MAGRIStalc

Engineered Antiblock Solutions

- Mistroblock® H/6H - Powder
- Mistroblock® HC/6HC - Compacted
- Mistroblock® HTC/6HTC/6MTC - Compacted and Surface Treated for FDA Applications

Introduction

Magris Mistroblock® is derived from a microcrystalline ore producing a high brightness talc which has better overall film properties than conventional high lamellar talcs. The Mistroblock® series of talcs are unique anti-blocking performance additives (Fig. 1) that exhibit all the advantages of talc in polyolefins; softness, dispersion, and cost-effectiveness, while maintaining high brightness (Fig. 2), low haze (Fig. 3), and high clarity (Fig. 4)

Talc is the softest mineral known on earth and, as such, is the least abrasive on production equipment. The significant reduction of wear on extruder barrels, screws, and dies versus other minerals, saves on preventative maintenance and CAPEX to rebuild equipment. An additional processing benefit is a wide processing window for efficiency.

Mistroblock® from Magris Talc is a globally produced talc for anti-blocking performance in plastic and film with outstanding blocking performance, excellent clarity, haze, and physical properties. It is both a high performance and economical choice developed for masterbatch producers, resin suppliers, and film convertors, in the flexible packaging markets.

Fig. 1 Blocking Force

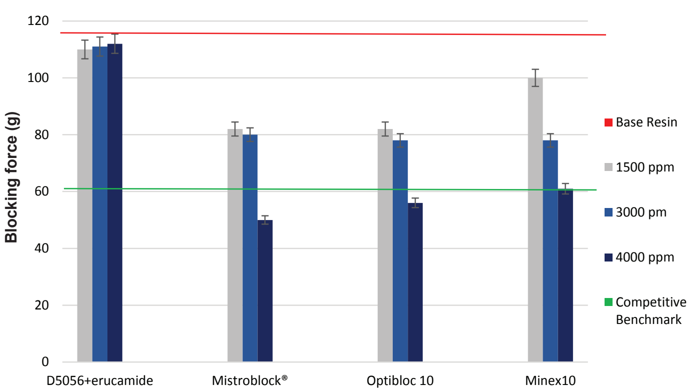


Fig. 2 Roll Color (Brightness)

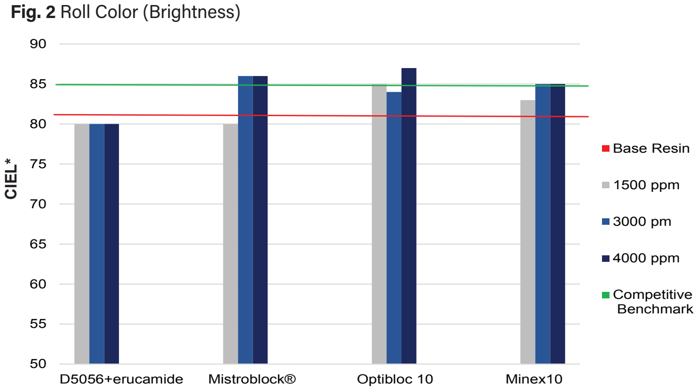


Fig. 3 Haze

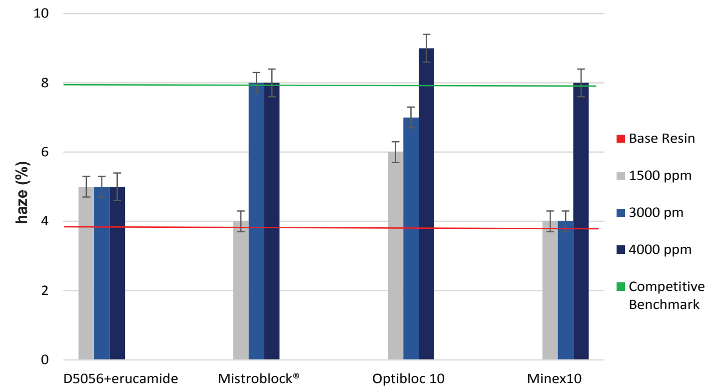
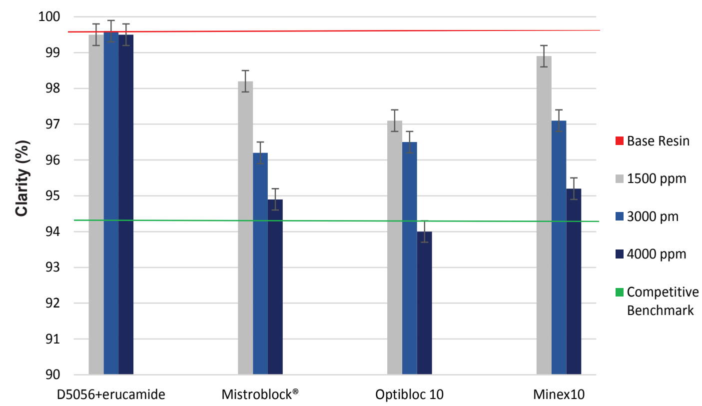


