

Car Wash 101

Dr. Andy Sun, Business Manager, HI&I and Vehicle Care Products

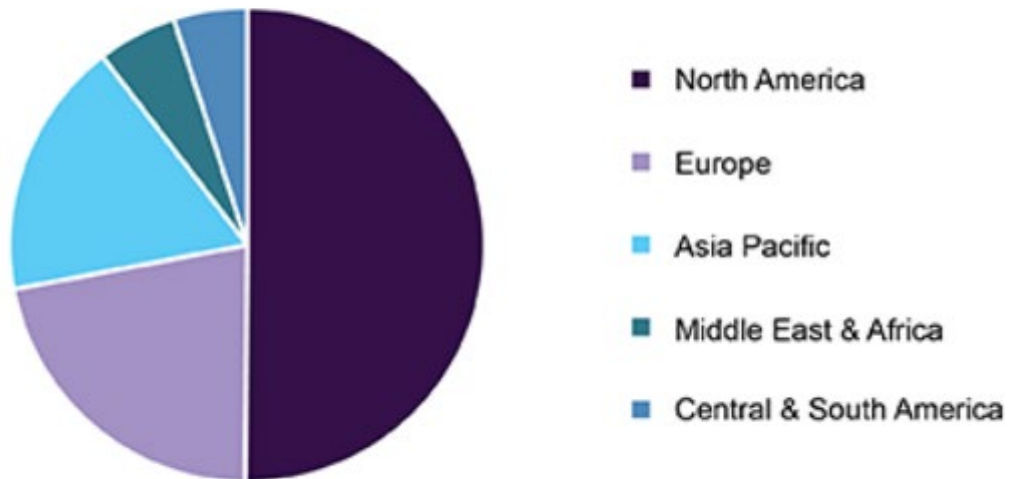


Content

- Car Wash Market Outlook
- Car Wash Types
- Soils to Be Cleaned
- Car Wash Chemicals

Global Car Wash Service Market

Global car wash service market share, by region, 2018 (%)



Source: www.grandviewresearch.com

Global Car Wash Service Market Outlook 2015-2025



- 2018 – 38 Billion USD
- 2025 – 41 Billion USD
- CAGR 3.2% 2019-2025
- Reasons for growth
 - Rising spending power.
 - Focusing on vehicle maintenances
 - Switching to professional car washes from DIY home

US Car Wash Market Overview (by International Carwash Association in 2020)

US Car Wash	Locations
In-Bay Automatic / Roll-over	28,999
Self-Service	16,182
Conveyor	17,487
Total	62,668

Global	Europe (EU)	Australia
In-Bay Automatic / Roll-over	50,000	1,600
Self-Service	11,000	300
Conveyor	8,000	50
Total	69,000	1,950

US Car Wash Market Overview (by International Carwash Association in 2020)

- **Consumer Trends**

In NA& EU, increasingly preferring to have their cars washed for them versus doing it themselves. In the United States, the percentage of drivers that report most frequently washing their vehicle at a professional car wash has increased from approximately 48% in 1994 to more than 77% in 2019.

- **Ownership Profile**

The majority of car wash locations in the United States are owned and operated by small to medium sized independent car wash companies. The market is highly fragmented, with the 100 largest conveyor car wash companies representing only 13% of total conveyor car wash locations - and the largest single operator representing less than 2% of locations. Leading car wash chains include. *Mister Car Wash, Zips Car Wash, International Car Wash Group (ICWG), Autobell Car Wash, Quick Quack Car Wash, Super Star Car Wash, True Blue Car Wash, Magic Hand Car Wash, Hoffman Car Wash, Wash Depot Holdings Inc*

US Car Wash Market Overview (by International Carwash Association in 2020)

Employment

The professional car wash industry employs more than 220,000 full and part-time employees at retail stores and more than 15,000 in car wash equipment, chemical and service providing companies.

Retail Activity

More than 2 billion cars are washed each year in North America and nearly 1 billion in Europe. Car wash retail sales are approximately \$15B in North America, €5B in Europe and A\$1.5B in Australia.

Supplier Activity

Gross sales of chemicals into the car wash market are nearly \$1B annually in North America and €400M in Europe. Gross sales of car wash equipment and parts exceed \$700M in North America and €400M in Europe.

Types of Car Washes

- **Self-Service**

Wash cars in-person with a spray-gun or brush and dialing-in choices of chemicals and waxes

- **In-Bay Automatic or Roll-Over**

Car wash machines moves around cars to spray chemicals, to brush, to rinse-off, to blow dry

- **Tunnel or Conveyor**

Cars are carried by conveyers to move through fixed chemical spraying bars, brushes, water blasts, and blow dryers

- Advantages:

personal satisfaction

- Disadvantage:

water wasting, higher costs, time consuming (10-20mins), no blow-dry



- Advantages:

stay in the car, less hassle

- Disadvantage:

longer time (5-10mins) than tunnel, higher costs (\$8-15)



- Advantages:

fastest (0.5 min), low cost

- Disadvantage:

conveyer hassle or leave the car



Soils to Be Cleaned at Car Washes

- **Inorganic (remove with acids)**

- Clays and minerals
- Concrete dusts
- Salts (ice melt)
- Insoluble salts (from acid rain)
- Rusts on metals
- Break dusts (polymer and metals)

- **Organic (remove with alkaline)**

- Engine oils
- Lubricants and greases
- Polymers
- Dead bugs and insects
- Tree saps
- Bird drops
- Asphalts
- Beet juice, protein

Car Wash Procedures and Associated Care

- Undercarriage Cleaning
- Presoaks (acidic and alkaline, bug remover, wheel cleaner)
- Foam Brushes
- High Pressure Rinse
- Tricolor Conditioner
- Drying agent/Clearcoat
- Waxes: total body protectant, lava wax, ceramic sealant, etc.
- Tire dressing (online or offline)
- Carpet cleaning
- Leather and vinyl care
- De-odorizing



Car Wash Chemicals

Undercarriage Wash

- Purpose: clean salts and soils that may cost corrossions bottom frame, metals, pipes
- Clean with water (recycled water)
- Additional corrosion inhibitors

Vehicle Care Formulary

Undercarriage Protectant	WT%
Water	qs to 100.0
<i>Cola®Cor 400</i>	0.2 – 1%
Dilution at use: 10-50:1	



Presoaks (Friction or Friction Free)

- **Acid Presoaks:** remove clays, minerals, rust, and other inorganics

Acid Presoak for Car and Truck Wash #8026	WT%
Water	qs to 100.0
Phosphoric Acid (85%)	20.0
Sulfuric Acid (50%)	5.0
Glycolic Acid (40%)	2.0
Glycol EB	5.0
Cola®Terge 102	5.0
Cola®Cor 100	3.0
Appearance: Clear liquid pH: 1.0 – 1.5 Viscosity: 20 cP Dilution at use: 100-300:1	



Presoaks (Friction or Friction Free)

- **Alkaline Presoaks:** remove greases, oils, lubricants, hydraulic fluids, dead bugs, insects, tree saps, bird drops, asphalt, etc.

