

DOW CORNING® MB50-002 Masterbatch

FEATURES

- Imparts processing improvements and modified surface characteristics

BENEFITS

- Improved throughput
- Reduced energy consumption
- Enhanced scratch resistance
- Improved slip properties
- Reduced waste
- Enhanced stability vs. traditional processing aids and lubricants

COMPOSITION

- Solid pellets

Ultra-high molecular weight siloxane polymer

APPLICATION

- Additive in polyethylene compatible systems.

TYPICAL PROPERTIES

Specifications writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales representative prior to writing specifications on this product.

Property	Unit	Value
Appearance		Off-white pellets
Siloxane content	%	50
Organic resin		LDPE, MI 4
Suggested use level (0.1 to 5% siloxane)		0.2 to 10

DESCRIPTION

DOW CORNING MB50-002 Masterbatch is a pelletized formulation containing 50% of an ultra-high molecular weight siloxane polymer dispersed in low-density polyethylene (PE). It is designed to be used as an additive in polyethylene-compatible systems to impart benefits such as processing improvements and modification of surface characteristics.

Liquid siloxane plastic additives have been used for several years to improve the lubricity and flow of thermoplastics. They are effective in this role although some difficulties have been experienced in the incorporation of liquids into thermoplastic melts without the use of specialized equipment. It has also been difficult to produce masterbatches with greater than 20% liquid siloxane because of processing difficulty and bleed problems.

The DOW CORNING® MB Series Masterbatches address these problems by supplying a high concentration of

an ultra-high molecular weight siloxane as a dispersion in a dry pellet form in a variety of thermoplastics.

BENEFITS

When added to polyethylene or similar thermoplastics at 0.1% to 1.0%, improved processing and flow of the resin is expected, including better mold filling, less extruder torque, internal lubrication, mold release and faster throughput. At higher addition levels, 1% to 5% siloxane, improved surface properties are expected, including lubricity, slip, lower coefficient of friction, and greater mar and abrasion resistance.

The DOW CORNING MB Series Masterbatches are expected to give improved benefits compared to conventional lower molecular weight siloxane additives, e.g., less screw slippage, improved release, a lower coefficient of friction, fewer paint and printing problems, and a broader range of performance capabilities.

Table 1 shows that an ultra-high

molecular weight siloxane additive in polyethylene has a small effect on tensile and impact strengths; coefficient of friction values are lowered by the siloxane additive.

Figure 1 shows the improvement in mold release: 100% of injection molded parts released easily from the mold with 1% ultra-high molecular weight siloxane added versus only 63% without the siloxane.

The scanning electron micrograph shown in Figure 2 demonstrates the particle size of the siloxane dispersed in low-density polyethylene carrier resin in DOW CORNING MB50-002 Masterbatch.

Figure 3 demonstrates the minimal screw slippage effected by the addition of up to 3% UHMW siloxane; Figure 4 demonstrates the amperage reduction in a single screw extruder by the addition of just 0.2% UHMW siloxane.

LIMITATIONS

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

FOOD CONTACT

DOW CORNING MB50-002 Masterbatch is suitable for use as an optional adjuvant substance in the production of basic olefin polymers or finished food-contact articles under U.S. Food and Drug Administration Regulation 21 CFR 177.1520 covering olefin polymers. It may comply with BGVV or other global regulatory agency or Kosher requirements as well. Contact your local Dow Corning representative for current compliance information.

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 MB50-002 Masterbatch should be blended with virgin polymer pellets to give the desired siloxane level in the final product. DOW CORNING MB50-002 Masterbatch pellets can be added during compounding in a single screw

extruder or added at the feed hopper during injection molding or extrusion.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED. 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 FROM YOUR LOCAL DOW CORNING SALES REPRESENTATIVE.

USABLE LIFE AND STORAGE

When stored at or below 35°C (95°F) in the original unopened containers DOW CORNING MB50-002 Masterbatch has a usable life of 48 months from the date of production.

PACKAGING

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.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Health, Environment and Regulatory Affairs specialists available in each area.

For further information, please consult your local Dow Corning representative.

LIMITED WARRANTY - PLEASE READ CAREFULLY

The information contained herein is offered in good faith based on Dow Corning's research and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information shall not be used in substitution for customers'

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Table 1: Physical properties of high-density polyethylene modified with an ultra-high molecular weight Polydimethylsiloxane additive.

Property	Siloxane content, %		
	0	1.0	5.0
Tensile strength, MPa	25	25	22
Elongation, %	76	79	105
Modulus, MPa	1364	1632	908
Izod, notch, J/m	957	811	721
Melt flow, g/10 min	0.1	0.1	0.1
Vicat softening, C	128	125	119
Coefficient of friction,			
Static	0.21	0.13	0.07
Kinetic	0.12	0.07	0.05

