



**For Personal Care**

# Why Silicones?

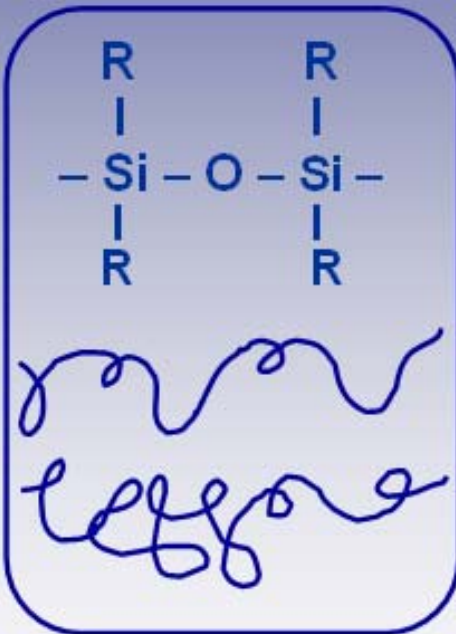
# Unique Properties

- High and Low Temperature Stability
- Oxidation Stability
- Low Surface Tension - 20mN/m
- Excellent Spreading and Wetting
- Low Coefficient of Friction
- Minimal Interfacial Tension
- Low  $T_g$  - 153°K
- Odorless and Colorless
- Low Toxicity
- Excellent Water Resistance and Water Repellency
- Does Not Obstruct Skin's Respiratory Process
- Gives a Unique Gloss or Polish

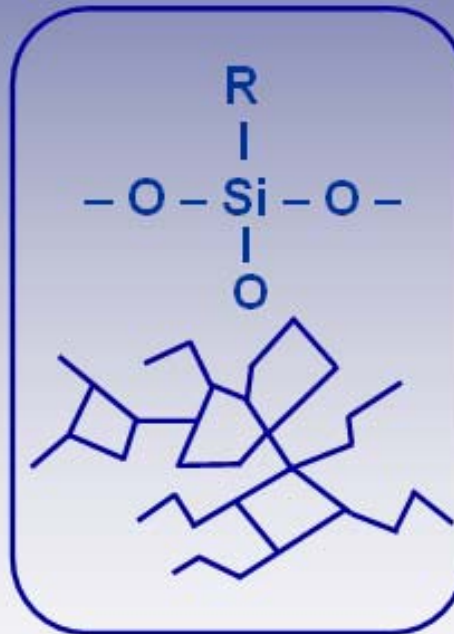
# What are Silicones

# Forms of Silicone

Fluids



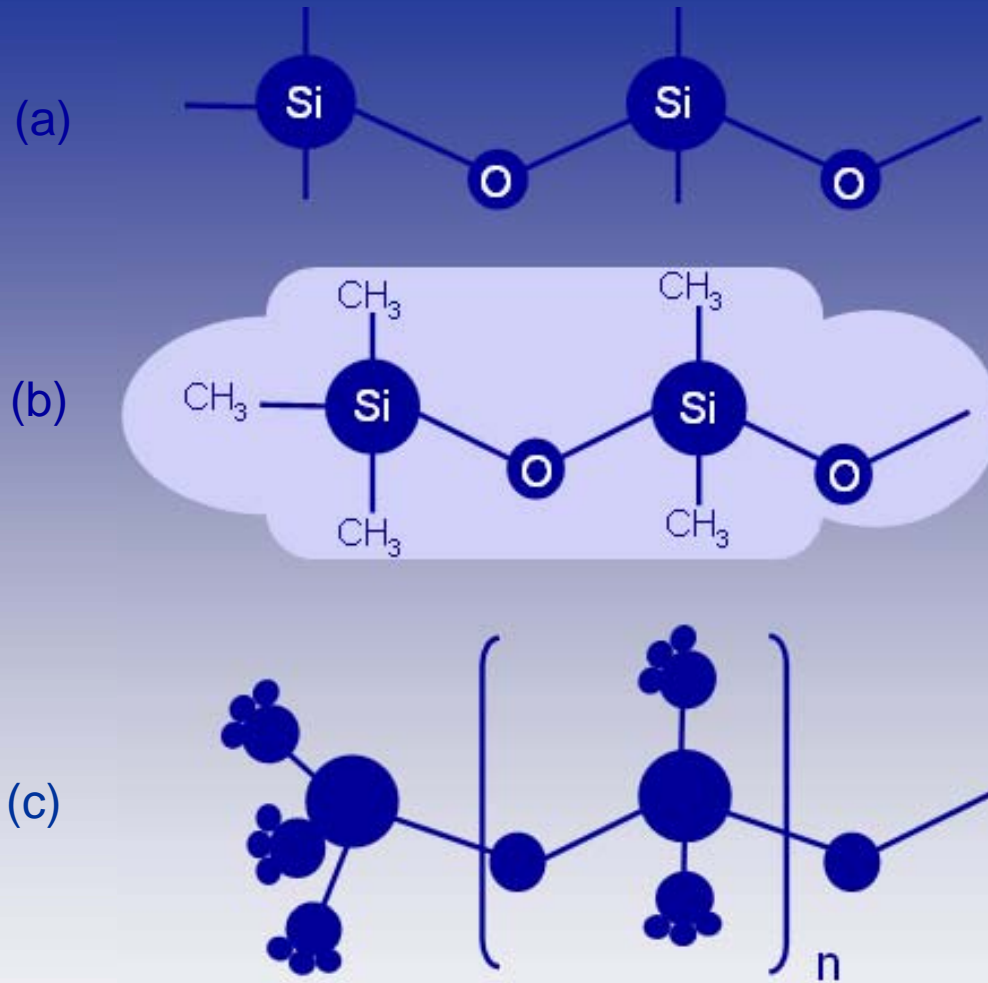
Resins



Elastomers



The Siloxane backbone with long bond length, high bond angles, and very low barriers of rotation – creates extremely flexible polymers that can easily satisfy functional group references.



