

## Technical Leaflet

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# Styropek



## Expandable Polystyrene BF Product Series

### Products and their uses

**Styropek® BF** series include **BF-295, BF-395, BF395M BF-395S, BF-495**. **Styropek® BF** products can be used in a wide variety of applications including blocks for construction, panels, thermal and acoustical insulation, and general packaging. Additional applications include ICF's (insulated concrete forms), thin walled custom molding, lost foam and other general protective packaging. The intended uses of each product grade are outlined in **Table 1**.

### Description

Modified expandable polystyrene (EPS) / non-flammable / ant flame / auto-extinguishable that containing approximately 5.7 to 6.4 wt% pentane as blowing agent.

All products are supplied as spherical beads with a bulk density of approximately 40 pcf (640 kg/m<sup>3</sup>).

Technical specifications for **Styropek® BF** products are listed in **Table 2**.

**Styropek® BF** products are compatible with many anti-stat, mineral oil, color additives and other additives added during processing.

**Styropek® BF** products do not contain chlorofluorocarbons and hydrofluorocarbons compounds.

### Regulatory Compliance

EPS foams manufactured from Styropek® BF comply with several standards and international regulations depending on their application:

\* ASTM E-84/UL-723 & CAN/ULC S102.2 for Surface burning characteristics of building materials. UL listing under report R38219 at UL Online Certification Directory.

\* ASTM C-578 & CAN/ULC 701-11 for Thermal Insulation. UL listing under report R38219.

\* ASTM D6817 for Geofoam application. UL listing under report R38219.

\* UL 94 for flammability for parts in Devices and Appliances, rated as HF-1. UL listing under report E474710 at UL Online Certification Directory.

\* Several International Building Codes, as described in ESR-1498 report issued by ICC-ES.

\* FM Standards 4411, 4651, 4880, 4881 & 4882 for Walls and Ceilings, getting the mark FM Approved, as described at the online FM Approval guide.

\* GREENGUARD UL 2818 for Chemical Emissions (VOC's) for building materials, finishes and furnishings. Certificated # 1828-420.

\* REACH Directive for regulation of SVHC substances.

\* RoHS Directive for regulation of Heavy metals and specific flame retardants.

\* FMVSS 302 for Flammability of Interior Materials, according US DOT.

**Table 1: Uses**

| Product                  | Intended uses   |
|--------------------------|---|
| <b>Styropek® BF-295</b>  | Block molding applications, low-range densities, thickness of wall >12 cm., with excellent fusion and high regrind addition.  |
| <b>Styropek® BF-395</b>  | Block molding applications, mid-range and high densities, thickness of wall >8 cm., with excellent fusion and surface appearance. Shape molding applications for machines without vacuum system and excellent cycle time. |
| <b>Styropek® BF-395M</b> | Block molding applications, low and mid-range densities, thickness of wall >8 cm., with excellent fusion and regrind addition.  |
| <b>Styropek® BF-395S</b> | Shape molding applications, high densities, thickness of wall >8 mm., with excellent fusion and surface appearance. Shape molding application for machines with vacuum system and excellent cycle time                    |
| <b>Styropek® BF-495</b>  | Shape molding applications with requirements of non-flammable material, thickness of wall >6 mm., excellent cycle time and surface appearance. Blocks of high density with excellent surface appearance after cutting.    |

**Note:** These products can be used for other applications depending on the skill and equipment of each molder

**Table 2: Technical Products Specifications**

| Product           | Pentane, % | Res. Monomer, ppm | Bead size, mm        |                    |
|-------------------|------------|-------------------|----------------------|--------------------|
| Styropek® BF-295  | 5.7 – 6.4  | < 1000            | 0.85 – 1.70          | 97% min            |
| Styropek® BF-395  | 5.7 – 6.4  | < 1000            | 0.6 – 1.18           | 97% min            |
| Styropek® BF-395M | 5.7 – 6.4  | < 1000            | 0.6 – 1.18           | 97% min            |
| Styropek® BF-395S | 5.7 – 6.4  | < 1000            | 0.6 – 1.18           | 97% min            |
| Styropek® BF-495  | 5.7 – 6.4  | < 1000            | 0.35 – 0.85<br><0.35 | 97% min<br>2% max. |

**Packaging and Storage**

Styropek® BF products are packaged in Flexible Intermediate Bulk Containers of 800 kg (1,763 pounds). Plastic liners are used to maintain product shelf life by retaining the blowing agent.