Alkaline Presoak for Car and Truck Wash #8021	WT%
Water	qs to 100.0
Potassium Hydroxide (45%)	10.64
TKPP or Na ₄ EDTA or NTA	4.43
Sodium Metasilicate Pentahydrate	4.43
<i>Cola®Terge 102 or Cola®Terge 226</i>	7.23
<i>Cola®Terlc SC</i>	19.88
d-Limonene	1.77
Appearance: Amber liquid pH: >13 Viscosity: 20 cP Dilution at use: 100-300:1	

Presoaks (Friction Free)

- **Bug and Insect Remover:** remove dead bugs, insects, blood, protein, fatty acids

	COMPONENTS	FUNCTION	WT%
1	Water	Solvent	Balance
2	Na ₄ EDTA	Chelating Agent	5.0
3	Sodium Hydroxide	Alkaline Source	2.0
4	Triethanol Amine	Alkaline Source	3.0
5	SugaBoost 030	Cleaner	20.0
6	ColaDol DG13	Non-VOC Solvent	5.0



Dilution at use: 20-50:1

Presoaks (Friction or Friction Free)

- **Tire and Wheel Cleaner:** alkaline degreaser to remove brake dusts and greases

Tire and Wheel Cleaning #8038	WT%
Water	qs to 100.0
Potassium Hydroxide (45%)	7.0
Sodium Metasilicate Pentahydrate	10.0
<i>Cola®Trobe INC</i>	8.0
<i>Cola®Dol 173B</i>	4.0
<i>Cola®Quat C15</i>	4.0

Appearance: Clear yellow liquid pH: >13 Viscosity: 20 cP Dilution at use: 30-50:1



Car Shampoo for Brushes

- Foam Brush: cleans vehicle surface, lubricates brushes

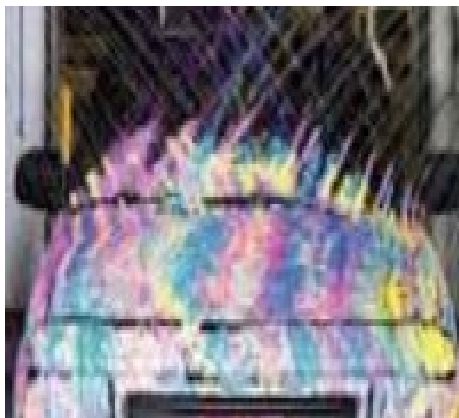
Car Wash Brush Shampoo #8016	WT%
Water	qs to 100.0
Sodium Metasilicate Pentahydrate	2.0
Ethylenediaminetetraacetic Acid (40%)	3.0
Glycol Ether EB	8.0
Colonial AOS-40	20.0
Colonial SLES-60	10.0
Cola®Teric SC	5.0

Appearance: Clear Yellow liquid pH: 13 Viscosity: 20 cP Dilution at use: 200-500:1



Conditioners

- **Tricolor Conditioners:** neutralize pH, color and fragrance show, rinse aid



Tricolor Foam Conditioner with Rinse Aid #8020	WT%
Water	qs to 100.0
<i>Cola®Terlc COAB</i>	32.0
<i>Cola®Quat C-15</i>	8.0
Dye and fragrance	qs
Appearance: Clear Yellow liquid pH: 5.0 – 6.0 Viscosity: 20 cP Dilution at use: 0.5 oz per color per wash	

Drying Agents, Cheater Waxes, and Clear Coats

- **Microemulsions**

- Mineral Seal Oil (or other hydrocarbons like olefins, alkylbenzene)
- Cationic emulsifiers
- Water
- Co-emulsifiers and solvents

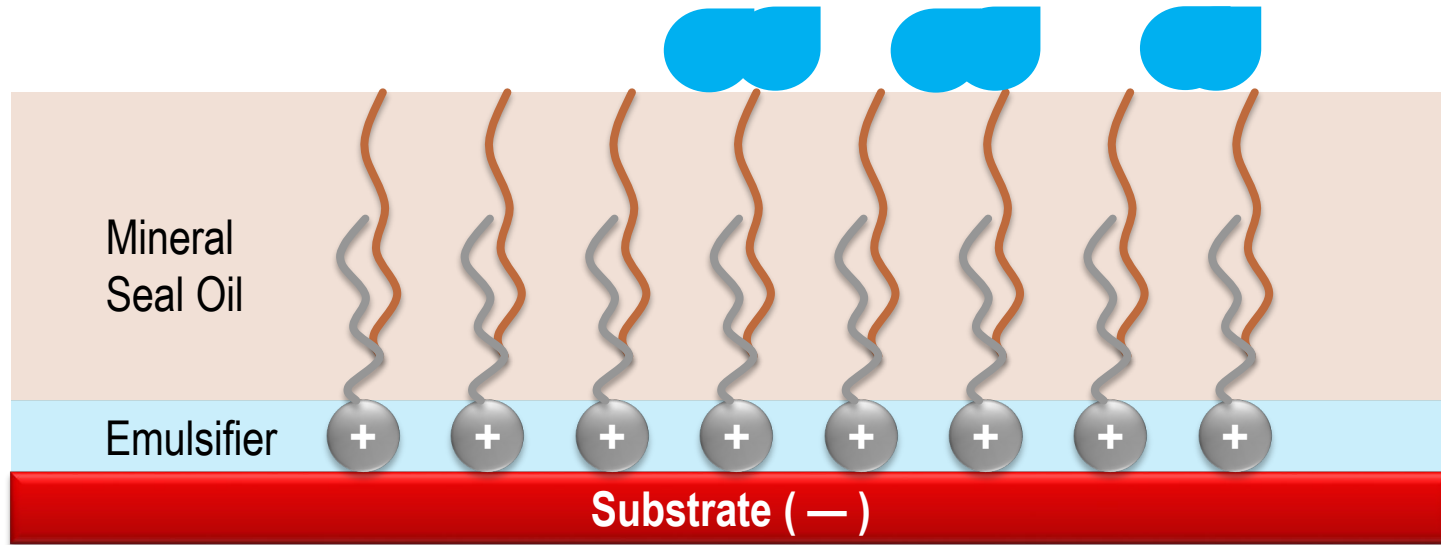
- **Performance and Stability Affected by**

- Impact of emulsifiers and design
- Impact of brands of mineral seal oil
- Impact of solvents
- Impact of co-surfactants like alcohol ethoxylates (ColaDol 91-6, NP-9, etc), etheramines
- Impact of wax additives

Beading or Sheeting?

