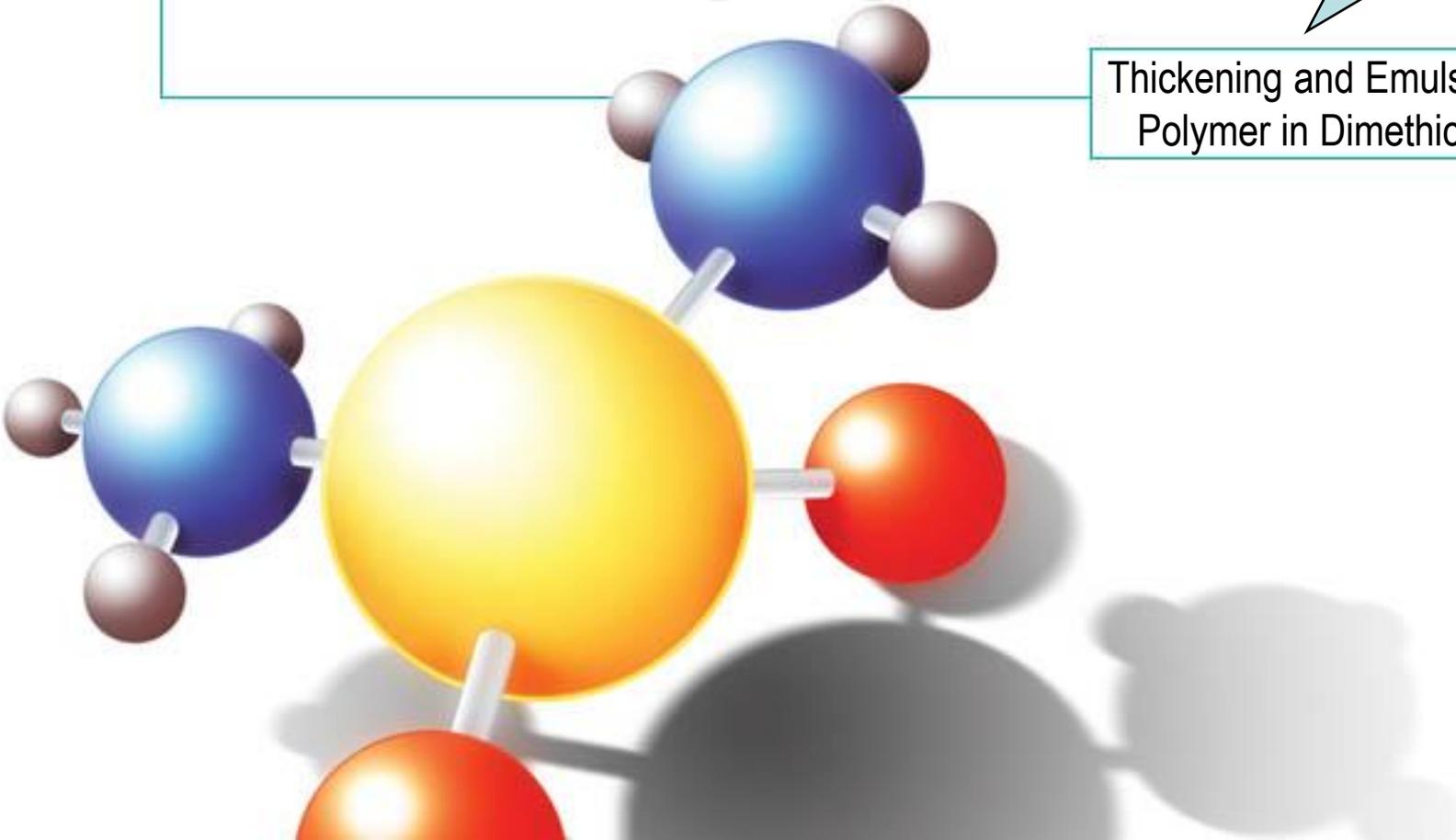


Dow Corning® RM 2051 Thickening Agent

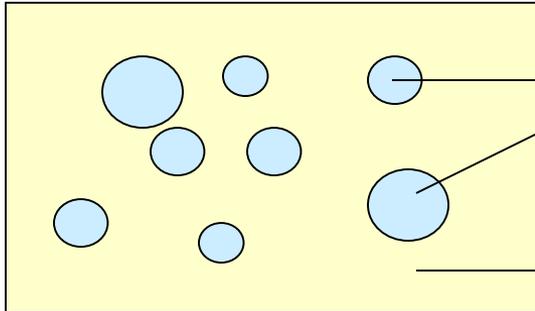
NEW

Thickening and Emulsifying
Polymer in Dimethicone

DOW CORNING



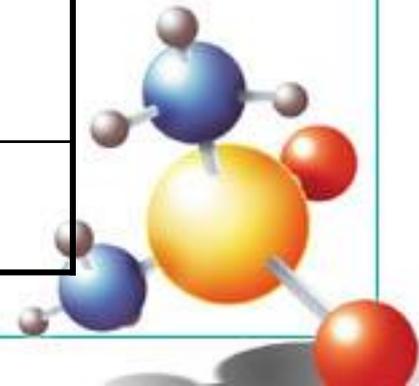
Dow Corning® RM 2051 Thickening Agent : Properties



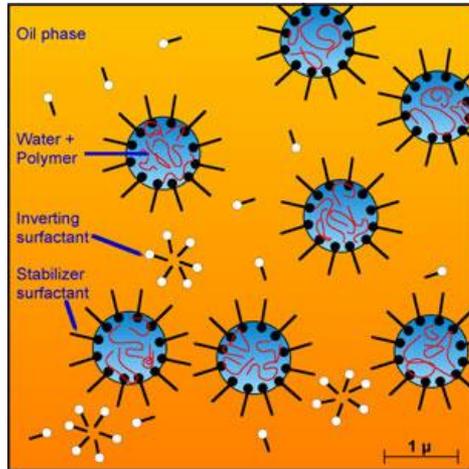
INTERNAL PHASE:
Water droplets containing Na Polyacrylate

CONTINUOUS PHASE:
Dimethicone (Dow Corning® 200 Fluid 5 cSt) and
Cyclopentasiloxane (Dow Corning® 245 Fluid)

