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IMCD Value through expertise

SILKFLO

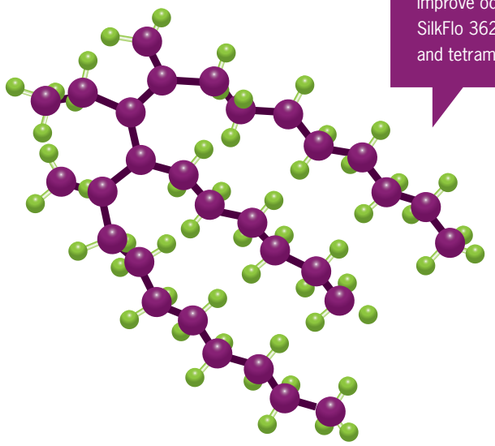
IMCD Personal Care Business Group

IMCD Value through expertise

SILKFLO

PURE, SAFE AND ELEGANT EMOLLIENTS

SilkFlo products are clear, odourless and colourless hydrocarbon liquids with high purity. Their cosmetic benefits are relevant for the skin and for cosmetic formulations. Cosmetics formulated with SilkFlo leave the skin clean, silky-soft, refreshed, more beautiful and smoothly toned.



SilkFlo 364 is a defined mixture of decene trimer isomers, hydrogenated to improve odour and chemical resistance. SilkFlo 362 and 366 are largely dimer and tetramer respectively.

WHAT IS SILKFLO?

The SilkFlo series are synthetic decene (C10 alpha olefin) oligomers, which are hydrogenated to remove the residual double bond. This 'Molecular Purity' is the source of SilkFlo's physical properties which underlie it's outstanding performance in cosmetic formulations.

Molecular Purity also distinguishes SilkFlo from simple mineral oils, which are blended to simple specifications, and give no guarantee of molecular chemistry or content.

SilkFlo comes in three viscosity grades

SilkFlo 362 (Hydrogenated Didecene is a dimer of 1-decene, i.e. C20). It is a popular choice as a hydrophobic dispersing medium for a range of mineral and polymer pre-dispersed raw materials. As unique, remarkably light, non-oily emollient it is a light non-volatile base for face and body products. In hair care products, SilkFlo362 is both a gloss agent, and can help reduce heat damage.

SilkFlo 364 (Hydrogenated Polydecene, mainly 1-decene trimer, C30). It is primarily used in skin products and as a moisturizer, often in combination with other emollients when a full sensorial experience is sought in the product. In sensorial terms SilkFlo364 is close to squalane.

SilkFlo 366 (Hydrogenated Polydecene, mainly 1-decene tetramer, C40) is used where a higher viscosity option is required, such as a nourishing/lubricating emollient in Lip, Body and Baby products. It is also popular in antiperspirants, where its compatible refractive index allows SilkFlo 366 to mask Aluminum and Zirconium residues.

SAFETY AND REGULATORY ISSUES

The SilkFlo series has an unblemished safety record stretching back several decades.

- Non comedogenic, Non toxic, Non irritating.
- Fully compliant with European and US cosmetics standards. Listed in JSCI
- Fully synthetic, so free of animal and vegetable traces and toxins.
- Free of the aromatics and naphthenes sometimes found in mineral oils.
- H1 approved in the US.

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SILKFLO
PROPERTIES & VERSATILITY

Typical properties

	SILKFLO 362 NF	SILKFLO 364 NF	SILKFLO 366 NF
INCI name	Hydrogenated didecene	Hydrogenated polydecene	Hydrogenated polydecene
Appearance	Clear colourless liquid	Clear colourless liquid	Clear colourless liquid
Odour	Odourless	Odourless	Odourless
Density (15.5˚C)	0.79-0.80	0.81-0.83	0.82-0.83
Refractive index nD20	1.4450	1.4555	1.4595
Viscosity cSt (20˚C)	9.5	41	90
Viscosity cSt (40˚C)	5.0- 6.0	16.7-18.0	30.0-32.0
Viscosity cSt (100˚C)	1.6-2.1	3.8-4.1	5.7-6.1
Colour (APHA)	10 max	10 max	10 max
Acid number	0.01 max	0.01 max	0.01 max
Bromine number	0.5 max	0.4 max	0.4 max
Flash point (PMC)	145 min	204 min	215 min
Tactile equivalent	Cyclomethicone D5	Squalane	Light mineral oil

SENSORIAL PROPERTIES

For skin care products such as facial/body creams and cosmetics, the overall sensorial experience on application is vital to the success of the formulation. From the behaviour of the product during the pick-up, to the way the emulsion breaks when applied to the skin and the final afterfeel, the SilkFlo series offer the formulator significant benefits.

