Alkyl Polyglucosides (APG®)

Benefits of Glucopon®-Types in Hard Surface Cleaning

carechemicals

cognis

Alkyl Polyglucosides
Content

Chemical Structure

Product Overview of Cognis APG®

Product Properties

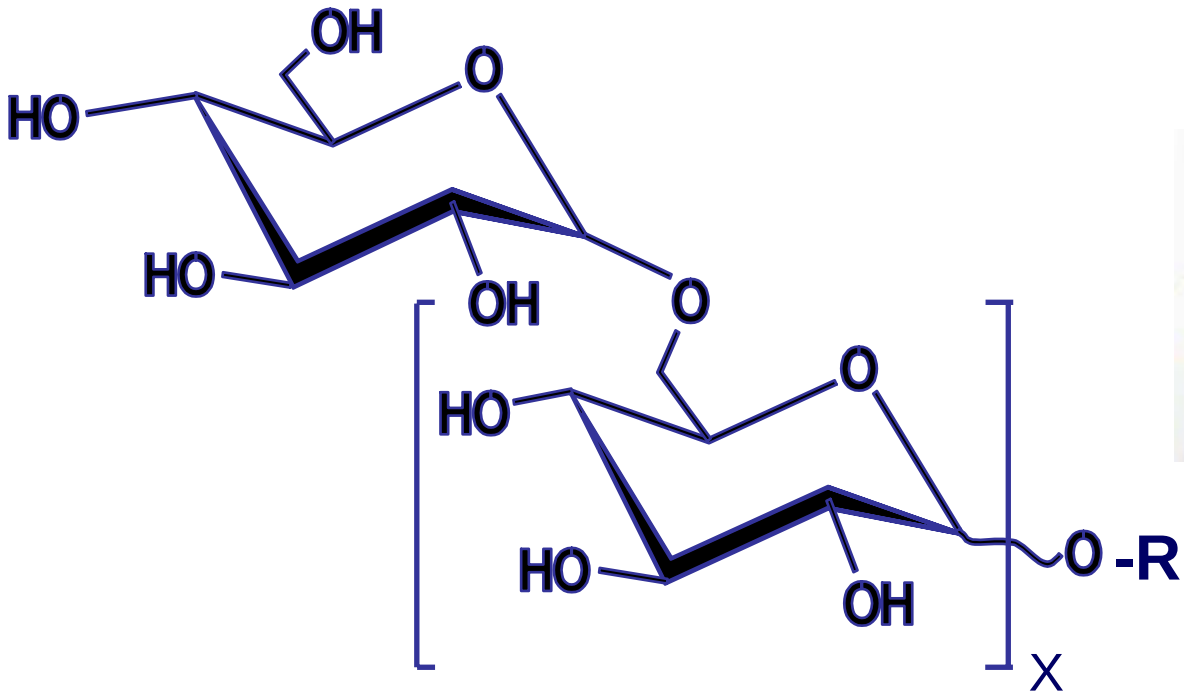
- Soil Removal
- Emulsifier Potential
- Plastic Compatibility
- Foaming Properties new
- Filming Properties new
- Anti-Streaking new
- Skin Compatibility

Summary

Alkyl Polyglucosides
Content

Alkyl Polyglucosides

Chemical Structure



R is based on natural, renewable resources

X = DP
DP = 1.3 – 1.7

Alkyl Polyglucosides
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Summary

Alkyl Polyglucosides

Cognis Glucopon®- Line for Home Care / I&I (EU Production)

