

## 1. PRODUCT DESCRIPTION

EKOPRODUR S11E-MAX is a two-component polyurethane system for the production of open-cell semi-rigid foam with self-extinguishing properties.

POLY COMPONENT (polyol mixture)	EKOPRODUR S11E-MAX POLY
ISO COMPONENT (isocyanate)	ISO KOMPONENT B

## 2. APPLICATION

EKOPRODUR S11E-MAX is designed for internal thermal and acoustic insulation of roofs, attics, canopies, ceilings, walls in wooden, masonry, concrete, steel structures and in skeletal systems of residential, industrial, public buildings, using the spray method. EKOPRODUR S11E-MAX polyurethane foam meets the requirements of national regulations on the release of hazardous substances, in accordance with the Regulation of the Minister of Health and Social Welfare and can be used without restrictions in rooms of category A and B<sup>1</sup>.

## 3. COMPONENT CHARACTERISTICS

POLY COMPONENT – prescription polyol mixture in the form of an oily liquid, colorless or yellow, without suspensions.

ISO COMPONENT – a mixture of aromatic polyisocyanates, mainly diisocyanate diphenylmethane. Brown liquid, without suspensions.

Parameter	POLY	ISO	Unit
Density at 20 ° C	1,10 ± 0,02	1,22 ± 0,02	g/cm <sup>3</sup>
Viscosity at 20 ° C	450 ± 100	350 ± 100	mPa·s

## 4. FOAMING CHARACTERISTICS IN LABORATORY CONDITIONS

Reaction times and apparent core density were measured in laboratory conditions (at 20 ° C) for manual foaming in a laboratory vessel - stirrer approx. 7000 rpm.

Parameter	Value	Unit
The volume ratio of POLY:ISO components	100 : 100	
Cream time	4 ± 2	s
Gel time	11 ± 2	s
Tack free time	13 ± 3	s
Apparent core density	8,0 ± 1,5	kg/m <sup>3</sup>

## 5. RECOMMENDED PROCESSING CONDITIONS

EKOPRODUR S11E-MAX is a system designed for spraying, which should be processed using specialized foaming units equipped with a spray head. Recommendations are based on experience spraying with a Graco Reactor H-XP3 machine with a PROBLER P2 ELITE gun (mix chamber 01).

**IMPORTANT: Both components must be heated to 30-40°C before use. In addition, the POLY component should be thoroughly mixed (approximately 1 hour before the start of application and continue mixing during spraying, with a barrel stirrer - recommended Graco Twistork agitator). The POLY component tends to slowly separation. The ISO component does not require mixing.**

The volume ratio of POLY:ISO components	100 : 100	
<b>Recommended machine settings</b>		
Parameter	Value	Unit
POLY and ISO heating temperature	50 - 60	° C
Hose heating	50 - 60	° C
Component's pressure	80-110 (1160-1595)	Bar (psi)
Component's temperature in barrels	30 - 40	° C
<b>Optimal processing conditions</b>		
Ambient temperature	10-35	° C
Recommended substrate temperature	15 - 50	° C
Relative ambient humidity	< 70	%
Humidity of the porous substrate	< 15	%
Humidity of non-porous substrate	0	%

Insulated surfaces should be prepared in advance. They cannot contain dust, water, oil, loose fragments and other substances that may reduce the adhesion of the foam.

Before spraying, carefully protect the surfaces of neighboring objects, windows, doors, floors, furniture, etc., to avoid accidental soiling during spraying - remember that the sprayed foam has very good adhesion and can be difficult to remove later from undesirable places. The pressure settings for the POLY Component and the ISO Component should be the same.

Spraying should be done in such a way that the layers obtained are as thick as possible (>100mm).

After applying the EKOPRODUR S11E-MAX system, the ventilation of the room is required, until the smell disappears. In case of lack adequate ventilation, forced air movement must be provided using dedicated devices. If the foam is exposed to direct UV radiation (e.g. sunlight) it should be secured. Before starting work with the EKOPRODUR S11E-MAX system, read the Material Safety Data Sheets of both components.

<sup>1</sup>Category A - buildings: residential, health care, education and rooms for storing food products. Category B – buildings: intended for people, public utility and other than category A rooms, as well as auxiliary rooms in apartments.

