

The Power to Do More



Faster cooling & shorter cycles in Resin Systems – with 3M™ Glass Bubbles

Formulating with 3M™ Glass Bubbles not only reduces final part weight, but also helps resin systems cool faster from the melt.

These low-density additives displace mass that would otherwise need to be heated and cooled, resulting in shorter cycle times – as shown here in data from 3M laboratory experiments.

The reduction in part temperature is approximately **1.1°C per each weight % of 3M™ Glass Bubbles iM16K** added to the formulation. Cooling time reductions of 15-25% have been reported in production-scale use.

See what 3M glass bubbles can do for your process!

3M.com/engineeredadditives

For additional information on 3M glass bubbles please contact 1-800-367-8905 or your local 3M Sales representative.

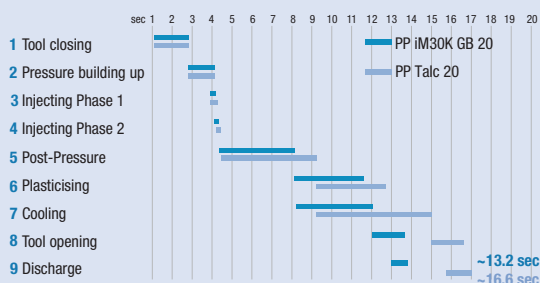
1. Baris Yalcin, et al. "Productivity Benefits of Glass Bubbles in Injection Molded Thermoplastics via Increased Cooling Rates." Technical paper issued by 3M Company, Feb. 2013.

2. Andrew S. D'Souza et al. "Innovative High Strength Glass Microspheres for Extruded and Injection Molded Plastics." Technical paper issued by 3M Company, Feb. 2007.

Effect of 3M™ Glass Bubbles iM16K loading on cycle time in various polymer systems.¹

| Material | iM16K Glass Bubble Loading | Other Fillers | Cycle Time Reduction (%) |
|-----------------------|----------------------------|---------------|--------------------------|
| Unfilled PP | 0 | – | – |
| | 5 wt% | – | 8 |
| | 10 wt% | – | 18 |
| | 20 wt% | – | 37 |
| Glass Fiber-Filled PP | 0 | 15 wt% GF | – |
| | 5 wt% | 15 wt% GF | 15 |
| | 7 wt% | 18 wt% GF | 24 |
| Talc-Filled PP | 0 | 20 wt% Talc | – |
| | 4 wt% | 10 wt% Talc | 6 |

Molding Cycle Time for 3M™ Filtrete™ Cabin Air Filter (CAF) frame E39 with and without 3M™ Glass Bubbles iM30K.²



Formulations

PP iM30K GB 20: 20 wt% 3M™ Glass Bubbles iM30K filled PP Homopolymer
 PP Talc 20: 20 wt% Talc-filled PP Homopolymer



3M™ Glass Bubbles

for Plastics Processing



3M™ Glass Bubbles are high-strength, low-density hollow glass microspheres used in a wide range of thermoplastics, composites and elastomers. Now, these density-reducing additives give you even more ways to reduce weight, improve processing, and boost productivity and profits.

Do more to reduce part weight

Reduce weight in resin systems by 15% or more, while maintaining mechanical properties.

Do more for productivity

Make more parts per hour by improving cycle time 15-25%. Parts with less mass cool faster – and require less energy to process.

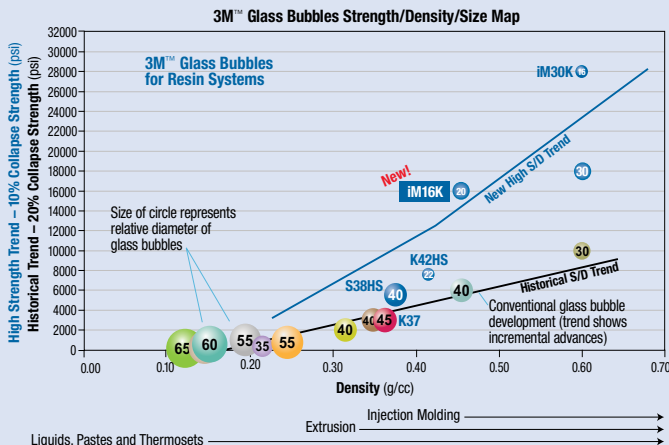
Do more to reduce waste

Improve dimensional stability, reduce shrinkage and warpage – and cut down on rejects and reprocessing.

Do more for sustainability

Contribute to environmental sustainability: reduce the carbon footprint of your products throughout their life cycle through lightweighting and better fuel economy.

Find the perfect balance for your application



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