

Technical Data Sheet

DOWSIL[™] 5200 Formulation Aid

INCI NAME: Lauryl PEG/PPG-18/18 Methicone

Features & Benefits

• Makes very stable W/O emulsions

- Cold manufacturing process
- Formulation flexibility
- High water content
- Low emulsifier use level
- Multiple (W/O/W) emulsions
- Water-in-wax emulsions
- Co-emulsifier for O/W emulsions
- Moisturizing and protective
- Non-greasy feel
- Easy to spread
- Wash off resistance
- Light, hair and skin conditioning properties
- Wide range of emulsion form: W/O/W, water-in-wax

Applications

- Emulsifier designed to prepare water-in-oil emulsions with excellent stability, flexibility and aesthetic.
- Many uses in skin care products such as:
 - Main emulsifier for water-in-oil creams and lotions: protective cream, cleansing lotion, night cream, sunscreen cream, baby cream, dry skin cream and lotion, moisturizing cream, foundation, hand and body cream and lotion.
 - Allows the preparation of multiple emulsions (water/oil/water, or W/O/W) and water in wax emulsions.
 - o Co-emulsifier for oil-in water creams and lotions.
 - Skin conditioning properties in clear 2-in-1 shower gels.
- Delivers light hair conditioning when formulated into shampoos. It can even be used in clear shampoo formulations.

Typical Properties

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

Property	Unit	Result
Physical form		Liquid
Viscosity range 25°C (77°F)	cSt	1100–2600
Flash point - closed cup	°C	92.5
Appearance		Clear to slightly hazy, amber liquid

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DOWSIL[™] 5200 Formulation Aid

Typical Properties (Cont.)

Property	Unit	Result
Specific gravity		0.896
Cyclotetrasiloxane (D4) content	%	< 0.1
Cyclopentasiloxane (D5) content	%	< 0.1

Description

DOWSIL[™] 5200 Formulation Aid is a liquid alkylmethyl silicone polyether copolymer. Its primary function is to produce water-in-oil emulsions with a low to medium polarity oil phase. Products made with DOWSIL[™] 5200 Formulation Aid bridge the gap between oil-in-water and water-in-oil systems, delivering the benefits of protection, water resistance and elegance attributed to water-in-oil formulations but without the greasiness and heaviness of typical water-in-oil systems. DOWSIL™ 5200 Formulation Aid enables the formulation of creams and lotions with low energy processing and at room temperature, resulting in lower energy costs and faster processing times. DOWSIL™ 5200 Formulation Aid has a high molecular weight while still remaining fluid. This inherent property results in the creation of a very stable visco-elastic film at the water/oil interface, therefore DOWSIL™ 5200 Formulation Aid is a very efficient emulsifier and leads to water-in-oil formulations exhibiting excellent stability at high water concentration and low emulsifier levels. It also allows the incorporation of high levels of humectants such as glycerine and propylene glycol, while maintaining a very good sensory profile. DOWSIL[™] 5200 Formulation Aid can be used as a co-emulsifier in oil-in-water systems and has also demonstrated hair and skin conditioning properties.

How to Use

Water-In-Oil Emulsions

The recommended use level of DOWSIL[™] 5200 Formulation Aid is 2% for an oil phase ranging from 18 to 25% for low polarity oil (e.g. Mineral oil) and from 25 to 28% for medium polarity oil (e.g. Octyl palmitate). No heating is required to produce these water-in-oil creams unless high melting point ingredients are incorporated.

To ensure optimum stability of the final emulsion, the following procedures are recommended:

a) Stirrer and homogenizer

The water phase is added very slowly into the oil phase with high speed agitation. The final emulsion is then processed through the homogenizer.

b) Turbine type equipment

Turbine set to medium speed during the water addition. Turbine set to maximum speed to build the viscosity at the end. The emulsion viscosity can be increased by the addition of water, within the limits defined above or the viscosity can be decreased by increasing the oil phase volume (up to 35%) but the emulsifier level needs to be increased accordingly.

c) Salts are necessary in the water phase for formulation stability.

Co-Emulsifier for Oil-In-Water Emulsions

DOWSIL[™] 5200 Formulation Aid is an efficient co-emulsifier for oil-in-water emulsions at concentrations between 0.5 and 0.9%.

How to Use (Cont.)	Skin and Hair Conditioning Additive DOWSIL™ 5200 Formulation Aid can be shower gels in the presence of fatty acid Monoisopropanolamide.	easily incorporated into clear shampoo and alkanolamides such as Coconut Diethanolamide or
Formulation Tips	Water-In-Oil Emulsions It is important to regulate the speed of ad there is continuous incorporation of the w on the surface during the emulsification p	dition of the water phase into the oil phase so vater in oil. Water should not be allowed to build up process.
	It is recommended to use sodium chloride	e at a 1% concentration in the water phase.
	A co-emulsifier can be added to help to ir in incorporation of polar materials.	ncrease the formulation flexibility, for example, the
	DOWSIL™ 5200 Formulation Aid has been phases. It is recommended to check the f actives or pigments need to be added. The the capabilities of the emulsifier.	en designed to emulsify low to medium polarity oil formulation carefully if polar materials, sunscreen his is to ensure that the formulation is well within
	When transferring a formulation from lab water addition needs to be carefully moni	scale to industrial scale, shear rate and speed of tored to ensure good results.
	Clear Shampoos and Shower Gels DOWSIL™ 5200 Formulation Aid is mixed 60°C (140°F). A thickening agent is requi	d together with fatty acid alkanolamide heated to ired to adjust the viscosity of the system.
Typical Formulations	Water-In-Oil Cream: Ref 2/7	91
	Ingredients	Weight %
	Oil Phase:	

Ingredients	Weight %
Oil Phase:	
DOWSIL [™] 5200 Formulation Aid	2.0
Light mineral oil	19.0
Sunflower Oil	6.0
Water Phase:	
Sodium Chloride	1.0
Distilled Water	up to 100
Preservative	q.s.

