

CIRCULUM®

NF-454e

DESCRIPTION

NF-454e is a Reduced Pentane flame retardant (FR) expandable polystyrene grade containing pentane as a blowing agent and a brominated polymeric flame retardant as an FR additive. The product is delivered in the form of spherical beads with a bulk density of about 0.6 g/cm³ and is available in 1050 kg octabins.

APPLICATIONS

The properties of **NF-454e** make it suitable for the production of flame retardant light and heavy insulation board by block or shape moulding in accordance with ISO EN 11925-2 class E and DIN4102 B1/B2

PROCESSING

The processing conditions of **NF-454e** depend on the combination of the product and processing equipment used. Optimal settings have to be adjusted for each combination. Some general processing conditions are given below:

- | | |
|---------------------|--|
| Prefoaming | The steam has to be saturated at a temperature of 100–110 °C. To reach densities below 20 kg/m ³ , batch prefoaming is recommended and with a continuous prefoamer to prefoam twice and to reach higher densities (>30 kg/m ³) to mix the steam with air. |
| Conditioning | Depends on the density. The higher the density the longer the conditioning time. Generally 12–24 hours is recommended. When prefoaming in two steps, a conditioning time of 4–6 hours between the first and the second step is optimal but can be a bit longer. |
| Moulding | <p>The machine should be fed with saturated steam with a max pressure of about 2 bar.</p> <p>The steaming time depends on the equipment used as well as the size and required strength of the final product. Therefore, all machines have to be adjusted individually. Equipment using vacuum is recommended to reduce cycle times and to increase product strength.</p> |
| Cutting | Hot wire cutting (oscillating or stationary wires) is recommended. Temperature of the wires should be about 200–300 °C. |

TECHNICAL INFORMATION

TYPICAL PHYSICAL PROPERTIES

Raw material

| | <u>Value</u> | <u>Unit</u> | <u>Test method</u> |
|-----------------------------|--------------|-------------|--------------------|
| Pentane content | 4.5 – 5.0 | % | Gas chromatography |
| Monomer level | < 0.1 | % | Gas chromatography |
| Main bead size distribution | 1.0 – 1.6 | mm | Image analyser |

End product

| | <u>15 kg/m³</u> | <u>20 kg/m³</u> | <u>30 kg/m³</u> | <u>40 kg/m³</u> |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Compressive stress (10 %), (kPa), EN 826 | 75 | 115 | 200 | 300 |
| Bending strength, (kPa), EN 12089 | 160 | 240 | 380 | 560 |
| Heat conductivity (λ_{10}), (W/mK), EN 12667 | 0.038 | 0.035 | 0.033 | 0.032 |

STORAGE AND HANDLING

NF-454e should be stored at below 20 °C. Protect from direct sunlight and other weather conditions (rain, wind, frost etc.). Keep away from any source of ignition. The storage time should not exceed three months. After opening of the packaging, it should be used as soon as possible.

SAFETY

In transport **NF-454e** is classified according to European regulations for product transport: Substance number UN2211, Class 9.

In processing avoid generating dust. All equipment should be properly earthen. Releases pentane during processing which might form a flammable/explosive vapour-air mixture. Use proper ventilation and keep away from any source of ignition. A Safety Data Sheet is available on request.

RECYCLING

NF-454e is suitable for recycling using modern methods of grinding, cleaning and regranulation. In-house production waste should be kept clean to facilitate direct recycling.

Please contact your BEWI RAW BV representative for more details on various aspects of safety, recovery and disposal of the product.