	Glucopon® Line				
Product Properties	**215 CS UP**	**225 DK**	**425 N/HH**	**600 CS UP**	**650 EC**
C-Chain	C8-10	C8-10	C8-14	C12-14	C8-14
DP (approx.)	1,5	1,7	1,5	1,4	1,5
Appearance	yellowish, slightly cloudy liquid	brownish liquid	yellowish liquid	yellowish, slightly cloudy paste	yellowish, slightly cloudy liquid
Active substance [%]	62 - 65	68 - 72	48 - 52	50 - 53	50 - 53
Water content [%]	35 - 38	28 - 32	48 - 52	47 - 50	47 - 50
Viscosity	3.000 – 4.000 mPa.s, 20°C	3.500 – 5.000 mPa.s, 20°C	300 - 600 mPa.s, 20°C	2.000 – 4.000 mPa.s, 40°C	1.500 – 3.000 mPa.s, 20°C
pH value	11.5 - 12.5 (10%)	6.0 - 9.0 (10%)	7.0 - 9.5 (20%)	11.5 - 12.5 (20%)	11.5 - 12.5 (20%)
Storage Temperature [°C]	< 40°C	< 40°C	< 40°C	< 50°C	< 40°C
Biodegradation (OECD 301 A-F)	**readily**	**readily**	**readily**	**readily**	**readily**
Compliant with EU- Detergent Regulation	✓	✓	✓	✓	✓

Alkyl Polyglucosides

Cognis Glucopon®- Line for Home Care / I&I (US Production)

	APG®	Glucopon® Line				
Product Properties	**325 N**	**220 UP**	**225 DK**	**425 N**	**600 UP**	**625 UP**
C-Chain	C9-11	C8-10	C8-10	C8-14	C12-14	C12-14
DP (approx.)	1,5	1,5	1,7	1,5	1,4	1,6
Appearance	light yellow, clear liquid	hazy liquid	brown liquid	clear liquid	light yellow, hazy paste	light yellow, hazy paste
Active substance [%]	48 - 52	58 - 62	68 - 72	48 - 52	48 - 52	48 - 52
Water content [%]	42 - 48	42 - 38	28 - 32	42 - 48	42 - 48	42 - 48
Viscosity [cps,25°C]	4.000	2.800	4.800	550	18.000	21.500
pH value [10%]	7.0 - 9.5	11.5 - 12.5	6.0 - 8.0	7.0 - 9.5	11.5 - 12.5	11.5 - 12.5
Storage Temperature [°C]	<43°C					
Biodegradation (OECD 301 A-F)	**readily**	**readily**	**readily**	**readily**	**readily**	**readily**
Compliant with EU- Detergent Regulation	✓	✓	✓	✓	✓	✓

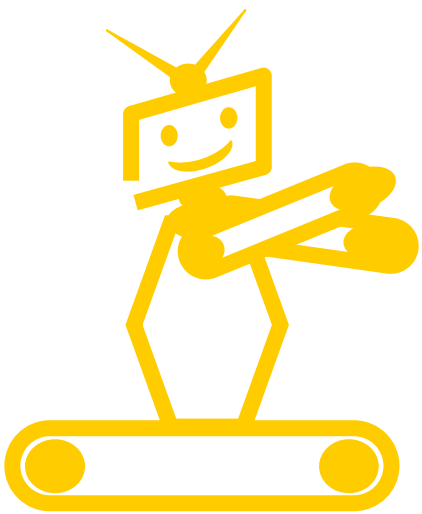
Alkyl Polyglucosides
Content

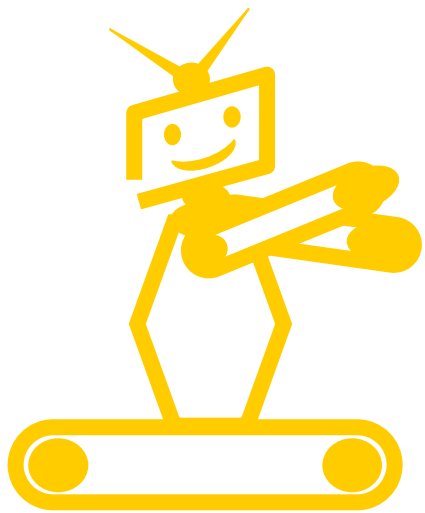
Alkyl Polyglucosides

Product Properties

Soil Removal

Testing of Cleaning Performance According to Gardner Method by Automatic Test Equipment.





Alkyl Polyglucosides

Product Properties

Soil Removal

Test Conditions for Automatic Test Equipment

Application of diluted solution of 2 % AM in water.

