



DOWSIL™ 9546 Silicone Elastomer Blend

INCI NAME: Cyclopentasiloxane (and) Dimethicone Crosspolymer (and) Dimethicone/Vinyl Dimethicone Crosspolymer (and) Dimethiconol

Features & Benefits

- Cross-linked silicone elastomer gel
- Easy to formulate
- Acts as a thickening agent for water-in-oil and water-in-silicone formulations and other silicone fluids
- Provides dry smoothness and a light, silky, non-greasy skin feel
- Enhances the aesthetics of volatile silicone fluids
- May improve fragrance retention
- Reduces tackiness of formulations
- Slight sebum absorption
- Quick absorption
- Cold processing
- Increased suspension of antiperspirant salts (see Figure 4)
- Reduced volatile silicone fluids syneresis in antiperspirant and deodorants (see Figure 6)

Composition

- Approximately 15.5 wt. percent Dimethicone Crosspolymer, Dimethicone/Vinyl Dimethicone Crosspolymer and a high molecular weight Dimethiconol in Cyclopentasiloxane (D5)

Applications

- Skin care
- Hair care
- Antiperspirants/deodorants
- Many other potential formulations (examples: sunscreens, color cosmetics, suncare, styling aids, etc.)

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Appearance		Slightly hazy, colorless to light amber, no significant particulate
Viscosity	mm ² /s	350,000
Non-volatile content	%	15.5
Cyclotetrasiloxane (D4) content	%	< 1

Description

DOWSIL™ 9546 Silicone Elastomer Blend is a mixture of high molecular weight silicone elastomer, Cyclopentasiloxane and a high molecular weight linear silicone polymer.

How to Use

DOWSIL™ 9546 Silicone Elastomer Blend can be used similarly to DOWSIL™ 9040 Silicone Elastomer Blend and DOWSIL™ 9041 Silicone Elastomer Blend. However, due to the higher viscosity of DOWSIL™ 9546 Silicone Elastomer Blend, it is recommended to pre-mix it with the other ingredients that comprise the oil phase in order to make sure that the oil phase is homogeneous.

This blend should be prepared by mixing the ingredients slowly with a spatula or a U blade. Do not use high shear. In some cases there are systems that include emulsifiers or waxes that require high temperatures to melt. For these systems, it is recommended to make the emulsion first and then cool down the mixture to 50°C and then add the DOWSIL™ 9546 Silicone Elastomer Blend pre-mixed with part of the oils that comprise the oil-phase. This helps to avoid the evaporation of the volatile components that comprise DOWSIL™ 9546 Silicone Elastomer Blend.

If your system is transparent, it is recommended to add from one to three percent of an ester, or an alkoxy alcohol (i.e. C12-15 Alkyl Benzoate, PPG-3 Myristyl Ether or Isononyl Isonanoate). The addition of one of these ingredients can also affect the viscosity of your final product.

Clear systems can be prepared by making a water-in-silicone emulsion using DOWSIL™ 9546 Silicone Elastomer Blend in combination with a silicone formulation aid such as DOWSIL™ 5225C Formulation Aid or in combination with an emulsifying elastomer such as DOWSIL™ 9011 Silicone Elastomer Blend. These systems can be prepared using levels up to 60 weight percent oil-phase. However, it has been shown that formulations that utilize greater than 30% oil-phase are less aesthetically pleasing than those formulations that contain 30% or less.

Formulation Tips

DOWSIL™ 9546 Silicone Elastomer Blend may be formulated into oil-in-water emulsions, water-in-silicone emulsions, water-in-oil emulsions and anhydrous products.

