

SPR 230

Closed Cell, Rigid Spray Polyurethane Foam

1 - Description

AKFIX SPR 230 is a two component (polyol - isocyanate), rigid spray polyurethane foam system with closed cell structure which is applied with high pressure and heated special spray machines for heat insulation purpose.

AKFIX SPR 230 contains ecological low GWP blowing agents that do not damage the ozone layer.

2 - Product Information

| | |
|---------------------------|--|
| Packacking | 480 kg set (250kg PMDI) + (230kg Polyol Blend) |
| Shelf Life | 6 months |
| Storage Conditions | Store in cool and dry conditions between +10°C to +30°C (+50°F to +86°F) |

3 - Properties

- Two component
- Closed cell structure
- B2 (E) fire reaction
- Easy and high application speed (~ 1000 m² per day)
- Seamless, no heat bridge
- Self-adhesive properties on many surfaces (concrete, wood, metal etc.)
- Does not grow insect and fungus
- Excellent thermal insulation for a long time (70-80 years)
- High energy saving
- Water vapor permeability
- Excellent mechanical properties
- Low storage and transportation cost
- Partial sound insulation

4 - Application Areas

- Roof
- Floor
- Wall
- Ceiling
- Chicken farms and barns
- Ships and storage tanks
- Cold storage room
- Other thermal insulation areas

5 - Technical Data

| Foam | Method / Conditions | Polyol Blend | Polymeric MDI |
|---------------------|---------------------|------------------|------------------|
| Physical Appearance | -- | Liquid | Liquid |
| Color | -- | Yellow | Yellow |
| Density | ASTM D 891 / 20°C | 1,13 ±0,03 gr/ml | 1,23 ±0,03 gr/ml |
| Viscosity | ASTM D 4878 / 25°C | 200 ±50 cps | 220-250 cps |
| NCO Content | ASTM D 5155 | - | 30-31 % |
| OH Content | ASTM D 4274 | 320-340 mgKOH/g | - |

| Reaction Parameters | Unit | Data |
|---------------------|-------------------|------|
| Cream Time | sec. | 3-4 |
| Gel Time | sec. | 6-8 |
| Tack Free Time | sec. | 8-10 |
| Free Rise Density | kg/m ³ | 30±1 |

* Tests were performed at 15°C (59°F) under laboratory conditions.

Finished Product Features:

| Test Name | Unit | Method | Data |
|---|-------------------|----------|-------------------|
| Application Core Density | kg/m ³ | -- | > 35 |
| Closed Cell Content | % | EN 4590 | ≥ 90 |
| Fire Reaction | -- | EN 13501 | E |
| | | DIN 4102 | B2 |
| Service Temperature | °C | - | (-30) – (+100) |
| | °F | - | (-22) – (212) |
| Water Absorption Amount | kg/m ² | EN 1609 | 0,20 (Declared) |
| | | | <0,20 (Measured) |
| Thermal Conductivity Coefficient | (W/m.K) | EN 12667 | 0,021 |
| Thermal Conductivity Coefficient of Aging | (W/m.K) | EN 14315 | 0,028 (Declared) |
| | | | ~0,027 (Measured) |
| Compressive Strength | kPa | EN 826 | 300 ~ 310 |

6 - Performance Chart

| | | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| e _p | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |
| λ _M | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 |
| R | 0,77 | 1,15 | 1,54 | 1,92 | 2,31 | 2,69 | 3,08 | 3,46 | 3,85 | 4,23 |
| e _p | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | |
| λ _M | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | 0,026 | |
| R | 4,62 | 5,00 | 5,38 | 5,77 | 6,15 | 6,54 | 6,92 | 7,31 | 7,69 | |

e_p: Thickness; (mm)

λ_M: Average measured aged thermal conductivity; (W/mK)

R: Thermal resistance level; (m² K/W)

7 - Application Conditions

- The application surface should be clean and dry, the elements that prevent adhesion should be cleaned from the surface. Do not wash to clean the surface.
- Recommended temperature of application surface is between 5°C and 40°C (41°F and 104°F).
- The recommended air temperature is between 10°C and 40°C (50°F and 104°F).
- It is not recommended to apply in windy weather.
- Recommended component temperatures and machine settings are as follows.

| Parameters | Data | |
|---------------------------|------------|---------------|
| Polyol Blend Temperature | 40-55°C | 104-130°F |
| Polymeric MDI Temperature | 40-55°C | 104-130°F |
| Hose Temperature | 35-55°C | 104-130°F |
| Machine Pressure | 80-110 bar | 1160-1600 Psi |

* Settings may vary depending on weather conditions and machine specifications.

