



# Silicone-Based Additives for Polyamide Compounds

*Reduce coefficient of friction, improve wear and enhance processing*

## Benefits

- High slip performance at low loadings
- Fluoro-free mar resistance
- Retention of mechanical properties
- Reduced torque
- Reduce processing temperature
- Improve productivity
- Improved surface properties
- Ease of handling

## Applications

- Automotive components
- Electrical and electronics
- Consumer goods
- Household appliances



Do you need to improve the slip, wear and processing performance of polyamide (PA) resins and glass fiber-reinforced PA compounds for highly demanding applications? To meet your specific needs, Dow Corning offers two silicone-based additives – *Dow Corning*<sup>®</sup> HMB-1103 Masterbatch and *Dow Corning*<sup>®</sup> 31-441 Additive – which provide a reduced coefficient of friction (COF) and improved wear resistance at lower loadings than polytetrafluoroethylene (PTFE) while retaining important mechanical properties. In contrast to PTFE, these products avoid the use of fluorine, a potential medium- and long-term toxicity concern. They also aid in processing efficiency and improve material injectability.

A third product, *Dow Corning*<sup>®</sup> MB50-011 Masterbatch, helps you deliver scratch resistance while enhancing surface quality. It also helps to improve polyamide compounds' injectability.

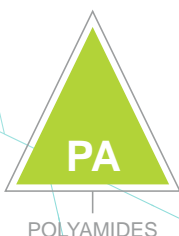
## Dow Corning<sup>®</sup> HMB-1103 Masterbatch

This new-generation tribology modifier for PA is designed for demanding applications that require long-term COF reduction and good wear performance, such as bearings and gears, window lifting systems, housings, roller shutter modules, household appliances and automotive seat adjustment systems.

### Highlights:

- Provides COF and wear performance similar that of PTFE at very low loadings (1.5-3.5 wt% vs. 15-20 wt% PTFE)
- Retains tensile and impact performance
- Maintains material density
- Improves material injectability
- Improves processing performance

Compared to powdered PTFE additives, *Dow Corning*<sup>®</sup> HMB-1103 Masterbatch pellets are easier to handle and process. They do not increase the density of PA compounds and provide a fluorine-free tribology solution.



	Av Dynamic COF 25N	Av Dynamic COF 50N	Wear 25N (depth in um)	Wear 50N (depth in um)
No additive	0.55	0.52	17.5	80
PTFE	0.08	0.11	0	0
<i>Dow Corning</i> <sup>®</sup> HMB-1103 Masterbatch	0.13	0.16	0	4

Table 1: *Dow Corning*<sup>®</sup> HMB-1103 Masterbatch at 3.3% delivers comparable wear resistance to perfluorinated additives and same slip performances as 15wt% PTFE

## Dow Corning® 31-441 Additive

Dow Corning® 31-441 Additive improves extrusion efficiency by decreasing screw torque and melt temperature. It also improves material flowability while reducing COF to a level close to that of PTFE.

This additive is designed for PA processors and compounders that wish to improve their productivity.

### Highlights:

- Increases productivity through lower extrusion torque
- Improves material flowability
- Provides COF performance similar to that of PTFE at lower loadings (2-5 wt% vs. 15 wt% for PTFE)
- Has minimal to no effect on mechanical performance
- Can be directly blended with polymer pellets or powdery additives

	Torque	Melt temperature (°C)	Relative Throughputs* (%)	Relative Spiral Flow (%)
No additive	36	340	100	100
PTFE 15wt%	36	338	116	100
Dow Corning® 31-441 Additive 2wt%	31	316	127	125

\* relative comparisons to maintain a constant machine load

Table 2: Dow Corning® 31-441 Additive increases by minimum 25% throughput and flowability while reducing torque by 10% with 2wt% addition

## Dow Corning® MB50-011 Masterbatch

For enhanced anti-scratch performance in glass fiber-reinforced PA compounds, Dow Corning® MB50-011 Masterbatch is the material of choice. At loadings of 1.5-2.0 wt%, this masterbatch delivers improved surface properties and resistance to scratching. Dow Corning® MB50-011 Masterbatch also provides some COF reduction benefits, more so in neat PA.

## Different Needs, Different Options

	Processing	Injectability	Mechanics	Density	Slip	Wear
PTFE	0	0	-	-	+++	+++
Dow Corning® 31-441 Additive	+++	+++	0	0	NA	NA
Dow Corning® HMB-1103 Masterbatch	+	+++	+	0	+++	+++

(-) Lower; (0) neutral; (+) good; (+++) excellent when compared to non additivated polyamide formulation

Table 3: Dow Corning® 31-441 Additive and Dow Corning® HMB-1103 Masterbatch key properties

## Many Solutions. One Source.

A long-time global leader in developing innovative silicon-based solutions, Dow Corning offers a variety of Plastics and Composites Solutions. Our additive and ready-to-use solutions help solve your needs in terms of processing, reinforcing materials and enhancing properties. From fluids to pellets, we help simplify the access to the uniqueness of silicone technology.

To learn more about Dow Corning's wide range of Plastics and Rubber solutions, visit [dowcorning.com/plascomp](http://dowcorning.com/plascomp), email the Plastics team on [plastics@dowcorning.com](mailto:plastics@dowcorning.com) or go to [dowcorning.com/ContactUs](http://dowcorning.com/ContactUs) for a contact close to your location.

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