A lasting debate since beginning of automatic car washes

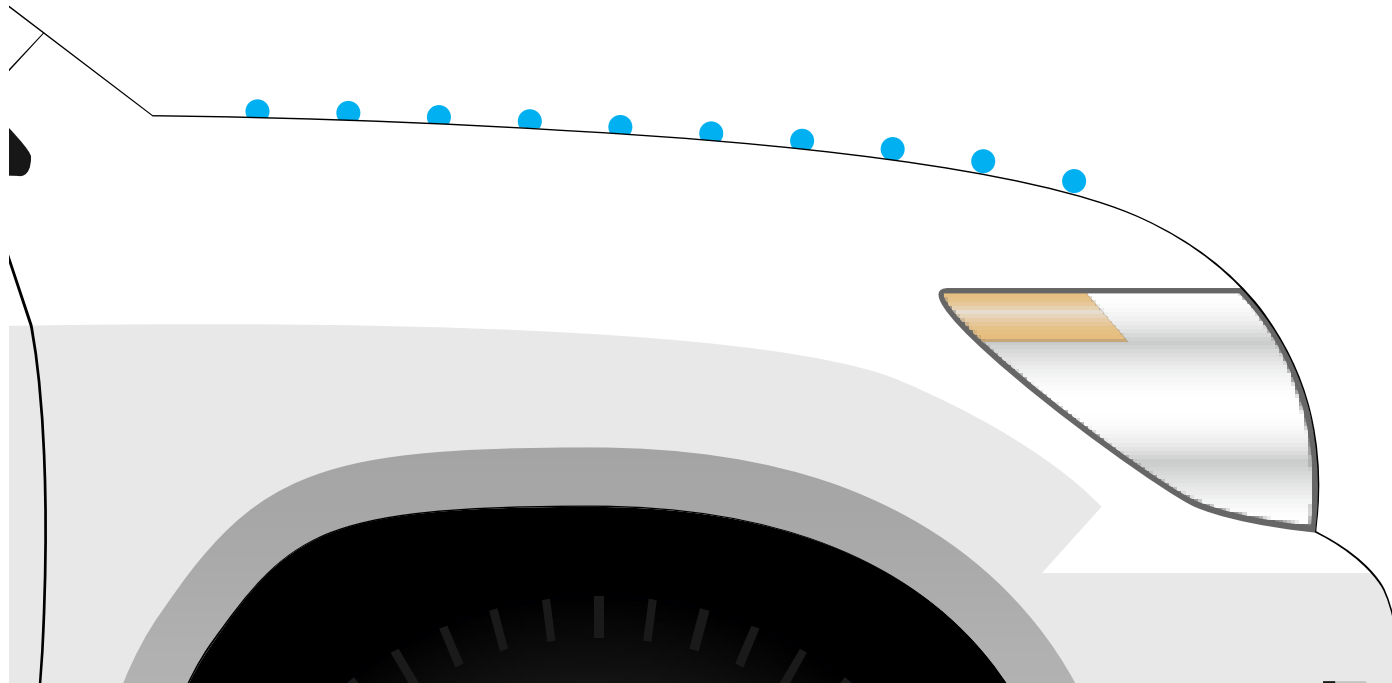
How Vehicles Become Dry? And Better Dried?



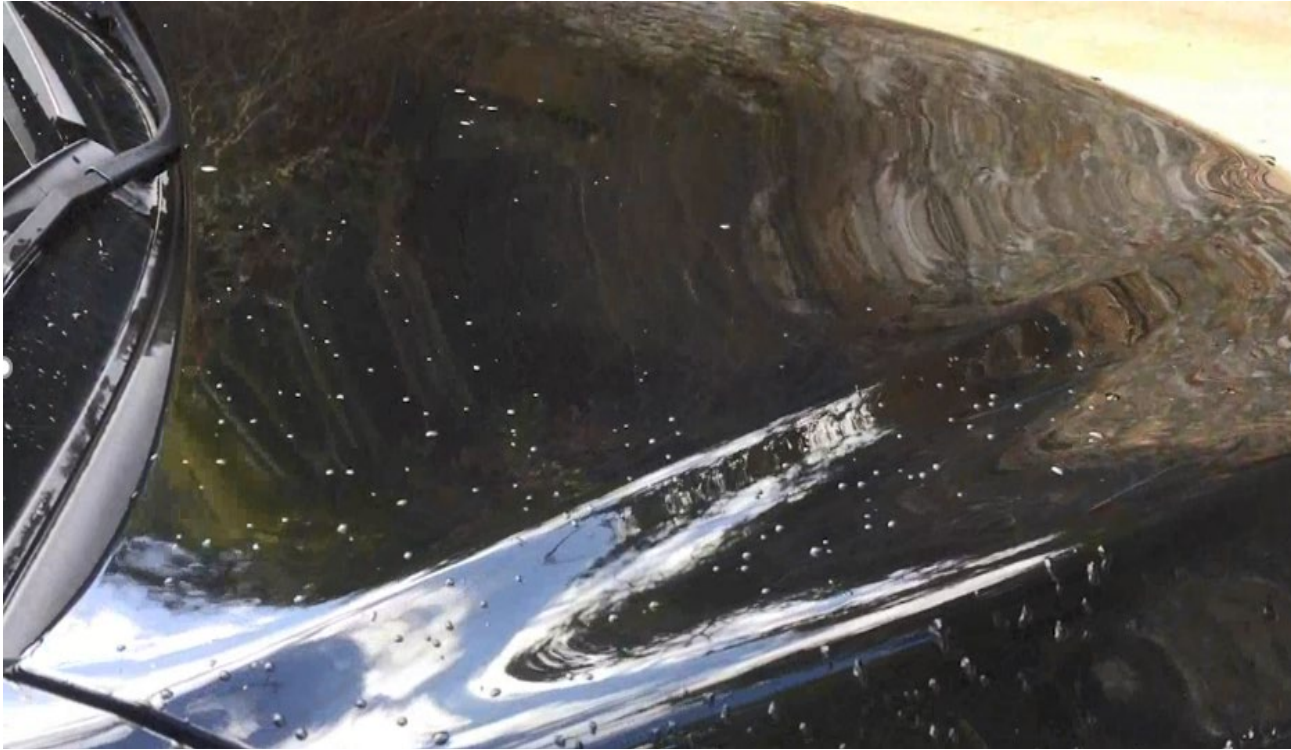
Water Soluble
 Oil Layer

What is better drying? Beading or Sheeting?