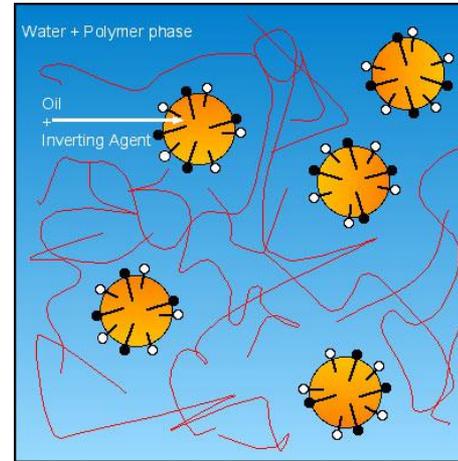
INCI Name:	Sodium Polyacrylate, Dimethicone, Cyclopentasiloxane, Trideceth-6, PEG/ PPG – 18/18 Dimethicone
Description:	Water in silicone emulsion with Sodium Polyacrylate in the water phase
Appearance:	Viscous liquid – pale yellow
Viscosity:	1000-4000 cPs
Thickener Polymer:	24-28 %
Silicone Content:	~ 29%
Flash Point:	>100°C
D4 content:	< 1%
Shelf Life:	9 months



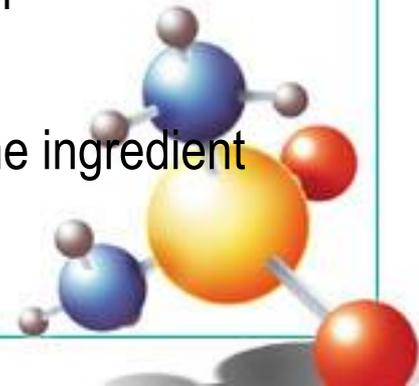
Dow Corning® RM 2051 Thickening Agent : Mechanism



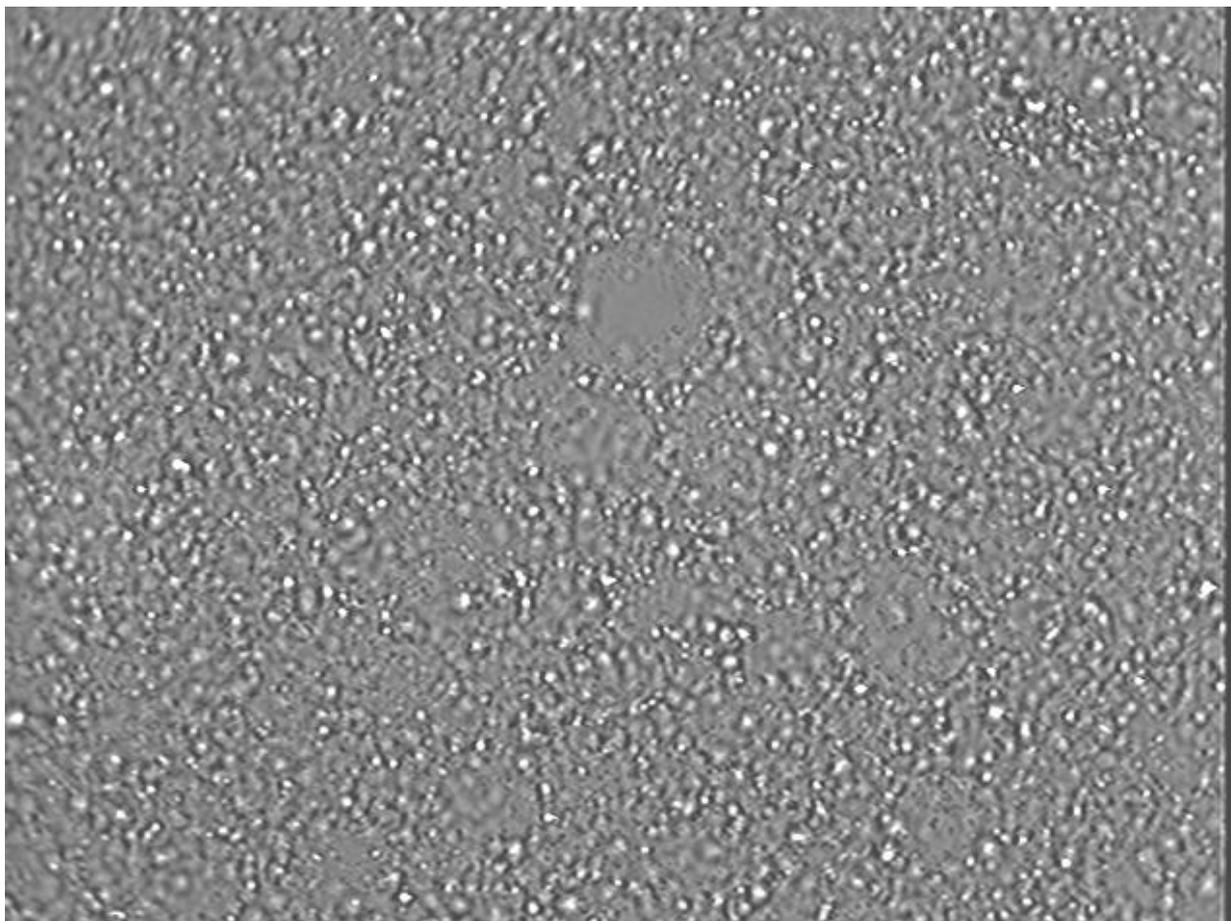
HYDRATION



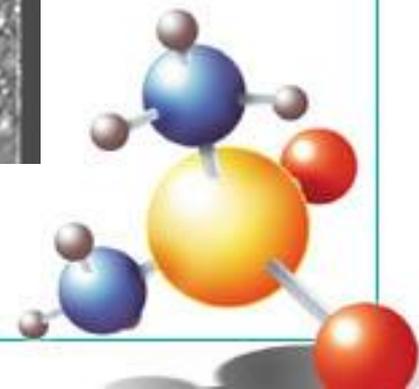
- ❑ Sodium Polyacrylate is dispersed in silicone together with an “inverting” surfactant
- ❑ When Dow Corning® RM 2051 Thickening Agent is mixed with water, the “inverting” surfactant helps bring water in contact with the polymer
- ❑ The polymer “blooms” into the water phase
- ❑ Both emulsification and thickening can be achieved from the same ingredient
- ❑ Product is designed for gels, O/W or Si/W emulsions



Dow Corning® RM 2051 Thickening Agent : *Appearance in water*



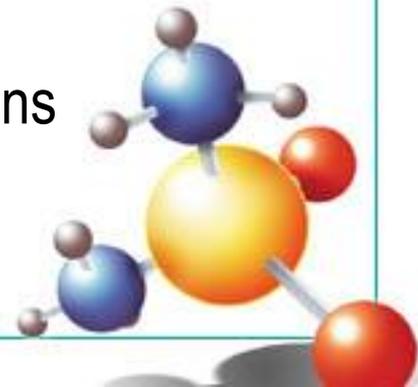
5% dispersion of Dow Corning® RM 2051 at 400x magnification