- It can be added to the oil phase or silicone phase in an emulsion formulation.
- It can be post-added to emulsions provided the emulsion is viscous enough for the DOWSIL™ 9546 Silicone Elastomer Blend to be dispersed.
- For ease of use, its viscosity may be reduced by blending with dimethicone or cyclomethicone.
- It may be formulated with organic oils and silicone-based materials with the use of mixers and may be subjected to high shear devices such as homogenizers and sonolators.
- It is dispersible in a variety of liquid oils (refer to the DOWSIL™ 9040 Silicone Elastomer Blend product information sheet, Form No. 22-1765, for details).
- Because the Elastomer is stable, DOWSIL™ 9546 Silicone Elastomer Blend may be subjected to heat for a short duration. When heat is used, the material should be processed in an enclosed vessel to prevent the Cyclopentasiloxane from volatilizing; the vessel should be inerted at temperatures over 60°C (140°F).

UNRESTRICTED – May be shared with anyone

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How to Use (Cont.)

Processing

DOWSIL™ 9546 Silicone Elastomer Blend is a viscous product but has the unique characteristic of being a shear-thinning material (see Figure 2). The following information will aid in the selection of the proper equipment to use when processing DOWSIL™ 9546 Silicone Elastomer Blend out of a drum.

Pump Selection

One possible pump that can be used is a GRACO Bulldog 10:1 Pump with follower plate. For more information, contact GRACO at +1 800 367 4023.

Note: GRACO offers various Bulldog models, and other pump manufacturers may offer similar equipment equally capable of processing this material efficiently. Users should work directly with the pump manufacturer to determine the best design for their needs.

Customer-specific Pump Design Considerations

1. Pressure and flow requirements
 - a. Air supply pressure: will depend on plant's air supply capabilities.
 - b. Discharge pressure: will depend on total pressure required to move the silicone elastomer blend from point A to point B. Pressure drops due to elevation, frictional losses within the piping, fittings, valves, filters, etc., will need to be considered.
 - c. Flow requirements: will depend on how quickly the user wishes to transfer the silicone elastomer blend from a 208 liter (55 gal) drum into a vessel.
2. Construction material for wetted parts:
Stainless steel is recommended but carbon steel may also be used.
3. Construction materials for seals and gaskets:
Viton or Teflon materials are recommended.

Clean-up

XIAMETER™ PMX-0245 Cyclopentasiloxane, which dilutes the viscosity of DOWSIL™ 9546 Silicone Elastomer Blend to water-thin, is recommended for soaking or cleaning equipment. Other non-polar solvents may work as well.

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 WEBSITE AT CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

When stored at or below 60°C (140°F) in the original unopened containers, this product has a usable life of 24 months from the date of production.

Packaging Information

This product is available in 15 kg pails and 180 kg drums.

Samples are available in 0.4 kg cans.

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 has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

