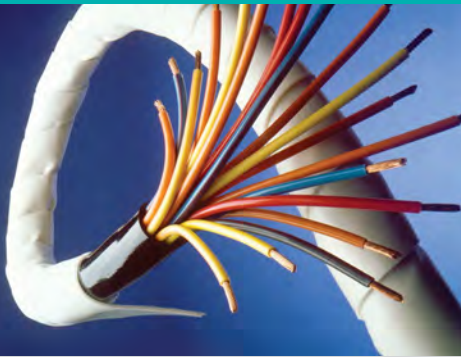


Silicone Additive Solutions for HFFR Wire and Cable Applications



Silicone additives from Dow Corning offer solutions for wire and cable formulators, such as:

- Processing aids to reduce torque and die drool
- Properties extenders to enhance dispersion and performance of flame retardants and other additives
- Reinforced material enhancers to improve compatilization and crosslinking
- Surface and bulk modifiers to provide more control over finish properties

Improve Performance, Processability and Productivity in HFFR Wire and Cable Formulations

As regulatory requirements and market demands for wire and cable products change, how can formulators meet new challenges?

Those challenges include:

- Increasing demand for halogen-free flame retardants
- Proper dispersion of pigments and additives

- Maintaining and improving hydrophobicity
- Reducing torque, die buildup and other extrusion problems
- Process stability and productivity
- Controlling surface properties



What's Your Challenge?

Dow Corning® brand additives are specifically formulated to help you solve many of the challenges common to formulating compounds for the wire and cable market.

Typical Properties of Additives and Modifiers for Wire and Cable Solutions

Products	<i>Dow Corning</i> ® Brand Products			XIAMETER® Brand Products	
	4-7081/4-7105 Resin Modifiers	MB50-002/MB50-320 Masterbatches	11-100 Additive	Amino Silanes	Vinyl Silanes
Physical Form	Free-Flowing Powder	Pellet	Liquid	Liquid	Liquid
Die Drool	+++	++	+	—	—
Surface Quality	+	+++	—	—	—
Crosslinking	—	—	—	+	+++
Processability	++	+++	++	—	—
Fire Retardant	+++	+	+++	+	+
Water Resistance	+	+	+++	+	+
Compatibility/Coupling	+	+	+++	++	++

+++ (EXCELLENT) ++ (VERY GOOD) + (GOOD) — (NEUTRAL)

Multifunction Additive: *Dow Corning*® Si Powder Resin Modifiers

Dow Corning Si Powder Resin Modifiers can help you replace additives that offer single benefits. *Dow Corning*® 4-7081 and *Dow Corning*® 4-7105 Resin Modifiers are free-flowing powders that enhance processing and performance properties.

Recommended loading of *Dow Corning* Si Powder Resin Modifiers is between 2% and 8% by weight, depending on application.

Comparison of *Dow Corning* 4-7081 Resin Modifier with Competitive Products

Property	Die Drool Reduction	Torque	Tensile Strength at Break	Tensile Elongation	Limited Oxygen Index	H ₂ O Absorption Reduction	Cost In Use
Value		(% Δ)	(% Δ)	(% Δ)	(% Δ)	1 Month (% Δ)	(% Δ)
<i>Dow Corning</i> 4-7081 Resin Modifier (4%)	+++	-11%	No Change	-3%	+9%	-30%	Base Case
4% C1 (Si-Based)	+	-19%	-19%	-46%	+5%	-23%	0%
2% C2 (Si-Based)	+++	-17%	-9%	-21%	-11%	+23%	0%
4% C3 (Organic)	∅	-12%	-25%	+6%	-3%	-16%	33% Lower
1% C4 (Fluoro-Based)	∅	-8%	-2%	-31%	-2%	-23%	33% Higher

+++ (EXCELLENT) + (GOOD) ∅ (POOR)

Significant Die Drool (Plate Out) Reduction



0% *Dow Corning* 4-7081 Resin Modifier, 61% ATH



4% *Dow Corning* 4-7081 Resin Modifier, 57% ATH

Improved Productivity and Surface Properties: Dow Corning® MB50-002 and MB50-320 Masterbatches

Dow Corning MB50-002 and MB50-320 Masterbatches are pelletized materials containing an UHMW siloxane polymer dispersed in LDPE. They can help you enhance surface properties while increasing productivity.