Dow Corning® RM 2051 Thickening Agent :

Key Benefits

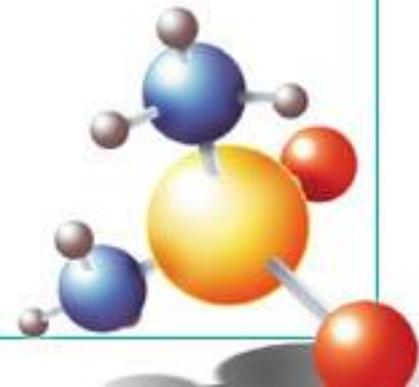
- Multifunctional product : thickening and emulsifying
- Ready and Easy-to-use fluid emulsion
- Silicone carrier that provides aesthetics
- Designed for formulating with elastomers, gum blends and other “hard to emulsify” silicones
- Provides smooth, non greasy and non sticky formulations



Dow Corning® RM 2051 Thickening Agent :

Comparison to competitive products

- Main products seen in the Market are based on carrier oils such as Isoparaffin, mineral oil, polyisobutene...
- Dow Corning® RM 2051 Thickening Agent carrier is **Dimethicone** and **Cyclopentasiloxane**



Dow Corning® RM 2051 Thickening Agent : *Ease of use*



Pour Dow Corning® RM 2051

Add Water



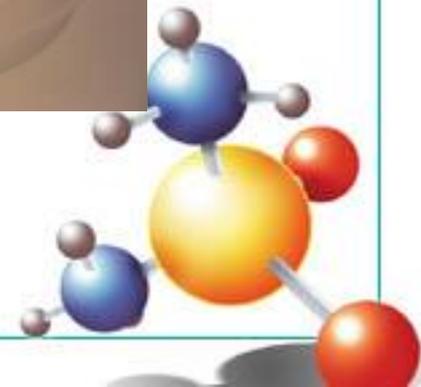
Mix



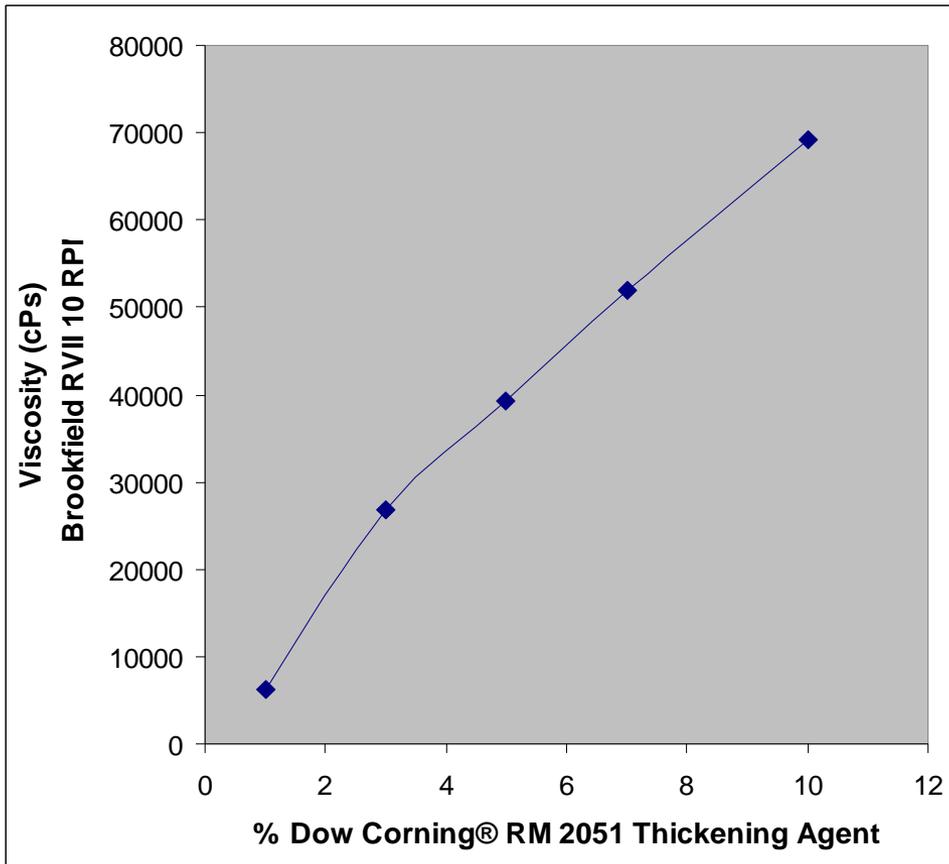
Instantaneous gelification

- Liquid form
- No pre-mixing
- No neutralization
- No heating
- Gels are instantaneously obtained by simply adding water

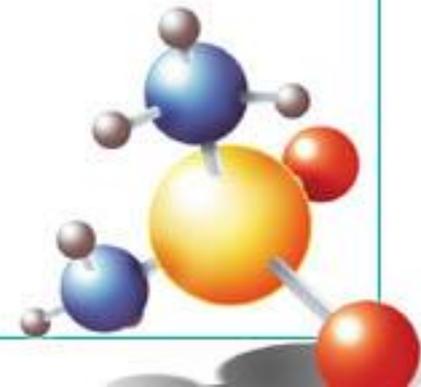
5% dispersion of Dow Corning® RM 2051
Thickening Agent in water



