





KAO SOFCARE® GP-1 (INCI Name: PPG-3 Caprylyl Ether) is a plant-derived multi-functional conditioning agent for personal care products.

Nowadays, silicones are an indispensable component for multiple personal care applications, especially for hair care. The shining and silky feeling in wet and dry conditions they provide to the hair are very appreciated by the consumers. Their main drawback is the biodegradability and synthetic structure, thus there is a rising trend to replace them by more environmentally friendly products. The intense research in this area by KAO Group has turned into a naturalderived silicone alternative: KAO SOFCARE® GP-1. KAO SOFCARE® GP-1 shares similar characteristics with silicones. Therefore, it is an ideal total or partial replacement for amodimethicones and dimethicones, giving some interesting extra benefits like easier incorporation and the possibility to formulate transparent products.

KAO SOFCARE® GP-1. PPG-3 Caprylyl Ether

R-0 (10+1)

R= C₈ n= 2.7 mols PO

MAIN FEATURES

- Derived from vegetal fatty oil
- Without water or any solvents (VOCs)
- Chemically stable and colorless liquid with low viscosity
- Non-ionic character

TECHNICAL DATA

Active Matter	100%
Appearance (25°C)	Clear transparent liquid
Viscosity (20°C)	< 10 cPs
pH (5% suspension)	5 - 7



KAO SOFCARE® GP-1 is a 100% active matter transparent and colorless liquid product, very easy to handle, low viscous and chemically stable.

BOOSTER EFFECT ON SILICONE CARE ADSORPTION

KAO SOFCARE® GP-1 is an outstanding conditioning agent that enhances the appearance and feel of hair, by increasing strength and reducing hair damage thanks to the uniform adsorption on hair cuticle.

ADSORPTION OF SILICONE

After applying conditioner

0.35
0.30
0.20
0.05
0.10
0.05
0.00

Amount of silicone (%)

GP-1, add 1.0%

KAO SOFCARE® GP-1 can be used in combination with silicones; as seen in the graphic, the uniform adsorption of KAO SOFCARE® GP-1 on hair cuticle improves silicone adsorption, reducing the amount of silicone needed in the final formulation, approximately ¼.

CONDITIONER TEST FORMULATION

INGREDIENTS	% in active matter (a.m.)
QUARTAMIN® AB Behentrimonium Chloride	1.5
KALCOL® 6098 Cetyl Alcohol	1.3
KALCOL® 8098 Stearyl Alcohol	2.6
Silicone (BY22-029, 100,000mm2/s)	0 to 5.0

CONSUMER BENEFITS

High conditioning and foaming

Good manageability and hair volume

No frizz

Tangible hair shine

Environmental improvement over silicones

FORMULATOR BENEFITS

Clear formulations

Alternative to silicone or silicone reduction

Easy incorporation and good stability

Higher final viscosity than silicones

Emulsion aesthetics improvement

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SHAMPOOS

HOW TO FORMULATE

KAO SOFCARE® GP-1 is easily incorporated after the addition of the main surfactants at room temperature, which results into a transparent formulation. Thereby, in comparison to silicone-based products, there is no need to add a polymer to obtain a good stability neither a pearlizing agent to mask turbid appearance.

The pictures illustrate the results of adding 1% of conditioning agent to a model shampoo formulation with Sodium Laureth Sulfate, Cocamidopropyl Betaine, AMIDET® N (Cocamide DEA replacement) and Polyquaternium-10. Furthermore, the viscosity obtained is higher than the formulation with dimethicone. As seen in the comparative pictures, the foaming ability is also enhanced.





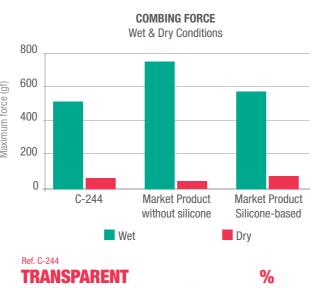
HAIR VOLUME

In comparison to non-conditioning shampoos, formulations containing dimethicone dramatically reduce the hair volume, whereas the use of KAO SOFCARE® GP-1 makes it practically invariable.

COMBING FORCE

KAO SOFCARE® GP-1 performs similar than silicones at half concentration in wet and dry conditions. Furthermore, combing force reduction is obtained by reducing the amount of silicone and adding a small amount of KAO SOFCARE® GP-1. These results confirm the formulator's benefits of using KAO SOFCARE® GP-1 as silicone alternative or as silicone booster.

The following graphic compares the combing force of two market products and a silicone-free formulation (C-244) which contains KAO SOFCARE® GP-1.