A silicone is a siloxane backbone (a) with a methyl (CH<sub>3</sub>) group “cloud” surrounding the backbone (b) to form a polydimethylsiloxane polymer (c).

# Chemical Categories

## 1. Volatile Dimethyl

- Cyclomethicone: TBF-504, TBF-505, TBF-506, TBF-509
- Dimethicone: TBF9 - (0.65 - 2)

## 2. Polydimethylsiloxanes

- Low to High Viscosity Dimethicone: TBF9- (5-1,000), TBF9-50NF, TBF9-350NF, TBF9 - (10,000 - 300,000)

# Chemical Categories (cont'd)

## 3. Specials

- Dimethicone (and) Trimethylsiloxysilicate: TBF-395
- Phenyltrimethicone: TBF-677
- Cyclomethicone (and) Trimethylsiloxysilicate: TBS-311
- Trimethylsilylamodimethicone: RS-1500
- Dimethicone (and) Trimethylsilylamodimethicone: RS-1200, RS-300

# Chemical Categories (cont'd)

## 4. Silicone Polyethers

- Dimethicone Copolyols: TBF-77, TBF-190, TBF-193, TBF-2509
- Alkyl Dimethicone Copolyols: TBF-7608, TBS-3322

## 5. Silicone Gum Blends

- Gum in Cyclics: TBS-1214, TBS-1214-10, TBS-1401A, TBS-1404, TBS-1501
- Gum in Fluids: TBF-605, TBF-1403, TBF-1428

# Chemical Categories (cont'd)

## 6. Methyl Alkyl Siloxanes

- Alkyl Methicone Wax: TBF-2530
- Alkyl Dimethicone Wax: TBF-2518
- Alkoxy Silicone Wax: TBF-2580

## 7. Silicone Emulsions

- Amine: TBM-2059B
- Dimethyl: TBM-400M, TBM-2000M, TBM-6,000

# Chemical Categories (cont'd)

## 8. Silicone Elastomers

- Cyclomethicone (and) Dimethicone/Vinyl Dimethicone Crosspolymer: TBF-8015A, TBF-8060, TBF-8093, TBS-8007 (in Isododecane)
- Alkyl Dimethicone/Vinyl Dimethicone Crosspolymer in Isododecane: TBS-8008

# Cyclomethicones

## Suggested Applications

- Antiperspirants/Deodorants
- Hair Sprays
- Cleansing Creams
- Skin Creams/Lotions
- Bath Oils
- Suntan/Sunscreen Lotions
- Shaving Products
- Color Cosmetics
- Nail Polishes

## Benefits

- Non-oily Emolliency
- Non-sticky Feel
- Spreadability, Rub-in
- Leveling
- Volatile
- Unique Delivery System

# Dimethicones

## Suggested Applications

- Protective Creams
- Skin Lotions
- Waterless Hand Cleaners
- Suntan Lotions
- Aerosol Shave Lathers
- Make-up
- Shampoos, Liquid Soaps
- Antiperspirants/Deodorants

## Benefits

- Skin Protection
- Water Repellency
- Soft, Velvety Skin Feel
- Non-Occlusive
- Detackifier
- Emolliency and Lubricity
- De-Soaping
- Spreadability
- Hair and Skin Conditioner

# Silicone Gum Blends

## Gum in Cyclics

- CTFA Names:
  - Cyclomethicone (and) Dimethicone : TBS-1214, TBS-1214-10
  - Cyclomethicone (and) Dimethiconol: TBS-1401A, TBS-1404, TBS-1501

## Gum in Fluids

- CTFA Names:
  - Dimethicone: TBF-605, TBF-1428
  - Dimethicone (and) Dimethiconol: TBF-1403

