DOW CORNING

Product Information

Dow Corning® MB25-035 Masterbatch

Ultra-high molecular weight siloxane polymer

FEATURES & BENEFITS

- Low dynamic CoF at low loadings (example: 0.2 CoF in film against steel at 3 percent masterbatch loading)
- Longer lasting slip performance than organics with thermal ageing
- Non-migrating across film layers
- U.S. Food & Drug Administration (FDA) compliant
- Prevent die build-up or gel deposition during extrusion
- Reduces friction to enable higher throughput and productivity in (FFS) packaging
- Delivers long-lasting stability to maintain slip performance during delays between film extrusion and FFS operations
- Avoids quality issues by preventing migration of slip additive between film layers or into package contents
- Optimizes processing with smooth dosing and homogeneous dispersion
- Controls costs with lower loadings and use in only the outer layer of multi-layer film

COMPOSITION

- Free flowing solid pellets

APPLICATIONS

- Additive in polyethylene compatible systems.

TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Property	Unit	Result
Appearance		Off-white pellets
Siloxane content	%	25
Organic resin		LDPE blow extrusion film grade
Specific gravity	g/cm^3	0.93
Suggested use level	%	2 w% to 5 w%

DESCRIPTION

Dow Corning® MB25-035 Masterbatch is a pelletized formulation containing 25% of an ultra-high molecular weight (UHMW) siloxane polymer dispersed in low density polyethylene (LDPE). It is designed to be used as an additive in polyethylene compatible systems to impart benefits such as processing improvements (FFS: Form, fill and seal bagging process) and modification of surface characteristics (low coefficient of friction (CoF). High-speed, high-volume form-fill-seal (FFS) packaging operations place stresses on low-density polyethylene (LDPE) film, including increased levels of surface friction. Reducing coefficient of friction (CoF) is critical to seamless throughput, high productivity and consistent quality. *Dow Corning* MB25-035 Masterbatch provides exceptional slip performance while Traditional organic slip additives, including erucamide and oleamide, rapidly migrate to the film surface and dissipate in a short period of time. Because they migrate so easily, they can transfer between film surfaces during rolling and storage, from one film layer to another and from film to package contents, increasing the risk of food contamination. They also lose effectiveness under elevated temperatures, such as exposure to hot foods.

BENEFITS

Dow Corning MB25-035 Masterbatch eliminates these issues by retaining excellent CoF reduction values for an extended period (for instance for long time storage before using) at temperatures as high as 60°C far surpassing any other technology on the market today. This formulation also prevents migration of the slip additive between film layers.

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overcoming the drawbacks of organics –
and controlling costs.

This does not affect corona treated layer (opposite layer) when film is winding (storage) and allows to keep stable over time printability of the film From a cost efficiency standpoint, *Dow Corning* MB25-035 Masterbatch offers several advantages. First, it is effective at low loadings. Second, it can be incorporated only in the outer layer of multi-layer films (unlike organics, which are added to all layers), so less is needed. Which finally providing a cost effective way to improve the film properties. Finally, it is based on a standard LDPE grade for packaging film to ensure perfect homogeneity that optimizes performance of the slip additive.

In film processing, the masterbatch pellets do not stick together, and therefore feed smoothly into the extruder. The formulation also prevents die build-up and gel deposition on the film.

Figure 1 shows improvement of dynamic CoF Steel/Film up to 0.2 into LDPE blown film, reached at 3% of silicone additive. The dynamic CoF Film against film at same amount is 0.3.

<u>Figure 1</u>: Dynamic CoF monolayer 40 µ LDPE blown film versus *Dow Corning* MB25-035 Masterbatch content, %.

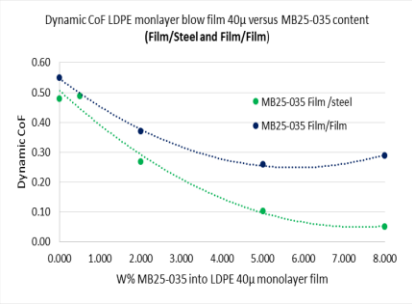
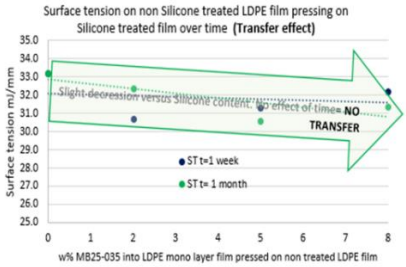


Figure 2 demonstrates consistency of Surface Tension of a pure LDPE blown film laid on a SiMB treated PE film and a pressure of 0.37 N/cm² is applied. (Weight 15 kg/20*20 cm).

