

# **Section X**

## **Soaps and Hand Cleaners**

Antibacterial Handwash

A premium liquid cleansing system that leaves a long lasting soft and smooth after-feel.

<u>Ingredients:</u>	<u>Wt%</u>
Water	44.3
Ammonium Lauryl Sulfate(28%)	23.0
Sodium Laureth-2 Sulfate(26%)	21.5
Promidium CO	3.5
Monateric LMAB	3.0
Phospholipid CDM	2.5
Pricerine 9083	1.0
Triclosan	0.2
Monamate RMEA-40	0.7
Disodium EDTA	0.2
Cutric Acid	0.1

**Procedure:**

With stirring, combine all ingredients except Triclosan. Heat mixture to 55C and add Triclosan. While cooling, add color and fragrance. Adjust the pH to 6 with citric acid.

**Typical Properties:**

Appearance: Clear Liquid

Solids(%): 18

Viscosity (cP) @ 25C: 5400

Formula F-858

Clear Antibacterial Hand Wash

<u>Ingredients:</u>	<u>Wt%</u>
Part 1:	
Ethanol(95%)	63.0
Hydroxyethyl Cellulose	1.0
Part 2:	
Propylene Glycol	5.0
Phospholipid CDM	3.0
Part 3:	
Water	28.0

**Procedure:**

Blend hydroxyethyl cellulose and ethanol with high speed agitation. Separately, mix Phospholipid CDM, propylene glycol and water. Add part 1 to part 2. Mix until uniform. Add water, color and fragrance. Package.

**Typical Properties:**

Appearance: Clear colorless liquid

pH: 6.0

Formula F-853

SOURCE: Mona Industries, Inc.: Formulas F-858 and F-853

**Clear Liquid Hand Soap with Suspended Mineral Oil Beads**

<b><u>Ingredient:</u></b>	<b><u>Wt%</u></b>
DI Water	68.00
Carbopol ETD 2020	0.90
Glycerin	2.00
Triethanolamine	0.20
Ammonium lauryl sulfate (30%)	20.00
Lauryl ether sulfosuccinate (40%)	2.00
Disodium EDTA	0.10
Propylene glycol	2.00
Triclosan	0.50
DMDM hydantoin	0.70
Triethanolamine	0.60
Cocamidopropyl betaine (35%)	2.00
Mineral oil beads	1.00

**Physical Properties:**

Brookfield RVT Viscosity-20 rpm: 5,000 cP

Product pH: 5.0-6.0

Product Clarity/Appearance: Clear

**Procedure:**

1. Using moderate agitation (800 rpm) provided by a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations, disperse or screen the Carbopol polymer into the DI water. Mix the slurry for approximately 15 minutes or until the slurry is homogeneous. Heating the water to 40-50C will increase the wetting and dispersability of the Carbopol ETD polymers.
2. With minimal agitation to avoid excessive air entrapment, add in the glycerin, TEA, lauryl sulfate, sulfosuccinate, and the EDTA.
3. Premix the propylene glycol and the triclosan. Add the mixture.
4. Continue agitation and add the DMDM hydantoin followed by the triethanolamine and the cocamidopropyl betaine surfactant. Add the mineral oil beads with reduced agitation to avoid breaking the beads.
5. Add color and fragrance, as desired.

**SOURCE:** BFGoodrich Co.: Formulation HIT-410

d-Limonene Hand Soap

Starting formulation for a hand soap containing d-Limonene as a grease cutter.

<u>Ingredients:</u>	<u>Wt%</u>
Phase A:	
Water, DI	77.40
Carbopol 1382	1.00
Triethanolamine 99%	1.50
Phase B:	
Sulfochem ES-2	5.10
Phase C:	
d-Limonene	15.00

**Blending Procedure:**

Charge water and begin vigorous agitation. Add the Carbopol 1382 and mix. After adequate mixing, add the TEA-99 (Note: This will form a thick gel.) To this, add the Sulfochem ES-2 and mix until homogeneous. Add the d-Limonene. Adjust the pH up with TEA and down with citric.