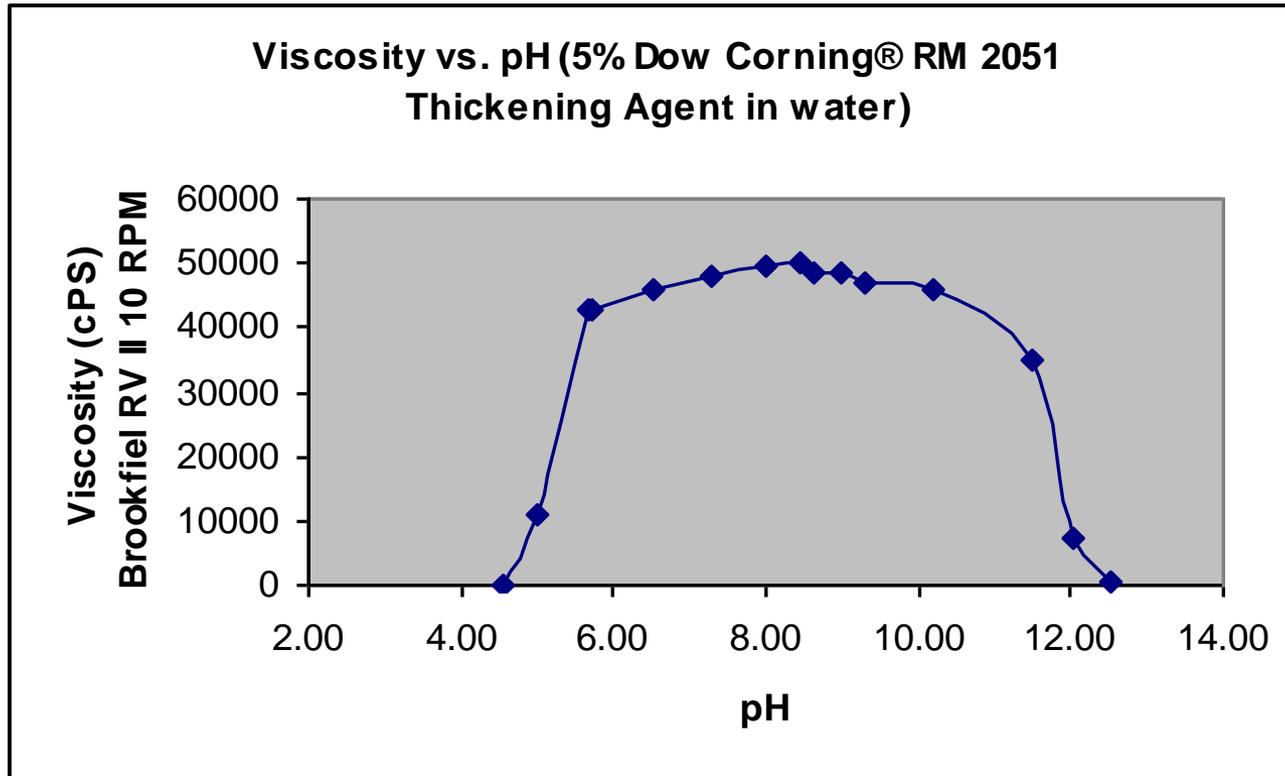
Dow Corning® RM 2051 Thickening Agent : *Thickening effect*



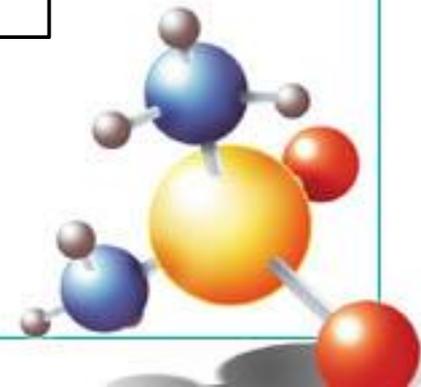
- Linear thickening effect which facilitates optimization of fluid formulations
- To obtain thick gels, 5 % addition level is recommended



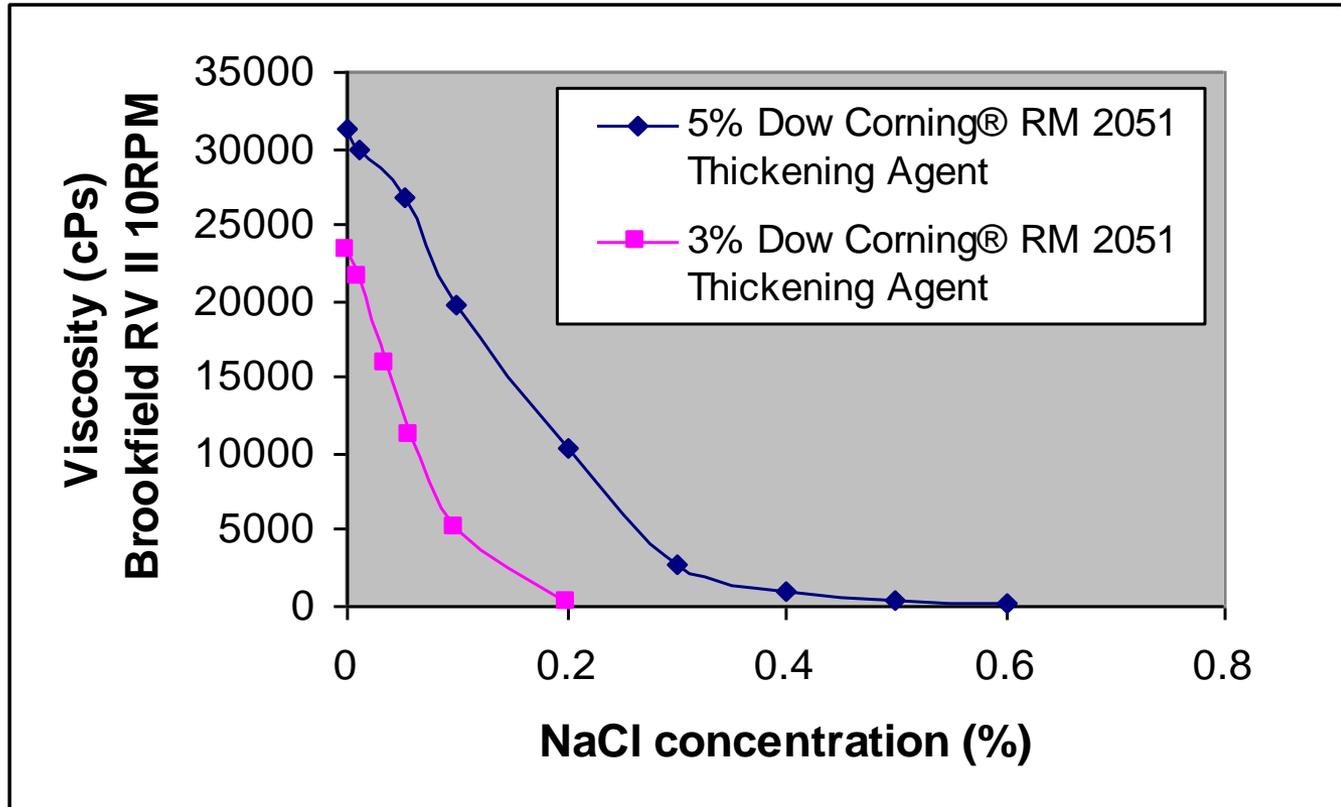
Dow Corning® RM 2051 Thickening Agent : *pH influence*



