

Dow Personal Care

**A guide to silicone emulsifiers for
skin care, sun care and color cosmetics**



Create stable water-in-silicone, water-in-oil, and oil-in-water emulsions

With a range of silicone emulsifiers and formulation support from Dow, you can formulate skin care, sun care and color cosmetic products that deliver the ideal combination of texture, feel and performance for your application.

Physical properties of silicone emulsifiers¹ from Dow for water-in-oil and water-in-silicone emulsions

	INCI name	Type of emulsion	Dispersed material	Carrier	Viscosity at 25°C (77°F)	Closed-cup flash point	Use level	Processing notes
DOWSIL™ 5200 Formulation Aid	Lauryl PEG/PPG18/18 Methicone	Water-in-silicone+oil Water-in-oil	No	NA	1,100-2,600 mm ² /s	93°C (199.4°F)	1-6%	High shear Cold or hot processing
DOWSIL™ 9011 Silicone Elastomer Blend	Cyclopentasiloxane (and) PEG-12 Dimethicone Crosspolymer	Water-in-silicone Water-in-silicone+oil	Yes (12.5%)	Cyclopentasiloxane <i>Volatile</i>	<100 mm ² /s	73°C (163.4°F)	6-24%	Low to high shear Cold or hot processing
DOWSIL™ 5225C Formulation Aid	Cyclopentasiloxane (and) PEG/PPG-18/18 Dimethicone	Water-in-silicone Water-in-silicone+oil	Yes (12.5%)	Cyclopentasiloxane <i>Volatile</i>	400-1,000 mm ² /s	>77°C (>170.6°F)	6-24%	High shear Cold or hot processing
DOWSIL™ BY 11-030	Cyclopentasiloxane (and) PEG/PPG-19/19 Dimethicone	Water-in-silicone Water-in-silicone+oil	Yes (50%)	Cyclopentasiloxane <i>Volatile</i>	15,000-60,000 mm ² /s	78°C (172.4°F)	2-8%	Low to high shear Cold or hot processing
DOWSIL™ BY 25-337	PEG/PPG-19/19 Dimethicone (and) C13-16 Isoparaffin (and) C10-13 Isoparaffin	Water-in-silicone+oil	Yes (50%)	C13-16 Isoparaffin (and) C10-13 Isoparaffin <i>Volatile</i>	1,500-9,000 mm ² /s	83°C (181.4°F)	2-8%	Low to high shear Cold or hot processing
DOWSIL™ ES-5612 Formulation Aid	PEG-10 Dimethicone	Water-in-silicone Water-in-silicone+oil	No	NA	500-1,200 mm ² /s	>100°C (>212°F)	2-8%	Low to high shear Cold or hot processing
DOWSIL™ FZ-2233	Bis-Isobutyl PEG/PPG-10/7/Dimethicone Copolymer	Water-in-silicone Water-in-silicone+oil	No	NA	2,500-7,500 mm ² /s	118°C (244.4°F)	1-6%	High shear Cold or hot processing
DOWSIL™ ES-5226 DM Formulation Aid	Dimethicone (and) PEG/PPG-18/18 Dimethicone	Water-in-silicone Water-in-silicone+oil	Yes (37.5%)	Dimethicone, 2 cSt <i>Volatile</i>	1,000-8,000 mm ² /s	78°C (172.4°F)	3-12%	High shear recommended Cold or hot processing
DOWSIL™ ES-5227 DM Formulation Aid	Dimethicone (and) PEG/PPG-18/18 Dimethicone	Water-in-silicone Water-in-silicone+oil	Yes (25%)	Dimethicone, 5 cSt <i>Non-volatile</i>	2,000-10,000 mm ² /s	>100°C (>212°F)	4-16%	High shear recommended Cold or hot processing
DOWSIL™ ES-5300 Formulation Aid	Lauryl PEG-10 Tris(trimethylsiloxy)silylethyl Dimethicone	Water-in-silicone Water-in-silicone+oil Water-in-oil	No	NA	1,800 mm ² /s	>100°C (>212°F)	1-6%	Low to high shear Cold or hot processing
DOWSIL™ ES-5600 Silicone Glycerol Emulsifier	Cetyl Diglycerol Tris(trimethylsiloxy)silylethyl Dimethicone	Water-in-silicone Water-in-silicone+oil Water-in-oil	No	NA	2,000-5,000 mm ² /s	>100°C (>212°F)	1-8%	Low to high shear Cold or hot processing

Physical properties of silicone emulsifiers¹ from Dow for oil-in-water and silicone-in-water emulsions

