

Phono Spray S-904

Isocianato H

DESCRIPTION

Phono Spray S-904 is a thermo-acoustic two-component polyurethane system comprising polyol, and isocyanate. The system is "in situ" sprayed and open cell low-density foam (7-9 g/l) with acoustic absorption properties is obtained.

Phono Spray S-904 system does not contain ozone depleting blowing agents.



COMPONENTS

COMPONENT A: **Phono Spray S-904**
Mixture of polyols, containing catalysts and flame-retardants

COMPONENT B: **ISOCIANATO H**
MDI polymeric (diphenyl methane diisocyanate)

USES

The **Phono Spray S-904** system is applied with a high-pressure spray equipment, which is heating outfitted, with a mixing ratio of 1:1 in volume. The applications can be the improvement in acoustic insulation to airborne noises for building enclosures such as partition walls, as well as for filling building cavities and cracks.

Application advantages:

- Total suppression of acoustic and thermal bridges. This system does not present joints or gaps since it is a continuously applied product.
- Good adherence to the substrate. Nor glues or adhesives are needed for its installation.
- Mobility. It is possible to get quickly to any site without having to transport or store bulky products like other acoustic and/or thermal insulating materials.

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CONDITIONS OF USES

Before being loaded into the machine, component A (Phono Spray S-904) must be homogenised for 5-10 minutes in a suitable mechanical mixer (above 1500rpm).

During the application it is important to avoid the excessive overlapping of the successive sprayings that are necessary to cover the surface. This reduces means the irregularities in the sprayed surface and the thickness is better controlled.

During the application and depending on the weather conditions, certain quantities of steam forming white clouds could be released from the foam. These vapours do not involve any risk to human health. In any case, it is recommended to ventilate the area before proceeding with the work in order to avoid high vapour concentration that may result uncomfortable.

The recommended initial heater and hose setpoint temperature is in the range of 50-55°C depending on the weather conditions and a working setpoint pressure of 1200 psi. The minimum recommended substrate temperature during spraying is 5°C.

COMPONENTS CHARACTERISTICS

Characteristics	Units	H	S-904
Specific weight 25°C	g/cm ³	1,23	1,10
Viscosity 25°C	mPa.s	230	350
NCO content	%	31	-

SYSTEM SPECIFICATIONS

Test beaker measurements at 22°C at the indicated mixing ratio and according to our Standard Test (MAN-S01).

Mix Ratio A / B: 100/100

Characteristics	Units	S-904
Cream time	s	4 ±1
Gel time	s	12 ±2
Tack free time	s	14 ±2
Free rise density	g/l	10 ±1

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FOAM PROPERTIES

Characteristics		Units	S-904
Apparent Core Density	EN 1602	kg/m ³	10 ±1
Closed Cell Content	ISO-4590	%	<20
Thermal resistance and thermal conductivity	EN 12667 EN 12939		See performance chart
Reaction to fire	EN 13501-1	Euroclass	F ⁽¹⁾
Water absorption (W _p)	EN 1609	Kg/m ²	≤3,5
Water vapour resistance factor (μ)	EN 12086	-	≥5
Sound Absorption	UNE EN 20354:1993		0,5
Air Flow Resistivity r	UNE EN 29053:1993	Kpa s/m ²	5-6 ⁽²⁾
Dynamic Stiffness s'	UNE EN 290501	MN/m ³	4,83 ⁽³⁾

⁽¹⁾ Result of valid test for any applied thickness (60 mm of thickness)

⁽²⁾ Certified by CEIS file number: LAT0067/08

⁽³⁾ Certified by APPLUS file number: 08/32309712

Performance chart

Sprayed insulation foam product CCC1 system. Diffusion open faces.

e_p	25	30	35	40	45	50	55	60	65
λ _D	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
R _D	0,65	0,80	0,90	1,05	1,20	1,35	1,45	1,60	1,75
e_p	70	75	80	85	90	95	100	105	110
λ _D	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
R _D	1,5	2,00	2,15	2,30	2,40	2,55	2,70	2,80	2,95
e_p	115	120	125	130	135	140	145	150	155
λ _D	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037	0,037
R _D	3,10	3,25	3,35	3,50	3,65	3,75	3,90	4,05	4,20
e_p	160	165	170	175	180	185	190	195	200
λ _D	0,037	0,037	0,037	0,03	0,037	0,037	0,037	0,037	0,037
R _D	4,30	4,45	4,60	4,70	4,85	5,00	5,15	5,25	5,40

e_p Thickness; mm

λ_D Declared aged thermal conductivity; (W/mK)

R_D Thermal resistance level; (m²K/W)

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FIRE REACTION TEST

Characteristics	Euro class	Conditions
Reaction to fire of end-use application (N° rapport:P-08-10356)	EN 13501-01 B S1 d0	Laminated plaster 15 mm Air chamber 15-20 mm

ACOUSTIC ABSORPTION TEST

The sound absorption of Phono Spray S 904 was determined at different frequencies, according to standard UNE-EN 20354:1993, in a reverberating chamber. The following table shows the obtained results as well as sound absorption of a closed cell polyurethane foam for thermal insulation such as Poliuretano® S Spray :

Frequency (Hz)	Acoustic absorption coefficient UNE-EN 20354 :1993	
	Phono Spray S 904*	Closed cell PU **
125	0.20	0.12
250	0,40	0.18
500	0.80	0.27
1000	0.60	0.19
2000	0,40	0.62
4000	0.50	0.22
NRC***	0.50	0.32

* Certified by Applus in Barcelona file number 3009439

** Data extracted from the technical information published by AISLA (www.aisla.org).

*** NRC states for the Noise Reduction Coefficient.

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ACOUSTIC INSULATION TEST

Acoustic insulation test for airborne noise have been carried out according to UNE-EN ISO 140-3:1995 in a vertical faces type facade and type watershed between neighbours.