# Silicone Gum Blends

## Suggested Applications

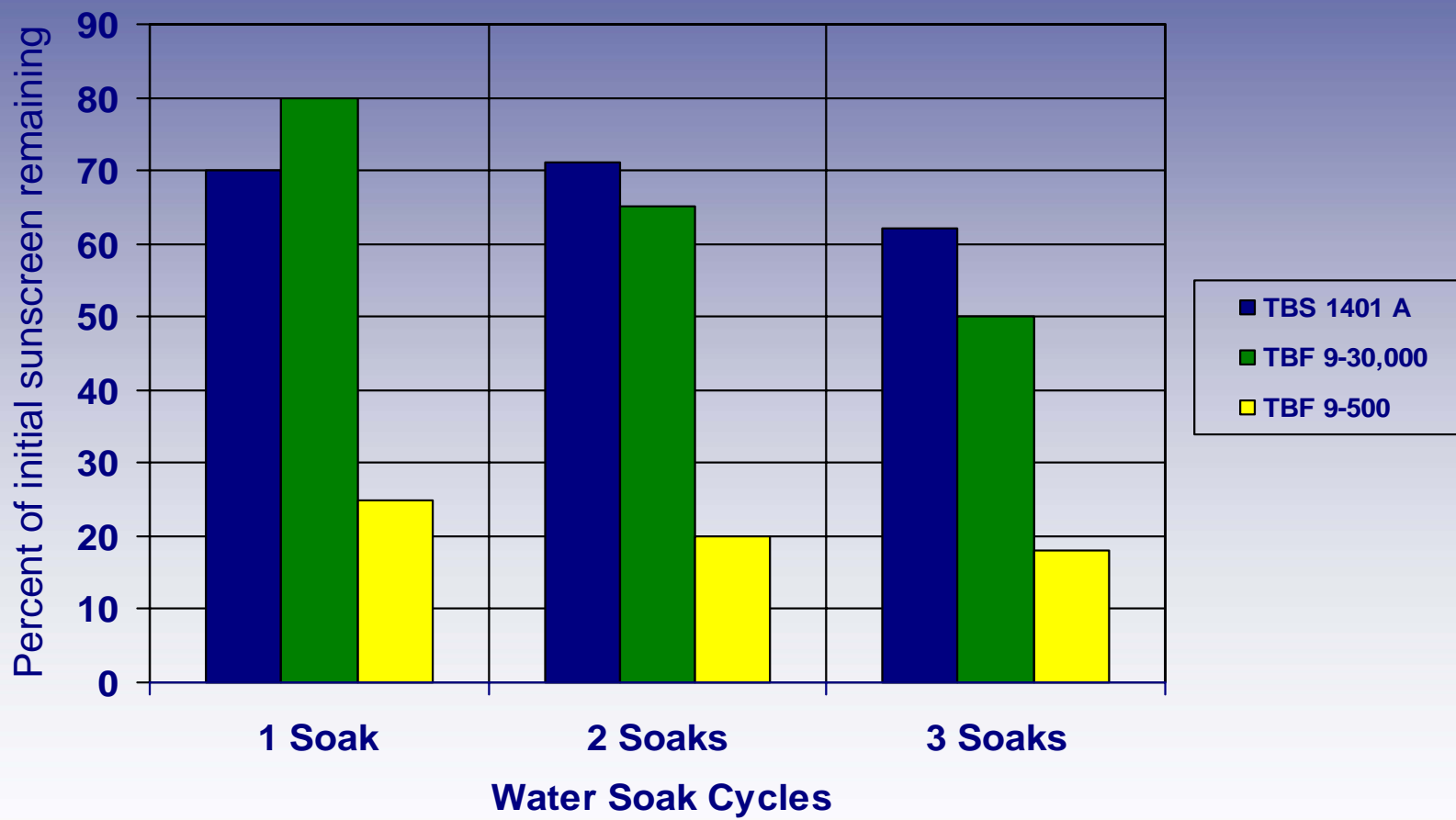
- Hair Cuticle Coating
- Hair Conditioners
- Sunscreen products
- Color Cosmetics
- Antiperspirants/Deodorants
- Skin Care Products

## Benefits

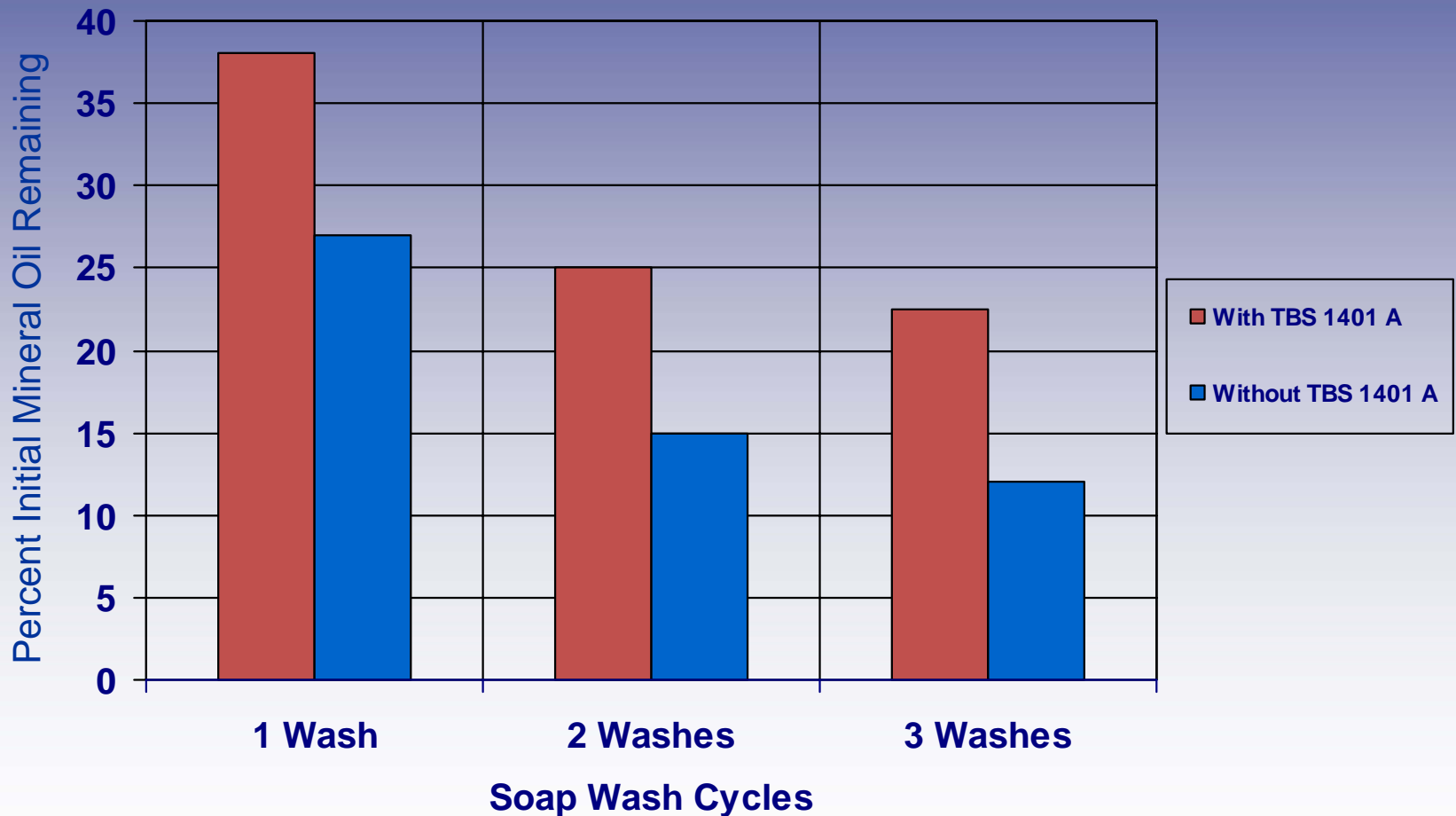
- Substantivity
- Film Forming
- Soft, Silky, Dry Feel
- Non-Occlusive
- Easy Application and Spreadability
- Improved Wet Combing
- Provides Gloss to Hair
- Provides Conditioning and Protection for Hair