CONDITIONING SHAMPOO	
EMAL® 270D Sodium Laureth Sulfate	16.4
AKYPO® RLM 45CA Laureth-6 Carboxylic Acid	4.2
BETADET® HR Cocamidopropyl Betaine	8.3
AMIDET [®] N PEG-4 Rapeseedamide	1.5
KAO SOFCARE® GP-1 PPG-3 Caprylyl Ether	0.6
QUARTAMIN® AB Behentrimonium Chloride	0.6
MERQUAT® 550 Polyquaternium-7	1.11
UCARE® LR-400 Polyquaternium-10	0.4
Preservative	q.s.
Deionized Water	Up to 100

REPAIRING: SHINING

Hair can be physically and chemically damaged in our day-to-day activities. KAO SOFCARE® GP-1 uniformly adsorbs and coats on the hair surface, as seen in the SEM images. As a result, it repairs hair cuticles leading to a stronger and more shining hair.



Dimethicone 1.0% (BY22-029, 100.000mm2/s)

NaCI

KAO SOFCARE® GP-1 1.0%

0.5

PEARLED SILICONE-FEEL CONDITIONING SHAMPOO	%
EMAL® 270D Sodium Laureth Sulfate	18.6
AMIDET® N PEG-4 Rapeseedamide	1.0
BETADET® S-20 Lauryl Hydroxysultaine	3.0
BETADET® THC-2 Disodium Cocoamphodiacetate	1.6
KAO SOFCARE® GP-1 PPG-3 Caprylyl Ether	0.75
SOFCARE® KG-101E Polyquaternium-52	8.0
DANOX® PI -10 Pearlizing Agent	4.0

Preservative q.s.

Deionized Water Up to 100

MANAGEABILITY AND STYLING

As a result of the excellent uniform adsorption of KAO SOFCARE® GP-1 on the hair, hair manageability can be improved and controlled from roots to tips, hair becomes smoother and hair style lasts longer. As seen in the comparative pictures, KAO SOFCARE® GP-1 helps to make curly hair style easily by hand blow when incorporated in hair shampoos. It also helps styling by using a hot curler.

AFTER DRY



Model shampoo

KAO SOFCARE® GP-1

AFTER SETTING HOT CURLER



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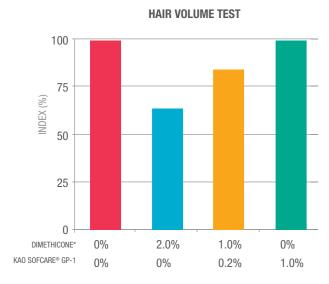


HOW TO FORMULATE

KAO SOFCARE® GP-1 can be added easily into hair conditioner formulations, after the emulsification step at 40°C. Higher amounts of KAO SOFCARE® GP-1 can be incorporated compared to silicones without stability problems and achieving higher viscosities, which improve product handling and spreading it on hair.

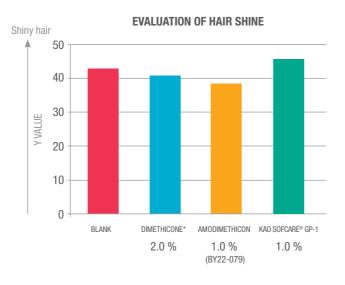
HAIR VOLUME

The incorporation of KAO SOFCARE® GP-1 in a conditioner will prevent the hair from losing its original volume as seen in the graphic. Furthermore, the reduction of hair volume using the combination of 1% dimethicone and 0.2% KAO SOFCARE® GP-1 is cut to half in comparison with a 2% silicone-based conditioner.



SHINING

KAO SOFCARE® GP-1 imparts hair shine, obtaining better results than silicone even at lower concentrations.



The results are also macroscopically seen in a real saloon test illustrated by the following picture.



KAO SOFCARE® GP-1 conditioner

Dimethicone*: BY22-029, 100.000mm2/s.

Dimethicone* conditioner

MANAGEABILITY

As commented in the Shampoo section of the leaflet, the manageability is greatly improved thanks to the uniformity in which KAO SOFCARE® GP-1 adsorbs onto the hair. As seen in the image below, not only the hair body gets more homogeneous but the hair tips are more easily managed.



Dimethicone KAO SOFCARE® GP-1

Ref. C-242 VOLUME UP CONDITIONER SILICONE-FEEL	%
KALCOL® 6850 Cetearyl Alcohol	3.0
TETRANYL® CO-40 Dioleyloylethyl Hydroxyethylmonium Methosulfate	1.62
KAO SOFCARE® GP-1 PPG-3 Caprylyl Ether	1.0
AMIDET® APA-22 Behenamidopropyl Dimethylamine	0.64
Glycerin	2.0
Isopropyl Myristate	0.5
Lactic Acid 90%	0.15
Preservative	q.s.
Deionized Water	Up to 100

Ref. C-219 AGING CARE CONDITIONER SILICONE REDUCTION	%
KALCOL® 6850 Cetearyl Alcohol	3.0
AMIDET® APA-22 Behenamidopropyl Dimethylamine	1.5
KAO SOFCARE® GP-1 PPG-3 Caprylyl Ether	1.0
Abil® Quat 3272 Quaternium-80	1.0
Dermofeel® E74A Tocopheryl Acetate	0.3
Provit® 50 D-Panthenol	0.5
Lactic Acid 90%	0.3
Preservative	q.s.
Deionized Water	Up to 100

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Enriching lives, in harmony with nature.

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