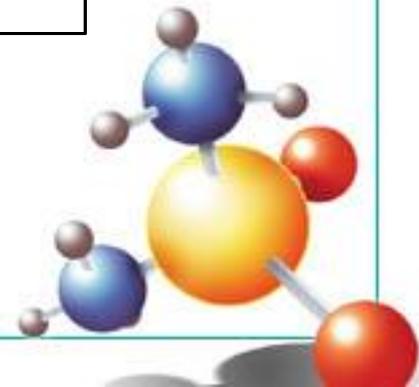
- Effective pH : 5.5 –11
- Suitable for use in high pH products
- Not recommended for use in acid conditions



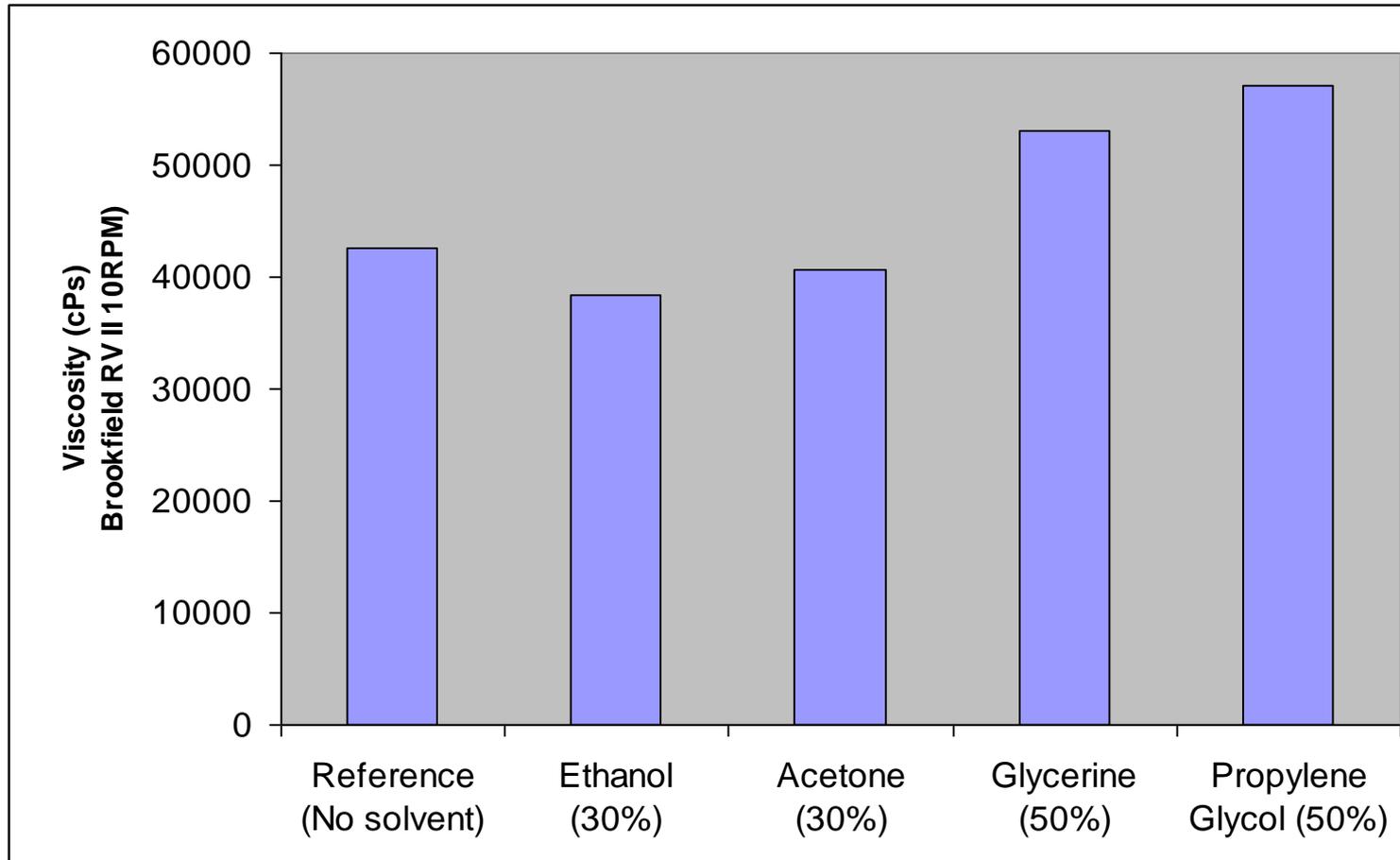
Dow Corning® RM 2051 Thickening Agent : *Electrolytes effect*



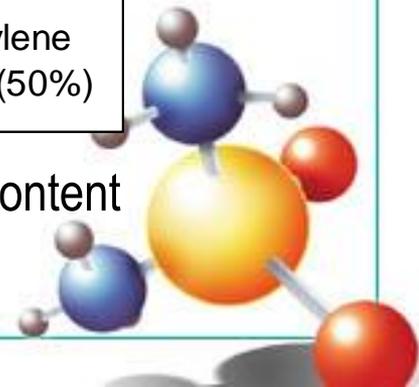
- Addition of electrolytes results in a reduction of the viscosity
- Can be overcome by increasing the amount of thickener used