# Sunscreen Substantivity By FTIR

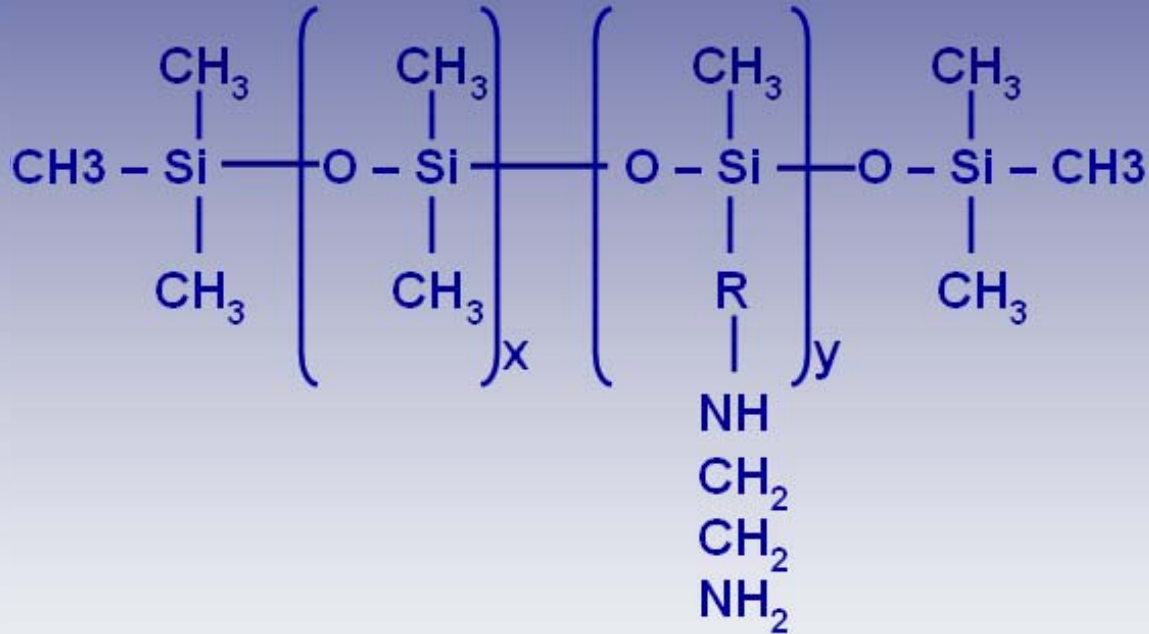
## Octyldimethyl PABA / Cyclomethicone Solutions



