

IMERYYS **FilmLink**[®]

ENGINEERED MINERALS FOR FILM



THE WORLD'S LARGEST
SUPPLIER OF WHITE
INDUSTRIAL MINERALS

IMPROVE YOUR BOTTOM LINE WITH FilmLink

FilmLink additive technology represents a series of engineered minerals designed specifically for film applications.

Benefits include:

- Faster line speeds
- Improved printability
- Enhanced film-to-film antiblocking
- Better film handling/stackability

STRONGER FILMS

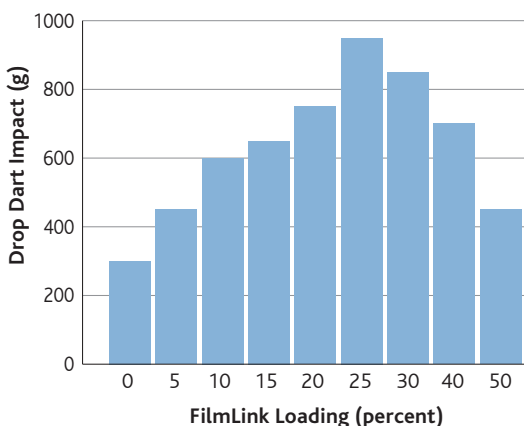
FilmLink 500 for LLDPE-hexene films

FilmLink 500 provides dramatic improvements in impact strength, puncture resistance, tear strength and stiffness in blown LLDPE-hexene film. Optimal properties are achieved when FilmLink 500 is added at 20-25% by weight. (Negligible property improvements are realized below 10% loading.) These metallocene-like property improvements offer the film producer a new alternative to realize cost savings via downgauging.

FilmLink 500 modified films can also expect:

- Improved heat seal
- Increased haze while maintaining contact clarity
- Reduced tensile strength while maintaining yield stress

FILMLINK 500 INCREASES DROP DART IMPACT*



*Maximum for test = 951g



FilmLink 3000 improves films for labels and packaging by making them lighter weight and more white.

LIGHTER WEIGHT PACKAGING

FilmLink 3000 for BOPP films

White and opaque, bi-axially oriented polypropylene (BOPP) film is a replacement for paper, foil, cellophane and polyester, utilized in general packaging. Typical applications include packaging materials for food (snacks, baked products, dried foods), packaging materials for non-food (cosmetics, tobacco) and non-packaging (tapes, labels). The main attributes of white BOPP film are its opacity, low density, stiffness, dimensional stability, excellent tensile properties, chemical resistance and low permeability to gas and vapors.

Lighter weight and more white

With unique surface chemistry and tight particle control, FilmLink 3000 is designed for use in white BOPP films to allow a reduction in film density (lighter weight) versus conventional mineral fillers, while increasing the film's opacity (whiteness).

FilmLink 3000 modified films can also expect:

- Increased melt stability
- Increased modulus of elasticity

HIGH TEMPERATURE PROCESSING

FilmLink 2029 for specialty films

FilmLink 2029 provides a solution for specialty resins that require high temperature processing, such as in extrusion coating applications. It offers the same characteristics as FilmLink 500.

WHAT IS FilmLink?

FilmLink products are finely ground minerals produced in North America from high quality, naturally-occurring deposits. They are treated with a proprietary hydrophobic coating to minimize moisture pick-up and provide ease of dispersion in most film grade polymers.

Our FilmLink products are unique due to controlled particle size distribution and use of an organophilic coating to enhance dispersion and prevent moisture pick up prior to blending with the polymer. These features enable FilmLink products to provide extraordinary improvements in cast, blown or stretched films. With FilmLink additive technology, downgauging and higher output are made possible.

MADE TO ORDER

Imerys works with masterbatch producers to develop mutually agreed specifications in order to achieve maximum benefits of the FilmLink technology. These specifications address requirements such as:

- › CaCO₃ content
- › Moisture content
- › Melt rheology
- › Screening requirements

FILMLINK | FEATURES & BENEFITS

Features	Benefits
KEY FEATURE FilmLink 500	
Low and controlled top cut	Enables downgauging of films
KEY FEATURE FilmLink 3000	
Monolayer surface treatment coverage	Eliminates all free stearic acid for further improved processing
KEY FEATURE FilmLink 2029	
High temperature stability due to unique surface treatment	Provides solution for specialty resins in high temperature processing
FEATURES All FilmLink Grades	
Increased thermal conductivity	Results in faster line speeds
Reduced surface tension	Enables improved printability & enhanced antiblocking
Reduced surface coefficient of friction (CoF)	Provides better film handling/stackability

QUALITY ASSURED CUSTOMER DRIVEN

CUSTOMER-DRIVEN Imerys works actively with customers to develop new and innovative solutions to solve their technical challenges. As a global leader in white minerals, Imerys brings its unique knowledge, technology and unrivaled depth of application expertise to improve the value of our customers' products.

NEW PRODUCT DEVELOPMENT Imerys is continuously creating new and better ways to transform mineral resources into high-performance, solution-driven products. We invest heavily in the development of comprehensive polymer application laboratories and analytical capabilities to support the development and evaluation of FilmLink products for the growing films market.

ENVIRONMENTAL POLICY Imerys is committed to being a good neighbor to our environment and we take this responsibility very seriously. We have adopted the principles of Sustainable Development, which includes extensive training programs and considerable investment in environmental performance improvement.



Cross-section of stretched film containing FilmLink additive. FilmLink increases impact and tear strength in breathable film.

RATE STUDY USING FILMLINK 500 BY GLOUCESTER ENGINEERING

A controlled rate study conducted for Imerys demonstrated an extruder output increase of 13% when FilmLink was added at 20% to standard film grade LLDPE. An extruder output increase of 21% was demonstrated when FilmLink was added to metallocene LLDPE. On-line measurement of bubble surface temperature as well as frost line height verified enhanced bubble cooling. Physical properties were also improved.

- LLDPE was Exxon 1.0 MI hexane, 0.916 density
- mLLDPE was Exxon 1.0 MI hexene metallocene, 0.916 density
- FilmLink masterbatch was a compounded pellet of 60% FilmLink 400 coated calcium carbonate plus 40% 3.0 MI octene LLDPE, 0.917 density
- LLDPE and mLLDPE films were run at 1.0 mil average gauge
- 2.0:1 blow up ratio was used

Full results of Rate Study by Gloucester Eng. available upon request.

Base Resin	FilmLink loading	pph/inch die-c (corrected)	% increase over baseline	pph/RPM (corrected)	lb/hp-hr (corrected)
Exxon LL3001.32	0%	9.55	----	5.52	9.83
	10%	10.61	11.1%	5.58	9.31
	20%	10.79	13.0%	5.56	9.47
Exceed 350D60	0%	7.40	----	5.70	8.50
	10%	8.95	20.8%	5.74	8.09
	20%	8.96	20.9%	5.75	8.35

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IMERYS PERFORMANCE MINERALS

100 Mansell Court East, Suite 300, Roswell, GA 30076 USA
t: +1 770-594-0660 f: +1 770-645-3384
e: perfminsNA@imerys.com

www.imerys-perfmins.com/usa

As Green As
White Can Be™