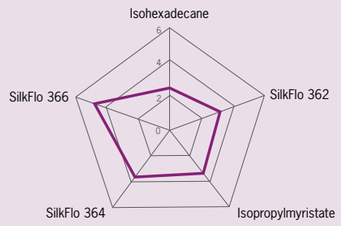
Versatility through SilkFlo range in cosmetics

APPLICATIONS		Emollient	Moisturizer	Agent/solvent Wetting	Glosser	SilkFlo 362	SilkFlo 364	SilkFlo 366	Use level %
Skin care	Creams	•	•			•	•	•	5 - 15
	Lotions	•	•			•	•	•	5 - 10
	Ointments	•	•				•	•	10 - 30
Baby care		•	•				•	•	5 - 15
Sunscreen	Creams	•	•	•		•	•	•	10 - 30
	Lotions	•	•	•		•	•	•	5 - 10
	After-sun	•	•			•	•	•	5 - 15
Sensitive skin		•	•			•	•	•	5 - 15
Toiletries			•		•		•	•	2 - 6
Hair care	Shampoos		•		•	•			2 - 6
	Conditioners		•		•	•			4 - 8
	Dressings	•	•		•		•	•	4 - 20
Make-up foundation	Creams	•	•	•	•	•	•	•	5 - 30
	Fluids								
	Mousse								
	Compacts								
Eye products	Mascara	•		•		•	•		5 - 15
	Creamy Eye schadow			•		•			5 - 15
Lip products	Lipstick	•		•	•		•	•	10 - 30
	Lip gloss	•		•	•		•	•	
Deodorant	Aerosols	•		•		•			2 - 5
	Roll-on	•	•	•			•	•	2 - 6
	Stick		•	•			•	•	5 - 10

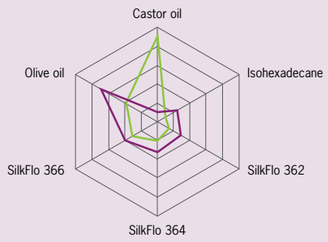
Why should you consider SilkFlo for your next formulation?

- Superb tactile/sensorial properties. When used as emollients, SilkFlo impart a superior silky, elegant skin feel, combined with good moisturizing, spreading and lubricating properties.
- Trouble free formulation, compatible with common emollients, silicones and oil phase additives, stable over the entire pH range, stable at temperature up to 200°C.
- High solids wetting power giving stable pigment pre-dispersions allowing a low content of pigments in the formulation.
- Reduce syneresis in stick formulations.
- Reliable high purity guarantee ensures product safety. Tasteless and odourless.
- 'Molecular purity'. You will get exactly the same product from batch to batch.

Examples in graphic view



GRAPH 1: Body/heaviness
Graph showes a linear increase in terms of body from SilkFlo 362 to SilkFlo 366. Graph shows also that both Silkflo 362 and 364 behave as light esters and light mineral oils.



GRAPH 2: Oily and Greasy feel
Graph showes that SilkFlo 362 and 364 provide a low oil feel while SilkFlo 366 provides a medium oily feel at the same time SilkFlo range provide a very low greasy feel. For the purposes of the study, castor oil was chosen as a greasy afterfeel standard, and olive oil as the oily afterfeel standard.

GRAPH 3
This chart showes the type of residue perceived when gently touching skin surface provided by SilkFlo product range during the rub out (immediate feel) and 15' after the application (Afterfeel).

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NEW LAUNCH!

SILKFLO4 ECO

SilkFlo4 Eco has been produced using a unique new technology. The molecular geometry is even more regular than that of its cousin SilkFlo 364, and in terms of the physical properties the two are almost identical.

By reducing molecular complexity and internal branching, however, it becomes more readily metabolized by bacteria, and as a consequence is the most biodegradable hydrogenated polyalkene available on the market today.

INCI name: Hydrogenated Tetradecenyl/Methylpentadecene

Formulation examples from IMCD PC Laboratory

Foundation mousse (IMCD Ref. P01007)

PHASE	INGREDIENTS (Trade Names)	INGREDIENTS (INCI Names)	% W/W
A	SILKFLO 364	Hydrogenated polydecene	8,50
	Lexfeel 7	Neopentyl glycol diheptanoate	8,00
	Compritol ATO 888	Tribehenin	1,50
	White beeswax	Cera alba	1,00
	Tixogel VP	Quaternium-90 bentonite	1,80
	Indopol H100	Hydrgenated polyisobutene	9,00
A1	Ethyl Alcohol	Alcohol	1,20
B	Gransil DMCM-5	Dimethicone, Cyclopentasiloxane, Polysilicone-11	23,45
B1	Belsil DM 5	Dimethicone	8,00
	Belsil DM 1 Plus	Dimethicone	10,00
	Belsil DM 065	Disiloxane	5,00
	Gransil EPLS	Polysilicone-11, Laureth-12	7,00
	Gransil EPSQ	Dimethicone/Divinyldimethicone/	7,00
	Grandpowder USQ	Polymethilsilsesquioxane HDI/ Trimethylol hexyllactone crosspolymer Silsesquioxane crosspolymer	
	Barium Sulfate HM	Barium sulfate	3,00
C	Phenoxetol	Phenoxyethanol	0,30
	Fragrance	Parfum	0,20
	Colour solution	Red colour	0,05
			100

