

New Suga[®]Boost *With China Compliance*

Suga[®]Boost 070, 080, 090 (Patent Pending)

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2021 EPA Green Chemistry Challenge Award Suga® Boost 030, 050

Green Features

- *Atom economical*
- *Made from natural components*
- *No ethylene oxide or dioxane by-products*
- *Water-based chemistries with no emissions, no solvent cleanup*
- *Readily or ultimately biodegradable*
- *Potential to replace problematic surfactants*



Functionalized APG Surfactants Provide Solutions

- **Increasingly Stringent Regulation**

- Alkyl phenol ethoxylates (APE/NPE, reproduction issue and 1,4-dioxane)
- Alcohol Alkoxylates (1,4-dioxane)
- DEA in amides
- Dichloro acetic acid (DCA) in betaines

- **Public Safety Concerns**

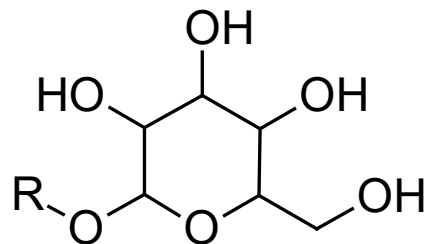
- Carcinogenic (1,4-dioxane, DEA, NPE, DCA, SLES, etc.)
- Irritants and sensitizers (sulfate, ethoxylates, etc.)

- **Environment Concerns**

- Soil, water, air contamination
- Aqua toxicity
- VOC
- Toxic residuals in degradation
- Reclamation of resources and green cycle

- **Performance in Green Surfactants**

A Full Spectrum of Green Chemistry



Alkyl Poly Glucoside

Suga®

Suga®Nate • APG Sulfonates
Suga®Fax • APG Phosphate Esters
Suga®Citate • APG Citrate

Poly Suga®

Poly Suga®Glycinate • Poly APG Amphoterics
Poly Suga®Mulse • EO-Free Poly APG Emulsifiers
Poly Suga®Nate • Poly APG Sulfonates
Poly Suga®Phos • Poly APG Phosphates
Poly Suga®Quat • Poly APG Quats

Suga®Boost

High Performance Boosting Blends

Suga[®] and Poly Suga[®]

- 100% or close to 100% naturally-derived
- Very mild to eyes and skin contact, over harsh sulfates, alkoxylates, coco DEA
- No GHS warning labels for some products
- Free of Prop 65 components (1,4-Dioxane, DEA, DCA, etc.)
- Stable in wide range of pH
- Stable in hard water and electrolyte solution without hydrotropes
- Great environmental profiles (readily biodegradable, low aqua toxicity, direct release)
- Broad regulation approval (EPA Safer Choice, USDA Biobased, EU Detergent Directive)
- Compatible with majority of surfactants
- Variety of chemistries that meet different formulation and performance demands

Suga[®]Boost – Synergistic Performance Blends

- ***Enhanced performance over traditional surfactants in many HI&I applications***
- High degree of natural plant-based carbons
- Mild to eyes and very mild characteristics for skin contact
- Free of hazardous components like 1,4-Dioxane, DEA, DCA, etc.
- Based on patent-pending technologies in synergy of naturally derived components
- Variety of chemistries that meet different formulation and performance demands
- Compatible with majority of surfactants
- Broad regulatory approvals
- Globally registered in major markets

Overview of Suga[®]Boost Chemistry and Plant-Based

	Chemical Synergy	Plant-Based (USDA Biopreferred)
Suga [®] Boost 030	Nonionic / Cationic	95%
Suga [®] Boost 050	Nonionic / Anionic	100%
Suga[®]Boost 070	Nonionic / Cationic	99%
Suga[®]Boost 080	Nonionic / Anionic	100%
Suga[®]Boost 090	Anionic / Cationic	97%

Suga[®]Boost 070, 080 and 090

Description Functionalized Alkyl Polyglucosides

CAS Proprietary

Inventories US (TSCA), Canada (NDSL), China (IECSC/IECIC)

