



MICA FOR POLYPROPYLENE REINFORCEMENT

Imerys mica grades for plastics provide cost-effective improvements in the critical properties of many thermoplastic composites, particularly those based on polypropylene (PP), nylon 6 and nylon 6,6 resins.

MICA IMPROVES THERMOPLASTIC COMPOSITES

Mica can be incorporated in resin systems by processing dry blends of mica with powdered resins or added in masterbatch concentrate. The resulting composites may be fabricated by standard thermoplastics processing methods, e.g., injection molding, blow molding, thermoforming, extrusion, rotomolding, etc. Typical end-use applications for mica-reinforced composites are in formed automotive products such as fenders, fascia and seat backs and in plastic casings requiring outstanding stiffness and/or sound and vibration dampening.

Mica occurs in a book-like form, which is delaminated into extremely thin, high-aspect ratio particles that are tough and flexible. Imerys mines silvery white muscovite mica in Kings Mountain, North Carolina for use in color-sensitive applications. Phlogopite mica is processed in Boucherville, Quebec and provides even higher heat resistance for plastic composites.

When compared to virgin polypropylene resin and to other mineral additives, Imerys mica offers:

- Significantly higher flexural modulus
- Dramatically improved heat deflection temperature
- Low warpage of parts due to low shrinkage
- Reduced coefficient of linear thermal expansion (CLTE)
- Lightweight solution to suppress sound and vibration
- Improved electrical insulation properties



Muscovite and phlogopite mica.

TYPICAL PROPERTIES | IMERYS MICA GRADES FOR PLASTIC COMPOSITES

Grades	Crystal Structure	Color	Mean Particle Size (µm)	Bulk Density (lbs/ft ³)	Shape Factor (Jennings)	Surface Area (m ² /g)	Specific Gravity	Product Type
WG-325	Muscovite	White	35	11	90	4.4	2.8	Wet Ground
C-3000	Muscovite	White	25	13	70	5.4	2.8	Micronized
L-135	Muscovite	White	260	14	N/A	1.2	2.8	Flake
325-HK	Phlogopite	Bronze	30	14	80	2.7	2.8	Dry Ground
200-HK	Phlogopite	Bronze	65	13	60	2.1	2.8	Dry Ground
150-S	Phlogopite	Bronze	140	15	135	2.2	2.8	Dry Ground

TYPICAL PROPERTIES | MINERAL-REINFORCED POLYPROPYLENE COMPOSITES*

Property	ASTM Method	PP	L-135 Mica	CaCO ₃	Talc	Wollastonite	Glass Flake	Milled Glass	Silica	Feldspar
Tensile Strength (psi)	D638-01	4240	3380	3250	4220	3690	3370	3580	3090	3180
Tensile Modulus (kpsi)	D638-01	160	720	340	510	590	550	520	330	360
Flexural Modulus (kpsi)	D790-00	200	1080	430	660	740	710	670	380	430
Un-notched Izod (ft-lb/in)	D256-00	No break	1.7	3.5	3.6	3.9	2.6	4.0	2.5	3.5
Notched Izod (ft-lb/in)	D256-00	1.8	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4
Heat Deflection Temperature (°F)	D648-01	140	203	157	181	190	183	200	154	159
Shrinkage (%)	Parallel	2.1	0.7	1.5	1.1	0.6	0.6	0.4	1.5	1.5

* 40% mineral loadings in Basell Profax 6523 PP resin

FIGURE 1 | FLEXURAL MODULUS (kpsi)

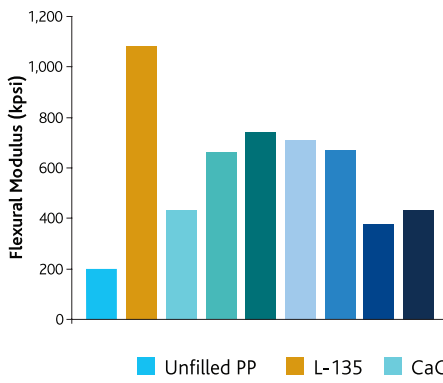


FIGURE 2 | HEAT DEFLECTION TEMPERATURE (°F)

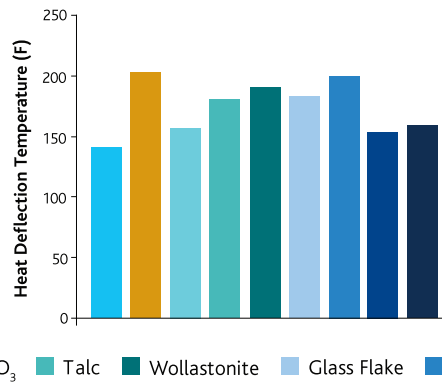
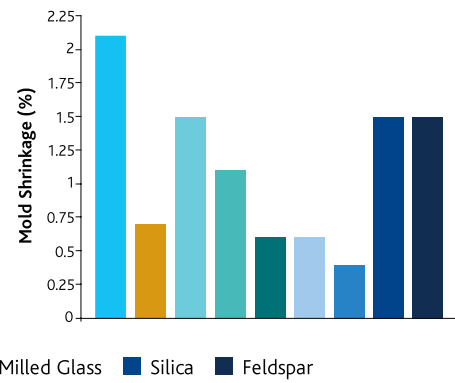


FIGURE 3 | SHRINKAGE (%)



TYPICAL PROPERTIES | SUZORITE® 200-HK MICA-REINFORCED POLYPROPYLENE COMPOSITE

Property	ASTM Method	PP	40% 200-HK
Tensile Strength (psi)	D638-01	5120	4690
Flexural Modulus (kpsi)	D790-00	191	669
Un-notched Izod (ft-lb/in)	D256-00	No break	3.2
Notched Izod (ft-lb/in)	D256-00	1.1	0.9
Heat Deflection Temperature (°F)	D648-01	130	205
Shrinkage (%)	Parallel	2.0	0.8

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