# Mineral Oil Substantivity by FTIR Cyclomethicone with TBS-1401 A and Mineral Oil



# Amodimethicones (RS-300, RS-1200, RS1500)



Di-Aminofunctional Polydimethylsiloxane

# Amodimethicone

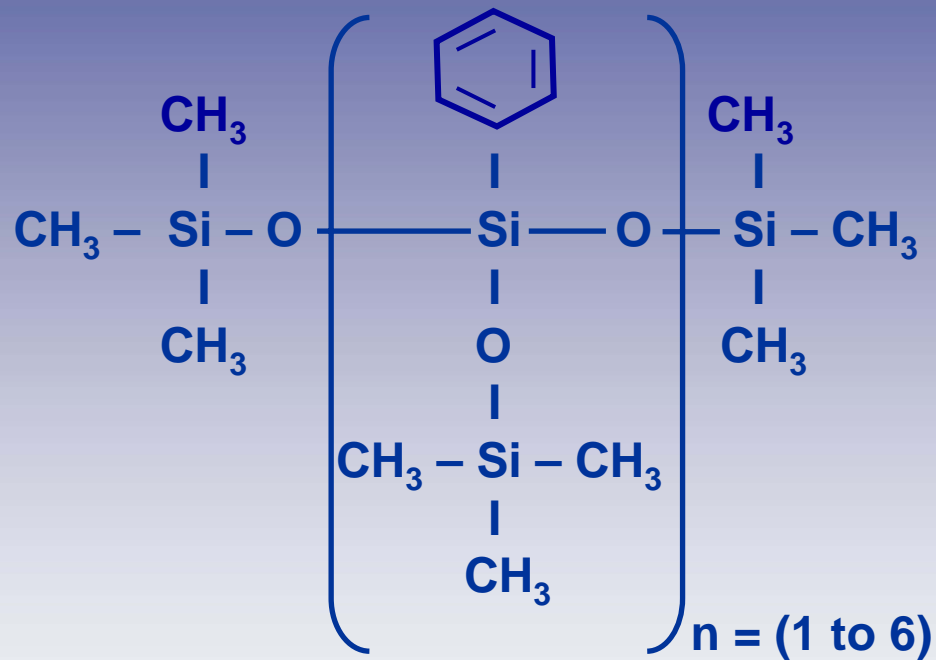
## Suggested Applications

- Conditioning Shampoo
- Rinse-Off and Leave-On Conditioners
- Styling Aids
- Colorants
- Perms
- Relaxers

## Benefits

- Smooth Feel to Dry Hair
- Eases Wet/Dry Combing
- Decreases Fly-Away
- Enhanced Shine in Shampoos
- Long Lasting Conditioning without Buildup
- Improved Color Depth and Longevity

# Phenyltrimethicone (TBF-677)



Siloxanes and silicones, phenyl trimethylsiloxo

# Phenyltrimethicone

## Suggested Applications

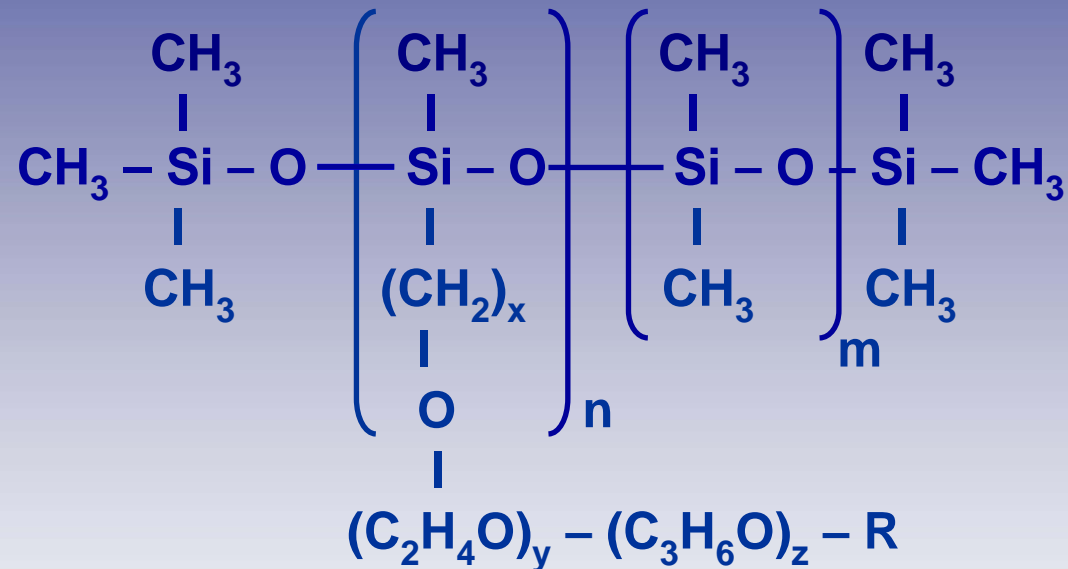
- Hair Gloss Agent
- Protective Creams/Lotions
- Foundations, Blush
- Stick Products
- Lipsticks
- Suntan Lotions and Sprays
- Pre-Shave Lotions

## Benefits

- Excellent Solubility
- Gloss and Softness
- Water Repellency
- Non-Sticky
- Non-Tacky
- Easy to Spread Lubricity
- Emolliency