- High Beading

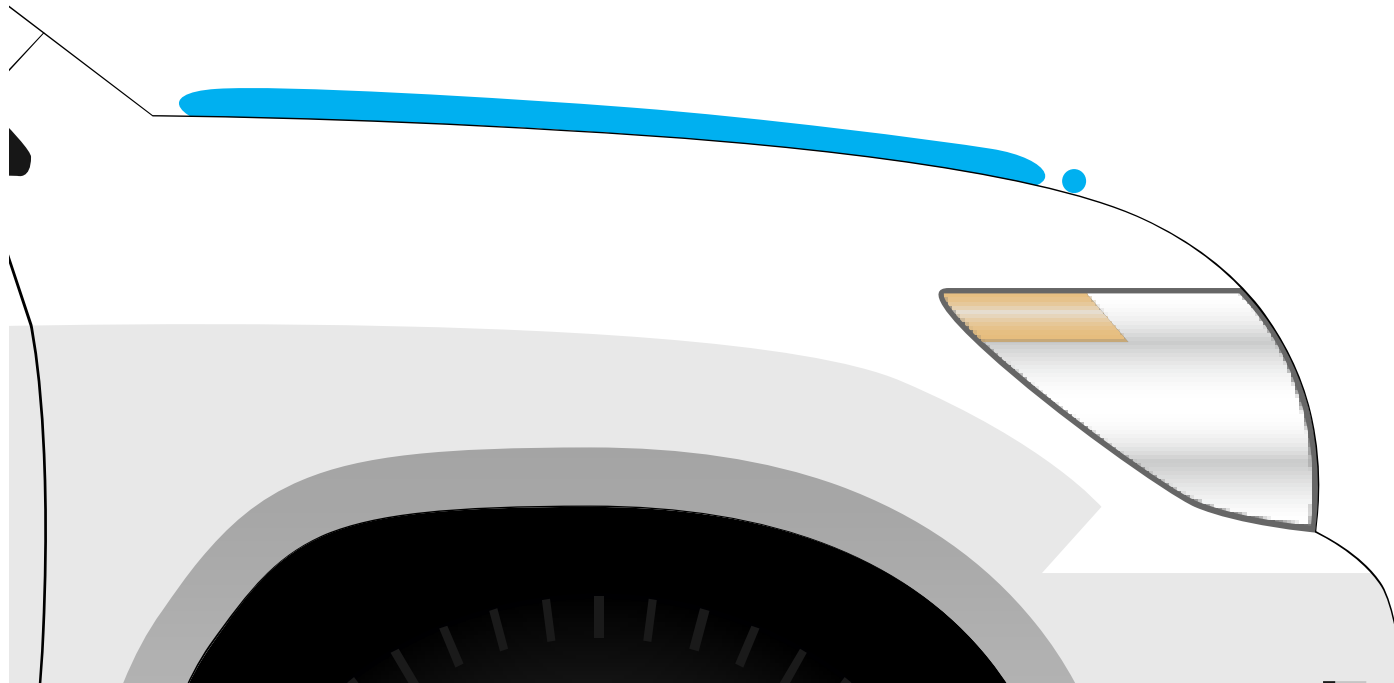


High Beading – Dicocoquat based



What is better drying

- High Sheeting

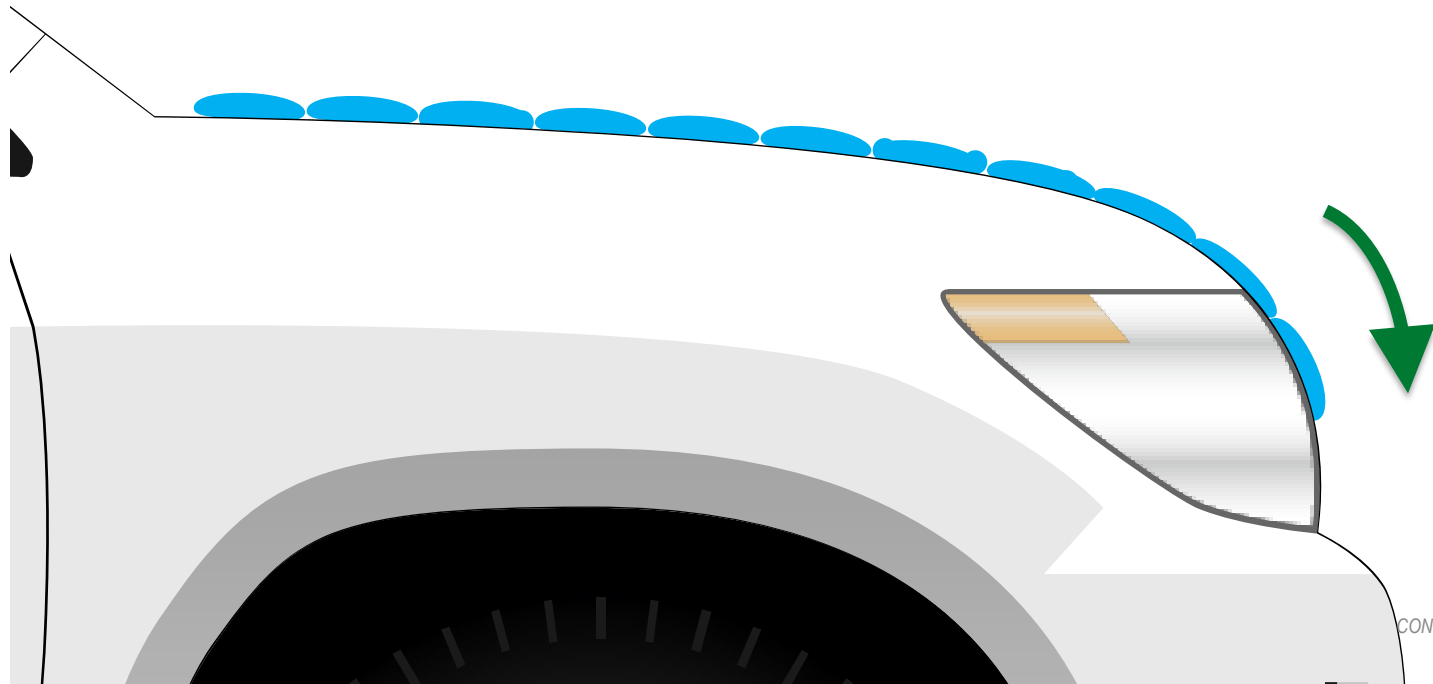


High Sheeting



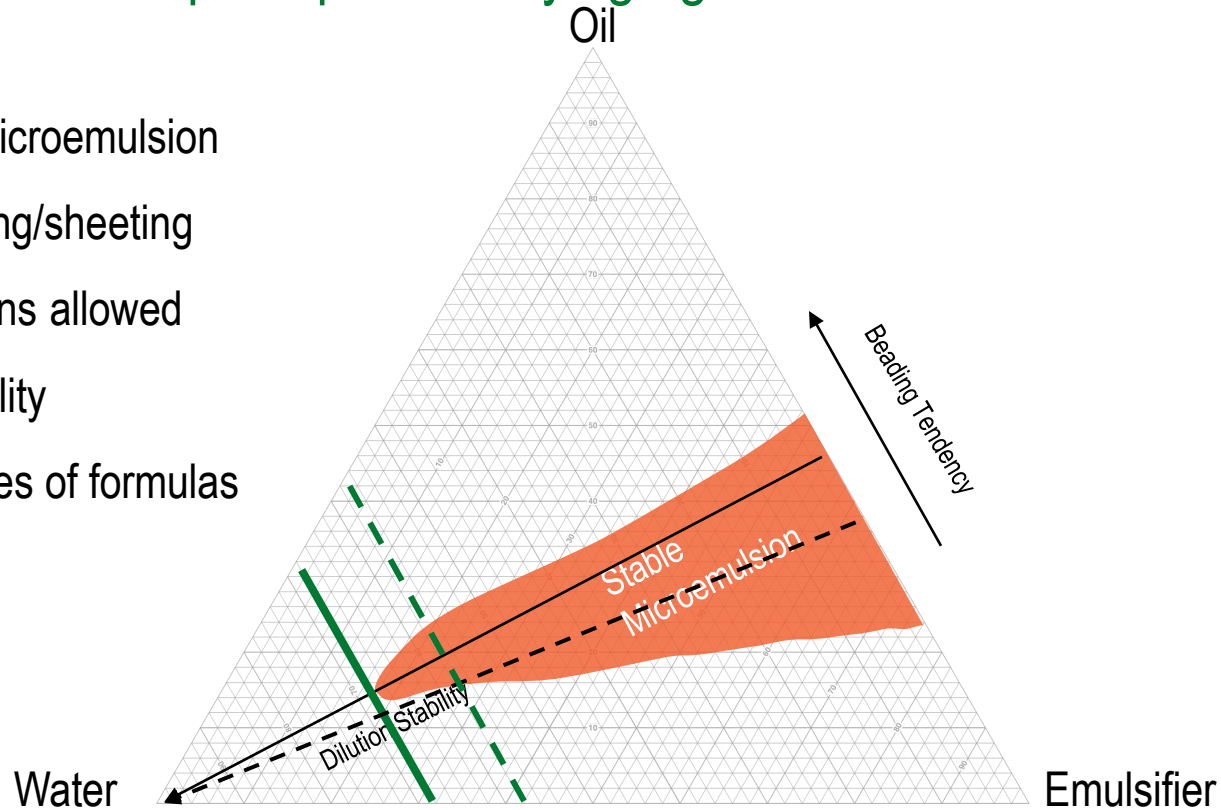
What is better drying?

• Optimal



Phase Diagram: map to optimize drying agent formulas

- Stability of microemulsion
- Adjust beading/sheeting
- Concentrations allowed
- Dilution stability
- Develop series of formulas



Cola[®]Mulse CS400

Highly Effective Emulsifier for
Spray Waxes in Transportation Cleaning

Cola[®]Mulse CS400 Based Drying Agents

Formulation Guide on High Efficiency Drying Agents for Professional Car Washes

Components	50% WT	45% WT	40% WT	35% WT	30% WT	25% WT
Calumet 600 MSO	24.2	21.8	19.3	16.9	14.5	12.1
ColaMulse CS 400	22.3	20.1	17.9	15.6	13.4	11.1
