

## 1. PRODUCT DESCRIPTION

EKOPRODUR S0331FL is a two-component system for the production of closed-cell, self-extinguishing, rigid polyurethane foam. Excellent insulating properties of the foam were obtained thanks to the use of HFO - a fourth generation foaming agent from the group of hydrofluoroolefins with a low global warming potential  $GWP^1 = 1$  and a zero ozone depletion potential indicator  $ODP^2 = 0$ .

COMPONENT POLY (polyol mixture)	EKOPRODUR S0331FL POLY
COMPONENT ISO (isocyanate)	ISO KOMPONENT B

## 2. APPLICATION

EKOPRODUR S0331FL is designed to perform internal and external thermal insulation by spraying. This product has been specially developed for thermal insulation of floors and foundations. It can also be used for insulation of: walls, ceilings, attics, cellars, tanks, pipelines and other elements of unusual geometry. The EKOPRODUR S0331FL polyurethane system can be applied in residential and commercial construction, in agriculture or industrial areas. Furthermore, EKOPRODUR S0331FL functions as a barrier against radon penetration from the environment. EKOPRODUR S0331FL polyurethane foam meets the requirements for national regulations on the release of hazardous substances in accordance with the Decree of the Minister of Health and Welfare, and can be used without restrictions in premises of category A and B<sup>3</sup>.

## 3. COMPONENTS CHARACTERISTIC

COMPONENT POLY – polyol blend formulation in the form of oily liquid without suspension, from light red to dark brown.

COMPONENT ISO – mixture of aromatic polyisocyanates, especially diphenylmethane diisocyanate. Brown liquid without suspension.

Parameter	POLY	ISO	Unit
Density at 20°C	1,17 ± 0,02	1,22 ± 0,02	g/cm <sup>3</sup>
Viscosity at 20°C	400 ± 100	350 ± 100	mPa·s

## 4. FOAMING CHARACTERISTIC IN LABORATORY CONDITIONS

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

Parameter	Value	Unit
The volumetric ratio of components POLY:ISO	100 : 100	
Cream time	3 ± 1	s
Gel time	10 ± 3	s
Tack free time	13 ± 4	s
Apparent core density	40 ± 2	kg/m <sup>3</sup>

## 5. RECOMMENDED PROCESSING CONDITIONS

EKOPRODUR S0331FL is a system designed for spraying, and should be processed using specialized foaming units equipped with a spray head. Recommendations are based on experience in applying the foam using Graco Reactor H-XP3 machine and FUSION AP spray gun (5252 mixing chamber).

The volumetric ratio of components POLY:ISO	100 : 100	
Recommended machine settings		
Parameter	Value	Unit
POLY and ISO heating temperature	35 – 45	°C
Heating the hoses	35 – 45	°C
Component’s pressure	70-100 (1015-1450)	Bar (psi)
Component’s temperature in barrels	15 – 30	°C
Optimal processing conditions		
Ambient temperature	15 – 35	°C
Recommended substrate temperature	15 – 50	°C
Relative ambient humidity	< 70	%
Humidity of porous substrate	< 15	%
Humidity of non-porous substrate	0	%

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

Before spraying, carefully protect the surfaces of adjacent objects such as windows, doors, floors, furniture, etc., to avoid accidental soiling during spraying – keep in mind that the sprayed foam has very good adhesion and may be difficult to remove later from undesirable places.

Pressure settings for the POLY component and the ISO component should be the same.

In order to obtain the best insulation parameters, at least two uniform layers of foam should be sprayed so that the total thickness is greater than 30 mm. Between spraying successive layers of insulation, wait until the foam stabilizes (layer temperature below 30°C). All layers of insulation should be done in one day.

**IMPORTANT: Do not exceed the recommended layer thickness - the maximum thickness of each insulation layer is 35 mm.**

After application the EKOPRODUR S0331FL system, it is recommended to ventilate the room until the odor disappears. If the ventilation is not adequate, forced air movement should be ensured using dedicated devices. If the foam is exposed to direct UV radiation (e.g., sunlight), it should be protected.

Before starting work with the EKOPRODUR S0331FL system, read the Safety Data Sheets of both components.

## 6. PERFORMANCE PROPERTIES

<sup>1</sup> GWP, Global Warming Potential – potential of creating greenhouse effect - indicator used to quantify the impact of a substance on the greenhouse effect.

<sup>2</sup> ODP, Ozone Depletion Potential – potential of depleting ozone layer – indicator used to quantify the impact of substance on the ozone layer.