FACADES

A constructive solution has been determined consisting of a vertical ceramic blocks where Poliuretano® S Spray and Phono Spray S 904 were applied and finished later by badges of standard laminated plaster. The results are shown below and they are compared to the ones obtained with Poliuretano® S Spray :

Description de l'échantillon	Taux de réduction sonore Unit-dans ISO 140-3:1995	
	R _a (dBA)	R _w (dB)
blocs béton* + 3.5 cm Poliuretano® S Spray **	46.7	47 (0 -4)
Partition de blocs béton* + 3.5 cm Poliuretano® S Spray + 5 cm Phono Spray S-904 + 10 cm lame d'air +Plaque de plâtre laminé de 13 mm***	60.3	62 (-2 -8)

* Ceramic blocks of 28x13x9 cm with an average weight of 3.5 Kg.

** Certified by Applus in Barcelona file number 3009437

*** Certified by Applus in Barcelona file number 3009438 M2

PARTITION BETWEEN NEIGHBORS

A constructive solution has practised for partition between neighbours consisting of a vertical ceramic blocks where Poliuretano® S Spray and Phono Spray S 904 were applied and finished later by another vertical ceramic block.

DESCRIPTION OF THE FACE (PARTITION BETWEEN NEIGHBORS)	Sound reduction index UNE-EN ISO 140-3:1995	
	R _a (dBA)	R _w (dB)
Ceramic blocks section* + 1.0 cm Poliuretano® S Spray + 4.0 cm Phono Spray S 904 + Ceramic blocks section *	45.6**	46 (-1 ; -5)**

* Double hollow brick of 31.5 x 14.5 x 7 cm with an average weight of 2.5 Kg.

** Certified by the Acoustic Area from the Laboratory of Control Laboratory of the Basque Government (Vitoria).
File number PI 04638-IN-CM-7 II

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This solution has been compared with another identical constructive solution which has filled the space between the two partitions vertical ceramic blocks with rock wool BX SPINTEX 623-70 (40 mm thickness and density of 65 kg/m³). The result is Rw of 45 dBA *.

(*)Certified by the Acoustic Area from the Laboratory of Quality Control of the Basque Government (Vitoria). File number PI 04638-IN-CM-7 I.

PARTITION BETWEEN PROTECTED ENCLOSURES

We have conducted test of soundproofing airborne noise as standard UNE-EN ISO 140-3:1995 and UNE-EN ISO 140-4, testing and measuring laboratory and in situ in dividing between enclosures protected , similar to dividing between neighbours.

DESCRIPTION OF THE FACE (PARTITION BETWEEN NEIGHBORS)	Soundproofing to airborne noise	
	R _a (dBA)	DN _{t,A} (dBA)
LP ½ PIE* + 3-4 cm Phono Spray S 904 + LHDGF7** Both carry leaves 7-10 mm mortar by the outside and perimeter bands.	58-60	51-54
LHDGF9** + 3-4 cm Phono Spray S 904 + LHDGF7** Both carry leaves 7-10 mm mortar by the outside and perimeter bands.	53-55	48-51

* Brique Perforé, mesures: 24 x 11,5 x 7 cm.

** Brique creux double grand format, mesures: 70 x 50 x 7 cm et 70 x 50 x 9 cm.

Certificats des essais réalisés dans les laboratoires de LABEIN et in situ N° Visa 6/08/00746 et 6/08/00747 du Collège officiel d'ingénieurs techniques industriels de Guipuzkoa.

STORAGE RECOMMENDATIONS

Components A and B are sensitive to moisture, and must be stored in hermetically sealed drums or hermetic containers. Storage temperature must be kept between +10°C and +30°C. Avoid lower temperatures that may build up crystallizations in the isocyanate, as well as higher temperatures that may alter the polyol and produce swelling of the drum.

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

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SAFETY RECOMMENDATIONS

Properly handled **Phono Spray S-904** system does not present significant risks. 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

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

ANNEX: APPLICATION TROUBLESHOOTING

Our Technical-Commercial customer service will give you advice for any queries you may have on the preparation of this product. Nevertheless, some of the problems that may appear during the process are outlined below:

PROBLEM	POSIBLE CAUSE	SOLUTION
Uneven atomisation	Needle /gun wrongly adjusted or dirt in the mixing chamber	Adjust the position Clean the chamber.
Coloured streaks	Bad mixing due to components obstruction or differences in viscosity.	Check pressures, fix obstruction. Adjust and raise temperatures.
Poor and closed atomisation.	High component viscosities. Cold temperature.	Rise temperatures and pressures.
Atomising too open and mist formation.	Excess of air in gun tip. Excessive pressure of mixing.	Reduce air passage. Reduce a little the pressure.
The material reacts slowly and it falls off.	Cold surface.	Rise hose heating.
Excessively fast material, uneven finishing with mist	Pressure excess	Reduce the air pressure in the gun and the mixing pressure.
The material is granulated as it gets on the surface and obstructs the gun.	Temperature excess	Reduce hose heating..
Blistering.	Coatings thickness higher than 20mm.	Apply thinner coatings.
Random shape bubbles are formed in the surface of the material.	It is applied on a surface that is too hot.	Wait the surface to cool down.
	Contamination with the formerly used product.	Let the presently used product to go through the hose a little bit more