Glycol EB	3.5	3.2	2.8	2.5	2.1	1.8
Water	50.0	55.0	60.0	65.0	70.0	75.0
Dilution Ratio, Up to	2000:1	1800:1	1600:1	1400:1	1200:1	1000:1

Video: Cola[®]Mulse CS400 vs. Competition in Split-Hood Test



Cola[®]Mulse CS400

Benefits

- **Non-flammable** - more convenient for storage and shipping
- Balanced beading and sheeting for high drying efficiency
- Minimizes spotting and streaking
- Promotes high shine and durable protection
- Reduces smearing on windshield
- Easy to blend with no viscosity variations
- Lower cost in use



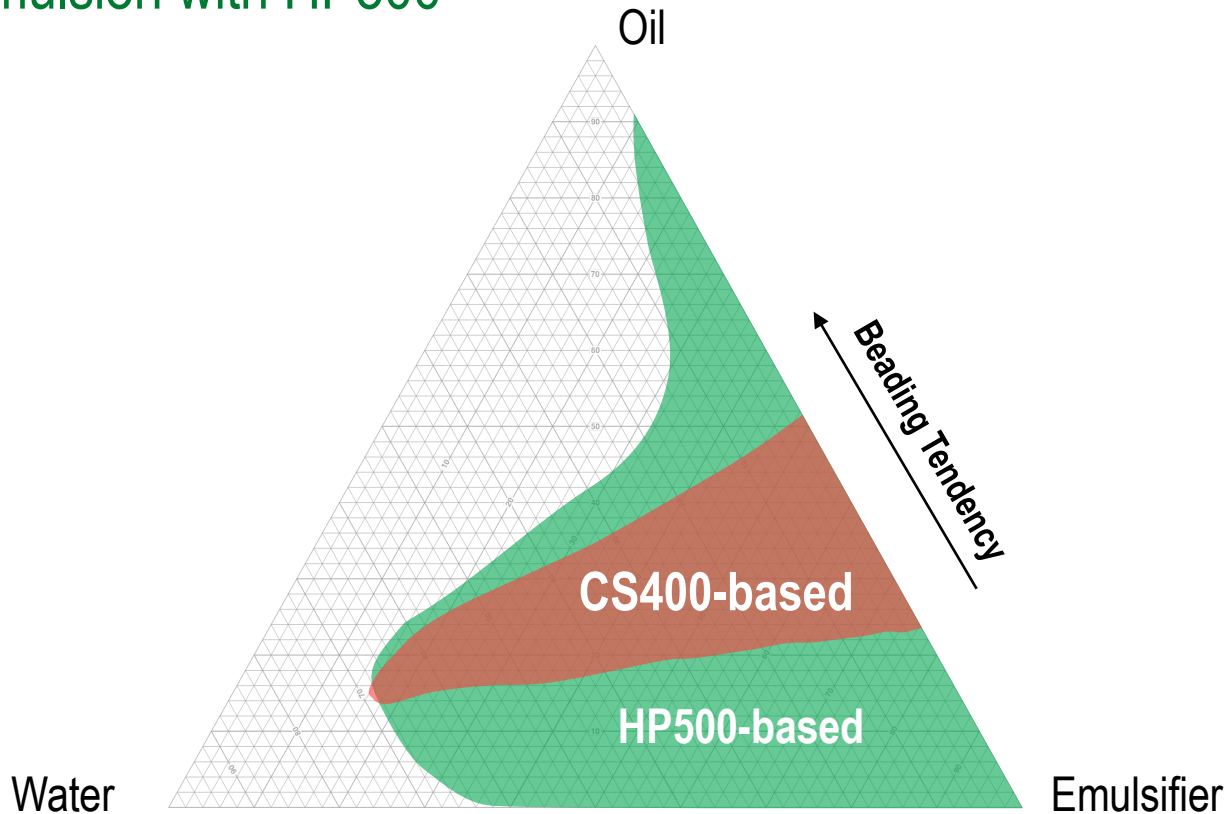
Cola[®]Mulse HP500

Cationic Emulsifier for Mineral Seal Oil

Versatility, Forgiving, Ease of Formulation

Formulation of Microemulsion with HP500

- Stability of microemulsion
- Adjust beading/sheeting
- Concentrations allowed
- Dilution stability