Formulation No. F1027

d-Limonene Hand Soap

Starting formulation for a hand soap containing d-Limonene as a grease cutter.

<u>Ingredients:</u>	<u>Wt%</u>
Phase A:	
Water, DI	73.40
Carbopol 1382	1.00
Triethanolamine 99%	1.50
Phase B:	
Sulfochem ES-2	5.10
Amidex O	2.00
Neodol 91-8	2.00
Phase C:	
d-Limonene	15.00

**Blending Procedure:**

Charge water and begin vigorous agitation. Add the Carbopol 1382 and mix. After adequate mixing, add the TEA-99. (Note: This will form a thick gel.) To this, add the Sulfochem ES-2, Amidex O, and the Neodol 91-8, and mix until homogenous. Add the d-Limonene. Adjust the pH up with TEA and down with citric.

Formulation No. F1028

**SOURCE:** Chemron Corp.: Suggested Formulations

**d-Limonene Waterless Hand Cleaner**

<u>Ingredient:</u>	<u>Wt%</u>
DI water	69.85
Carbopol ETD 2001	0.35
d-Limonene	25.00
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.30
<b>Pumice*</b>	<b>10.00</b>

**Physical Properties:**

Brookfield RVT Viscosity, 20 rpm: 35,000 cP

\*addition of pumice may increase viscosity

Product pH: 5.5-5.8

Product Clarity/Appearance: Thick, white, creamy emulsion

**Procedure:**

1. Using moderate agitation (800 rpm) provided by a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations, disperse or screen the Carbopol polymer into the DI water. Mix the slurry for approximately 15 minutes or until the slurry is homogeneous. Heating the water to 40-50C will increase the wetting and dispersability of the Carbopol ETD polymers.
2. Using moderate agitation, add the d-Limonene to the polymer dispersion and mix for 10 minutes.
3. Premix the propylene glycol, glycerin, alcohol ethoxylate and preservative together. Add to the solvent/water mixture.
4. Add the sodium hydroxide to the formulation-check the pH frequently-until pH 5.8 is achieved. For best results, keep pH under 6.0.
5. Add the pumice, or other abrasive, as desired.
6. Add color and fragrance, as desired.

SOURCE: BFGoodrich Co.: Formulation HIT-400

d-Limonene Waterless Hand Cleaner

<u>Ingredient:</u>	<u>Wt%</u>
d-Limonene	25.00
Pemulen TR-1	0.20
Deionized water	70.10
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.20
Pumice	10.00

**Physical Properties:**

Brookfield RVT Viscosity 20 rpm: 11,400 cP  
 Product pH: 5.8  
 Product Clarity/Appearance: Opaque

d-Limonene Waterless Hand Cleaner

<u>Ingredient:</u>	<u>Wt%</u>
d-Limonene	25.00
Pemulen TR-2	0.20
Deionized water	70.10
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.20
Pumice	10.00

**Physical Properties:**

Brookfield RVT Viscosity 20 rpm: 6,500 cP  
 Product pH: 5.8  
 Product Clarity/Appearance: Opaque

**Procedure:**

1. Use a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations. Add the Pemulen polymer into the vortex of the rapidly agitating d-limonene (800 rpm). Allow to mix until homogeneous and free of polymer lumps.
2. Using moderate agitation, add the deionized water to the oil phase and mix for 10 minutes.
3. Premix the propylene glycol, glycerin, alcohol ethoxylate and preservative together. Add to the solvent/water mixture.
4. Add the sodium hydroxide to the formulation-check the pH frequently-until pH 5.8 is achieved. For best results keep pH under 6.0.
5. Add the pumice, or other abrasive, as desired.
6. Add color and fragrance, as desired.

SOURCE: BFGoodrich Co.: Formulation HIT-401

Emollient Liquid Soap (With Conditioner)

<u>Ingredients/CTFA Name:</u>	<u>Wt%</u>
Deionized Water	49.00
Schercoquat DAS/Quaternium-61	3.00
Schercotaine CAB-G/Cocamidopropyl Betaine	10.00
Schercopol DOS-70/Dioctyl Sodium Sulfosuccinate	15.00
Rhodacal A246/L/Sodium C14-16 Olefin Sulfonate	16.50
Schercomid AME-70/Acetamide MEA	3.00
Glycerine	1.50
Schercemol DISD/Diisostearyl Dilinoleate	1.00
Germaben II	1.00

Procedure:

Dissolve Schercoquat DAS in water at room temperature (or with gentle heat to 40C). Add the rest of the ingredients one by one, mixing well after each addition.