Fig. 4 Clarity



Materials and Methods

Base Resin System:

- Dowlex NG5056G
- LLDPE, ethylene-hexene copolymer, d=0.919, MI=1.1
- Blown film at 30 micron

Additive Concentrations: 1000, 3000 and 4500 ppm of mineral; Mistroblock®, Optiblock 10, and Minex 10 (10% masterbatch). Slip additive at 500, 1500, and 2250 ppm respectively (50% of antiblock).

Commercial Benchmark: Base Resin 2000 ppm antiblock and 1000 ppm slip additive.

Mistroblock®

Coefficient of Friction and Tear Resistance

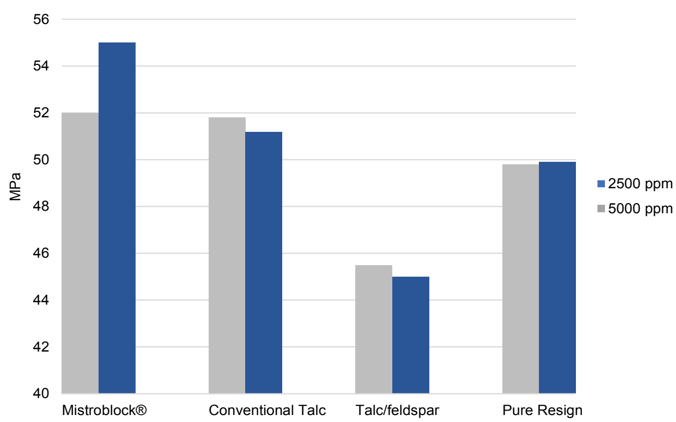
Mistroblock® demonstrated the lowest coefficient of friction compared to other minerals tested. Tear propagation resistance is an important property when specifying the material and thickness of plastic films used in packaging. Depending upon the application, a lower or a higher propagation force may be more desirable. Mistroblock® performs similarly to pure resin and the other minerals in tear resistance tests.

	Neat m-LLDPE	Mistroblock®	Conventional talc	Talc/ feldspar	Synthetic silica
Coefficient of static friction [μ_s] ASTM D-1894	0.65	0.15	0.15	0.2	0.19
Coefficient of kinetic friction [μ_k] ASTM D-1894	0.58	0.15	0.14	0.18	0.17
Tear Resistance Machine Direction [N] ASTM D-1922	3.2	3.1	3.2	3.1	3

Tensile Strength

Mistroblock® has a very strong affinity to the polyethylene film matrix resulting in an increase in the tensile properties of pure resin - in particular, tensile strength and elongation at maximum force. Other minerals and talc/mineral blends do not have the same beneficial effect.

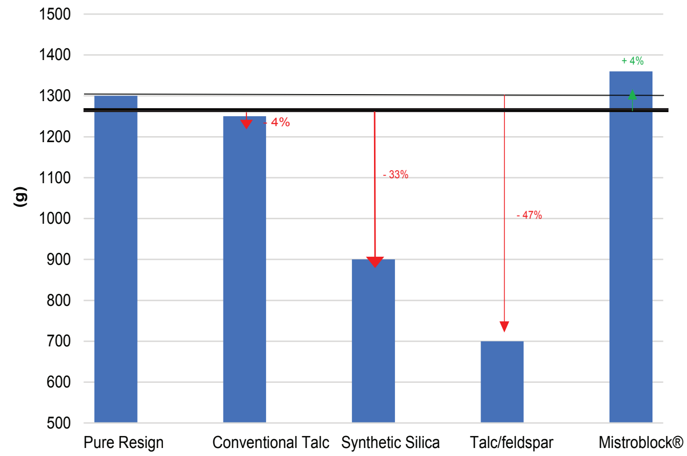
Tensile Strength (machine direction) of 25µm m-LLDPE film containing various antiblock minerals