Cola[®]Mulse HP500 in Formulation

Formulation Guide on High Efficiency Drying Agents for Professional Car Washes

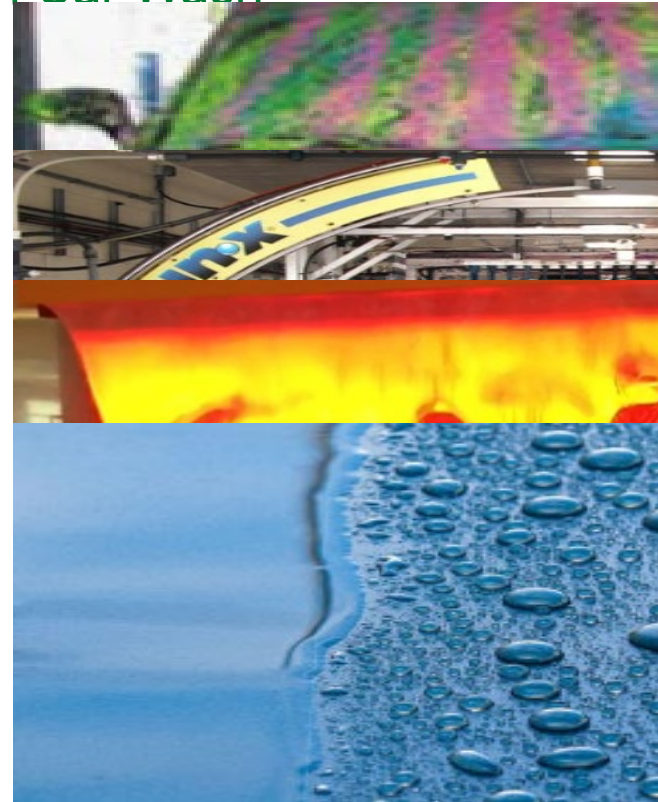
Components/Activity	100% WT	80% WT	50% WT	40% WT	30% WT
Calumet 600 MSO	25.4	20.3	12.7	10.2	14.5
ColaMulse HP500	38.1	30.5	19.1	15.2	13.4
Glycol EB	36.5	29.2	18.3	14.6	2.1
Water	0	20.0	50.0	60.0	70.0
Dilution Ratio, Up to	4000:1	3200:1	2000:1	1600:1	1200:1

Cola®Mulse HP500 – Points to Remember

- **Forgiving:** Easy to formulate with
- **Wide concentration range:** Creating spray waxes in wide range of concentrations (20%-100%)
- **Enable to adjust on beading and sheeting tendencies** to create variety of products for different applications (self-service, tunnel, wash and shine)
- **Easy to switch:** Compatible with spray waxes made from many other emulsifiers
- **Non-Flammable**

Major Marketing Themes of Wax and Protection in Car Wash

- 1960s: Hot waxes
- 1970s: Foam polishes and sealer waxes
- 1980s: Pressure waxes and glaze
- 1990s: Triple foam conditioners and polishes
- 2005: Rain-X online, total body protectants (30-day wax effect guaranty), Teflon coating
- 2011: Hot Lava Waxes (spray bar of big bubbles with carnauba wax)
- 2019: Ceramic sealants and coatings (indicating silica type of ceramics in durability)



Main Components in Drying Agents and Waxes in Car Wash

Components	Drying Agent	Clear Coat Sealar Wax	Tricolor Conditioner	Total Body Protectant (Rain-X Online)	Hot Lave Wax	Ceramic Sealant
Cationic Emulsifier	X	X	X	X	X	X
MSO or Alkylbenzene	X	X		X	X	Optional
Silicone Wax Additives		Optional	Optional	X	X	X
Carnauba Wax					X (minimal)	
Other Waxes (acrylic, olefin, fluoropolymers)						Optional



Cola[®] Dry DAB

Water Soluble Silicone Wax Additive for Shine and Protection

LISTINGS

US (TSCA); Canada (NDSL); Australia (AICS); China (IECSC);
New Zealand (NZIoC)



SPECIFICATIONS

Appearance @ 25°C	Clear Amber Liquid
pH (as is)	6.5 – 8.0
Active (100-K.F.), %	65 – 70

RECOMMENDED USE LEVELS

Application	Benefits	Use Level
Total Body Paint	Performance improvement	5 – 10%

Recommended Use Levels of Cola[®]Dry DAB

Application	Benefits	Use Level
Ceramic Sealant /Total Body Protectant	Enhancement in drying, shine, and protection	5-10%
Clear Coat	Improving shine and drying	2-5%
Tri-Color Conditioners	Improve rinse and water breaking	1-3%
Wash and Shine or Waterless Car Wash	Improve rinse, drying, and shine	1-3%
Leather cleaner and protection	Add shine, protection, and reduce greasy film	2-5%
Tire Dressing	Improving adhesion of silicone and shine, while reducing sling	3-6%
Window Treatment	Improve water repellence	0.5-2%

New! ColaQuat QS100 Wax Additive

- Create “**Ceramic Coating Effect**” for high beading and long-lasting wax effect and water repellency
- Enhance high gloss shine and color rejuvenation
- Protect surface like paint, metal, wood, vinyl, rubber, and glass against environmental damage, and improve ease of cleaning
- **Non-flammable**



Cola®Dry QS100

Silicone Wax Additive

DESCRIPTION Quaternized Silicone Polymer Blend
INVENTORIES US (TSCA); Canada (DSL); EU (REACH); Australia (AICS); China (IECS); Japan (MITI); Korea (KECI); New Zealand (NZIoC); Taiwan (NECI); Philippines (PICCS)

FEATURES / BENEFITS

- Cationic polymer blend
- Soluble in water
- Substantive to surfaces, color rejuvenation and high gloss shine
- Water repellancy
- Enhances water beading, wax effect
- Concentrated, ready to dilute
- Low viscosity, easier handling
- Non-flammable



APPLICATIONS

Application	Benefit	Use Level
Total Body Protectant	Enhancement in drying, shine and protection	2 – 5%
Clear Coat Protectant	Improving shine and drying	1 – 3%
Tri-Color Conditioners	Improve rinse and water breaking	1 – 3%
Wash and Shine or Waterless Car Wash	Improve rinse, drying and shine	1 – 3%
Leather cleaner and protection	Add shine, protection and reduce greasy film	1 – 3%
Tire Dressing	Improving adhesion of silicone and shine while reducing sling	2 – 5%
Windshield Treatment	Improve water repellence	0.5 – 2%

SPECIFICATIONS

Appearance, 25°C	Clear Liquid
Solubility, 5% in DW	Soluble and Clear
Viscosity, 25°C, cP	500 – 1000
Color, Gardner	6.0 Max.