Formula SK 134

Liquid Hand Soap  
(Pearlescent)

<u>Ingredients/CTFA Name:</u>	<u>Wt%</u>
Water (Deionized)	51.8
Dowicil-200/Quaternium-15	0.2
Schercoquat IAS (90%)/Isostearamidopropyl Ethyldimonium Ethosulfate)	1.0
Schercotaine CAB-G (45%)/Cocamidopropyl Betaine	10.0
Schercomid SLM-LC/Lauramide DEA	1.0
Ethylene Glycol Monostearate/Glycol Stearate	1.0
Stepanol WA Paste (30%)/Sodium Lauryl Sulfate	35.0
Fragrance	q.s.

Procedure:

1. Heat water to 45-50C. With stirring add Dowicil-200 and Schercoquat IAS. Mix to dissolve.
2. Add Schercotaine CAB-G.
3. Dissolve (melt) EGMS in Schercomid SLM-LC, then add to above.
4. Add Stepanol WA Paste.
5. When uniform, cool and add fragrance.

Specifications:

Activity, %: 18

Viscosity @ 25C\*: 4,000-6,000 cps

pH @ 25C: 8.0

\*To increase viscosity, decrease % amide.

\*To decrease viscosity, increase % amide.

Formula SO-021

SOURCE: Scher Chemicals, Inc.: Suggested Formulations

Hand Sanitizing Gel

<u>Ingredient:</u>	<u>Wt%</u>
DI water	38.75
Carbopol ETD 2001	0.20
Propylene glycol	0.50
Ethanol	60.00
PEG-60 almond glycerides	0.30
Triisopropanolamine	0.25

Physical Properties:

Brookfield RVT Viscosity-20 rpm: 7,000 cp  
 % Transmission 420nm: 95-97  
 (Brinkman Colorimeter)  
 pH range: 7.3-7.6

Hand Sanitizing Gel

<u>Ingredient:</u>	<u>Wt%</u>
DI Water	38.65
Carbopol Ultrez 10	0.30
Propylene glycol	0.50
Ethanol	60.00
PEG-60 almond glycerides	0.30
Triisopropanolamine	0.25

Physical Properties:

Brookfield RVT Viscosity-20 rpm: 11,000 cp  
 % Transmission 420nm: 92-94  
 (Brinkman Colorimeter)  
 pH range: 7.3-7.6

Procedure:

1. Using moderate agitation (800 rpm) provided by a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations, disperse or screen the Carbopol polymer into the DI water. Mix the slurry for approximately 15 minutes or until the slurry is homogeneous. Heating the water to 40-50C will increase the wetting and dispersability of the Carbopol ETD polymers.
2. Slowly add the ethanol with gentle mixing. Allow as much air to escape as possible before proceeding.
3. Add the PEG-60 almond glycerides with gentle mixing.
4. Add the triisopropanolamine with gentle sweeping motion to minimize air entrapment. Mix until uniform.
5. Add dye or fragrance if desired.

SOURCE: BFGoodrich Co.: Formulation HIT-420



Hand Sanitizing Gel (Continued)

<u>Ingredient:</u>	<u>Wt%</u>
DI water	38.55
Carbopol ETD-2020	0.40
Propylene glycol	0.50
Ethanol	60.00
PEG-60 almond glycerides	0.30
Triisopropanolamine	0.25

Physical Properties:

Brookfield RVT Viscosity-20 rpm: 7,000 cp

% Transmission 420 nm: 96-98

(Brinkman Colorimeter)

pH range: 7.3-7.6

Procedure:

1. Using moderate agitation (800 rpm) provided by a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations, disperse or screen the Carbopol polymer into the DI water. Mix the slurry for approximately 15 minutes or until the slurry is homogeneous. Heating the water to 40-50C will increase the wetting and dispersability of the Carbopol ETD polymers.
2. Slowly add the ethanol with gentle mixing. Allow as much air to escape as possible before proceeding.
3. Add the PEG-60 almond glycerides with gentle mixing.
4. Add the triisopropanolamine with gentle sweeping motion to minimize air entrapment. Mix until uniform.
5. Add dye or fragrance if desired.

