



Technical Data Sheet

DOWSIL™ HMW 2220 Non-Ionic Emulsion

INCI NAME: Divinyldimethicone/Dimethicone Copolymer and C12-13 Pareth-23 and C12-13 Pareth-3

Features & Benefits

- Small particle size emulsion of an extremely high viscosity polymer
- Ease of formulation/cold processing
- Compatible with non-ionic, cationic and anionic surfactants systems
- Not tested on animals

Skin Care

- Imparts rich feel to skin care formulations
- Wash-off resistance
- Film barrier properties
- Viscosity builder for water-in-silicone systems

Body Wash

- Superior foam profile
- Superior skin feel

Hair Care

- Increased fragrance intensity
- Prolonged fragrance release
- Prolonged hair color retention (color lock)
- Good wet/dry-detangling and smoothness without weighing hair down

Applications

DOWSIL™ HMW 2220 Non-Ionic Emulsion has been designed as a unique way of incorporating high viscosity polymer ($> 120 \times 10^6$ mm²/s) into water-based systems.

This product can be used in skin care and body wash applications including:

- Skin creams
- Facial cleansers
- Shower gels

This product can be used in hair care applications including:

- Shampoos
- Rinse-off and leave-in conditioners
- Styling products

Typical Properties

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

Property	Unit	Result
Appearance		Milky-white to white liquid, free from particulate
Silicone content	wt%	60
Internal phase viscosity at 0.01 Hz	mm ² /s	> 120,000,000
pH		4.5–7.5
Particle size D50 (Microtrac)		< 0.6 microns
Suitable diluent		Water
Emulsifier type		Non-ionic
Preservative system		Phenoxyethanol
Microbiological evaluation	cfu/ml	10 maximum
Cyclotetrasiloxane (D4) content	%	< 0.1
Cyclopentasiloxane (D5) content	%	< 0.1

Description

DOWSIL HMW 2220 Non-Ionic Emulsion is a 60% non-ionic emulsion of a very high viscosity ($> 120 \times 10^6$ mm²/s at 0.01 Hz) polydimethyl-siloxane/vinyl copolymer.

How To Use

DOWSIL HMW 2220 Non-Ionic Emulsion is best added at temperatures below 50°C (122°F) to minimize risk of emulsion separation. The recommended addition level is 2 to 5% silicone active.

How To Apply

Shower Gels

DOWSIL HMW 2220 Non-Ionic Emulsion should be added at the end of the process after the final water addition.

Skin Creams

DOWSIL HMW 2220 Non-Ionic Emulsion should be added at the end after the preparation of the cream base. Avoiding high shear mixing is important to prevent the emulsion breaking.

Benefits

Pure Product Data

Wash-Off Resistance

40% of DOWSIL HMW 2220 Non-Ionic Emulsion remains on the skin after 3 washes.

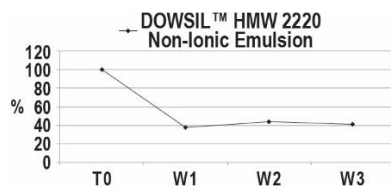


Figure 1: Wash-Off Resistance

UNRESTRICTED – May be shared with anyone

®™ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

DOWSIL™ HMW 2220 Non-Ionic Emulsion

© 2017 The Dow Chemical Company. All rights reserved.

Benefits (Cont.)

Skin Protection/Film Barrier Properties

DOWSIL HMW 2220 Non-Ionic Emulsion forms a protective film on skin.

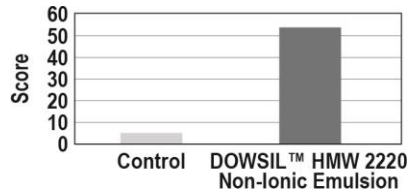


Figure 2: Skin Protection

Formulated Product Data

Shower Gel

Sensory Data

DOWSIL HMW 2220 Non-Ionic Emulsion generates foam faster than the control and gives a more creamy foam. Wet skin is more slippery and after drying, skin is smoother and more supple.

Test Results

Shower Gel Deposition

1. Spectrum of neat skin of volar forearm is taken
2. The test zone is washed with the shower gel
3. A spectrum is taken and the relative quantity of silicone is measured

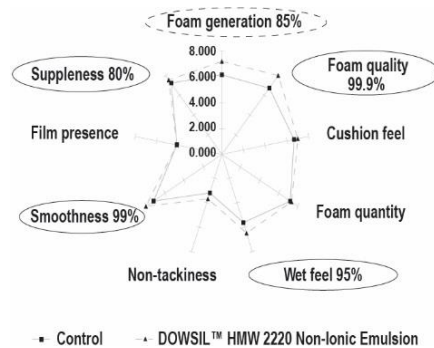


Figure 3: Sensory Profile for Shower Gel Containing DOWSIL HMW 2220 Non-Ionic Emulsion Versus Control

Deposition Data

The presence of silicone can be detected on the skin after the use of the shower gel.

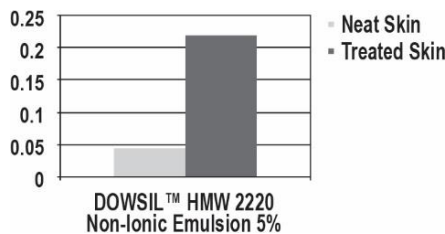


Figure 4: Deposition of DOWSIL HMW 2220 Non-Ionic Emulsion on Skin

Benefits (Cont.)

Water in Silicone Creams

Sensory Data

A water-in-silicone cream containing 2.3% of DOWSIL HMW 2220 Non-Ionic Emulsion has been found to have a significantly different feel (99% confidence level) from the same cream without the silicone. In addition, the sensory threshold has been found to be very low to provide expected benefits.

Viscosity Data

DOWSIL HMW 2220 Non-Ionic Emulsion helps increase the viscosity of water-in-silicone creams. (See Table 1).

Table 1: Viscosity Data

Ingredients	Control	DOWSIL HMW 2220 Non-Ionic Emulsion
Phase A		
DOWSIL™ 5225C Formulation Aid	10%	10%
XIAMETER™ PMX-0245 Cyclopentasiloxane	20%	18.6%
Phase B		
DOWSIL HMW 2220 Non-Ionic Emulsion		2.3%
NaCl	2.0%	2.0%
Water	68%	67.1
Viscosity 24 hours	19200	72800
3 weeks	16000	46400

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

Usable Life And Storage

When stored between 5°C (41°F) and 32°C (89°F) in the original unopened containers, this product has a usable life of 18 months from the date of production.

Packaging Information

This product is available in 20 kg pails and 200 kg drums.

Samples are available in 250 g.

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, www.consumer.dow.com or consult your local Dow representative.

<http://www.consumer.dow.com>

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

Dow's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

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.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DOW SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

DOW DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

