

# SiBrid<sup>®</sup> Diethicone

SiBrid<sup>®</sup> Fluids are hybrid fluids that cross the boundaries between organics and silicones. SiBrid<sup>®</sup> Fluids are the preferred cosmetic vehicles for naturals where silicone-like properties are desired.

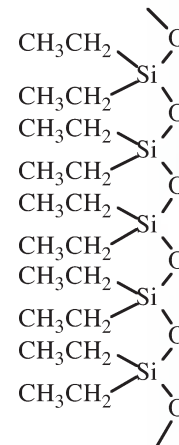
## DiEthicone

Polydiethylsiloxane (INCI name)

### DiEthicone compared to DiMethicone\*

	DiEthicone	DiMethicone
Surface Tension	25-28 mN/m	20-22 mN/m
Glass Transition, T <sub>g</sub>	-139°C	-121°C
Refractive Index	1.43-1.45	1.40-1.41
Viscosity	Full Range	Full Range
Organic Compatibility	Wide Range	Slight

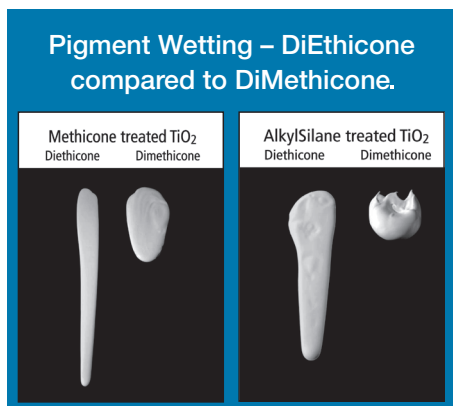
\* Typical properties for fluids in the viscosity range of 10-500 cSt.



Polydiethylsiloxanes (DiEthicones) are the first of a series of hybrid silicone polymers without methyl substitution. Analogous in structure to DiMethicones, the flexible polymer structure of DiEthicones allows the manufacture of a wide range of fluid viscosities. The beneficial properties of DiEthicones include excellent spreading, gas permeability, water resistance, lubricity and the ability to reduce tack. DiEthicone's tactile properties include a dry feel similar to that of DiMethicone but with increased cushion. DiEthicones have dramatically broad compatibility with organics compared to DiMethicones, allowing

formulation with common cosmetic raw materials including many hydrocarbons, esters, waxes and surfactants. DiEthicones overcome the solubility limitations of DiMethicones with many surfactants, emollient oils and both natural and synthetic waxes.

DiEthicones, in contrast to DiMethicones, wet pigments well. The greater organic character of DiEthicones allows coated pigments and fillers to disperse more readily in organic vehicles allowing either higher pigment volume concentration at equivalent formulation viscosities or substantially lower viscosities at equivalent pigment loadings.



### DiEthicone - Pigment Wetting Color Grind Viscosity

	55% TiO <sub>2</sub> SI (methicone treated)	50% TiO <sub>2</sub> AS (C <sub>8</sub> silane treated)	40% Red 7 (untreated)
<b>DiMethicone DMS-T15</b> 50 cst	<b>8790 cps</b> (3 passes)	<b>&gt;30,000 cps</b> (3 passes)	<b>40 cps</b> (5 passes)
<b>DiEthicone DE-15</b> 50 cst	<b>59 cps</b> (3 passes)	<b>552 cps</b> (2 passes)	<b>25 cps</b> (3 passes)

### DiEthicone Physical Properties

polydiethylsiloxane [63148-61-8]

	Viscosity	Density	Refractive Index	Flashpoint	Molecular Weight
SiBrid <sup>®</sup> DE-12	15-20 cSt	0.93	1.438	125°	400-500
SiBrid <sup>®</sup> DE-15	40-50 cSt	0.96	1.442	170°	500-800
SiBrid <sup>®</sup> DE-23	250-350 cSt	0.99	1.447	250°	1300-2000

## Solubility of Naturals in SiBrid® DiEthicone

	DiEthicone/20cSt DE-12	DiMethicone/20cSt DMS-T12
Jojoba Oil	S	I
Butyrospermum Parkii (Shea Butter)	S (Hot)	I (Hot)
Olea Europaea (Olive) Oil	S	I
Natural Vitamin E	S	I
Helianthus Annus (Sunflower) Seed Oil	S	I
Theobroma Cacao (Cocoa) Seed Butter	S (Hot)	I (Hot)
Euphorbia Cerifera (Candelilla) Wax	S (Hot)	I (Hot)



## Solubility of UV Absorbers

	DiEthicone/20cSt DE-12	DiMethicone/20cSt DMS-T12
Octinoxate	S	I
Avobenzone	1%	I
Benzophenone-3	2%	I
Octocrylene	5%	I



## SiBrid® DiEthicone Solubility

	DE-12	DE-15	DE-23	Dimethicone
Cyclopentasiloxane	S	S	S	S
Dimethicone, 10 cSt	S	S	S	S
Stearyl Methicone	S	S	PS	I
Hydrogenated Polydecene	S	S	S	PS
10% Microcrystalline Wax	S	S	PS	I
Ozokerite	S	S	PS	I
Octyldodecyl Stearate	S	S	S	I
Triisostearyl Citrate	S	S	S	I
Ethylhexyl Palmitate	S	S	S	S
Octyldodecanol	S	S	S	S
Castor Oil	I	I	I	I
Ethylene-Dimethicone Block Polymer	S	S	S	S

S = Soluble I = Insoluble PS = Partially Soluble

**Gelest**  
PCS

*Silicon Innovations for Cosmetics*

**Gelest, Inc.**  
11 East Steel Rd.  
Morrisville, PA 19067  
215-547-1015 (General)  
888-734-8344 (Order Entry)  
Fax: 215-547-2484  
Email: sales@gelest.com  
Website: www.gelest.com