- In order to obtain mixture in the right ratio, the filters of the machine should be cleaned and pump maintenance should be done. Improper mixing ratio of components results in low quality foam formation. In addition, the improper mixing ratio causes the adhesion problem, the increase in consumption, the deterioration of the cell structure and the foam not reaching the desired hardness.

| Mixing Ratio | Unit | Data |
|------------------------------|-----------|-----------|
| Polyol Blend / Polymeric MDI | By volume | 100 / 100 |
| | By weight | 100 / 110 |

8 - Directions for Use

- AKFIX SPR 230 is applied in layers to the surface to be thermal insulation until the desired thickness is obtained. Application is made in different thicknesses according to the regional climate conditions and application areas.
- The ideal application thickness for each layer is between 1.0 cm and- 2.0 cm. If thicker than 2.0 cm is applied, blistering may occur due to exothermic reaction.
- Since the surface is generally cold in the first layer application, the reaction is slow and the desired thickness cannot be obtained. Therefore, the first coat application is usually applied as a primer layer. In the second layer application to be applied, the desired thickness will be obtained more easily because the surface is warmer.
- In outdoor applications which is under direct sunlight, the foam color becomes darker after a period of time, the foam surface becomes dusty and the foam becomes more brittle. Polyurea (AKFIX POLYUREA Series), liquid PU membrane (AKFIX PU MEMBRANE Series) or acrylic membrane (AKFIX EM600) must be applied to protect the foam from UV rays.

9 - Consumption

- Material consumption may vary for many reasons. These reasons are the air temperature, application surface temperature, machine temperature settings, mixing ratio, number of application layers and so on.
- According to the application thickness and the number of application layers the theoretical consumption table is as follows.

| Application Thickness | Consumption (kg) |
|-----------------------|------------------|
| 3 cm | 1,50 – 1,80 |
| 5 cm | 2,40 – 2,70 |
| 10 cm | 4,50 – 5,00 |

* The applied layer thickness is between 1,00 cm - 1,50 cm.

10 - Remarks & Restrictions

- AKFIX SPR 230 components are moisture sensitive. For this reason, it should be stored in original, unopened and undamaged packages, in store which is dry and not under direct sunlight.
- Storage of the components at low temperature can lead to increased viscosities of the components resulting in difficulty in application and crystallization of polymeric MDI.
- Storage of the components at high temperature causes evaporation of the blowing agent in polyol mixture and swelling of the barrel. In addition, when the pump is placed in the drum, it causes the material to bubble uncontrollably.
- The lids of the completely non-consumed drums should be closed tightly to prevent air entrance to barrel.
- Clean all tools and application equipment with suitable cleaner solvent immediately after use. Hardened and cured material can only be cleaned by mechanical methods.
- Read the MSDS form carefully before using the AKFIX SPR 230 product or when a problem is encountered and follow the written instructions.
- Personal protective equipment and full face mask with appropriate filter should be used during application.
- There must be sufficient air circulation in the application area.
- Give empty barrels to authorized hazardous waste collector companies.

11 - Safety

Contains Diphenylmethane-4,4'-Diisocyanate. Harmful by inhalation. Irritating to eyes, respiratory system and skin. Do not breathe spray/vapor. Wear suitable protective clothing and gloves. Use only in well-ventilated areas. Pressurized container. Keep away from direct sunlight and do not expose temperatures over 50°C (122°F). Do not pierce or burn, even after use. Keep away from sources of ignition, no smoking. Keep out of the reach of children.

12 - Disclaimer

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