Procedure

- In the main vessel add ingredients of phase A. Heat to 60-65°C and homogenize to disperse Tixogel
- Add A1 to A, while mixing
- Add B to A+A1 and mix at 60°C until complete dispersion on DMCM5
- Add the component of phase B1 to A+A1+B. Mix and homogenize until complete dispersion of the powders
- Cool to 40°C then add phase C, then cool to room temperature.

Clear shampoo (IMCD Ref. P14106)

PHASE	INGREDIENTS (Trade Names)	INGREDIENTS (INCI Names)	% W/W
A	SILKFLO 364	Hydrogenated polydecene	2,00
	Arlatone T	Peg-40 Sorbitan peroleate	4,00
B	Empicol ESB3	Sodium laureth sulfate	43,00
C	Empigen BS/FA	Cocamidopropyl Betaine	14,00
D	Deionized water	Aqua	26,90
E	Oramix CG110	Caprylyl capryl glucoside	3,50
	Fragrance	Parfum	0,50
F	Kathon CG	Aqua, Methylchloroisothiazolinone, Methylisothiazolinone, Magnesium nitrate, Magnesium chloride	0,10
G	Antil 200	PEG-200 Hydrogenated glyceryl palmate, PEG-7 Glyceryl cocoate	3,00
H	Empigen A	Cocamide dea	3,00
			100

Procedure

- Heat A to 60°C
- Heat B to 60°C
- Slowly add B to A while mixing
- Add C to A+B while mixing at 60°C
- Heat D to 60°C then add to A+B+C with gentle mixing
- Cool the mix to 40°C then add E
- Cool the mix to room temperature then add F, G and H

Body scrub cream gel (IMCD Ref. P13805)

PHASE	INGREDIENTS (Trade Names)	INGREDIENTS (INCI Names)	% W/W
A	Deionized water	Aqua	56,90
	Disodium EDTA	Disodium EDTA	0,10
	Kathon CG	Aqua, Methylchloroisothiazolinone, Methylisothiazolinone, Magnesium nitrate,	0,100
	Glycerin	Glycerin	5,00
	Keltrol CGSFT	Xanthan gum	1,00
	Natrosol HHR 250	Hydroxyethylcellulose	0,90
B	Empicol ESB3	Sodium laureth sulfate	20,00
	Proteol apple	Sodium cocoyl apple aminoacids	6,00
	Oramix CG110	Caprylyl capryl glucoside	1,50
	Silflo 362	Hydrogenated didecene	2
	Empipearl XA500	Sodium laureth sulfate cocamide DEA glycol cetearate	2,5
	Fragrance P5213	Parfum	
	EDT N 2074 a femme		
C	Empilan 2502	Cocamide DEA	2,00
D	Purple haze jojoba Spheres 40/60	Hydrogenated jojoba oil	2,00
			100

Procedure

- In the main vessel add ingredients of phase A. Mix at room temperature until complete dispersion of the gums
- After complete dispersion of phase A, add phase B while gentle mixing
- In a side vessel add the ingredients of phase C and mix until the complete dispersion of the fragrance
- Slowly add C to A+B
- Add phase D and mix to uniform dispersion of Jojoba spheres

Make-up remover (IMCD Ref. P17606)

PHASE	INGREDIENTS (Trade Names)	INGREDIENTS (INCI Names)	% W/W
A	Cyclopentasiloxane	Cyclopentasiloxane	58,00
	Belsil DM 065	Disiloxane	20,00
	SILKFLO 362	Hydrogenated didecene	22,00
			100
B	Deionized water	Aqua	43,87
	Sodium chloride	Sodium chloride	0,05
	Glycerin	Glycerin	46,00
	Colour (sol 10%)	//	0,08
	Alcohol denat	Alcohol	10,00
			100

Procedure

- Mix the components of the two phases at room temperature.

Phase A - phase B ratio: 40% - 60% (volume) Phase A - phase B ratio: 35% - 65% (weight)
If a perfume is needed please find fragrances without solubilizers or surfactants inside. Best to use pure oil essence.