

Technical Leaflet

April 2017
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FT P40 I – 2017 – V2.0

Expandable Polystyrene P-40 Product Series

Styropek



Products and their uses

Styropek® P-40 products are: **P-240AH, P340H, P-440H and P-440MH**. Styropek® P-40 products can be used in a wide variety of applications including protective packaging, food boxes, fish boxes, ice boxes and seedling trays. **Table 1** describes the common uses of each product.

Description

Styropek® “P-40” is an expandable polystyrene (EPS) in spherical beads which contains a min. of 5.2 % and a max. of 5.8 %wt pentane as blowing agent. Do not contain chlorofluorocarbons and hydrochlorofluorocarbons compounds.

Contains less than 1000 ppm of residual monomer and 0.5% as maximum of total moisture.

All sizes present a bulk density of approximately 42 lb/ft³ (670 kg/m³). Bead size's range is shown in **Table 2**.

Styropek® P-40 products are compatible with many anti-stat, mineral oils and colors additives added during the processing.

Regulatory Compliance

EPS foams manufactured from Styropek® P40 comply with the following standards and regulations depending on their application:

- * Articles 21 CFR 177.1640 and 21 CFR 178.3010 from the FDA for Polystyrene used as component or articles intended for use in contact with food.
- * NOM-010-STPS-1999 and NMX-K-466-1979 from the Mexican regulation for applications in consumer goods.
- * EU 10-2011 Regulation from the Europe Union for plastics materials and articles intended to come in contact with food.
- * REACH Directive for regulation of SVHC substances.
- * RoHS Directive for regulation of Heavy metals and specific flame retardants.

Packaging and Storage

Styropek® P-40 products are packaged in flexible super bags of 800 kg. (1763 pounds). Plastic liners are used to maintain product shelf life by retaining the blowing agent.

Styropek® P-40 products should be stored in a cool place (maximum temperature 27°C or 80°F).

Table 1: Uses

| Product | Intended uses |
|--------------------------|---|
| Styropek® P-240AH | Block molding and Shape molding applications, mid-range and high densities with excellent fusion and short cycle time. |
| Styropek® P-340H | Shape molding applications, mid-range density with excellent fusion, regrind absorption and short cycle time. |
| Styropek® P-440H | Shape molding applications of narrow wall, mid-range and high densities with excellent surface appearance, fusion and excellent cycle time. (wall thickness > 6 mm) |
| Styropek® P-440MH | Shape and seedling trays molding applications of narrow wall, with excellent surface finish smooth appearance and fusion. |

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

Table 2: Technical Product Specifications

| Product | Pentane, % | Res. Monomer, ppm | Bead size, mm | |
|--------------------------|------------|-------------------|------------------------|-----------------------|
| Styropek® P-240AH | 5.2 – 5.8 | < 1000 | 0.85-1.70 | 97.0% min |
| Styropek® P-340H | 5.2 – 5.8 | < 1000 | 0.60 – 1.18 | 97.0% min |
| Styropek® P-440H | 5.2 – 5.8 | < 1000 | 0.355 – 0.85 <0.355 | 97.0% min 2.0% max |
| Styropek® P-440MH | 5.2 – 5.8 | < 1000 | 0.355 – 0.85 <0.355 | 97.0% min 2.0% max |

In the unopened bulk containers, the typical shelf life of **Styropek® P-40** after it is supplied is 120 days. Opened the packages, should be used promptly, and if it is not possible, should be closed hermetically, otherwise their physical or chemical properties can change. The container bags should be protected from rain, snow, frost, direct sunlight and mechanical damage.

Processing

Polystyrene foams made from **Styropek® P-40** products are produced in three stages: pre-expansion, intermediate aging and molding. Full details are given in the Technical Handbook.

Pre-expansión

The minimum density achievable depends on the pre-expansion equipment and technique used.

Styropek® P-40 products should be processed in batch pre-expander and can reach bulk densities shown in Table 3. In continuous pre-expander the densities can be lower than 28 kg/m³ (1.75 pcf).

Tabla 3

| Product | Typical expanded density range |
|--------------------------|--|
| Styropek® P-240AH | 18 - 40 kg/m ³ (1.13 – 2.50 pcf) |
| Styropek® P-340H | 16 – 32 kg/m ³ (1.00 – 2.00 pcf) |
| Styropek® P-440H | 20 - 40 kg/m ³ (1.25 – 2.50 pcf) |
| Styropek® P-440MH | 20 - 48 kg/m ³ (1.25 -3.00 pcf) |

pcf = pound per cubic foot = lb/ft³

The pressure in pre-expansion should be 0.25 to 0.50 bar. 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 by products is 2 hr. depending of density and ambient temperature. Care should be taken when aging products in excess of 24 hr. because conditions of molding may increase times and steam pressures in order to obtain acceptable fusions.

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. The typical pressures of molding are majors than **Styropek®** products with regular contents of pentane.

Safety

Styropek® P-40 products and the finished foam products could form flammable/explosives 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 pentane vapors.

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

Biological effects

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 discompose nor form any polluting substances.

Observed the local regulations, expanded **Styropek® P-40** material can be disposed as domestic garbage. **Styropek® P-40** products have been produced and transformed for over 50 years, and during this period no harmful health effects have been observed.

Styropek® P-40 products are 100% recyclable.

Chemical effects

The chemical resistance of **Styropek® P-40** 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.

STYROPEK S.A. DE C.V.
Fernando Montes de Oca #71
Col. Condesa, México, D.F.
CP. 06140
Tel.: + 52 55 9140 0500
Fax: + 52 55 9140 0520
www.STYROPEK.com