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

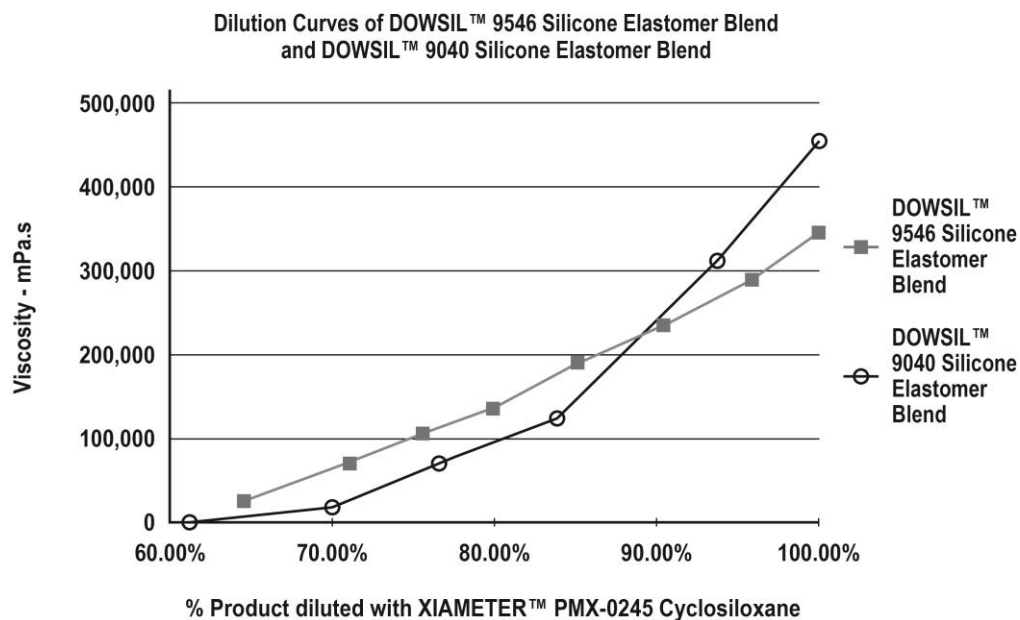


Figure 1: Dilution curves comparing DOWSIL™ 9546 Silicone Elastomer Blend and DOWSIL™ 9040 Silicone Elastomer Blend.

Rheological Flow Experiment Comparison of DOWSIL™ 9546 Silicone Elastomer Blend vs. DOWSIL™ 9040 Silicone Elastomer Blend

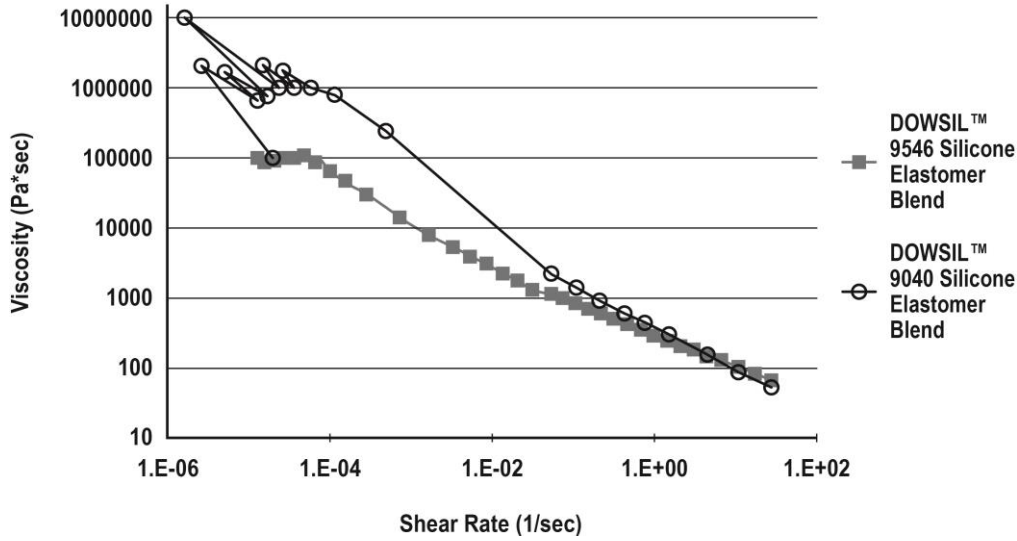


Figure 2: Rheological flow comparison of DOWSIL™ 9546 Silicone Elastomer Blend and DOWSIL™ 9040 Silicone Elastomer Blend.