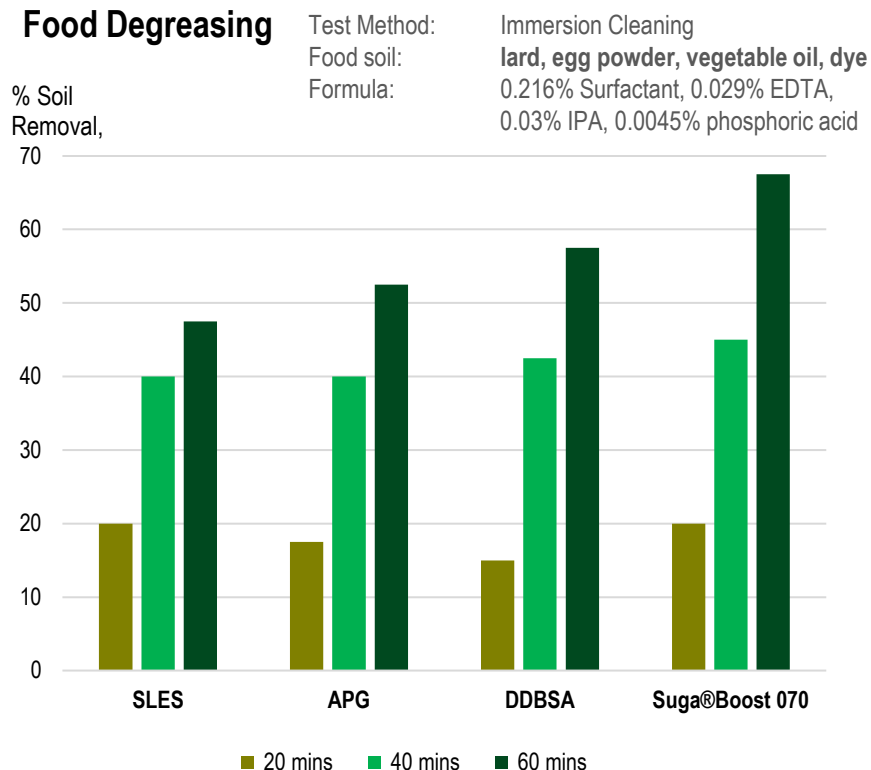
Suga®Boost 070, 080 and 090 Specifications

Specifications	Suga®Boost 070	Suga®Boost 080	Suga®Boost 090
Appearance	Clear Liquid	Clear Liquid	Clear Liquid
pH (10% aqueous)	5.0 – 7.0	6.0 – 8.0	6.0 – 8.0
Solids	37.0 – 41.0	43.0 – 46.0	33.0 – 36.0
Viscosity @ 25 C	~200 cP	~6,500 cP	~600 cP
Color, Gardner '98	4 Max.	4 Max.	4 Max.
Surface Tension @ 1%,	28.4 dyne/cm	28.3 dyne/cm	28.1 dyne/cm
Pour Point	- 3 °C	7 °C	- 4 °C
Draves Wetting @ 1%	11 seconds	7.7 seconds	13.6 seconds
CMC, %	0.03	0.000047	0.006
Flash Point	>95 °C	>95 °C	>95 °C
Ross Miles Foam @ 1%	170 (Immediate) 150 (1 min) 145 (5 mins)	155 (Immediate) 140 (1 min) 135 (5 mins)	155 (Immediate) 140 (1 min) 135 (5 mins)

Suga®Boost 070 and Applications (Nonionic/Cationic Synergy)

Applications

- **Hard surface cleaners**
- **Industrial degreasing**
- Stain and spot removal
- Grill and smokehouse cleaning
- Carpet cleaners
- Toilet bowl cleaners
- Transportation cleaning
- Hand dish detergents



Suga®Boost 070 and Applications (Nonionic/Cationic Synergy)

Applications

- **Hard surface cleaners**
- **Industrial degreasing**
- Stain and spot removal
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- Hand dish detergents

Industrial Degreasing

Test Method:

Soil:

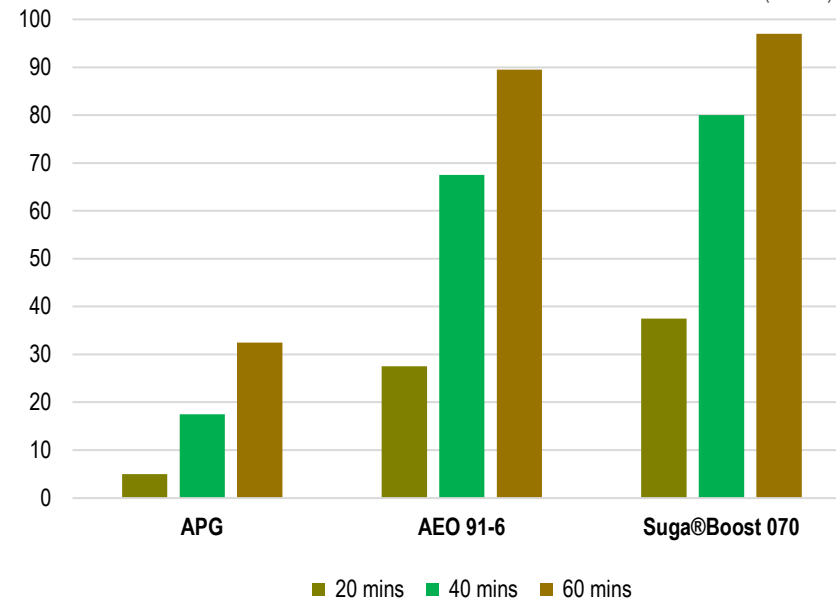
Formula:

Immersion Cleaning

Engine Oil/Lithium Grease

3% SMS, 0.4% EDTA, 0.45% KOH,
1% surfactant (active)

% Soil Removal



Naturally Derived Hard Surface Cleaner

<i>Component Name</i>	<i>%</i>
Water	qs to 100.00
Dissolving GL-47s	0.5
Suga[®]Boost 070	5.0
Preservative	q.s, optional

Naturally Derived Toilet Bowl Descaler and Cleaner

Component Name	%
Water	qs to 100.00
Cetyl Hydroxyethylcellulose	1.0
Sodium Hydroxide, 50%	qs to pH 8.5
Suga®Boost 070	2.0
Citric Acid, 50%	3.0
Glycolic Acid	1.0

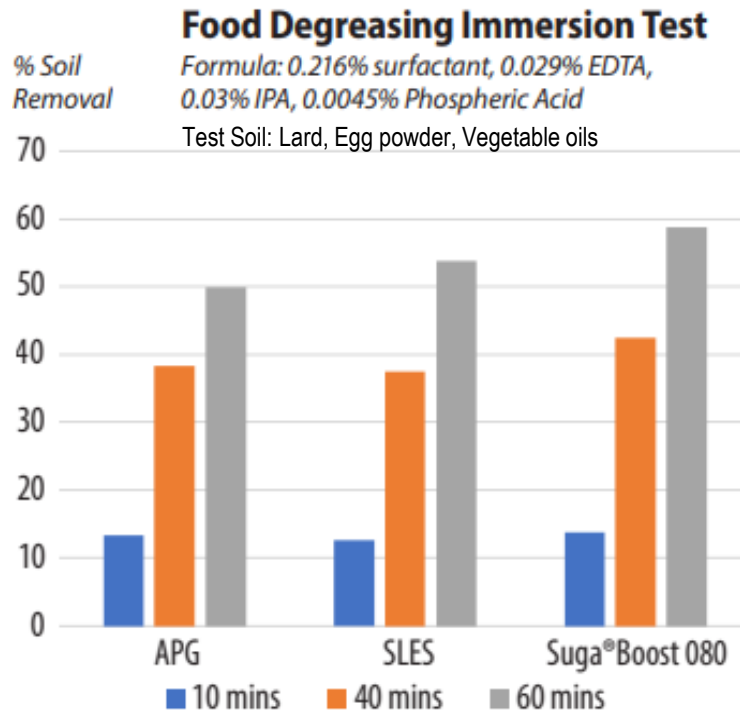
Naturally Derived Carpet Spot Remover

<i>Component Name</i>	<i>%</i>
Water	qs to 100.00
Suga[®]Boost 070	4.0
Cola[®]Lux LO	0.2
Hydrogen Peroxide, 30%	3.0

Suga®Boost 080 and Applications (Anionic/Nonionic Synergy)

Applications

- **Hand dish washing detergents** replacing SLES
- **Laundry** replacing AEO, etc
- **Hand Soaps** replacing SLS, DDBSA, etc



Natural Dishwashing Detergent

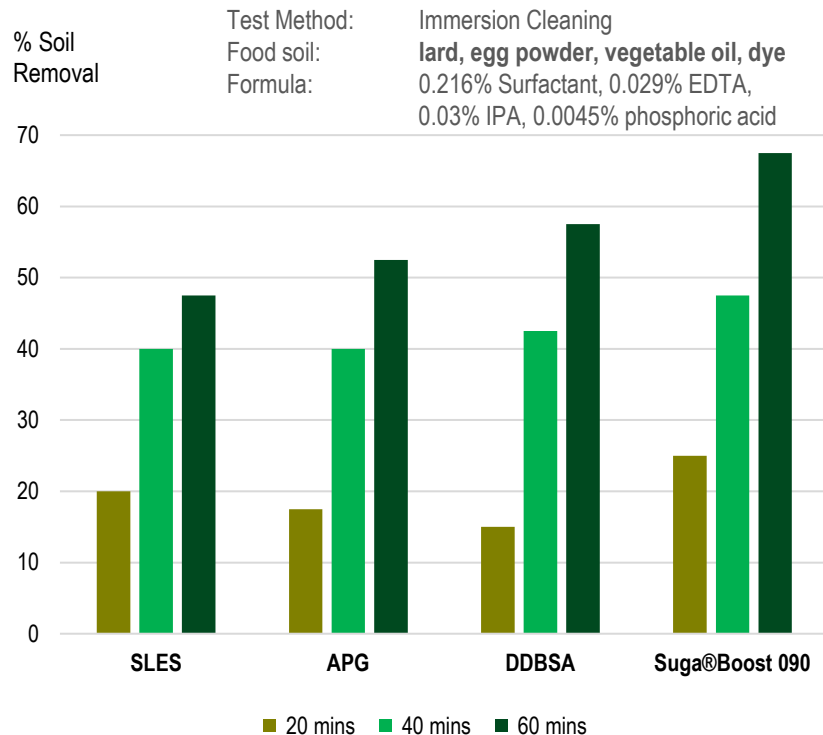
<i>Component Name</i>	<i>%</i>
Xanthan Gum	0.25
Glycerin	3.0
Dissolvine® GL47S	1.0
Suga®Boost 080	30.0
Cola®Lux LO	20.0
Citric Acid, 50%	qs to pH 6.5-7.5

