3M™ Glass Bubbles K37

Introduction

3M™ Glass Bubbles K37 are high-strength polymer additives made from a water-resistant and chemically-stable soda-lime-borosilicate glass. These hollow glass microspheres can be used as a low-density filler material that is ideal for plastic and rubber parts created from compression molding, extrusion processes and/or other vigorous processing equipment.

3M glass bubbles help to reduce weight; reduce noise, vibration and harmonics; reduce thermal expansion; and contribute to cost savings. They are used in a variety of applications in diverse markets, including automotive, construction materials, electronics, marine and paints and coatings.

Material Description

Not for specification purposes

Properties	3M™ Glass Bubbles K37
Shape	Hollow spheres with thin walls
Composition	Soda-lime-borosilicate glass
Color, unaided eye	White, powdery

Typical Physical Properties

Not for specification purposes.

Properties	3M™ Glass Bubbles K37	Test Method
Isostatic crush strength (psi)	3,000 psi	3M QCM 14.1.8
True density	0.37 g/cc	3M QCM 14.24.1
Packing factor (bulk density to true particle density)	60% (average)	
Oil absorption	33.5 g oil/100 cc of polymer additive	ASTM D282-84
Softening point	600°C	
Flotation (density<1.0 g/cc)	94% (in volume)	3M QCM 37.2
Volatile content	0.5% max. (by weight)	3M QCM 1.5.7
Alkalinity	0.5 milliequivalents/gram max.	3M QCM 55.19
pH	9.5 at 5% loading in water	ASTM D3100-1982
Diameter (average)	45 microns	3M QCM 193.0

Particle Size Distribution (microns, by volume)

10th%	50th%	90th%	Effective Top Size
20	45	80	85

Formulating Information

Flow properties: 3M glass bubbles K37 will remain free flowing for at least one year from the date of shipment from 3M when stored in the original, unopened container in accordance with the recommended storage conditions. (See below for storage recommendations.)

Glass bubble breakage: Breakage may occur if the product is severely processed. To minimize breakage, minimize exposure to high shear processes such as high speed Cowles Dissolvers, and point contact shear such as gear pumps and 3-roll mills. For twin screw extruders, place 3M glass bubbles K37 in a downstream port to minimize time in the extruder. Contact 3M technical service or your equipment vendor for assistance if breakage is suspected.

Packaging

3M glass bubbles K37 are packaged in heavy-duty polyethylene bags with cardboard containers designed to prevent damage during normal handling and shipping while maintaining free-flowing properties. Each container is labeled with the following:

- Name of manufacturer
- Product identification
- Lot number
- Quantity in pounds
- Density (average) of the box

Additional information for each shipment is supplied in the form of a Certificate of Analysis.

Product Storage, Handling and Safety

Storage: Ideal storage conditions include unopened cartons in a dry and temperature-controlled warehouse.

Extended exposure of 3M™ Glass Bubbles K37 boxes to high humidity and/or conditions susceptible to condensation may result in some amount of "caking" of the glass bubbles. To minimize the potential for caking and thereby maximize storage life, the following suggestions are offered:

1. Carefully re-tie opened bags immediately after use.
2. If the polyethylene bag is punctured during shipping or handling, seal the hole as soon as possible or insert the contents into an undamaged bag.
3. During hot and/or humid months, store boxes in the driest, coolest space available.

If controlled storage conditions are unavailable, carry a minimum inventory and process on a first in/first out basis.

Handling: Due to the low weight and small particle size of 3M glass bubbles K37, dusting may occur while handling and processing. To minimize the dusting potential during handling, consider the following:

- Do not open glass bubbles packages until ready to use.
- Upon opening, have an air siphon near the opening to pull away airborne particles. (Dust collection equipment may be required – check local OSHA and other applicable regulations.)
- Remove glass bubbles with a suction "wand" (with slight positive pressure aeration) and transfer to a closed mixing tank inside fully contained piping. If a closed mixing tank is not available, use dust collection equipment as close as practical to the point of entry. Pneumatic conveyor systems have been used successfully to transport glass bubbles without dusting from shipping containers to batch mixing equipment. Equipment vendors should be consulted for recommendations.
- Static eliminators should be used to prevent static buildup.

Safety: For worker protection, please consider the following:

- Use safety glasses with side shields for eye protection.
- For respiratory protection, wear an appropriate NIOSH/MSHA approved respirator based on airborne concentration of contaminants and in accordance with OSHA regulations. (For additional information about personal protective equipment, refer to the product Material Safety Data Sheet.)
- Use with appropriate local exhaust ventilation/dust collection in the work area.

Additional Information

For additional information about 3M glass bubbles K37, or more product information on any 3M™ Microspheres, please call 1-800-367-8905, or contact your local 3M representative.

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