

DOW CORNING® 5-7113

Silicone Quat Microemulsion

FEATURES

- Easy to formulate into hair treatment products
- Dilutable in water

BENEFITS

- Heat protection
- Color lock from R/O conditioners
- Extra body/volume
- Wave enhancement
- Superior wet detangling
- Superior dry detangling
- Clear formulations possible
- Enhances hair strength

INCI Name: Silicone Quaternium-16 (and) Undeceth-11 (and) Butyloctanol (and) Undeceth-5

APPLICATIONS

- Shampoos
- Rinse-off and leave-on conditioners
- Styling products

TYPICAL PROPERTIES

Specification writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales representative prior to writing specifications on this product.

Property	Unit	Value
Color		Translucent
Physical form		Liquid
Silicone content	%w/w	22
Viscosity at 25°C (77°F)	mm ² /s	10
Emulsifier type		Non-ionic
pH		6-8
Suitable diluent		Water

DESCRIPTION

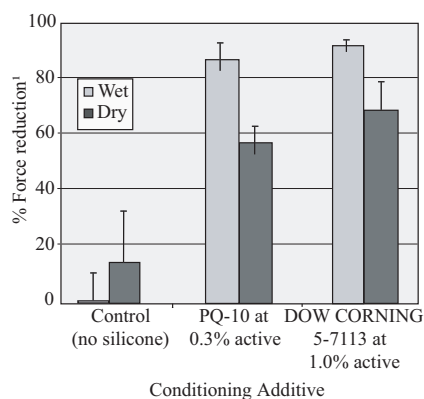
DOW CORNING 5-7113 Silicone Quat Microemulsion is a 22% non-ionic emulsion of a cationized amino-functional silicone polymer. This emulsion was developed as a conditioning additive for hair care products such as shampoos, conditioners and styling aids. The product provides easy formulation and dilution stability.

BENEFITS

DOW CORNING 5-7113 Silicone Quat Microemulsion can provide multiple benefits. It provides excellent wet and dry conditioning effects on the hair with the added benefit of body and volume enhancement. When incorporated into a rinse-off conditioner, the loss of permanent hair color was significantly reduced over non-silicone treatments. Hair treated with the quaternary silicone and then exposed to thermal heat reduced the overall moisture loss as compared to other silicone materials.

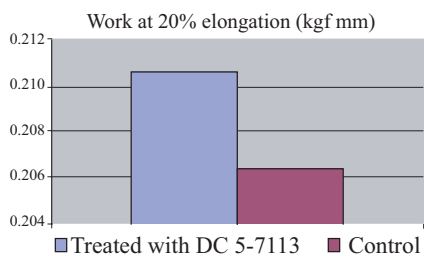
Hair fibers treated with DOW CORNING 5-7113 Silicone Quat Microemulsion exhibited hair strengthening benefits. See Figure 2.

Figure 1: Instron® combing evaluation. DOW CORNING 5-7113/Polyquaternium-10 comparison



1. % Force reduction = $\frac{ACL \text{ untreated} - ACL \text{ treated}}{ACL \text{ untreated}}$
 ACL: Average Combing Load
 PQ-10: Polyquaternium-10

Figure 2: Hair fibers treated (leave-on dilute solution) with DOW CORNING 5-7113 Silicone Quat Microemulsion exhibited higher work vs. untreated fibers. Statistically significant at 90% confidence level. (Work is the total load or force to elongate a fiber multiplied by displacement).



HOW TO USE

To optimize the dispersion of DOW CORNING 5-7113 Silicone Quat Microemulsion into the final formulation, it is recommended to add it slowly at the end of the formulating procedure at a temperature below 40°C (104°F) with continuous mixing or stirring.

Recommended use levels for shampoo, conditioner and styling products is from 2 to 8%.

ATTENTION: Sample formulations are provided for illustrative purposes only. Dow Corning does not warrant their merchantability, fitness for use, performance, efficacy, safety or freedom from patent infringement. They are not commercial formulations and have not been subjected to extensive testing. It is your responsibility to thoroughly test any formulation before use.

HANDLING PRECAUTIONS

Product safety information required for safe use is not included. Before handling, read product and safety data sheets and container labels for safe use, physical and health hazard information. The material safety data sheet is available on the Dow Corning website at www.dowcorning.com.

You can also obtain a copy from your local Dow Corning sales representative or Distributor or by calling your local Dow Corning Global Connection.

LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support Customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our website, www.dowcorning.com or consult your local Dow Corning representative.

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PROTOTYPE FORMULATIONS

A. Volumizing conditioner (CPF-507)

<i>Ingredients</i>	<i>Weight %</i>	<i>Trade name/supplier</i>
1. Deionized water	Up to 100%	
2. Tetrasodium EDTA	0.2	Versene® 220/The Dow Chemical Company
3. Hydroxyethylcellulose	1.5	Natrosol® 250 HHR/Hercules
4. Cetrimonium chloride	0.3	Arquad® 16-29/Akzo Nobel Chemicals Inc.
5. Cetearyl alcohol	1.0	Lannette O/Cognis
6. Glyceryl stearate (and) PEG-100 stearate	1.0	Arlacel® 165/Uniqema
7. Silicone Quaternium-16 (and) Undeceth-11 (and) Butyloctanol (and) Undeceth-5	2.0 ¹	DOW CORNING 5-7113 Silicone Quat Microemulsion
8. Preservative (choice)	0.4	
9. Fragrance	q.s.	

Procedure:

1. Heat ingredient 1, 2 and 4 to about 75°C (167°F) and add ingredient 3.
 2. Mix until uniform.
 3. Decrease heat to 60°C (140°F) and add ingredients 5 and 6 with moderate mixing until melted.
 4. Decrease heat to 40°C (104°F) and add ingredient 7.
 5. Mix for 10 minutes.
 6. Cool to room temperature and add ingredient 8 and 9 with gentle mixing.
1. Equivalent weight of active silicone quat in both shampoo and conditioner formulations is 0.5%.

DOW CORNING® Application Patents

Dow Corning hopes that this suggested formulation will be of interest to you, but you should be cautioned that this is only a representative formulation and is not a commercialized product. Dow Corning believes that the information and data on which this formulation is based are reliable, but it has not been subjected to extensive testing for performance, efficacy or safety. In addition, Dow Corning has not undertaken a comprehensive patent search on the formulation. BEFORE COMMERCIALIZATION, YOU SHOULD THOROUGHLY TEST THE FORMULATION OR ANY VARIATION OF IT TO DETERMINE ITS PERFORMANCE, EFFICACY AND SAFETY. IT IS YOUR RESPONSIBILITY TO OBTAIN ANY NECESSARY GOVERNMENT CLEARANCE, LICENSE OR REGISTRATION. Suggestions of uses should not be taken as inducements to infringe any particular patent.

PROTOTYPE FORMULATIONS (Continued)

B. Clear conditioning shampoo (CPF-517)

<i>Ingredients</i>	<i>Weight %</i>	<i>Trade name/supplier</i>
Phase A		
1. Deionized water	21.60	
2. Ammonium lauryl sulfate	28.6	Standapol A/Cognis
3. Disodium EDTA	0.20	Disodium EDTA/Universal Preserv-A-Chem
4. PEG-120 methylglucose dioleate	0.50	Glucamate DOE 120/Chemron Corporation
Phase B		
5. Ammonium laureth sulfate	25.00	Standapol EA-3/Henkel KGaA
6. Cocamidopropyl betaine	7.00	Lonzaine C/Lonza
7. Cocamide DEA	3.00	Comperlan KD/Henkel KGaA
8. PEG-15 stealkonium chloride	0.30	Ethoquad 18/25/Akzo Nobel Chemicals Inc.
Phase C		
9. Hydroxypropyl guar hydroxypropyltrimonium chloride	0.30	Jaguar® C-162/Rhodia, Inc.
10. Deionized water	11.20	
Phase D		
11. Preservative (choice)	0.30	
12. Silicone Quaternium-16 (and) Undeceth-11 (and) Butyloctanol (and) Undeceth-5	2.0 ¹¹	DOW CORNING 5-7113 Silicone Quat Microemulsion
13. Citric acid	q.s.	
14. Fragrance	q.s.	

Procedure:

1. Mix ingredients of Phase A together.
 2. Heat Phase A ingredients to 70-75°C (158-167°F). Mix until uniform.
 3. Mix Phase B ingredients together.
 4. Add Phase B to Phase A with mixing.
 5. Disperse ingredients 9 into ingredient 10.
 6. Add Phase C to the A/B mixture with additional mixing.
 7. Cool to 40°C (104°F) and add ingredients 11 and 12.
 8. Adjust pH to 6.5 with citric acid.
 9. Perfume (fragrance) can be added at this point.
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