STORAGE AND HANDLING

Cola®Dry QS100 is shipped in 55 gal. poly drums, net weight 440 lbs/200 kg. Cola®Dry QS100 should be stored in closed containers. Shelf life is 24 months from date of manufacture. Safety Data Sheet and more information is available at www.colonialchem.com.

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Innovative Specialty Surfactants

www.colonialchem.com

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Hand Car Washes / New Car Dealers

Green Vehicle Cleaner

(For boats, trains, trucks, cars, etc)

Compound	Weight %
Water	qs to 100.00
Sodium Citrate	5 - 10
Trilon M	3 - 5
Suga[®]Boost 050	30 - 40
Dilution	30 to 50:1

***SugaBoost 050:** Qualified for EPA Direct Release



Exterior and Interior Care

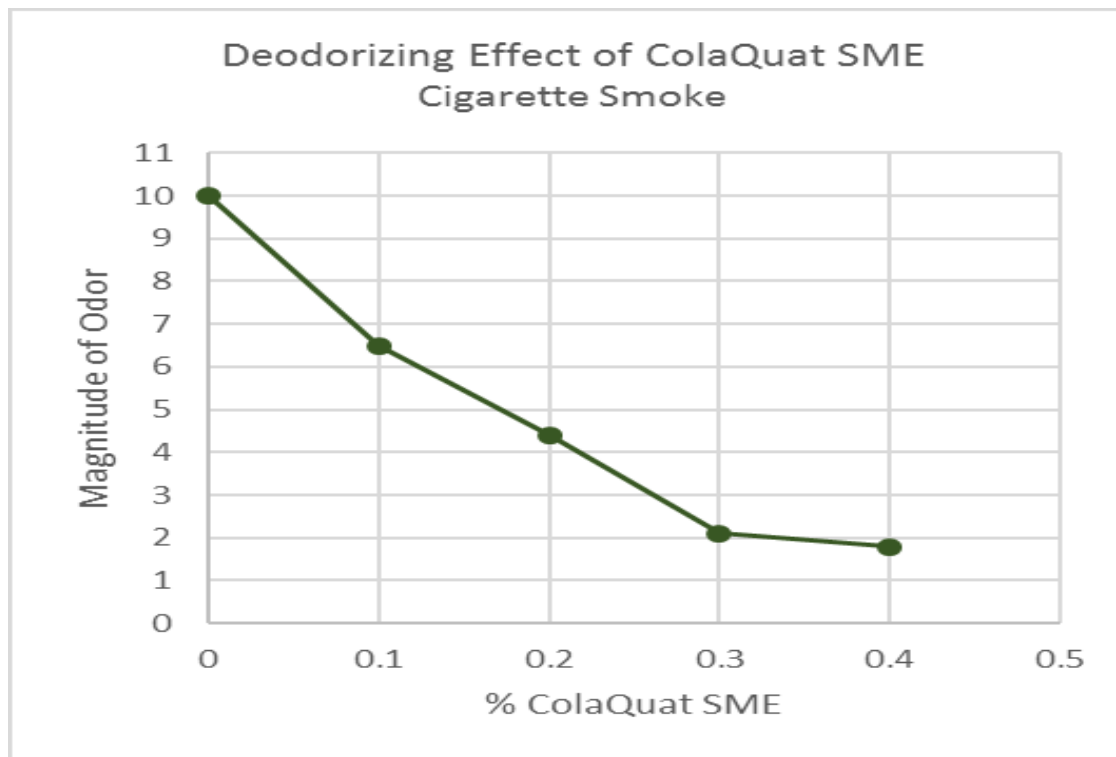
- Odor Control
- Tire Dressing
- Carpet Cleaning

Odor Control

Deodorizing Spray: remove cigarette smoke and animal malodor

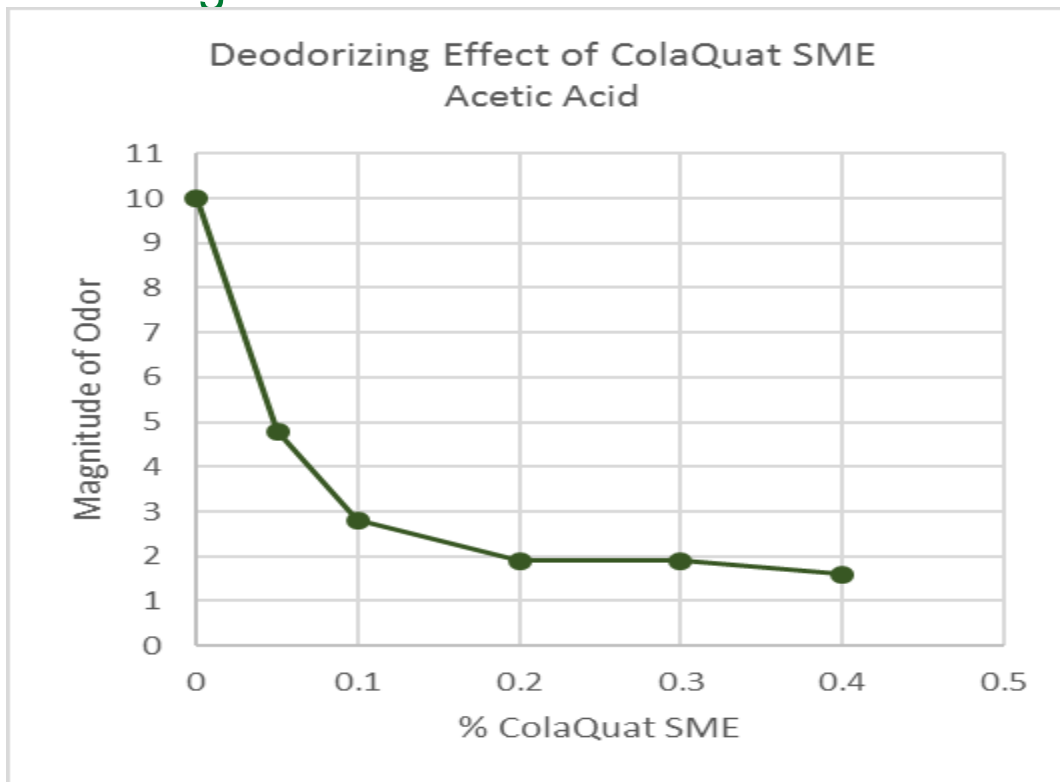
<i>Chemical Name</i>	<i>Trade Name</i>	<i>%</i>
Water		balance
Soyethyl Morpholinium Ethosulfate	Cola[®] Quat SME	1.00
Fragrance		0.50
Preservative		qs





