.
- Increase in the floor space compared to other insulating materials.

TYPICAL COMPONENTS CHARACTERISTICSo

Characteristics	Units	H	S-303 HFO
Specific Weight 20°C	g/cm³	1,23	1,14
Viscosity	cP	200 (25°C)	350 (22°C)
Free NCO content	%	31	-

TYPICAL PROCESS VALUES

The specifications of the system were measured in a test vessel at 22°C with the mixing ratio specified in Synthesia Technology's standard (MANS -01) and as per Annex E of product standard EN 14315-1.

A/B mixing ratio: 100/100 by weight

Specifications	Units	S-303 HFO-W	S-303 HFO-S
Cream time	s	3	3
Gel time	s	6	7
Set-to-touch time	s	8	8
Free density	g/L	33	33

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PREPARATION OF THE SUBSTRATE

Surfaces should be clean, dry, and free of dust and grease so that the foam can properly adhere to the substrate; if the substrate is a metal, it should also be free of rusting. In favourable conditions, the **Poliuretan Spray** foam adheres well to most building materials. Even so, should its adhesion prove to be not strong enough, a suitable primer should be used, and a minimum spray density of 38 kg/m3 attained.

Nevertheless, we cannot guarantee that this system will adhere to all types of substrates and primers. Consequently, the user should carefully study each specific case.

PROCESS OF APPLICATION

The foam's performance is affected by quite a few factors, which are listed below:

- The atmospheric conditions: ambient/room and substrate-surface temperature and humidity and other environmental factors (wind...).
- The settings of the equipment. The correct mixing ratio.
- The type of application: vertical, horizontal, or upside down.
- The application method: coat thickness, use of varnish.

In order for the foam to have an optimal performance and properties, the application conditions listed in the following table should be taken into account

		S-303 HFO-W	S-303 HFO-S
SETTINGS OF THE EQUIPMENT			
Component mixing ratio		1:1 by volume	
Temperature of the components		15 - 30°C	
Temperature of the hoses and pre-heaters		25 - 50°C	
Static pressure		1200 - 1800 psi / 80 - 120 bar	
Maximum difference in dynamic pressure between components		290 psi / 20 bar	
ENVIRONMENTAL CONDITIONS			
Ambient/room temperature		+5 to +30°C	+10 to +40°C
Wind speed		≤ 30 km/h	
SUBSTRATE CONDITIONS			
Temperature		+5 to +30 °C	+10 to +40 °C
Moisture	Porous substrates	≤ 20 %	
	Non-porous substrates	No surface condensation	

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The coat thickness can be controlled without any problems and modified by varying the spray rate and/or the mixing chamber of the gun, and it should range from 10 to 20 mm.

Please note that the smaller the number of coats for the same thickness, the higher the foam's performance. However, it is not advisable to spray on coats having thicknesses exceeding 20 mm in order to prevent pockets and having issues owing to the strong exothermic characteristics of the reaction and thus for the foam to maintain its properties.

TYPICAL CHARACTERISTICS OF THE SYSTEM

Characteristics	Standard	Poliuretan Spray S-303 HFO
Thermal resistance and thermal conductivity	UNE EN 14315-1:2013 + NB-CPR/SG19-22/213r1 (12/12/2022)	See performance chart
Closed Cell Content	UNE EN 14315-1:2013	CCC4
Water absorption (Wp)		≤0,2
Water vapour resistance factor (μ)		≥70
Tensile strength perpendicular to faces		≥100 (A3)
Reaction to fire (naked foam)	EN 13501-1:2019	E (1)

(1) Test result valid for any applied thickness (test carried out at 60 mm thickness.

