

Abstract:

KF-7002 is a white, high purity, odorless organic compatible silicone wax. It is a high molecular weight **stearoxy** functionalized copolymer with a 40°C melting point. Surprisingly KF-7002 has **good hydrolytic stability** possibly because of its high molecular weight. The product is designed to enhance the texture of cosmetic formulations including those for hair care, skin care, color cosmetics, sun screen, and personal cleansers. KF-7002 gives a high shine with a silicone-like silky, non-tacky skin feel, unlike most waxes that are mattifying. It adds “creaminess” to lotions; it makes organic-rich formulations less tacky. Most interesting is its ability to enhance the **solid texture** of high water content water-in-oil emulsions. By utilizing Shin-Etsu’s water-in-oil formulation design chassis, a variety of solid textures are attainable. KF-7002 enhances textures ranging from “rigid solid” to “creamy lotion” with skin feel ranging from “rich melting” to “light quick-water-breaking” depending upon the emulsifier concentration and the choices of organic waxes. A variety of visual effects can also be obtained by the choices of waxes and powders.

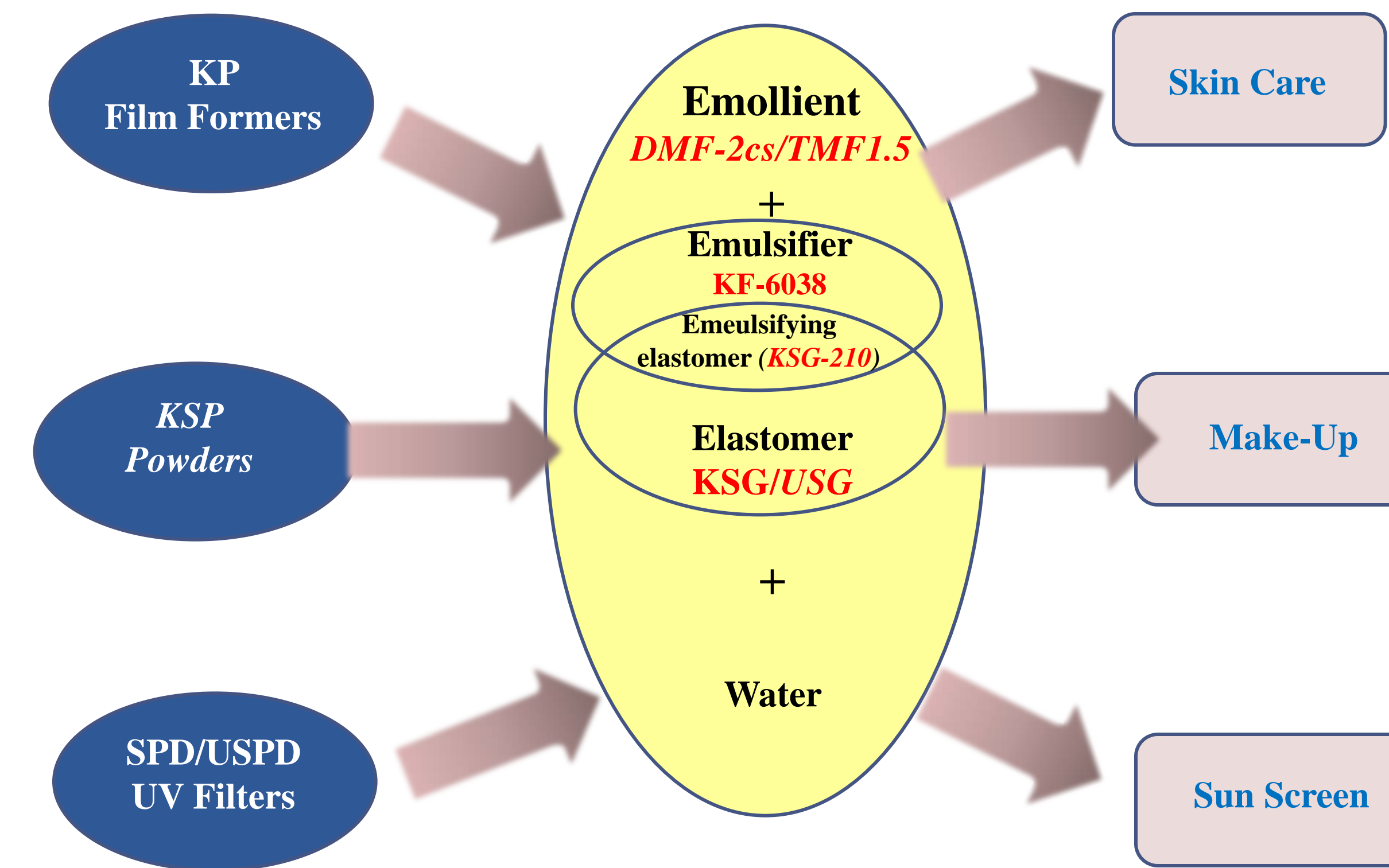
What’s unique about the new KF-7002:

- Versatile sensory enhancer offering a wide range of sensorial experience
- Excellent silky, lubricious skin feel
- Unexpected miscibility with organic waxes and certain silicones
- Body melting wax, providing radiance in skin care and high shine in lip products
- Enhances glide of stick products
- Makes oil rich creams and lotions less tacky
- Adds body and creaminess to lotions; softens solid emulsions
- Improves payout in stick products

Applications and Recommended Use Levels:

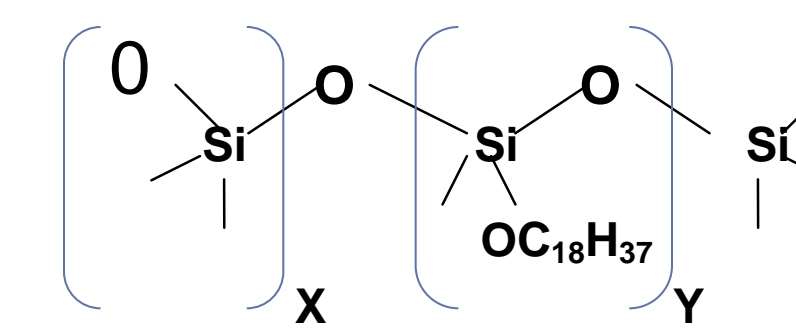
- Skin care lotions and creams: 2-10%
- Anti-aging facial products: 2-5%
- Lipsticks: 5-20%
- Foundations, mascaras: 2-5%
- Hair treatment products: 1-5%
- Sunscreens: 1-5%
- Antiperspirants and roll-ons: 2-5%
- Non-foaming cleansers: 0.5-5%

Shin-Etsu Formulation Design



KF-7002, INCI Name: Stearoxymethicone/Dimethicone Copolymer

Chemical Structure



Typical Properties

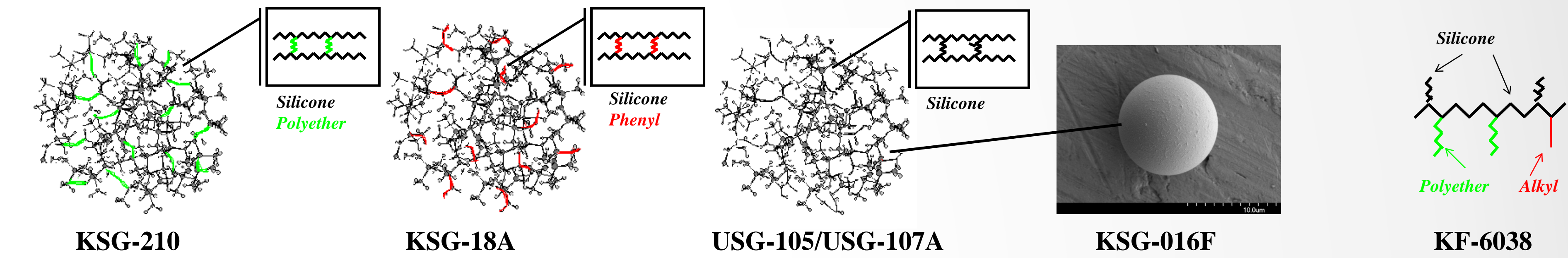
	Unit	Property
Appearance	Visual	White Wax
Melting Point	(°C)	40-50
Volatiles	% (105°C/3hrs)	5 max

KF-7002 Stability

KF-7002 Hydrolysis		
pH	Test Condition	Stability
3*	50°C, 1 month	Stable, no change in % Stearyl Acid
8**	50°C, 1 month	1% additional Stearyl Alcohol found

* pH adjusted with Triethanolamine; ** pH adjusted with Salicylic Acid

Chemical Schematic for Key Ingredients used in Prototypes



Prototype Formulations for Texture Studies

Ingredients	Solid Emulsion Texture				Cream Emulsion Texture			
	MH6-93-13	MH6-93-14	MH6-96-19	MH6-96-20	MH6-91-1	MH6-91-2	MH6-91-5	MH6-91-6
KSG-210	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
KF-6038	0.1	0.1	0.1	0.1	0.5	0.5	0.2	0.2
KSG-18A		5		2				
USG-105	5				5	5		
USG-107A							5	5
KSG-016F			5					
TMF-1.5		5	5	5	15	10		
DMF-2	5						10	5
Triethylhexanoin	2	2	2	2				
Neopentyl Glycol Dioctanoate					5	5	5	5
KF-7002	5	5	5	5		5		5
Ozokerite SP-1022P	1	1	1	1				
Ceresin SP-252P	4	4	4	4				
KSP-300				3				
Glycerin	9	9	9	9				
1,3 BG	2.3	2.3	2.3	2.3	5	5	5	5
NaCitrate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NaCl	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
H2O	62.4	62.4	62.4	62.4	65.3	65.3	70.6	70.6
Total	100	100	100	100	100	100	100	100
Prototype Properties								
Hardness	+	o	o	o				
Appearance on skin	+	o	matte	matte				
Play time	+	o	o	-				
Silky Feel					+	++	+	++
Moisturizing Feel	+	o	silky smooth	o				
Water-Breaking	o	+	+++	++	+	-	-	-

Ranking: o = standard, + = more, ++ = most

KF-7002 Compatibility

Ingredient	Solubility (% KF-7002)		
	10%	50%	90%
Ethanol (200 Proof)	I	-	-
Petrolatum	C*	-	-
Mineral Oil	I	-	-
Finsolv TN	C	C*	C
Candellila Wax	C**	-	-
Polyethylene Wax	C**	-	-
Beeswax	C**	-	-
Octyl Methoxycinnamate	C	C*	C
Isododecane	-	I***	C
DMF-1000cs	I		
DMF-10cs	I***		
DMF-A6cs	I***	I***	C
KF-995	I	I***	C

Key: I = Incompatible; PC = Partially Compatible; C= Compatible; - = not tested
 * Hazy
 ** Hazy, very hard solid
 *** Syneresis