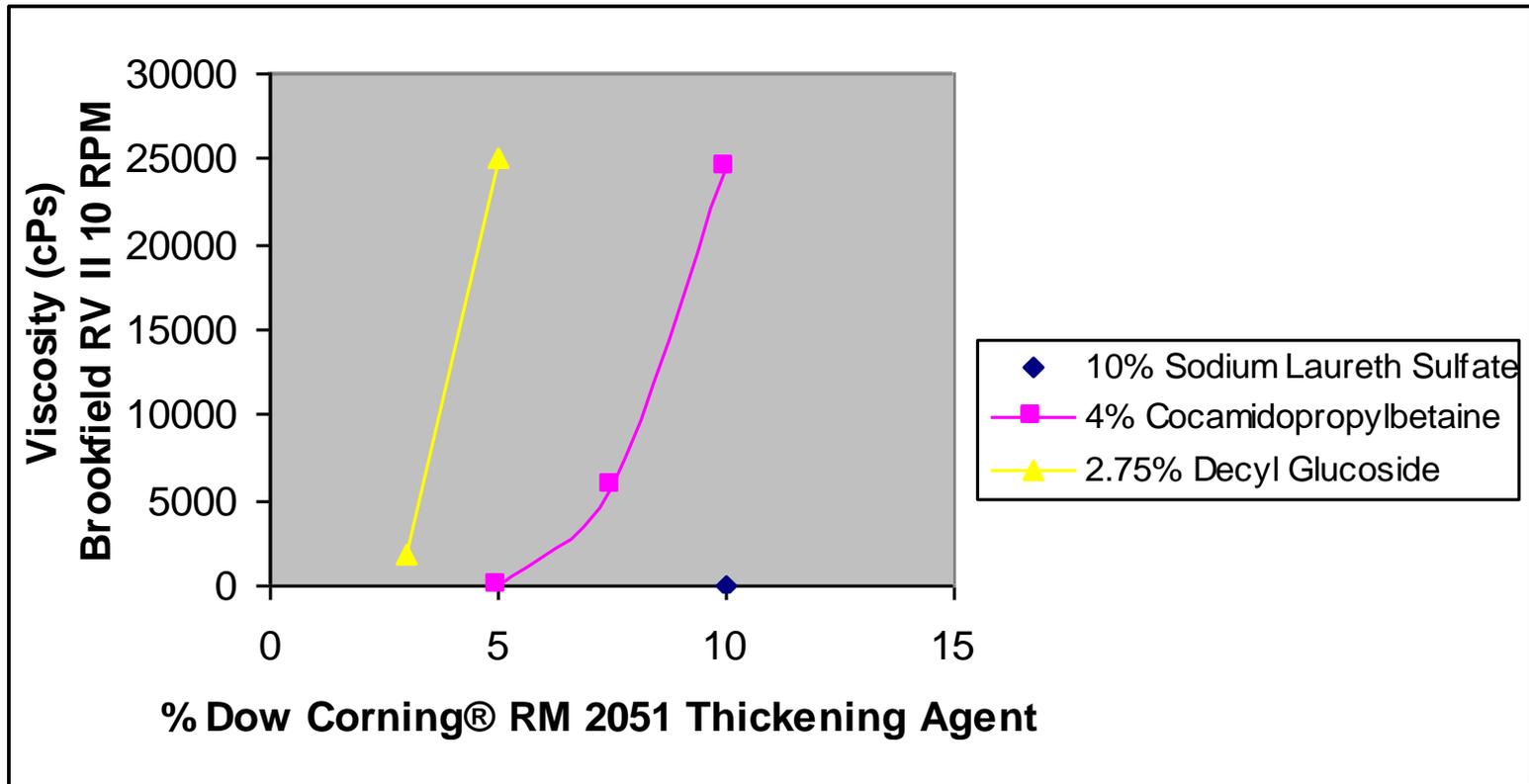
Dow Corning® RM 2051 Thickening Agent : *Polar solvents effect*



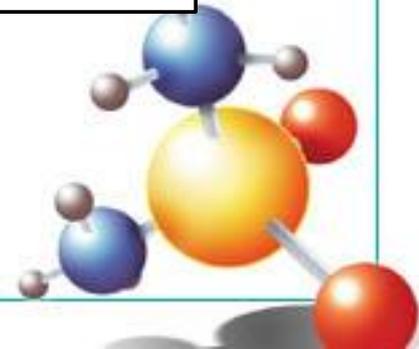
Dow Corning® RM 2051 Thickening Agent thickens with high solvent content



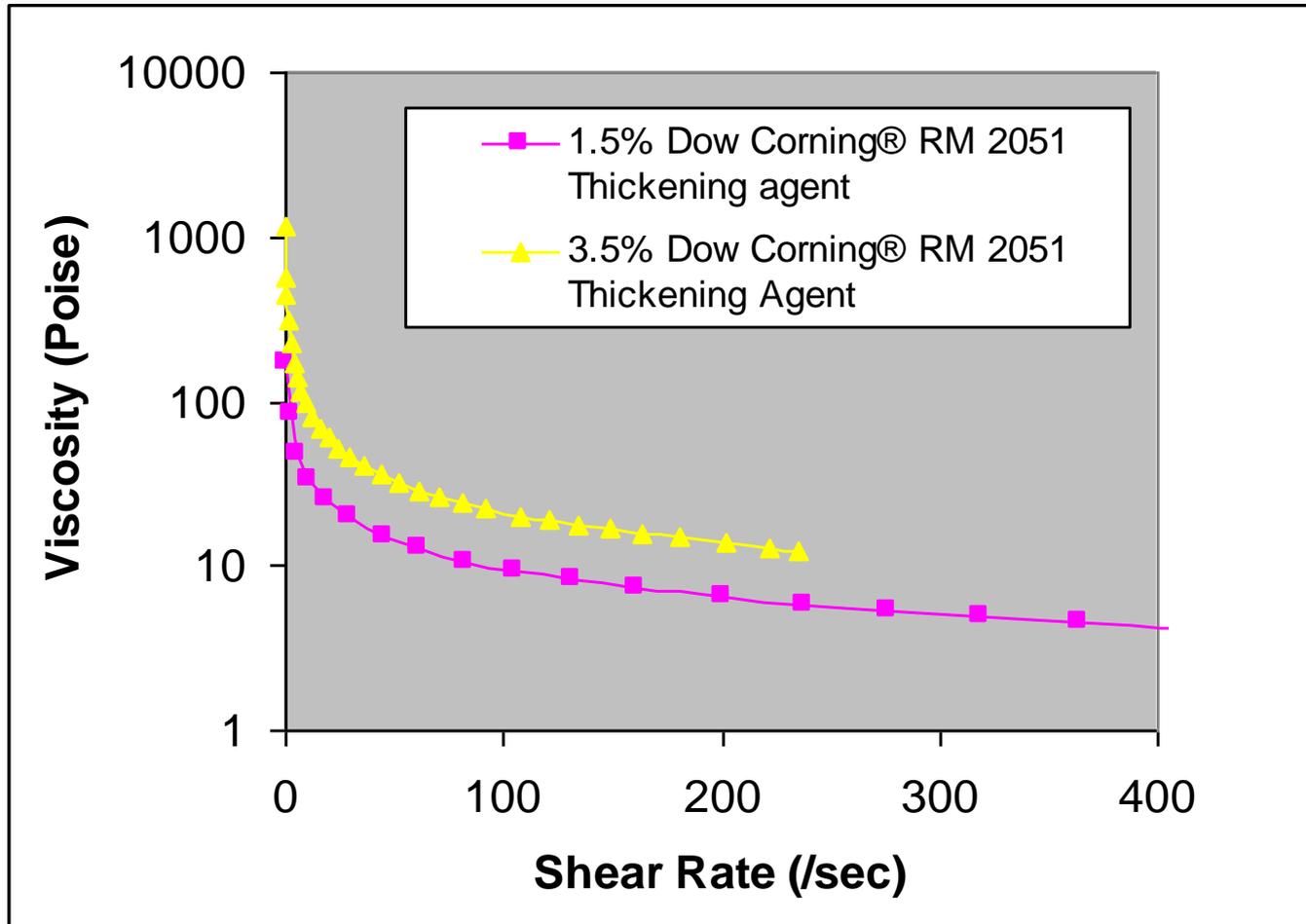
Dow Corning® RM 2051 Thickening Agent : Surfactants effect