Performance chart

Sprayed-on CCC4 insulation foam (uncoated or open to diffusion).

e_p	25	30	35	40	45	50	55	60	65
λ_D	0,028	0,028	0,028	0,028	0,028	0,028	0,028	0,028	0,028
R_D	0,90	1,10	1,25	1,45	1,65	1,85	2,00	2,20	2,40
e_p	**70**	**75**	**80**	**85**	**90**	**95**	**100**	**105**	**110**
λ_D	0,028	0,028	0,027	0,027	0,027	0,027	0,027	0,027	0,027
R_D	2,55	2,75	3,00	3,20	3,40	3,55	3,75	3,95	4,15
e_p	**115**	**120**	**125**	**130**	**135**	**140**	**145**	**150**	**155**
λ_D	0,027	0,026	0,026	0,026	0,026	0,026	0,026	0,026	0,026
R_D	4,30	4,70	4,90	5,10	5,30	5,45	5,65	5,85	6,05
e_p	**160**	**165**	**170**	**175**	**180**	**185**	**190**	**195**	**200**
λ_D	0,026	0,026	0,026	0,026	0,026	0,026	0,026	0,026	0,026
R_D	6,25	6,45	6,65	6,85	7,05	7,25	7,45	7,65	7,85

e_p Thickness (mm)
λ_D Declared aged thermal conductivity (W/mK)
R_D Thermal resistance level ($m^2 \cdot K/W$)

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INDOOR AIR EMISSIONS (VOCs)

Regulation	Poliuretan Spray S-303 HFO
French VOC Regulation	Class A+
French CMR components	Compliant
Italian CAM Edilizia	Compliant
ABG/AgBB	Compliant
Belgian Regulation	Compliant
Indoor Air Comfort GOLD®	Compliant
Blue Angel (DE-UZ 132)	Compliant
BREEAM International	Exemplary level
LEED v4.1 BETA (outside U.S.)	Compliant

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SAFETY RECOMMENDATIONS

Isocyanate H (Component A) causes skin, eye and airway irritation. It can also cause irreversible damage to human health by inhalation or through contact with the skin.

Poliuretan Spray S-303 HFO (Component B) causes skin irritation and severe ocular lesions. In addition, it can cause irreparable damage to health and to the aquatic environment.

When working with the product, the workers should wear complete personal protective gear, including a full facemask breathing apparatus (which should supply fresh air if working inside confined, unventilated spaces), protective workwear, and safety gloves. Any other workers who are not going to take part in the application of the product should stay clear from the area. In addition, additional ventilation might be required in the form of natural or forced draught ventilation to prevent gases from building up and moving into other occupied areas of the building during the spraying process.

In the case of already occupied buildings, a 24h waiting period before reoccupation is recommended.

When handling the system and/or the products, it is advisable to take all safety and precautionary measures described in each product's MSDS.

SUPPLY FORM

Check with the Sales Department the different supply formats.

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STORAGE RECOMMENDATIONS

VERY IMPORTANT: **Poliuretan Spray** components are sensitive to humidity, and must be stored in hermetically sealed drums or containers. **The storage temperature must be keep between +5 and +35°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 take 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 4 months for **Poliuretan Spray S-303 HFO** and 9 months for **Isocianato H.**

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APPENDIX: APPLICATION ISSUES

Our Sales and Technical Support Service is available to answer any questions you might have during the preparation of the product. Nevertheless, below we have listed some of the most common issues that can occur during the spraying process:

Issue	Possible cause	Solution
Irregularly shaped span	Improperly adjusted gun pin or dirt in the mixing chamber	Adjust the position. Clean the chamber.
Span with colour veining	Poor mixture owing to components clogging the gun or having differences in viscosity	Check pressures, fix obstruction. Adjust and increase temperatures.
Poor, closed span	High component viscosity. Cold weather	Increase temperatures and pressures.
Very open span and misting	Too much air in the gun's nozzle Mixing pressure too high	Reduce air passage. Reduce the pressure a little.
The material takes a while to react; it sags	Cold surface	Increase hose heating.
Material sprayed too fast; irregular finish; misting	The pressure is too high	Reduce air pressure in the gun and mixture.
The material arrives at the surface looking granulated and clogs the gun	The temperature is too high	Reduce hose heating.
Air pockets form	The coats are more than 20mm thick	Apply thinner coatings.

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