	INCI name	Type of emulsion	Dispersed material	Carrier	Viscosity at 25°C (77°F)	Closed-cup flash point	Use level	Processing notes
DOWSIL™ OFX-5329 Fluid	PEG-12 Dimethicone	Silicone-in-water Silicone+oil-in-water Oil-in-water	No	NA	360 mm ² /s	76.6°C (169.9°F)	2-5% (optimal 4%)	Cold or hot processing
DOWSIL™ ES-5373 Formulation Aid Low Odor	PEG-12 Dimethicone	Silicone-in-water Silicone+oil-in-water Oil-in-water	No	NA	820 mm ² /s	>100°C (>212°F)	1.5-5%	Cold or hot processing
DOWSIL™ ES-5800 Formulation Aid	Carboxydecyl Dimethicone	Silicone-in-water Silicone+oil-in-water Oil-in-water	No	NA	1,500-3,000 mm ² /s	>100°C (>212°F)	2-10%	Cold or hot processing

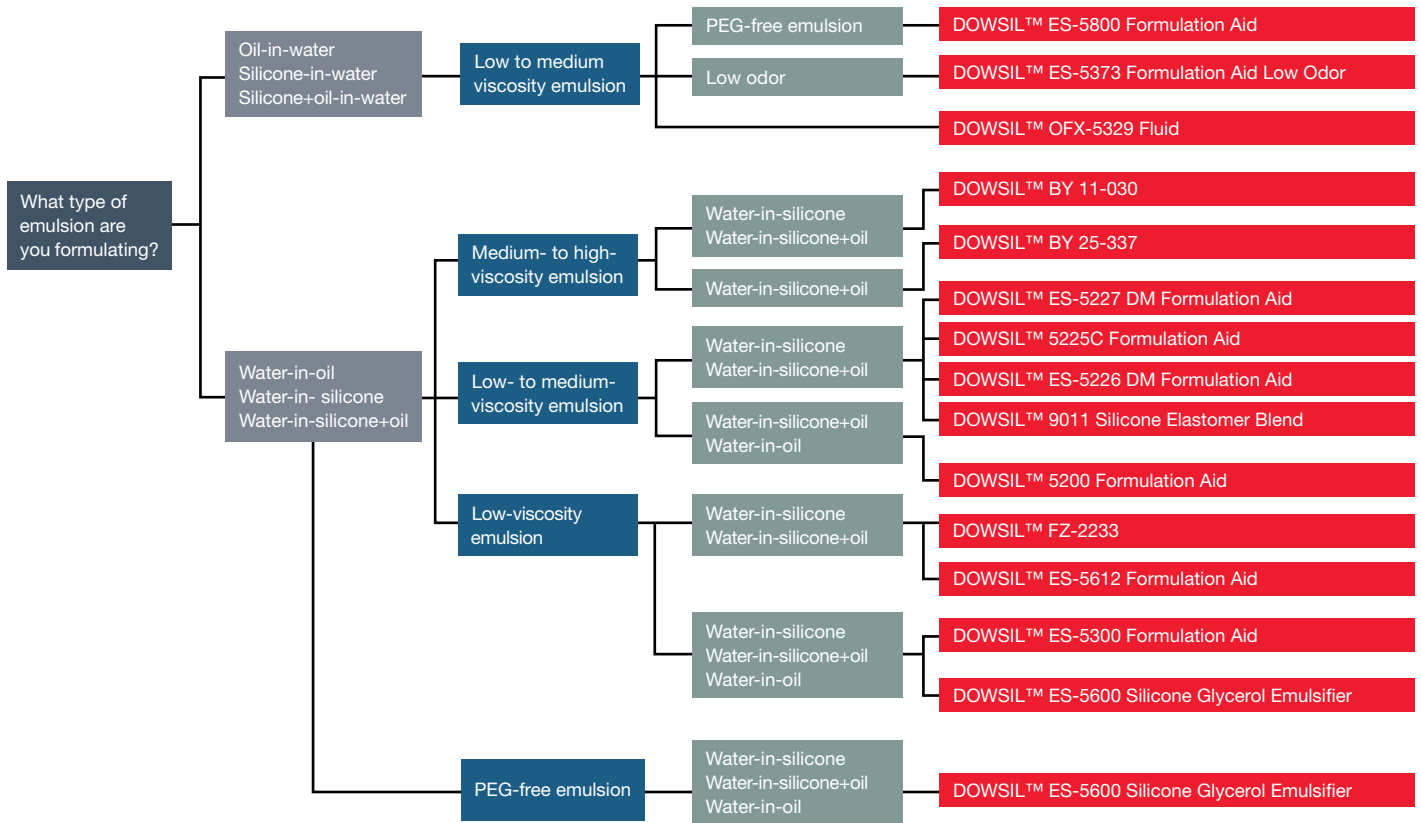
¹ These values are not intended for use in preparing specifications.

