

**Development of modified PPE expanded beads
featuring high flame retardance and high heat resistance**
The world's first expanded beads achieving UL 94 V-0 rating

Asahi Kasei Chemicals has developed SunForce™ expanded modified polyphenylene ether (mPPE) beads, the world's first expanded beads to achieve the UL 94 V-0* rating, made possible by proprietary polymer technology and foaming technology.

In addition to the characteristics of conventional foam, such as light weight and thermal insulation, SunForce™ provides dramatically improved flame retardance and heat resistance. These features of SunForce™ enable its use in a new range of applications for which foam was thought to be unsuited. As such, this groundbreaking new product is expected to usher in completely new markets for foam material, most notably in the electronics and automotive industries.

Foam moldings formed from expanded beads are widely used as thermal insulation and cushioning material based on the advantages of lighter weight and better insulation characteristics compared to solid resin. In recent years, the use of foam moldings has grown in automotive applications such as bumper impact absorber, seat cores, and floor mat leveling material. In the electronics industry, by contrast, adoption of foam moldings has not progressed. This is largely due to the inadequate flame retardance and heat resistance performance of available foam materials, and in particular the unavailability of any foam material achieving the UL 94 V-0 rating which is essential for many electronic parts.

SunForce™ expanded mPPE beads, revolutionary as the world's first foam material to meet the UL 94 V-0 specification, were developed by Asahi Kasei Chemicals utilizing its Xyron™ mPPE engineering plastic featuring outstanding flame retardance together with proprietary advancements in foaming technology, all with a non-halogen formulation.

* The most stringent flame retardance rating for plastic materials issued by Underwriters Laboratories Inc., a widely recognized product safety certification organization. A UL 94 V-0 rating is required by many manufacturers of electrical and electronic products throughout the world.

Features of SunForce™ expanded mPPE beads

1) High flame retardance

Improvements to the properties of mPPE resin and control of the cell size within the beads enable SunForce™ to achieve V-0 flame retardance even in thin foam parts. Foam having an expansion ratio of 10 times, for example, meets the V-0 standard with as little as 5 mm thickness.

2) High heat resistance

SunForce™ shows superior heat resistance, providing a high heat deflection temperature (HDT) of some 90°C in foam with an expansion ratio of to 10 times. The HDT of expanded polypropylene (EPP) beads, generally considered to have good heat resistance among foam materials, is only around 60°C under the same conditions.

3) Excellent moldability

The small diameter of SunForce™ beads enables the formation of complex shapes even with thin-walled portions in mass production with high uniformity.

4) Safety

SunForce™ is safe and eco-friendly, using a nonflammable inorganic gas as foaming agent. In contrast, flammable hydrocarbons such as butane and pentane are generally used as foaming agent in conventional expanded beads.

5) Resource conservation

Foam parts having an expansion ratio of 10 times weigh only one tenth of comparable parts made with solid resin. This means that SunForce™ is an environmentally friendly product which contributes to resource conservation as well as weight reduction.

Market development

1) Applications

With its UL 94 V-0 flame retardance and high heat resistance, as well as its characteristics as foam such as light weight, flexibility, and thermal insulation, SunForce™ holds great promise as a new material in the following applications.

In electronics: Internal components (such as ventilation ducts and fan holders), substitute for metal chassis (such as for computer motherboard mounting and HDD holders), etc.

In automobiles: Insulated battery covers for hybrid-electric and all-electric vehicles, base material for instrument panels, door panel backing boards, deckboard core material, etc.

In home fixtures: Power supply covers, thermal insulation for water heaters, etc.

2) Sales plan

Trial marketing of SunForce™ will begin in October 2011, and full-scale production and sale are scheduled for fiscal 2012. The sales target for fiscal 2015 is ¥2 billion.

3) Exhibition

SunForce™ will be exhibited at Automotive Engineering Exposition 2011, to be held at Pacifico Yokohama from May 18–20, 2011.