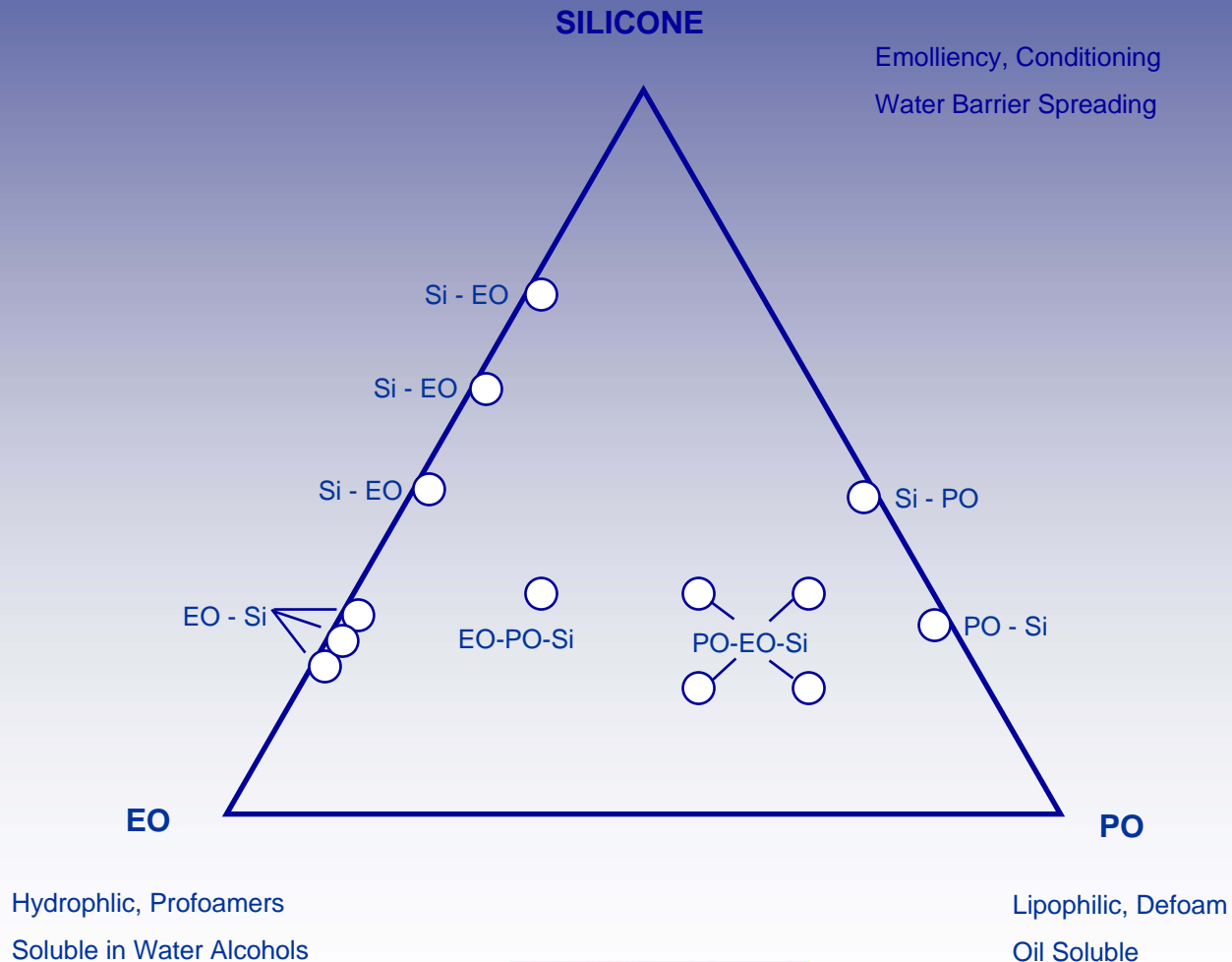
# Polyether Silicone Copolymers

(TBF-77, TBF-77A, TBF-190, TBF-193)



CTFA Name: Dimethicone Copolyol

# Dimethicone Copolyols Selection Guide



# Dimethicone Copolyols

## Suggested Applications

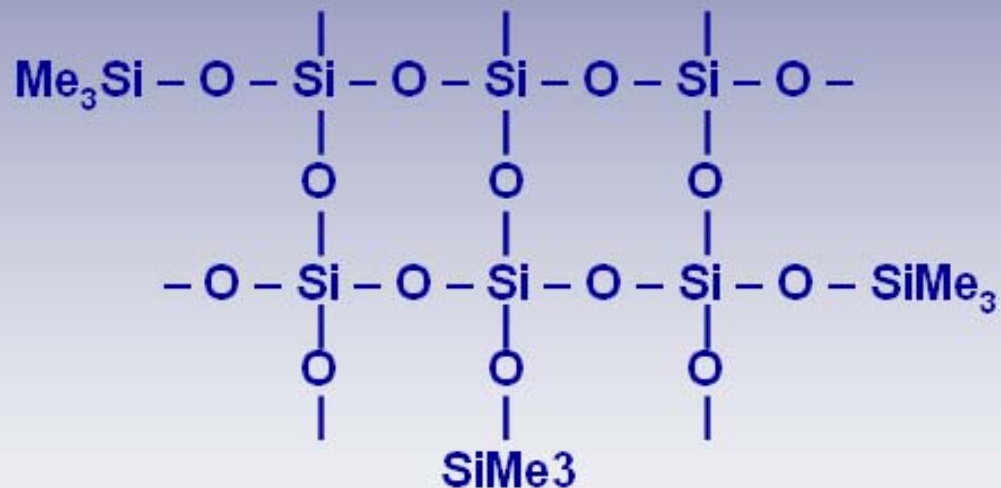
- Hand and Body Lotion/Cream
- Shower and Bath Gels
- Color Cosmetics
- Hair Conditioners
- Shampoos
- Ethnic Hair Care

## Benefits

- Spreading and Wetting
- Foam Boosters
- Emulsifiers
- Pigment Dispersants
- Antistatic Properties
- Detackifiers
- Lubricity, Emolliency