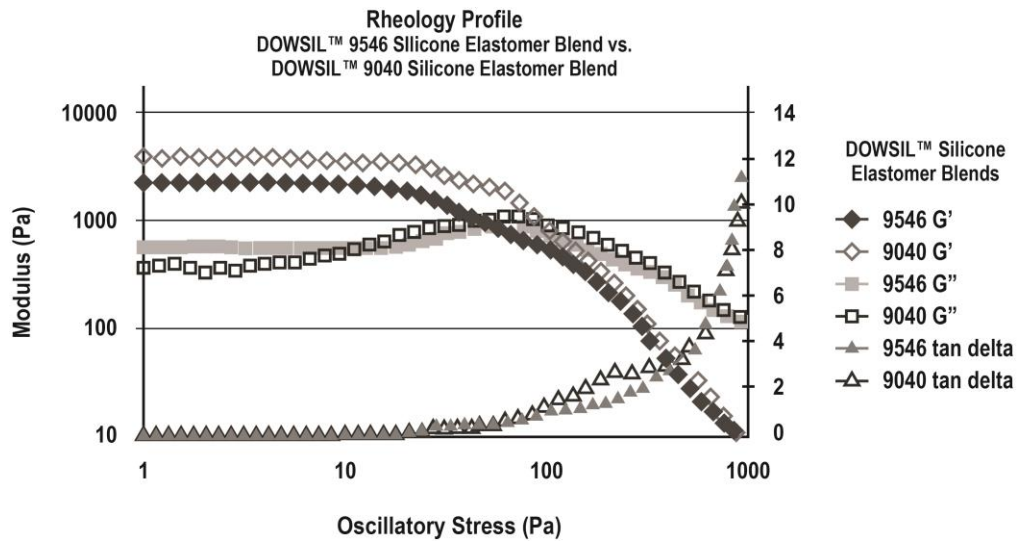
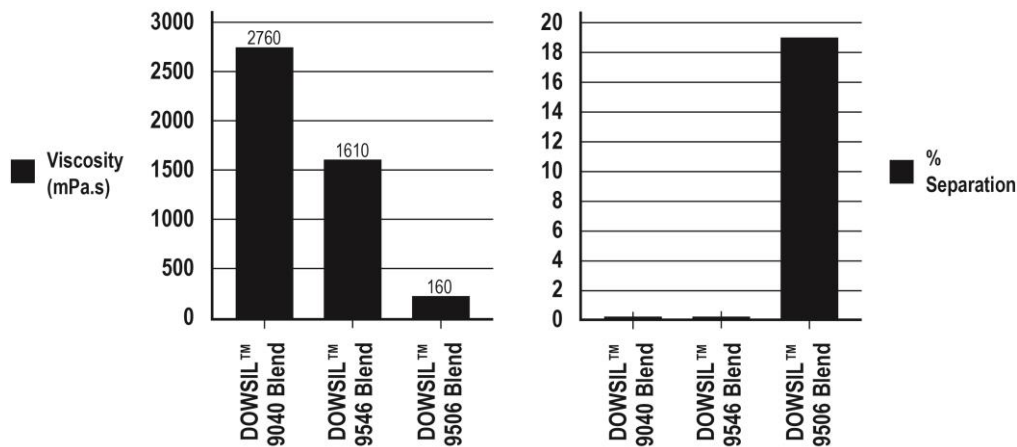
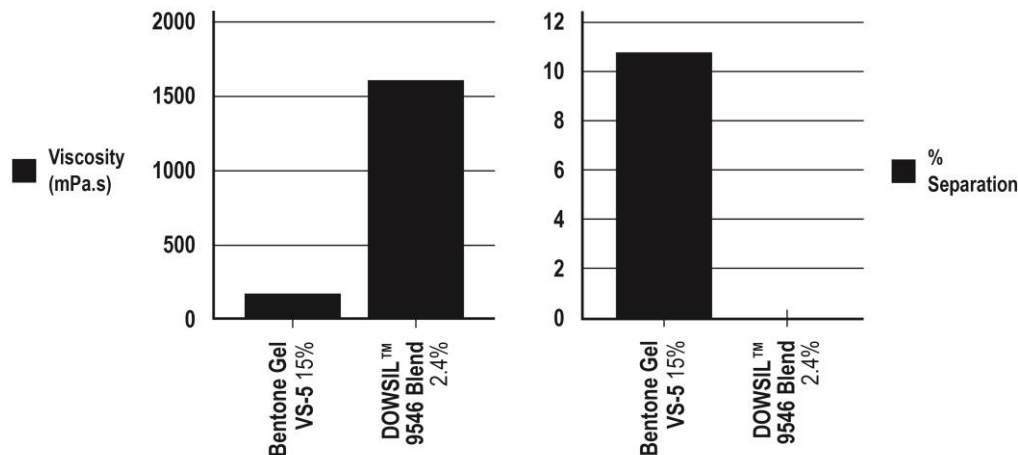


Figure 3: Rheology profile comparison of DOWSIL™ 9546 Silicone Elastomer Blend and DOWSIL™ 9040 Silicone Elastomer Blend.