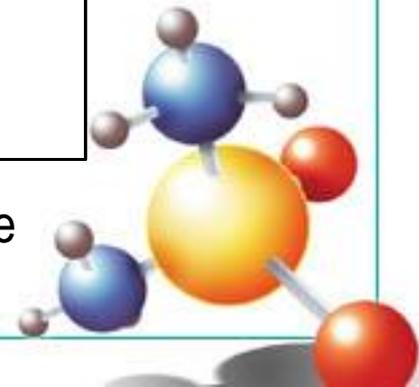
- ❑ Compatible with non ionics surfactants
- ❑ Thickening efficiency reduced with ionic surfactants



Dow Corning® RM 2051 Thickening Agent : *Rheological profile*



Shear-thinning behaviour : Very high viscosity at low shear rate
Low viscosity at high shear rate



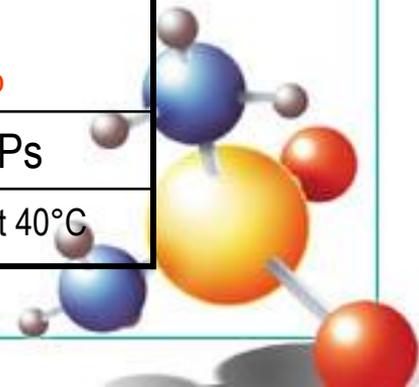
Dow Corning® RM 2051 Thickening Agent : Emulsifying Properties

- Emulsify high amount of oil phase (3% of Dow Corning® RM 2051 Thickening Agent)

	SILICONE	ESTER	HYDROCARBONS
	Dow Corning® 1501 Fluid 40 %	Isopropyl Myristate 30 %	Mineral oil 50 %
Viscosity (Sp5-10RPM)	80200 cPs	38500 cPs	82700 cPs
Stability	> 2 month at 40°C	> 2 month at 40°C	> 2 month at 40°C

- 1% of Dow Corning® RM 2051 Thickening Agent can emulsify « hard to disperse » silicones

	Dow Corning® 9040 Silicone Elastomer Blend 10 %	Dow Corning® 200 Fluid 300 000 cSt 5 %	Dow Corning® 1501 10 %
Viscosity (Sp5-10RPM)	10700 cPs	6500cPs	7820 cPs
Stability	> 2 month at 40°C	> 2 month at 40°C	> 2 month at 40°C

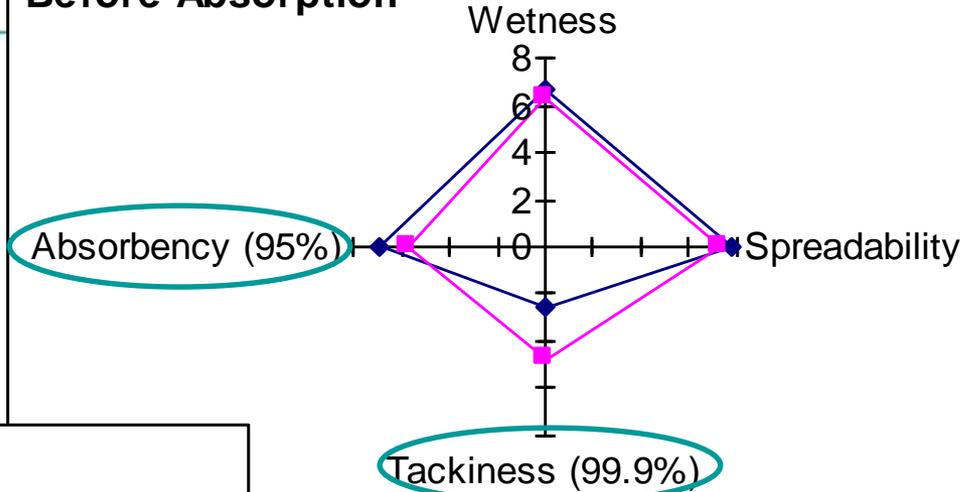


Dow Corning® RM 2051 Thickening Agent : Sensory Profile

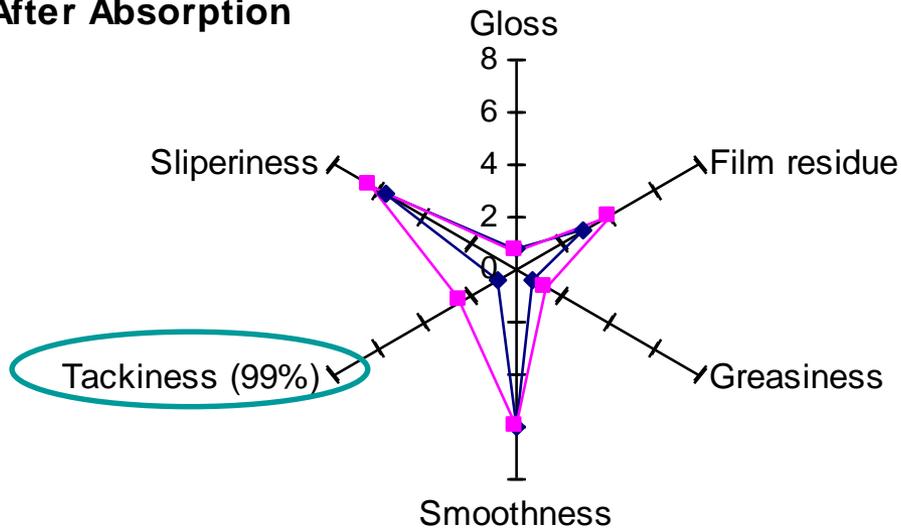
Paired test (18 panelists)

Formulation: 3% Thickener
3% Glycerin
0.3% Biocide
qs water

Before Absorption



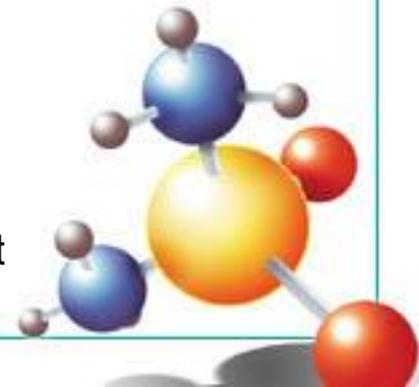
After Absorption



--- Dow Corning® RM 2051 Thickening Agent

--- Polyacrylamide/C13-14 Isoparaffin/Laureth-7

Dow Corning® RM 2051 Thickening Agent offers improved attributes versus a current market product based on Isoparaffin with regard to speed of absorbency and reduction of tackiness