# Siloxysilicate

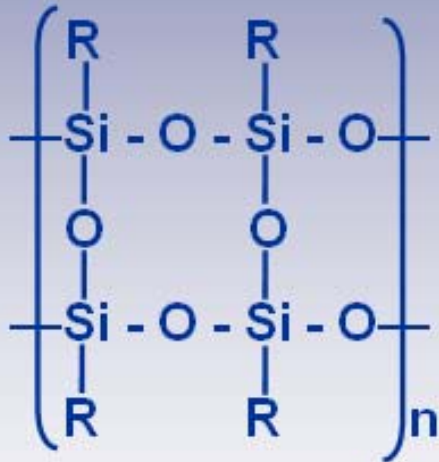
## Basic Chemistry and Structure



Trimethylsiloxysilicate  
(in TBF-395 and TBF-311)

# Silsesquioxanes

## Basic Chemistry and Structure



Silsesquioxanes (n=2 - 12)

# Siloxysilicate and Silsesquioxane Resins

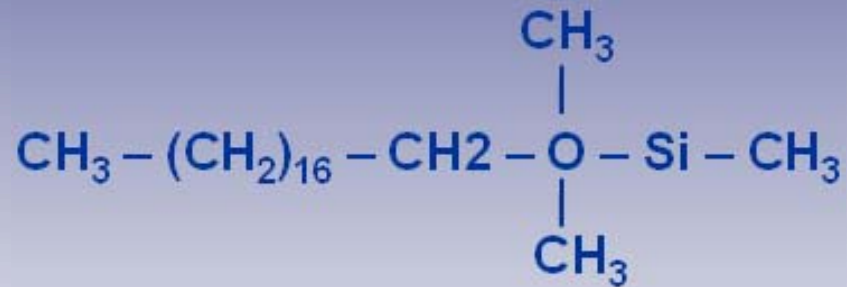
## Suggested Applications

- Protective Creams/Lotions
- Foundations
- Stick Products
- Pressed Powders
- Lipsticks
- Sunscreen Creams/Lotions
- Insect Repellent

## Benefits

- Film Forming
- Water Repellency
- Wash Off Resistance
- Non-Comedogenic
- Long Lasting Emolliency
- Lubricity With Very Little Slip

# Trimethylsiloxi Stearate In Stearyl Alcohol (TBF-2580)



CTFA Name: Stearoxy Trimethyl Silane (and) Stearyl Alcohol  
Melting Point: ~45°C

# Stearoxy Trimethyl Silane Wax (TBF-2580)

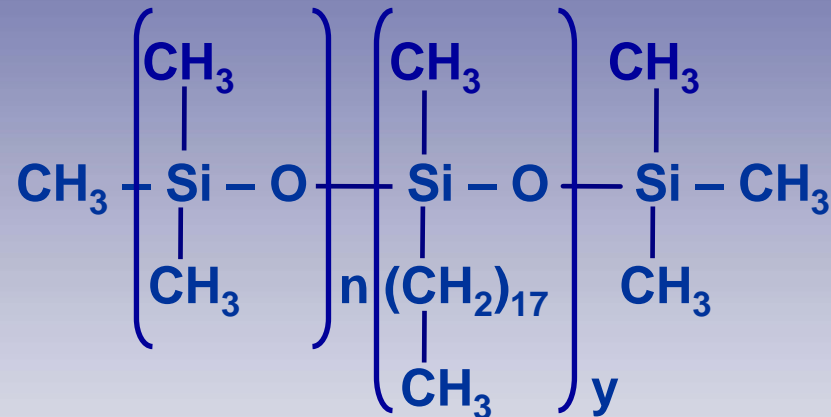
## Suggested Applications

- Skin Care
- Ethnic Hair Care
- Lipstick
- Make-up Products

## Benefits

- Low Melting Point
- Compatible with Organics
- Forms Occlusive Film
- Reduces Water Loss
- Non-Oily and Non-Tacky
- Substantive to Skin
- Aids Suspension
- Aids Pigment Deposition

# Alkyl Modified Silicone Wax (TBF-2518)



CTFA Name: Stearyl Dimethicone

Melting Point: ~32°C

# Stearyl Dimethicone Wax

(TBF-2518)

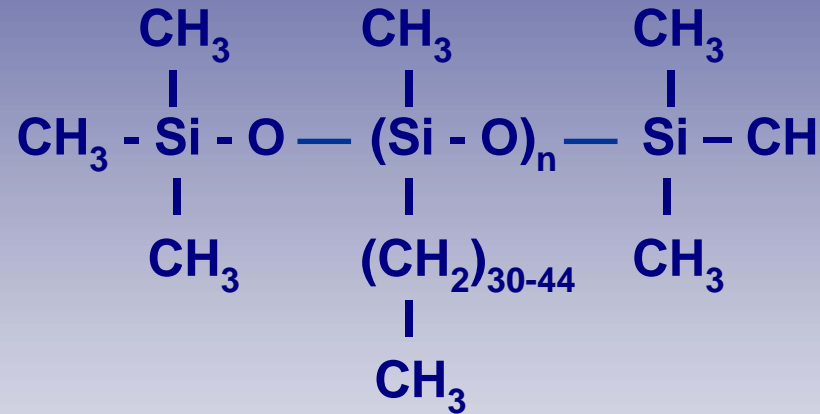
## Suggested Applications

- Hand and Body Lotion/Cream
- Facial System
- Color Cosmetics
- Hair Conditioners
- Suncare Creams/Lotions

## Benefits

- Low Melting Point
- Compatible with Organics
- Good Moisturizer
- Non Comedogenic
- Substantive to Skin