² Use levels are simply suggested starting points and will need to be adjusted based on other formulation ingredients.

For recommended use levels, see page 4.

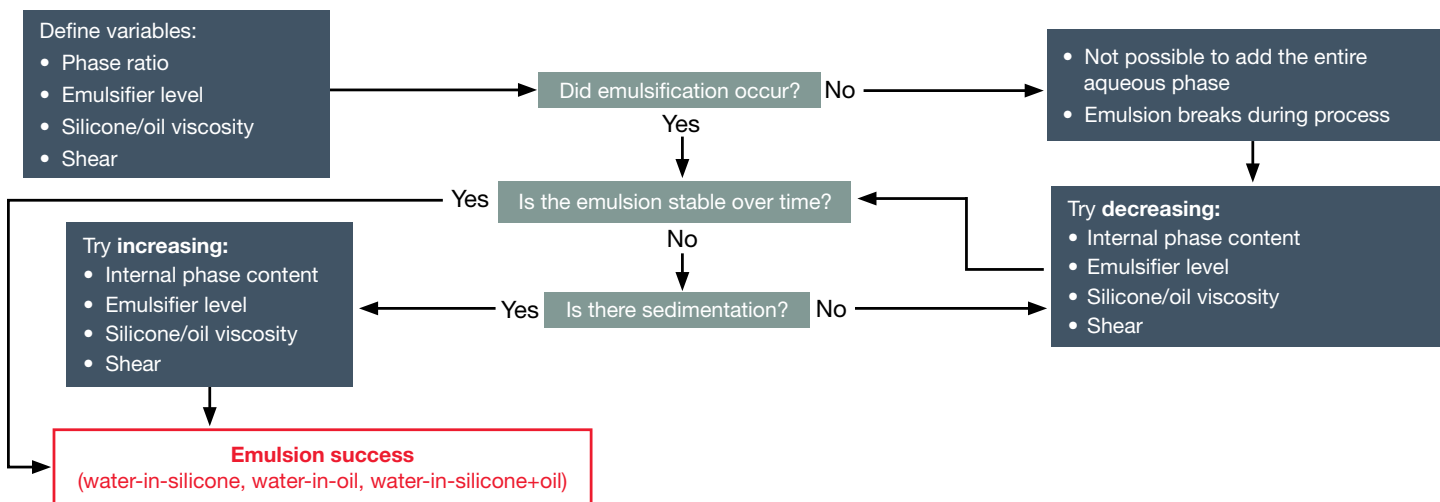
Silicone emulsifier decision tree

Answer the questions below to determine which silicone emulsifiers are best suited for your water-in-oil, water-in-silicone and oil-in-water emulsions.



Water-in-oil emulsion success tips

Emulsification success is both an art and a science. It may be necessary to adjust key variables, individually or in combination. Here are some tips to help you formulate with silicone emulsifiers from Dow. For specific formulating advice, please contact your Dow representative.



Recommended use level, %³

	Water/silicone oil ratio		
	80/20	70/30	60/40
DOWSIL™ 5200 Formulation Aid	1-2	2-4	3-6
DOWSIL™ 9011 Silicone Elastomer Blend	6-10	10-16	10-24
DOWSIL™ 5225C Formulation Aid	6-10	10-16	10-24
DOWSIL™BY 11-030	2-4	2-6	6-8
DOWSIL™ BY 25-337	2-4	2-6	6-8
DOWSIL™ ES-5612 Formulation Aid	2-3	3-5	5-8
DOWSIL™ FZ-2233	1-2	2-4	3-6
DOWSIL™ ES-5226 DM Formulation Aid	3-5	5-8	5-12
DOWSIL™ ES-5227 DM Formulation Aid	4-8	8-12	8-16
DOWSIL™ ES-5300 Formulation Aid	1-3	2-5	2-6
DOWSIL™ ES-5600 Silicone Glycerol Emulsifier	1-3	3-6	5-8

³Use levels are simply suggested starting points and will need to be adjusted based on other formulation ingredients.

About Dow Personal Care Solutions

Dow Personal Care offers unique, innovative ingredients that empower customers around the world to create products with exceptional performance and exciting benefits that consumers can trust and believe in. Consumers that seek the confidence of a healthy appearance can see and feel the difference in our products through their lustrous hair or radiant and protected skin. We leverage our understanding of customer needs, deep market knowledge and technical expertise—combined with one of the broadest portfolios of technologies—to deliver personal care solutions with outstanding performance that are safe for people and the planet. We foster these innovations on global and local levels to meet the needs of diverse consumers through business centers, research and development (R&D), manufacturing plants and customer applications centers around the world. Please visit www.dow.com/personalcare for more information.

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