Dart Drop Impact Resistance

Dart drop impact resistance values as high as 1300g are observed with some pure metallocene LLPDE resins. Unlike other minerals and talc/mineral blends which demonstrate significant reductions in impact resistance at addition rates as low as 2000 ppm, Mistroblock® does actually increase the initial impact resistance levels of pure resin due to its excellent affinity with the polyethylene resin matrix.

Dart Drop Impact Resistance of 25µm m-LLDPE film containing 2000ppm of different antiblock minerals



Materials and Methods

Base Resin System:
- 90% Exceeed 1018CA: m-LLDPE, ethylene-hexene copolymer, d=0.918, MI=1
- 10% Exxon LDPE LD150BW, d=0.923, MI=0.75
- Fully additivated commercial resin as reference (Exceed 1018EB)

Additive Concentrations: 1000, 1500 and 2000 ppm of mineral, 750 ppm slip additive.
Compounding: Prism TS 24, L/D28
Blown Film Production: Collins monofilm line E25x25P, 25µm film

Highlighted Products

The Mistron® and Mistroblock® range of products are available worldwide. They can be purchased in bulk, supersacks or small bags. Higher masterbatch throughput, ease of handling and lower processing dust can be achieved using our compacted versions. Our Compacted and Surface Treated for FDA Applications versions offer the lowest possible surface interaction with plastic additives and processing aids.

Product	Median Diameter (D50)	Top Size Hegman	Y Brightness	Compacted, Treated, Powder
Mistroblock® 6H/6HT/6HTC	2.4	6.0 (~25.0 microns)	91	P/T/C,T
Mistron® 600CT	2.3	6.0 (~25.0 microns)	88*	C,T
Mistroblock® 6MT/6MTC	1.9	6.0 (~25.0 microns)	87*	P,T/C,T
Mistroblock® H/HT/HTC	3.5	5.75 (~28.13 microns)	90	P/T/C,T
Mistron® NT/ Mistron® NTC	3.5	5.75 (~28.13 microns)	85	P,T/C,T
Mistron® 400C/400CT	4	5.5 (~31.5 microns)	88	P,T/C,T

*Brightness measurements in GEB

About Magris Talc

Magris Talc is one of the world's leading talc producers, supplying around 15 percent of world demand from our mines and processing plants in Canada and the United States. We are the acknowledged leaders in product quality, supply reliability and technical support – the services that create value for our customers and set us apart from competitors. With over a hundred years' experience in the extraction and processing of talc, we offer the highest quality talc products on the market today.

About Talc

Talc is a surprisingly versatile, functional mineral which possesses a unique combination of properties. Talc is soft, water repellent, chemically inert and highly platy and has oleophilic properties. Our industry experts have harnessed these properties to bring customers improved performance in a wide range of applications such as paper, paints, plastics, rubber, ceramics, agriculture, food and pharmaceuticals.

Meeting Today's Needs. Securing Tomorrow's.

We believe that running a successful business and sustaining quality of life and the environment go hand in hand. From implementing behavior-based safety training to rehabilitating the land, we think it's important that future generations' needs are not compromised by our actions today.

Our Fundamental Sustainability Principles are:

Safety – We promote the health and safety of employees, contractors, customers, neighbors and consumers through active caring.

Partnership – We seek to understand the issues that are important to our neighbors, and to make a lasting contribution to the communities in which we operate.

Environmental Protection – We work to minimize our environmental footprint by using natural resources efficiently, preventing pollution, complying with applicable laws and regulations and continually improving our performance.

Accountability – We conduct business in an accountable and transparent manner, relying on external auditing and reporting to understand and reflect our stakeholders' interests.

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