4X Ultra Natural Laundry Detergent

<i>Component Name</i>	<i>%</i>
Suga®Boost 080	70.7
Cola®Lux LO	24.2
Propanediol	5.0
Citric Acid	q.s

Suga®Boost 090 and Applications (Anionic/Cationic Synergy)

Food Degreasing

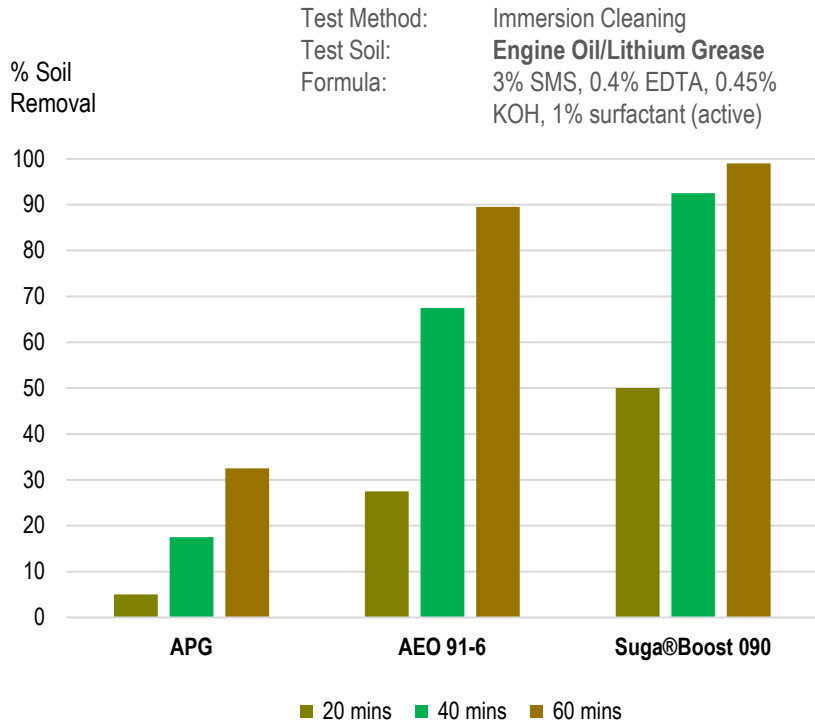


Suga®Boost 090

- Petroleum emulsification
- Secondary refinery
- Industrial lubrication
- Tea, coffee and other stain removers
- Personal care cleansing with conditioning

Suga®Boost 090 and Applications (Anionic/Cationic Synergy)

Industrial Degreasing



Suga®Boost 090

- Petroleum emulsification
- Secondary refinery
- Industrial lubrication
- Tea, coffee and other stain removers
- Personal care cleansing with conditioning

Dairy Cleaner

Component Name	%
Water	qs to 100.00
Cola[®]Teric AV	12.7
Suga[®]Boost 090	5.0
Cola[®]Cor 100	1.0
Citric Acid, 50%	1.5
Sodium Chloride	qs

Summary

Suga®Boost 030	Suga®Boost 050	Suga®Boost 070	Suga®Boost 080	Suga®Boost 090
Nonionic/Cationic	Nonionic/Anionic	Nonionic/Cationic	Nonionic/Anionic	Anionic/Cationic
Hard Surface Industrial Degreasing. Stain Removal	Laundry Hand Dish Hand Soap Exterior	Hard Surface Industrial Degreasing Stain Removal (Similar to 030)	Laundry Hand Dish (Similar to 050)	Industrial Petroleum Industrial lubrication (Unique)

Prices and Availability

- **Samples:** Readily available for request
- **TDS & SDS:** Ready to download from Colonial website
- **Packaging:** 450 lb drums and 2250 lb totes
- **Shelf Life:** 24 months
- **Initial Lead Time:** 4-6 weeks, shorter thereafter
- **Prices:** Available by end of August 25 (similar to Suga[®]Boost 030 and 050)

Thank you!

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Product TDS/SDS/Formulations: <https://www.colonialchem.com>