In processing, the addition of Dow Corning® Masterbatches:

- Reduces extruder torque and screw slippage
- Improves processing and flow
- Increases throughput
- Lowers scrap rate and energy costs
- Improves filler dispersion

It also offers finish properties that are important in wires and cables, such as:

- Smooth, glossy surface
- Scratch resistance
- Fewer printing problems

Recommended loading of Dow Corning MB50-002 or MB50-320 Masterbatch is 0.2% to 2.0% to improve processing and flow, and 2% to 6% to improve surface properties.

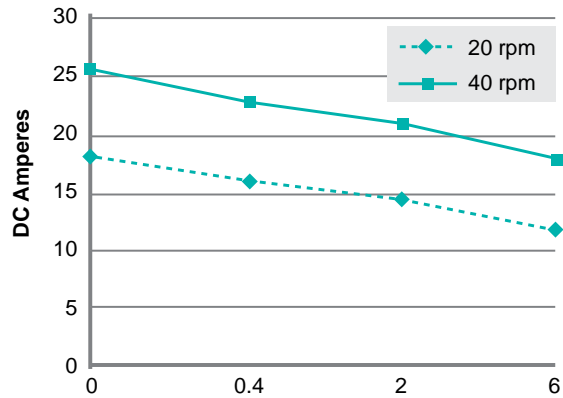
Improved Hydrophobicity: Dow Corning® 11-100 Additive

If improving water resistance is your primary goal, consider Dow Corning 11-100 Additive. It is an excellent hydrophobant, reducing water trees phenomena and providing better aging properties. This clear liquid also offers:

- Excellent water repellence
- Better compatibility with the polyolefin polymer matrix
- Improved process stability and compounding productivity, by improving filler de-agglomeration and hydrophobicity
- Improved dispersion of fillers such as MDH/ATH/CaCO₃
- Improved limiting oxygen index value
- Easier and more convenient usage than many other filler dispersion aids

Recommended loading of Dow Corning 11-100 Additive is between 1% and 3%, depending on the filler.

Amperage Effect in Single-Screw Extrusion



% Dow Corning MB50-002 Masterbatch in DOWLEX® 2047 LDPE

Physical Properties of HDPE modified with a UHMW Polydimethylsiloxane Additive

Property	Dow Corning® MB50-002 Content, %		
	0	2.0	10.0
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 minutes	0.1	0.1	0.1
Vicat Softening, °C	128	125	119



Proven Crosslinking and Coupling Agents

XIAMETER® OFS-6518 Silane

This vinyltrialkoxysilane agent provides excellent coupling and crosslinking between inorganic surfaces, organic rubber and plastics. It also provides moisture crosslinking sites when grafted into a polyethylene polymer backbone.

XIAMETER® OFS-6020 Silane

This diaminofunctional silane is an effective coupling agent for clay-reinforced elastomers such as natural and nitrile rubber. It improves adhesion and compatibility between inorganic filler and organic polymer. It also increases wet and dry:

- Tensile strength and modulus
- Flexural strength and modulus
- Compressive strength

XIAMETER® OFS-6011 Silane

This high-purity amino coupling agent offers improved adhesion. It also increases wet and dry:

- Tensile strength and modulus
- Flexural strength and modulus
- Compressive strength

Many Solutions. One Source.

A longtime global leader in developing innovative new silicon-based solutions, Dow Corning offers a variety of solutions to wire and cable formulators. Our additive portfolio offers property enhancement, processing aids and modifiers — in liquids, powders and pellets and our customer service and technical support can help you invent the future of the wire and cable industry.

Information, Answers and Product Samples

To learn more about Dow Corning's wide range of solutions for wire and cable formulators, visit dowcorning.com/plascomp.

If you have questions, email the Dow Corning Plastics team at plastics@dowcorning.com.

For product samples, contact the Dow Corning Technical Information Center nearest you.

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