Styropek® BF products should be stored indoor in a cool place (maximum temperature 80°F or 27 °C). In the unopened bulk containers, the typical shelf life after receipt is 120 days.

The containers should be protected from rain, snow, frost, direct sunlight and mechanical damage.

**Processing**

Polystyrene foams made from Styropek® BF products are produced in three stages: pre-expansion, intermediate aging and molding. Full details are given in the Technical Handbook.

**Tabla 3**

| Product           | Typical expanded density range                   |
|-------------------|--|
| Styropek® BF-295  | 10.0 – 19 kg/m <sup>3</sup><br>(0.62 – 1.18 pcf) |
| Styropek® BF-395  | 14 – 24 kg/m <sup>3</sup><br>(0.88 – 1.5 pcf)    |
| Styropek® BF-395M | 11 – 22 kg/m <sup>3</sup><br>(0.69 – 1.37 pcf)   |
| Styropek® BF-395S | 16 – 32 kg/m <sup>3</sup><br>(1.0 – 2.0 pcf)     |
| Styropek® BF-495  | 18 – 40 kg/m <sup>3</sup><br>(1.13 – 2.5 pcf)    |

pcf = pound per cubic foot = lb/ft<sup>3</sup>

**Pre-expansion**

The minimum achievable density depends on the pre-expansion equipment and technique used. Styropek® BF products processed by a batch pre-expander, could reach bulk densities shown in Table 3. With a second stage in pre-expansion (double pass) it is possible to reach a lower density according to the densities indicated in Table 3. It is very important to take into consideration that densities may vary according to the altitude above the sea level of your location. Care should be taken during expansion, as prolonged steam times will result in excessive loss of pentane and difficulty in achieving acceptable fusion during molding.

**Intermediate aging**

The minimum recommended pre-puff intermediate aging period for low density block molding of these products is 5 hrs depending on density, ambient temperature, the intended use of the bead, and the molding equipment to be used. Block densities greater than 1.76 pcf (28 kg/m<sup>3</sup>) may require 12 to 24 hrs intermediate aging. For shape molding applications, a minimum of 4 hrs is recommended. At low to mid-range densities for block or shape molding, care should also be taken when aging products in excess of 24 hours.

**Molding**

These products are intended for molding on automatic and manual molding machines (with or without vacuum). Molding can be accomplished under a wide range of conditions and densities.

**Safety**

Styropek® BF products and the finished foam products could form flammable mixtures with the air and the blowing agent (pentane) that migrates from the material. Therefore, all possible ignition sources must be eliminated (flames, sparks and electrostatic charges).

Adequate ventilation in all processing areas must be provided to prevent hazardous accumulations of hydrocarbon vapors.

For more information regarding safety, please refer to the Material Safety Data Sheets (SDS) and the Technical Handbook.

**Biological effects**

EPS foams manufactured from Styropek® BF products do not serve as food to animals nor have a nutritional value to microorganisms such as fungus and bacteria. None of its compounds are water soluble and do not emit hydro soluble substances that pollute underground water. In the dumping ground they do not decompose nor form any polluting substances.

Styropek® BF products are 100% recyclable.

**Chemical effects**

The chemical resistance of Styropek® BF products can be found in our Technical Handbook. Extended exposure to ultraviolet light may cause the EPS foam to turn yellowish and the surface to become brittle.

**Observations**

**IMPORTANT: The information provided in this publication is based on STYROPEK, S.A. DE C.V. best knowledge and experience. In view of the many factors that may affect the processing and application of the products, this data does not relieve molders from the responsibility of carrying out their own tests and experiments; neither does it imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to comply with any existing laws and legislation as well as proprietary rights, which STYROPEK S.A DE C.V. is holder.**

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