This consistency indicates no silicone transfer from film to the other film after one month.

<u>Figure 2</u>: Surface tension on non-silicone treated LDPE film pressing on Silicone treated film over time (Transfer Effect).



<u>Figure 3</u>: Infra-Red ATR film surface analysis of LDPE blown film with 5w% *Dow Corning* MB25-035 Masterbatch pressed against non-silicone treated film.

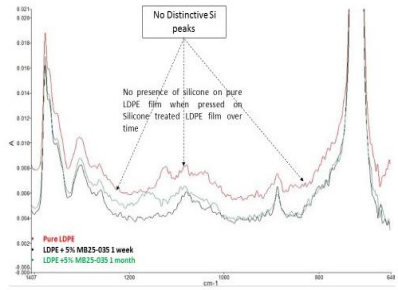


Figure 3 shows Infra-Red ATR film surface analysis of LDPE blown film with 5 w% *Dow Corning* MB25-035 Masterbatch pressed against non-silicone treated film. It does no show distinctive peaks of silicone on non-treated film. That indicate as with Surface tension analysis, no silicone transfer from film to film over time at room temperature after 1 month.

<u>Figure 4</u> : Comparison of increase of dynamic CoF Steel/film (in %) during thermal ageing (120h 60°C) in LDPE monolayer blown film 40 µm between *Dow Corning* MB25-035 Masterbatch and Erucamide.

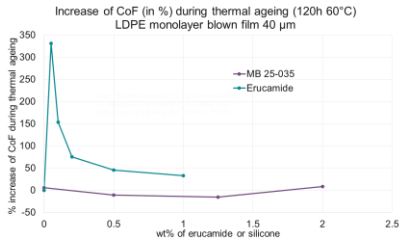


Figure 4 proves that our ultra high molecular weight silicone resists thermal ageing. For low concentration, the CoF is even better after ageing, surely because of the migration of anchored silicone chains to the surface. With erucamide, the increase is large and tends to reduce at high rates. This is due to the tank effect of erucamide, which limits (but does not avoid) the increase of CoF after ageing.

HOW TO USE

Dow Corning® MB Series Masterbatches may be processed in the same way as the thermoplastics on which they are based. Sufficient *Dow Corning* MB25-035 Masterbatch should be blended with virgin polymer pellets to give the desired siloxane level in the final product.
Dow Corning MB25-035 Masterbatch pellets can be added during compounding in a single screw extruder or added at the feed hopper during extrusion blown film process or injection molding.

FOOD CONTACT

Dow Corning MB25-035 Masterbatch is suitable for use as a slip agent in the production of the basic polymer or finished food contact article in compliance with US FDA regulation 21 CFR 177.1520 (c) 2.2 as well as 21 CFR 181.28. The olefin polymer portion of *Dow Corning* MB25-035 Masterbatch complies with 177.1520(c) 2.1 and the siloxane portion complies with 181.28.

This product may comply with European requirements concerning its use in contact with foodstuffs. The specific regulation(s) this product is

compliant with are stated in the 'Food Regulatory Profile'. This document is available from your local Dow Corning representative.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW CORNING WEBSITE AT DOWCORNING.COM, OR FROM YOUR DOW CORNING SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CORNING CUSTOMER SERVICE.

USABLE LIFE AND STORAGE

When stored at or below 35°C (95°F) in the original unopened containers *Dow Corning* MB25-035 Masterbatch has a usable life of 48 months from the date of production.

PACKAGING INFORMATION

This product is available in a variety of container sizes. Contact your local Dow Corning sales representative for information about container sizes available in your area.

LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, dowcorning.com or consult your local Dow Corning representative.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow Corning's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

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