<sup>3</sup> Category A - buildings: residential, health care, education, and premises for storing food products. Category B - buildings: intended for human occupancy, public utilities and other than those included in category A premises, as well as auxiliary spaces in apartments.

Usable properties of spray foam, applied using a specialized machine:

Parameter	Value	Unit	Standard
Apparent core density	≥ 38	kg/m <sup>3</sup>	EN 1602
Flammability class	Class E	-	EN 13501-1
Short-term water absorption by partial immersion, $W_p$	≤ 0,10	kg/m <sup>2</sup>	EN ISO 29767
Thermal conductivity $\lambda_{mean,i}$	0,020	W/(m·K)	EN 12667
Thermal conductivity, $\lambda_{90,90}$	0,021	W/(m·K)	EN 12667
Aging value, $\lambda_D$ for the thickness:			EN 12667 + NB-CPR/SG19- 17/167r2
$d_N < 80\text{mm}$	0,026	W/(m·K)	
$80\text{ mm} \leq d_N < 120\text{ mm}$	0,025	W/(m·K)	
$d_N \geq 120\text{ mm}$	0,024	W/(m·K)	
Compressive stress at 10% relative deformation, $\sigma_{10}$	≥ 250	kPa	EN 826
Deformation under compressive load (1st stage 40kPa/48h RT, 2nd stage 40kPa/168h 70°C)	<5	%	EN 1605
Resistance coefficient of water vapour diffusion, $\mu$	≥ 60	-	EN 12086
Dimensional stability at defined temperature: 70°C, 90% rH, after 48 h	DS(70,90)3	-	EN 1604
Dimensional stability: -20°C, after 48 h	DS(-20,-)3	-	EN 1604
Insulation application temperature range	-80 to +120	°C	-
Adhesion of the foam perpendicularly to the surface	≥ 100	kPa	EN 1607
Closed-cell content	≥ 90	%	EN ISO 4590
Emission of volatile organic compounds - French Regulation VOC	Class A+	-	EN 16516
Emission of volatile organic compounds – Emission Safety Directive for sprayed PUR foam	indoor-air comfort GOLD	-	EN 16516
Radon diffusion coefficient	R > 3, „radon tight“	-	ISO/TS 11665-13

Full mechanical properties of the foam obtained after 48 hours of seasoning.

## 7. PACKAGING

Metal barrels with a capacity of 216 dm<sup>3</sup>, IBC with a capacity of 1000 dm<sup>3</sup>.

## 8. RECOMMENDED STORAGE CONDITIONS

Both components should be stored in tightly closed containers in dry place at a temperature of 10 - 25°C. Protect against moisture and direct sunlight. Shelf life of component POLY stored in original sealed manufacturer's packaging, under recommended conditions, is **3 MONTHS**.

## 9. LEGAL REGULATIONS

- EKOPRODUR S0331FL does not contain ozone-depleting foaming agents, in accordance with European Union regulations on the marketing and use of controlled substances - Regulation (EU) No. 2024/590 of February 7, 2024.
- Polyurethane system EKOPRODUR S0331FL has been introduced to the market in accordance with the EU Regulation No. 305/2011, together with an assessment of the performance made in accordance with the European harmonized standard EN 14315-1:2013
- This product has CE marking and Declaration of Performance No. 26DOP-2022-EN
- Product approved by PZH (Państwowy Zakład Higieny) B.BK.60111.0803.2022
- Transport regulations apply in accordance with section 14 of the Product Safety Data Sheet.

## 10. ADDITIONAL INFORMATION

Data included in this technical information are based on the results of our laboratory tests and practical experience as well. This data does not guarantee the properties of the final product. The results obtained may differ from those listed above especially when the use of the product is under the conditions other than originally intended. Hence, we recommend testing performance of the product for specific application at own degree. Foam application and conditions of use are beyond manufacturer control and contractor is responsible for correct selection. Guidelines for use are included in technical Information sheets (TDS) and safety data sheets (SDS). Failing to meet the recommended conditions can have negative impact on the foam application process and its parameters.

**IMPORTANT:** We are happy to provide technical and substantive assistance in implementing and applying polyurethane system EKOPRODUR S0331FL. At the same time when it is necessary and possible, we help in adjusting relevant parameters. In all matters related to the purchase and usage of polyurethane system EKOPRODUR S0331FL we encourage you to use a direct contact to our technical and commercial representative or by writing to [prodex@pcc.eu](mailto:prodex@pcc.eu).