Procedure

- A. Mix the oil phase ingredients together.
- B. Mix the water phase ingredients together.
- C. Slowly add B) into A) under high agitation. Homogenize.

Clear Conditioning Shampoo: Ref 14/6 D

Typical Formulations (Cont.)

Ingr	redients	Weight %
Pha	se A:	
1.	Sodium Laureth Sulphate (Albright & Wilson Empicol ESB-3)	30.0
2.	Disodium Ricinoleamido MEA-Sulfosuccinate (Rewo Chemische Werke GmbH Rewoderm S1333 40)	4.0
3.	Cocamidopropylbetaine (Seppic Amonyl 380BA)	4.0
4.	PEG-120 Methylglucose Dioleate (Lubrizol DOE 120)	1.5
5.	Distilled Water	up to 100.0
6.	Polyquaternium-10 (UCARE™ Polymer JR-125)	0.03
Pha	se B:	
7.	Cocamide DEA (BASF)	4.0
8.	Lauryl PEG/PPG-18/18 Methicone (DOWSIL ™ 5200 Formulation Aid)	2.0
Pha	se C:	
9.	Citric Acid	q.s.
10.	Preservative	q.s.

Procedure

- A. Mix ingredients of phase A together and heat to 60°C (140°F).
- B. Heat separately phase B to 60°C (140°F).
- C. Add phase A to B while gently mixing. Cool down to room temperature and add preservative.
- D. Adjust pH to 6.5 with citric acid.

Moisturizing Cream with 10% Glycerine

Ingredients	Weight %
Oil Phase:	
DOWSIL [™] 5200 Formulation Aid	2.0
Light mineral oil	10.0
Dimethicone (and) Dimethiconol (DOWSIL™ Dimethiconol Blend 20)	5.0
Stearoxytrimethylsilane (and) Stearyl Alcohol (DOWSIL™ 580 Wax)	2.0
Cyclopentasiloxane (XIAMETER™ PMX-0245 Cyclopentasiloxane)	10.0
Water Phase:	
Sodium Chloride	1.0
Glycerine	10.0
Distilled Water	up to 100
Preservative	q.s.

Procedure

Typical Formulations (Cont.)

- A. Mix the oil phase ingredients together.
- B. Mix the water phase ingredients together.
- C. Slowly add B) into A) under high agitation.
- D. Homogenize.

Water-In-Wax Emulsion Stick

Ingredients	Weight %
Oil Phase:	
DOWSIL™ 5200 Formulation Aid	2.0
Light mineral oil	6.0
Stearyl Dimethicone (and) Octadecene (DOWSIL™ 2503 Cosmetic Wax)	1.0
C30-45 Alkyl Methicone (and) C30-45 Olefin (DOWSIL™ AMS-C30 Cosmetic Wax)	9.0
Cyclopentasiloxane (XIAMETER PMX-0245 Cyclopentasiloxane)	8.0
Water Phase:	
Sodium Chloride	1.0
Bis-PEG-18 Methyl Ether Dimethyl Silane (DOWSIL™ 2501 Cosmetic Wax)	3.0
Propylene Glycol	3.0
Distilled Water	up to 100
Preservative	q.s.

Procedure

- A. Melt phase A ingredients to 75°C (167°F) using a water bath and mix it until homogeneous.
- B. Mix the water phase ingredients together and heat to 70°C (158°F).
- C. Slowly add B) into A) under high agitation while keeping the temperature at 70°C (158°F).
- D. After complete addition of the water phase, increase the agitation speed and keep mixing for another 5 minutes.
- E. Pour into container while still hot.

Compatibility

Typical

(Cont.)

Formulations

Water	I	
Cyclomethicone	С	
Dimethicone 5 mm ² /S	С	
Dimethicone 100 mm ² /S	Ι	
Dimethicone 350 mm ² /S	I	
Mineral oil	С	
Lanolin	С	
Glycerine	I	
Propylene Glycol	Ι	
Ethanol (except 1:1)	С	
Isopropyl Myristate	С	
Isopropyl Palmitate	С	
C12-15 Alkyl Benzoate	С	
Capric/Caprylic Triglycerides	С	
Sunflower oil	С	
Olive oil	С	
Wheat germ oil	С	
Castor oil	l	



I: Incompatible C: Compatible

Time



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	Large quantities of DOWSIL [™] 5200 Formulation Aid must be stored in vented containers and should not be exposed to a pH of below 2 or above 11. Small quantities (20 kg or below) do not require such conditions. When stored at or below 25°C (77°F) in the original unopened containers, this product has a usable life of 30 months from the date of production.
Packaging Information	This product is available in 20 kg pails and 182 kg drums. Samples are available in 250 g packs.
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.

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