# Alkyl Modified Silicone Wax (TBF-2530)



CTFA Name: C30-45 Alkyl Methicone  
Melting Point: ~ 70 °C

# Alkyl Methicone Wax (TBF-2530)

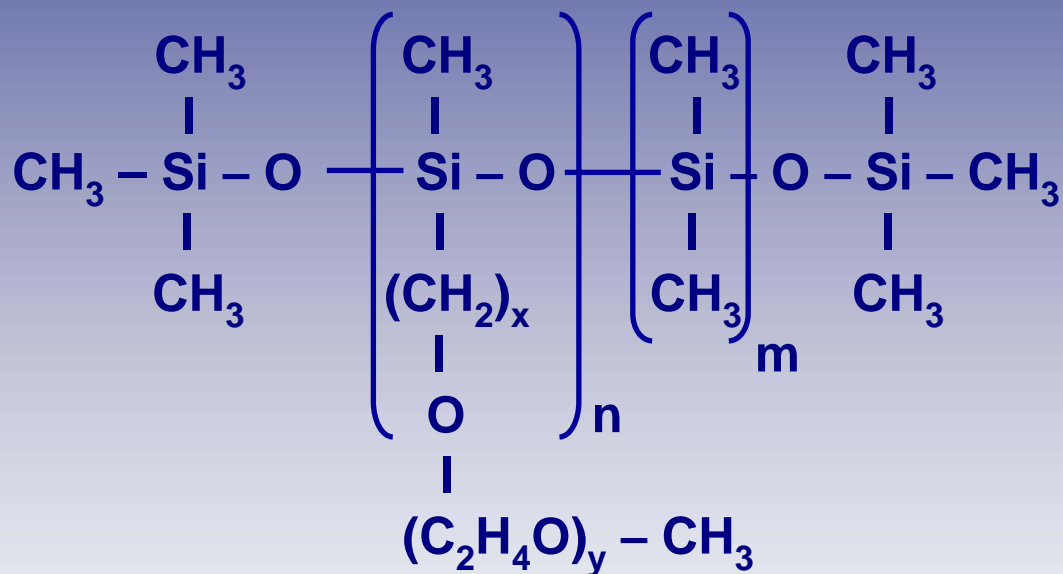
## Suggested Applications

- Hand and Body Lotion/Cream
- Color Cosmetics
- Suncare Creams/Lotions
- Antiperspirants/Deodorants

## Benefits

- Viscosity Builder
- Good Moisturizer
- Rheology Modifier
- Gives Smooth, Silky Feel

# Polyether Modified Polysiloxane Wax (TBF-2509)



CTFA Name: Dimethicone Copolyol

Melting Point: ~ 32 °C

# Dimethicone Copolyol Wax (TBF-2509)

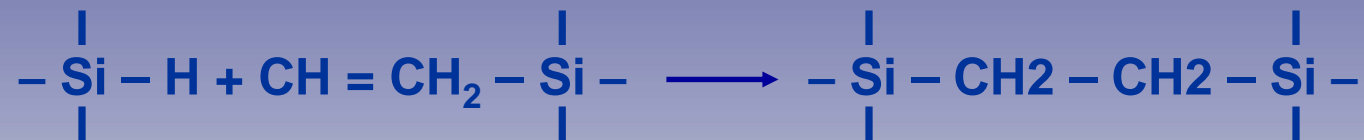
## Suggested Applications

- Hand and Body Lotion/Cream
- Facial System
- Foundation
- Hair Conditioners
- Shampoos

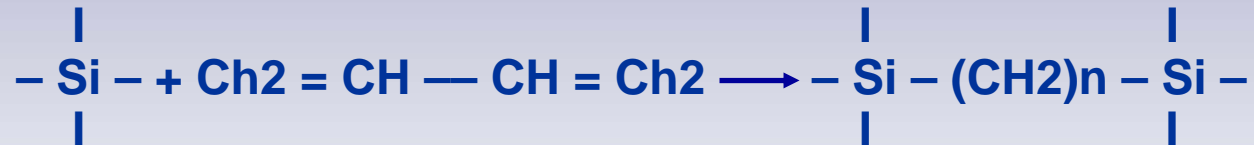
## Benefits

- Humectant
- Foam Booster
- Reduces Tackiness of Sticky Ingredients
- Non Comedogenic

# Basic Chemistry of Silicone Elastomers



or



CTFA Name: Dimethicone Crosspolymers

# Dimethicone Crosspolymers

## Suggested Applications

- Antiperspirants/Deodorants
- Color Cosmetics
- Sunscreens
- Skin Care Creams and Lotions

## Benefits

- Improved Viscosity
- Dry Smooth Silky Feel
- Enhanced Stability of End Product

# Silicone Elastomers

Product Name	Vehicle	Nonvolatile Content	Viscosity, Cps
TBF- 8015A	Cyclomethicone	5 - 7	30,000 - 60,000
TBF - 8060	Cyclomethicone	12 - 14	70,000 - 100,000
TBF - 8090	Cyclomethicone	12 - 14	250,000 - 600,000
TBF - 8093	Cyclomethicone	10 - 12	250,000 - 600,000
TBS - 8007	Isododecane and Cyclomethicone	6.5 - 8.5	200,000 - 400,000
TBS - 8008	Isododecane	14 - 16	5,000 - 10,000