Lightweighting re-imagined.

3M™ Glass Bubbles
For lightweight sheet-molded and bulk-molded composites

Advances in materials and processing technologies have made low-density sheet molded composites (SMCs) an increasingly practical and cost-effective alternative to metal and standard composites in automotive applications. SMCs can reduce part weight and still retain the physical properties needed for automotive applications.

A key element in the evolution of SMCs is the use of low density additives such as 3M™ Glass Bubbles – hollow glass microspheres made from water-resistant and chemically-stable soda-lime borosilicate glass.

A new generation of low density/high performance options

3M offers compounders, molders, and automotive manufacturers a new generation of lightweighting options with glass bubbles. They enable standard to ultra-light SMCs, allowing you to tailor the optimal balance of performance and cost for your application.

3M glass bubbles have a proven record in helping to pave the way for SMC lightweighting. These low-density additives have enabled lightweight SMC parts with a density of 1.2–1.4 g/cc, for a total part weight reduction of up to 30% compared to standard SMCs.

Thanks to a recent material innovation from 3M, our expanded glass bubbles portfolio features a grade capable of reducing SMC density to below 1.0 g/cc, with a total component weight reduction up to 40%, all while achieving a Class A paintable surface finish! The new grade, 3M™ Glass Bubbles S32HS, is one more example of 3M’s continuing commitment to innovation – and to meeting the needs of the ever-changing automotive industry.
**Warranty and Limited Remedy:** 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price. User is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose or application.

**Limitation of Liability:** Except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential, regardless of the legal or equitable theory asserted.

**Technical Information:** Technical information, recommendations, and other statements contained in this document or provided by 3M personnel are based on tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

---

**3M™ Glass Bubbles**

For lightweight sheet-molded and bulk-molded composites

---

**Designing Vehicles for a Lighter Future**

A typical automobile has about 300 kg of composite parts that contribute to vehicle weight. With electric and high efficiency vehicles becoming more popular, reducing that weight is the key to staying competitive. By integrating 3M™ Glass Bubbles into sheet and bulk molded composite parts, customers can improve a vehicle's fuel economy or battery range. Using ultra-light composite parts may even be more cost effective than aluminum or steel in the right applications.

Visit 3M.com/SMC to learn more about 3M glass bubbles in SMC applications.

---

**Recommended Products: Typical Benefits and Properties**

The grades listed below are optimized for SMC/BMC formulations. All end part properties are dependent on formulation and application. All 3M glass bubbles can be surface treated for added benefits. For specific recommendations on your application, contact your 3M representative.

<table>
<thead>
<tr>
<th>Product Grade</th>
<th>Composite Properties</th>
<th>Glass Bubble Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SMC Weight Class</td>
<td>Part Density, g/cc</td>
</tr>
<tr>
<td>S32HS</td>
<td>Ultra Lightweight</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>iM16K</td>
<td>Lightweight</td>
<td>1.2–1.4</td>
</tr>
<tr>
<td>S38HS</td>
<td>Lightweight</td>
<td>1.3–1.4</td>
</tr>
<tr>
<td>S28HS</td>
<td>Lightweight</td>
<td>1.2–1.4</td>
</tr>
</tbody>
</table>

Customer results may vary depending on formulation and application technique. All 3M glass bubbles can be surface treated for added benefits. For questions regarding Glass Bubbles in Automotive applications, contact 3M technical support at 1-800-367-8905.

---

**Warranty and Limited Remedy:** 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES OR CONDITIONS, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If a 3M product does not conform to this warranty, the sole and exclusive remedy is, at 3M’s option, replacement of the 3M product or refund of the purchase price. User is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose or application.

**Limitation of Liability:** Except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential, regardless of the legal or equitable theory asserted.

**Technical Information:** Technical information, recommendations, and other statements contained in this document or provided by 3M personnel are based on tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

---

3M Advanced Materials Division
3M Center
St. Paul, MN 55144 USA
Phone 1-800-367-8905
Web 3M.com/SMC

3M is a trademark of 3M Company.
Used under license.
© 3M 2018. All rights reserved. Issued: 7/18 14448HB
98-0050-0067-8 Rev B