

Driving down vehicle weight.



Low-density additives for injection molded automotive components

In the transportation industry, every ounce counts. “Lightweighting” with 3M™ Glass Bubbles can shed pounds per vehicle, helping increase fuel efficiency.

3M™ Glass Bubbles iM Series are high-strength, low-density hollow glass microspheres engineered to withstand the rigors of injection molding. They can be incorporated into a wide variety of plastics as a “plug-and-play” solution for reducing part weight while maintaining desirable physical properties. In addition, the lower density plastics take less time to cool – so you can produce more parts per hour.

Applications

- Door & pillar trim
- Engine cover & battery housing
- Instrument panel cover
- Center/floor console
- Steering wheel cover
- Headlight assembly
- Glove box

Recommended Products

3M™ Glass Bubbles iM16K:
density 0.46 g/cc,
crush strength 16,000 psi

3M™ Glass Bubbles iM30K:
density 0.60 g/cc,
crush strength 28,000 psi

Performance and processing advantages

- Reduce part weight up to 15%
- Decrease cycle time with 15–25% faster cooling
- Reduce rejects by improving dimensional stability
- Contribute to environmental sustainability and better fuel economy

3M™ Glass Bubbles for Injection Molding

Component	Control PP, 30 GF		Formula 1 PP, 31.5 GF, 9 GB		Formula 2 PP, 29.5 GF, 10.5 GB		Formula 3 PP, 22.5 GF, 15 GB		
	Wt%	Vol%	Wt%	Vol%	Wt%	Vol%	Wt%	Vol%	
Polypropylene	70	87	60	69	60	68	63	64	
Glass Fiber	30	13	32	13	30	12	23	8	
3M™ Glass Bubbles iM16K	-	-	9	18	11	21	15.0	28	
Density	1.12		1.04		1.02		0.93		
Density Reduction (%)	-		7.4%		9.5%		17%		
Tensile Strength (MPa)	72.3		69		63.1		50		
Tensile Modulus (MPa)	Specific Modulus (MPa/g/cc)	4033	3594	5500	5294	5350	5271	4580	4909
Flexural Modulus (MPa) @ 1% tangent	Specific Modulus (MPa/g/cc)	4890	4360	5400	5200	5385	5300	4350	4660
Flexural Strength (MPa)	108		106		113		81		
Impact Strength – Izod @ RT (J/m)	100		87		84		71		
Melt Index (230°C, 2.16 kg)	4		3.8		3.9		3.8		

Component	Control PA6, 30 GF		Formula 1 PA6, 30 GF, 5 GB		Formula 2 PA6, 35 GF, 8.1 GB	
	Wt%	Vol%	Wt%	Vol%	Wt%	Vol%
Polyamide 6	70	84	65	72	57	62
Glass Fiber	30	16	30	15	35	17
3M™ Glass Bubbles iM16K	-	-	5.0	14	8.1	22
Density	1.37		1.26		1.23	
Density Reduction (%)	-		8%		10%	
Tensile Strength (MPa)	181		160		179	
Tensile Elongation (%)	4.3		3.75		3.60	
Tensile Modulus (MPa)	6961		6976		7724	
Flexural Modulus (MPa) @ 1% secant	7615		7957		10232	
Flexural Modulus (MPa) @ 2% secant	7585		7716		9774	
Flexural Strength (MPa)	254		224		252	
Impact Strength – Izod @ RT (J/m)	104		80		76	

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98-0212-4258-5