Figure 1: Mold release of LDPE

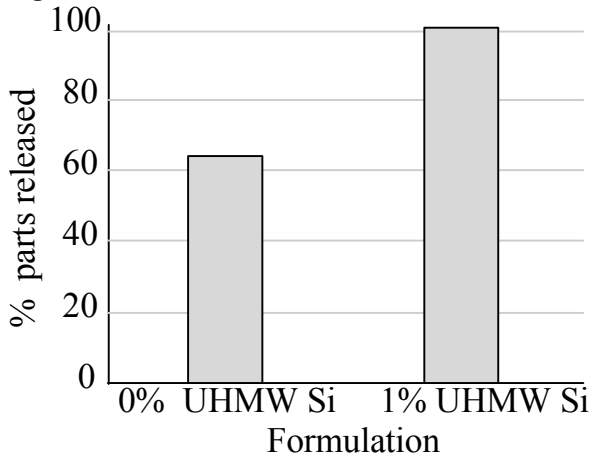


Figure 2: Scanning electron micrograph



Figure 3: Output effect in single screw extrusion

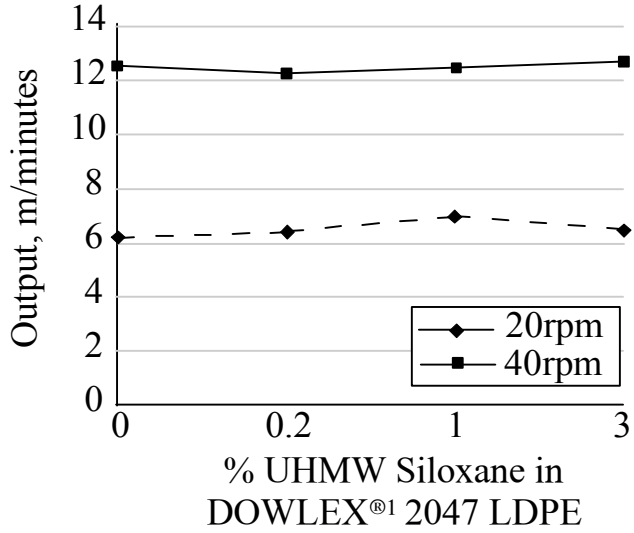
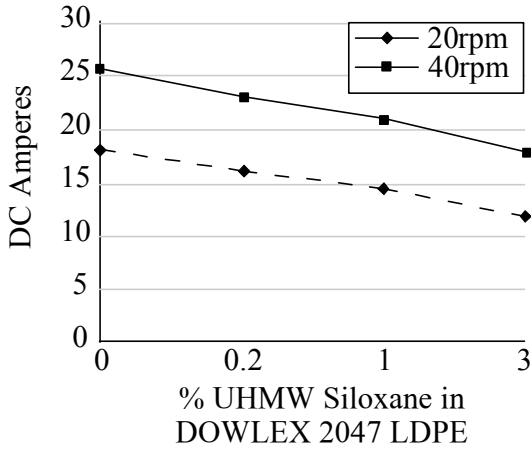


Figure 4: Amperage effect in single screw extrusion



¹ DOWLEX is a registered trademark of the Dow Chemical Company

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DOW CORNING ASIA

Australia & New Zealand

Dow Corning Australia Pty Ltd.

Tel.: +61 1300 360 732

Fax: +61 2984 741 00

China

Dow Corning China Ltd.

Tel.: +86 21 6249 2316

Fax: +86 21 6249 2317

China

Dow Corning Asia (H.K.)

Tel.: +852 2835 0350

Fax: +852 2836 6650

India, Indonesia, Singapore, Malaysia & Philippines

Dow Corning Singapore Pte Ltd.

Tel.: +65 253 6611

Fax: +65 253 6070

Japan

Dow Corning Asia Ltd.

Tel.: +81 3 3287 1151

Fax: +81 3 3287 1059 & 1081

Japan

Dow Corning Toray Silicone Co Ltd.

Tel.: +81 3 3287 1010

Fax: +81 3 3287 1201

Korea

Dow Corning Korea Ltd.

Tel.: +82 2 551 7600

Fax: +82 2 551 6800

Taiwan

Dow Corning Taiwan Inc.

Tel.: +886 2 2713 6936

Fax: +886 2 2717 2209

Thailand

Dow Corning Thailand Ltd.

Tel.: +66 2 326 0773

Fax: +66 2 326 0767

DOW CORNING EUROPE

Germany, Austria, Switzerland & Eastern Europe

Dow Corning GmbH

GERMANY

Tel.: +49 (0)611 - 23 71

Fax: +49 (0)611 - 237 610

France & North Africa

Dow Corning France S.A.

Tel.: +33 (0)4 72 84 13 60

Fax: +33 (0)4 72 84 13 79

Italy & Eastern Mediterranean Countries

Dow Corning S.p.A.

ITALY

Tel.: +39 039 - 60 711

Fax: +39 039 - 68 996 60

Poland

Dow Corning Polska Sp. zo.o.

Tel.: +48 (0)22 645 14 46

Fax: +48 (0)22 645 14 40

United Kingdom, Eire, Nordic Countries, Benelux, South Africa & Middle East

Dow Corning

UNITED KINGDOM

Tel.: +44 (0)1 676 52 80 00

Fax: +44 (0)1 676 52 80 01

Spain & Portugal

Dow Corning Ibérica S.A.

SPAIN

Tel.: +34 93 36 36 900

Fax: +34 93 36 36 901

DOW CORNING NORTH AMERICA

Dow Corning Corporation

Tel.: +1 517 496 6000

Fax: +1 517 496 8026

DOW CORNING SOUTH AMERICA

Dow Corning do Brasil Ltda.

Tel.: +55 11 3759 4300

Fax: +55 11 3758 5727