Odor Strength: 0–Non, 2–Weak, 5–Distinct, 8–Strong, 10–Very Strong

Cola[®]Quat SME Testing



Odor Strength: 0–Non, 2–Weak, 5–Distinct, 8–Strong, 10–Very Strong

Tire Dressing and Tire Shine

- **Water-Based Tire Dressing:** exerts shine and reduces sling

Water-Based Tire Dressing	WT%
Water	qs to 100.0
Carbopol Aqua 30	1.0
Xiemer 2-1171	40.0
<i>Cola®Dry DAB</i>	4.0
Triethanol amine	to pH=9
Dilution at use: Use as is	

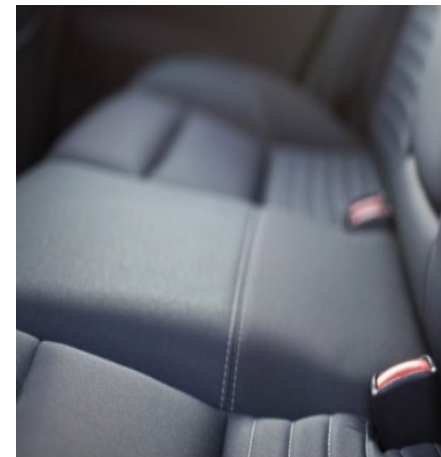


Leather and Vinyl Care

- **Leather Cleaning and Shine:** exert shine and improve softness

Premium Leather Cleaner with Protectant #8032	WT%
Water	qs to 100.0
Glycerin	20.0
<i>Cola®Dry DAB</i>	3.0
<i>Cola®Dol 173B</i>	0.5

Appearance: Clear yellow liquid pH: 5.0 – 5.5 Viscosity: 20 cP Dilution at use: Use as is



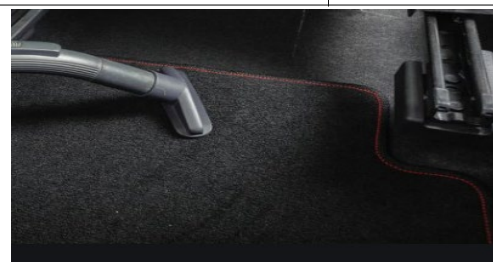
Carpet and Upholstery Cleaner (dry to a friable powder)

FORMULATION

Order	Chemical Name	Trade Name	%
1	Water		qs to 100.00
2	Disodium Lauryl Sulfosuccinate	Cola[®]Mate LA-40	3.00
3	Sodium Coco-Sulfate	Colonial SCS	1.00
4	Sodium Citrate		2.00
5	DMDM Hydantoin <i>and</i> Iodopropynyl Butylcarbamate	Glydant Plus [®] 1	0.30
6	Tetrasodium Glutamate Diacetate	Dissolvine [®] GL47S 2	0.30
7	Fragrance	EN English (United States) Fresh Emer [®] Fragrance 3	0.10

PROCEDURE

1. Heat water to 45 – 50°C.
2. Add ingredients 2-4 with moderate mixing. Mix until completely dissolved.
3. Once homogeneous, add remaining ingredients.
4. Adjust to pH 6.0 with Citric Acid.



Vehicle Care Formulary



Ready to clean,
Ready to shine.

Vehicle Care
Formulary Guide

Effective March 2018



Decontaminants Formulas

Heavy Duty Degreasers

21	42%	20%	20%	2%
91	97	95		87
21	18.3	16.9	14.5	12.3
22	12.9	15.6	11.4	
23	2.8	2.5	2.3	1.8
24	68.9	65.9	78.0	25.8

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Pre-treatment Formulas

25	10%	10%	10%	10%
26	10	10	10	10
27	10	10	10	10
28	10	10	10	10
29	10	10	10	10
30	10	10	10	10

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Agents for Straight Dilution

31	10%	10%	10%	10%
32	10	10	10	10
33	10	10	10	10
34	10	10	10	10
35	10	10	10	10
36	10	10	10	10

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Agents for Straight Dilution

37	10%	10%	10%	10%
38	10	10	10	10
39	10	10	10	10
40	10	10	10	10
41	10	10	10	10
42	10	10	10	10

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Starting Formulas

Clean Coat Protectant #F027

43	10%			
44	10%			
45	10%			
46	10%			
47	10%			
48	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Total Body Protectant #F028

49	10%			
50	10%			
51	10%			
52	10%			
53	10%			
54	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Tire and Wheel Dressing #F029

55	10%			
56	10%			
57	10%			
58	10%			
59	10%			
60	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Interior and Exterior Care

61	10%			
62	10%			
63	10%			
64	10%			
65	10%			
66	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Exterior and Interior Care

67	10%			
68	10%			
69	10%			
70	10%			
71	10%			
72	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Heavy Duty Engine Degreasers #F027

73	10%			
74	10%			
75	10%			
76	10%			
77	10%			
78	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Tire and Wheel Cleaning #F030

79	10%			
80	10%			
81	10%			
82	10%			
83	10%			
84	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

High Pressure Foamy Cleaner #F032

85	10%			
86	10%			
87	10%			
88	10%			
89	10%			
90	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Rug and Carpet Deodorizer #F035

91	10%			
92	10%			
93	10%			
94	10%			
95	10%			
96	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Tire Sap Cleaner #F029

97	10%			
98	10%			
99	10%			
100	10%			
101	10%			
102	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Exterior and Interior Care

Exterior and interior care of vehicles include products that help clean while ensuring shine and protection on vehicle surfaces such as vinyl, paint, rubber, carpet, leather and glass and chrome. Most manufacturers suggest that decontaminants be used first on exposed surfaces.



Interior care products are designed to clean and protect the interior surfaces of a vehicle. They also help eliminate odors and freshen up the interior.

Core Formulas

103	10%			
104	10%			
105	10%			
106	10%			
107	10%			
108	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Interior and Exterior Care

109	10%			
110	10%			
111	10%			
112	10%			
113	10%			
114	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Interior and Exterior Care

115	10%			
116	10%			
117	10%			
118	10%			
119	10%			
120	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Interior and Exterior Care

121	10%			
122	10%			
123	10%			
124	10%			
125	10%			
126	10%			

Application: In-line liquid pH 6.0 - 10.0 Viscosity: 20-40 cP Dilution: as per label

Questions?

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Thank you!