## 6. PERFORMANCE PROPERTIES

Usable properties of spray foam applied using a specialized machine:

Parameter	Value	Unit	Standard
Apparent core density	≥ 6,5	kg/m <sup>3</sup>	EN 1602
Flammability class:	E B-s <sub>1</sub> ,d <sub>0</sub> <sup>2</sup>	-	EN 13501-1+A1
	B2	-	DIN 4120
Fire spreading	NRO <sup>2,3</sup>	-	-
Fire resistance	REI 30 <sup>4</sup>	-	PN EN 13501-2
Short-term water absorption by partial immersion, W <sub>p</sub>	≤ 2,85	kg/m <sup>2</sup>	EN 1609
Thermal conductivity coefficient λ <sub>mean,i</sub>	0,037	W/(m·K)	PN-EN 12667
Thermal conductivity coefficient, λ <sub>90,90</sub>	0,038	W/(m·K)	PN-EN 12667
Aging value, λ <sub>b</sub>	0,038	W/(m·K)	PN-EN 12667
Compressive stress at 10% relative strain, σ <sub>10</sub>	≥ 5	kPa	EN 826
Diffusion resistance coefficient water vapor, μ	6	-	PN-EN 12086
Temperature stability: 70 °C, 90% RH, after 48 hours	DS(70,90)4	-	EN 1604
Temperature stability: -30 °C, after 48 h	DS(-20,-)4	-	EN 1604
Foam adhesion perpendicular to the ground	≥ 15	kPa	EN 1607
Closed cell content	≤ 15	%	PN-EN ISO 4590
Resistance to mold fungi - Intensity of growth	0	-	EN ISO 846
Emission of volatile organic compounds - French VOC Regulation	A+	-	EN 16516
Acoustics – class of sound absorption	D	-	EN ISO 354

Full mechanical properties of the foam are achieved after 48 hours of seasoning.

## 7. PACKAGING

Metal barrels with a volume of 216 dm<sup>3</sup>.

## 8. RECOMMENDED STORAGE CONDITIONS

Both components of the system should be stored in tightly closed packages in dry rooms at a temperature of 10 - 25°C. Protect against moisture and direct sunlight. The shelf life of the component POLY in the manufacturer's original sealed packaging, stored under recommended conditions, is **5 MONTHS**.

## 9. LEGAL REGULATIONS

- EKOPRODUR S11E-MAX does not contain foaming agents that deplete the ozone layer, in accordance with the provisions of the European Union on the circulation and use of controlled substances - Regulation (EC) No. 1005/2009 of September 16, 2009.
- The EKOPRODUR S11E-MAX polyurethane system has been placed on the market in accordance with Regulation of the European Union No. 305/2011, along with the assessment of performance made in accordance with the European harmonized standard EN 14315-1:2013
- The product has a hygienic certificate PZH (*Państwowy Zakład Higieny*) B.BK.60111.0801.022
- The product has the CE marking and a Declaration of Performance Nr 34DOP-2023-EN has been issued for it
- Transport regulations apply in accordance with section 14 of the Product Safety Data Sheet

## 10. ADDITIONAL INFORMATION

The data contained in this technical information is based on the results of our laboratory tests and practical experience and does not constitute a guarantee of the properties of the final finished product. The results obtained may differ from those given in the case of using the product in conditions other than those assumed. Therefore, we recommend carrying out your own tests to check the suitability of the product for a given application. The use of the foam and the conditions of its application are not controlled by the manufacturer, the contractor is responsible for their correct selection. The guidelines for the use of the system are contained in the Technical Information (TDS) and Safety Data Sheets (SDS). Failure to comply with the conditions recommended by the manufacturer may adversely affect the foam application process and its parameters.

**IMPORTANT: We are happy to provide technical and substantive assistance in the implementation and use of the EKOPRODUR S11E-MAX polyurethane system. At the same time, when necessary, we help in adjusting and selecting important parameters. In all matters related to the purchase and use of the EKOPRODUR S11E-MAX polyurethane system, we encourage you to contact your technical and commercial representative directly or by writing to [prodex@pcc.eu](mailto:prodex@pcc.eu).**

<sup>2</sup>Applies to a layer system consisting of EKOPRODUR S11E-MAX foam on combustible or non-combustible bases, covered with plasterboard lining, on a wooden or metal structure with a plasterboard thickness of 12.5 mm, the manufacturer is responsible for the classification of the product placed on the market.

<sup>3</sup>Journal of Laws ANNOUNCEMENT OF THE MINISTER OF INFRASTRUCTURE AND DEVELOPMENT

of 17 July 2015 on the announcement of the consolidated text of the Regulation of the Minister of Infrastructure on the technical conditions to be met by buildings and their location SECTION VI Fire safety Chapter 1 General rules requirements specified in the regulation as not spreading fire in accordance with the Annex No. 3 to the regulation

<sup>4</sup>Classification of the attic building system in the REI 30 fire resistance class of wooden roofs with Norgips cladding according to the classification report No. LBO-077-KZ/21