SOURCE: BFGoodrich Co.: Formulation HIT-420

Liquid Hand Soap

Starting formulation for a mild hand soap.

<u>Ingredients:</u>	<u>Wt%</u>
Sulfochem B-209	28.00
Water, soft	70.81
Fragrance	0.10
NaCl	typical: 1.00
Citric acid	typical: 0.09
Preservatives	q.s.

**Blending Procedure:**

Charge water into mixing vessel and add remaining ingredients in order listed. Mix until homogeneous.

**Typical Physical Properties:**

Viscosity: 5,000-7,000 cps

pH: 7.0-7.5

Formulation No. E3128

Liquid Hand Soap

Starting formulation for a mild hand soap

<u>Ingredients:</u>	<u>Wt%</u>
Sulfochem B-2090P	29.00
Water, soft	70.04
Fragrance	0.15
NaCl	typical: 0.75
Citric acid	typical: 0.06
Preservatives	q.s.

**Blending Procedure:**

Charge water into mixing vessel and add remaining ingredients in order listed. Mix until homogeneous.

**Typical Physical Properties:**

Viscosity: 5,000-7,500 cps

pH: 7.0-7.5

Formulation No. E3133

**SOURCE: Chemron Corp.: Suggested Formulations**

Liquid Soap

with a pearl-lustre effect, 14.6% active ingredient

<u>Recipe:</u>	<u>Wt%</u>
A Hostapon SCID/Sodium Cocoyl Isethionate	4.00
B Water	53.90
C Genapol ZRO liquid/Sodium Laureth Sulfate	30.00
Fragrance	0.30
Genapol PGL/Glycol Distearate, Cocamide MEA, PPG-4 Deceth-4	4.00
Dyestuff solution	q.s.
Preservative	q.s.
Genagen CAB/Cocamidopropyl Betaine	6.00
D Sodium chloride	1.80

Procedure:

1. Dissolve A in B at approx. 60C.
2. Cool 1 to approx. 35C.
3. Stir the components of C one after another into 2.
4. If necessary adjust the pH.
5. Finally adjust the viscosity with D.

Formula A II/1033

Liquid Soap

clear, 9.6% active ingredient

<u>Recipe:</u>	<u>Wt%</u>
A Genapol LRO liquid/Sodium Laureth Sulfate	20.00
B Hostapur SAS 60/Sodium C14-17 Sec Alkyl Sulfonate	5.00
Genagen CA-050/PEG-5 Cocamide	1.00
Fragrance	0.30
Water	72.60
Dyestuff solution	q.s.
Preservative	q.s.
C Tylose H 100000 yp/Hydroxyethyl Cellulose	1.10

Procedure:

1. Stir the components of B one after another into A.
2. Add C to 1 while stirring continuously until a homogeneous product free of lumps has been obtained.

Formula A II/1019

SOURCE: Hoechst Aktiengesellschaft: Guide Recipes

Mild Hand Cleanser

<u>Raw Materials:</u>	<u>Wt%</u>
Mackanate LO-Special (Disodium Lauryl Sulfosuccinate)	83.0
Mackamide PKM (Palmkernelamide MEA)	4.0
Mackernium 007 (Polyquaternium 7)	0.8
Mackstat DM (DMDM Hydantoin)	qs
Water, Fragrance	qs to 100.0

Procedure:

1. Add Mackamide PKM to Mackanate LO-Special.
2. Heat to 70C.
3. Blend until homogeneous.
4. Dissolve Mackernium 007 in water and add to product.
5. Blend until completely homogeneous.
6. Cool to 50C with mild agitation.
7. Add Mackstat DM and Fragrance.
8. Cool with continuous agitation.