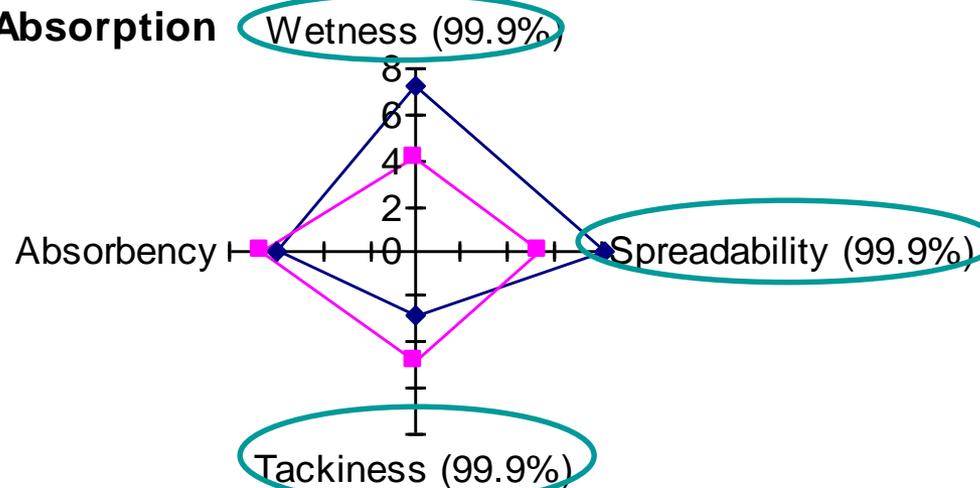


Dow Corning® RM 2051 Thickening Agent : Sensory Profile

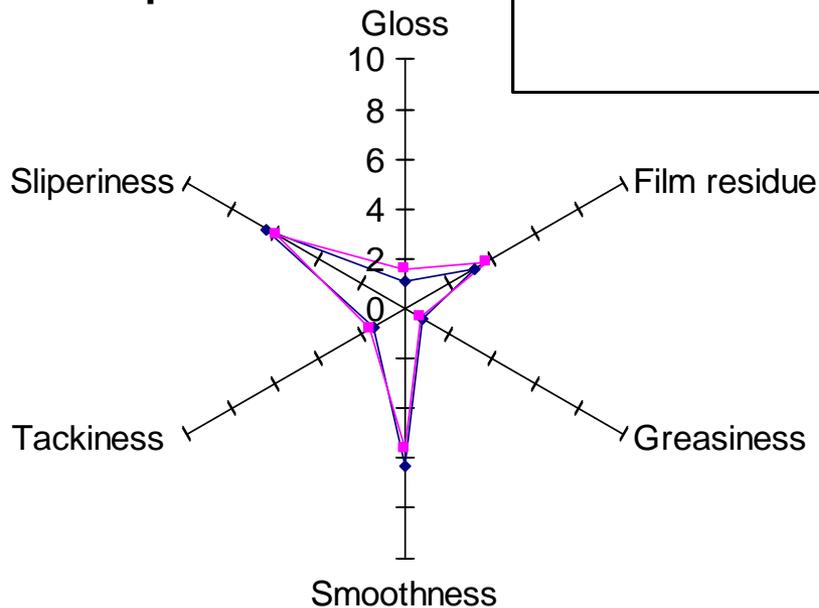
Paired test (18 panelists)

Formulation: 3% Thickener
3% Glycerin
0.3% Biocide
qs water

Before Absorption

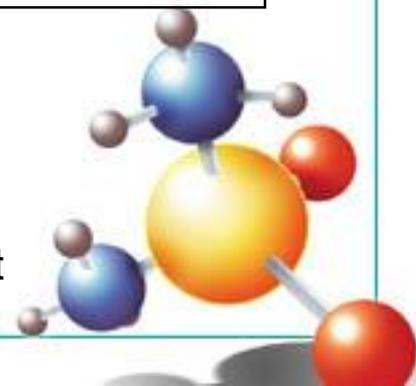


After Absorption



- Dow Corning® RM 2051 Thickening Agent
- Sodium Acrylates Copolymer/Mineral oil/PPG-1 Trideceth-6

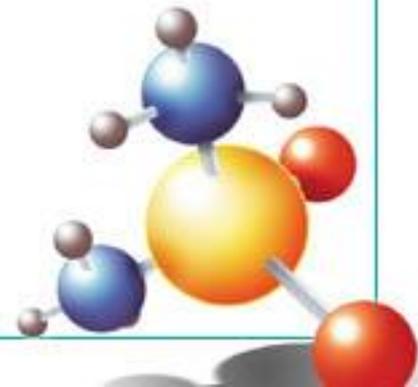
Dow Corning® RM 2051 Thickening Agent offers improved attributes versus a current market product based on Mineral oil with regard to wetness, spreadability and reduction of tackiness



Dow Corning® RM 2051 Thickening Agent : *Compatibility*

Compatible with formulations containing:

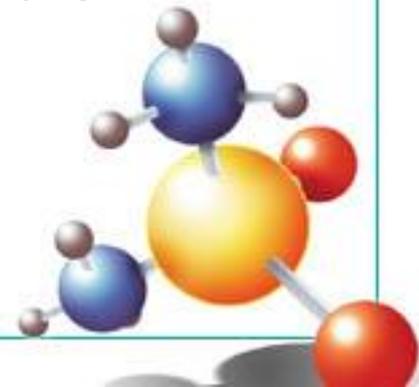
- ❑ A wide range of mineral and organic oils,
- ❑ Silicones,
- ❑ Esters,
- ❑ Sunscreens,
- ❑ Vitamins, ...



Dow Corning® RM 2051 Thickening Agent :

Potential applications

- ❑ Suitable in **Skin and Hair care formulations**
- ❑ Formulation tips :
 - ❑ Suggested level : 3-6 %
 - ❑ Can be used with high solvent content (30% ethanol, isopropyl alcohol or acetone, 50% glycerin or propylene glycol)
 - ❑ O/W or Si/W emulsions can be easily prepared by adding Dow Corning® RM 2051 Thickening Agent in the oil phase
 - ❑ Not recommended for ionic surfactant based formulations
 - ❑ Avoid salt and acid pH



For more information

If you have any further questions or comments please contact your local Dow Corning representative

Thank you for your attention