DOWSIL™ 9040 Silicone Elastomer Blend Develops a Very High Viscosity with Low Solvent Separation.
 DOWSIL™ 9506 Powder Develops a Very Low Viscosity with High Solvent Separation.
 DOWSIL™ 9546 Silicone Elastomer Blend Develops an Acceptable Viscosity for a Roll on with a Low Solvent Separation.

Figure 4: Viscosity and % of solvent separation in a roll-on formulation using DOWSIL™ 9040 Silicone Elastomer Blend, DOWSIL™ 9546 Silicone Elastomer Blend and DOWSIL™ 9506 Powder at 2.4% solids.



At Low Levels, DOWSIL™ 9546 Silicone Elastomer Blend is an Effective Suspension Aid with Optimum Formulation Viscosity Compared to Traditional Bentone Gels.

Figure 5: Effect on the viscosity with Bentone gel VS 5 and DOWSIL™ 9546 Silicone Elastomer Blend AP/Deo formulation with XIAMETER™ PMX-0245 Cyclopentasiloxane as the solvent.

Elastomer Type	% Elastomer in Formulation	% XIAMETER™ PMX-0245 Cyclosiloxane	% C12-15 Alkyl Benzoate	% REACH AZP 908 SUF	% Syneresis	Average Viscosity (cP)
DOWSIL™ 9546 Silicone Elastomer Blend	30	42	3	25	30.4	104320
DOWSIL™ 9546 Silicone Elastomer Blend	35	37	3	25	16.3	168480
DOWSIL™ 9546 Silicone Elastomer Blend	40	32	3	25	1.6	265600

Anhydrous APs with DOWSIL™ 9546 Silicone Elastomer Blend

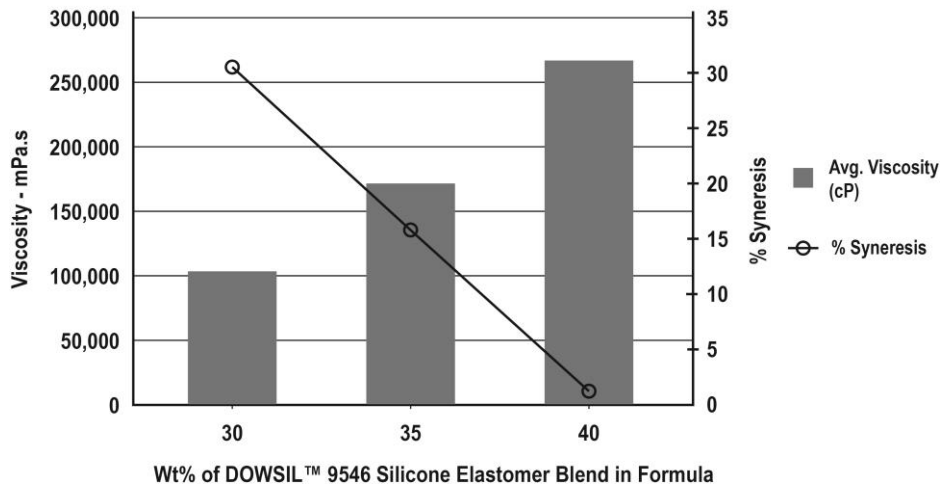


Figure 6: In soft solid applications, DOWSIL™ 9546 Silicone Elastomer Blend significantly reduces syneresis.

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LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

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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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