Facial Cleanser

<u>Raw Materials:</u>	<u>Wt%</u>
Mackanate LO-Special (Disodium Lauryl Sulfosuccinate)	88.0
Cetyl Alcohol	2.0
Brij 52	2.0
Mackstat DM (DMDM Hydantoin)	qs
Water, Dye, Fragrance	qs to 100.0

Solids, %: 40.0 (+-1.0)  
 pH (as is): 5.5-6.0  
 Appearance: Pearly Cream

Procedure:

1. Add Cetyl Alcohol, Brij 52, and water to Mackanate LO-Special.
2. Heat to 70C.
3. Blend until homogeneous.
4. Adjust pH to 5.0-6.0 with Sodium Hydroxide.
5. Cool to 50C and add Mackstat DM and Fragrance.
6. Adjust solids to 40.0 (+-1.0)% at this point.
7. Cool to room temperature.

SOURCE: McIntyre Group Ltd.: Personal Care Formulary: Formulas

**Mineral Spirits Waterless Hand Cleaner**

<b><u>Ingredient:</u></b>	<b><u>Wt%</u></b>
DI water	64.90
Carbopol ETD 2001	0.30
Mineral Spirits	30.00
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.30
 Pumice*	 10.00

**Physical Properties:**

Brookfield RVT Viscosity, 20 rpm: 45,000 cP

\*addition of pumice may increase viscosity

Product pH: 5.5-5.8

Product Clarity/Appearance: Thick, white, creamy emulsion

**Procedure:**

1. Using moderate agitation (800 rpm) provided by a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations, disperse or screen the Carbopol polymer into the DI water. Mix the slurry for approximately 15 minutes or until the slurry is homogeneous. Heating the water to 40-50C will increase the wetting and dispersability of the Carbopol ETD polymers.
2. Using moderate agitation, add the mineral spirits to the polymer dispersion and mix for 10 minutes.
3. Premix the propylene glycol, glycerin, alcohol ethoxylate and preservative together. Add to the solvent/water mixture.
4. Add the sodium hydroxide to the formulation-check the pH frequently-until pH 5.8 is achieved. For best results keep pH under 6.0.
5. Add the pumice, or other abrasive, as desired.
6. Mix color and fragrance, as desired.

**SOURCE: BFGoodrich Co.: Formulation HIT-402**

Mineral Spirits Waterless Hand Cleaner

<u>Ingredient:</u>	<u>Wt%</u>
Mineral Spirits	25.00
Pemulen TR-1	0.20
Deionized water	70.10
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.20
Pumice	10.00

**Physical Properties:**

Brookfield RVT Viscosity-20 rpm: 11,500 cP  
 Product pH: 5.8  
 Product Clarity/Appearance: Opaque

Mineral Spirits Waterless Hand Cleaner

<u>Ingredient:</u>	<u>Wt%</u>
Mineral Spirits	25.00
Pemulen TR-2	0.20
Deionized water	70.10
Propylene glycol	1.00
Glycerin	2.00
C12-15 linear alcohol, 7 moles EO	0.50
Germaben IIE	1.00
Sodium hydroxide (18%)	0.20
Pumice	10.00

**Physical Properties:**

Brookfield RVT Viscosity-20 rpm: 7,200 cP  
 Product pH: 5.8  
 Product Clarity/Appearance: Opaque

**Procedure:**

1. Use a Lightnin' Mixer or similar variable speed unit and an impeller suitable for general mixing and blending operations. Add the Pemulen polymer into the vortex of the rapidly agitating mineral spirits (800 rpm). Allow to mix until homogeneous and free of polymer lumps.
2. Using moderate agitation, add the deionized water to the oil phase and mix for 10 minutes.
3. Premix the propylene glycol, glycerin, alcohol ethoxylate and preservative together. Add to the solvent/water mixture.
4. Add the sodium hydroxide to the formulation-check the pH frequently-until pH 5.8 is achieved. For best results keep pH under 6.0.
5. Add the pumice, or other abrasive, as desired.
6. Add color and fragrance, as desired.

SOURCE: BFGoodrich Co.; Formulation HIT-403