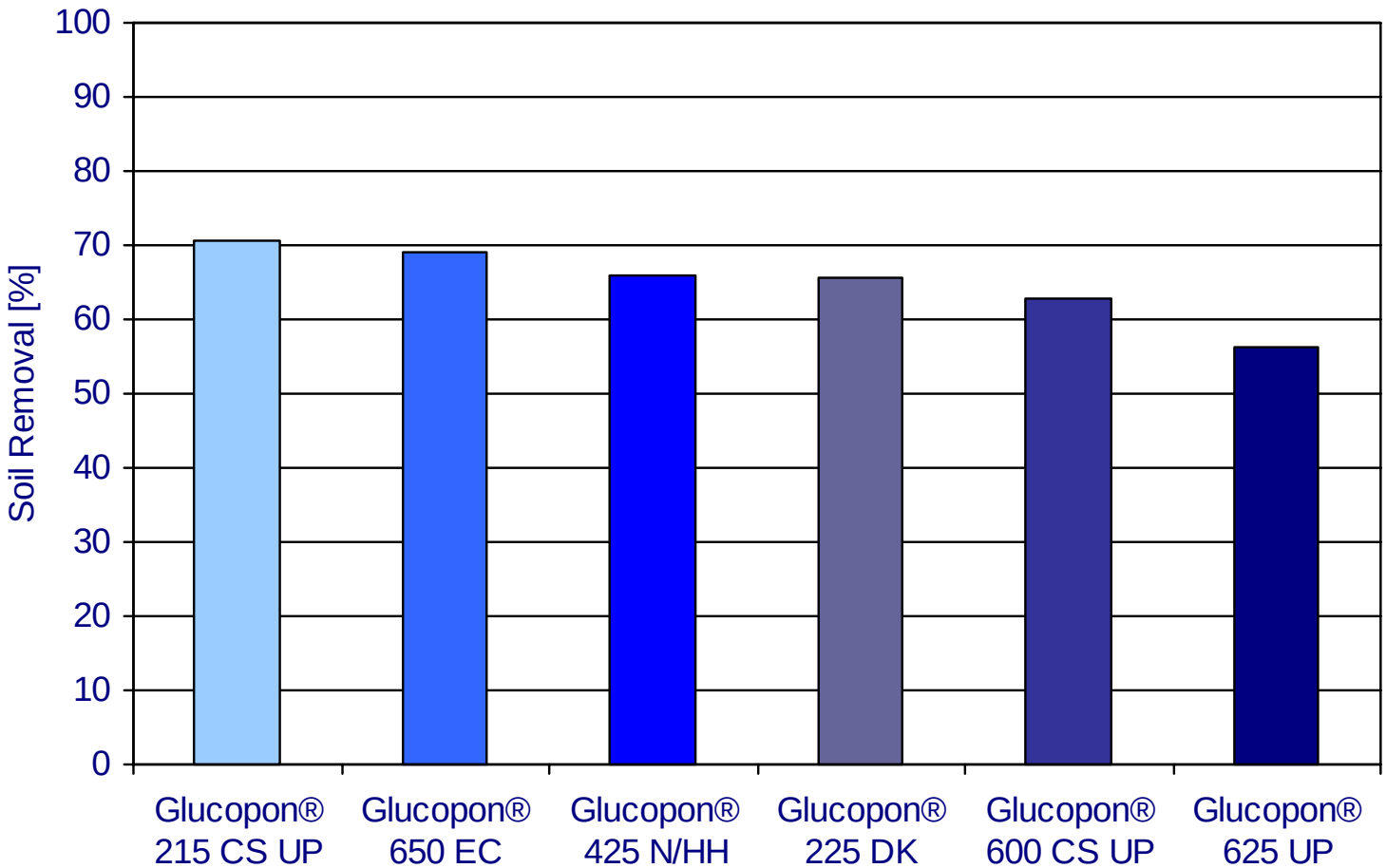
Soil for Diluted Application (83/21)

%	*Content*
17,0	Myritol 318 (caprylic / capric triglyceride)
40,0	Telura 310 (mineral oil, naphthenic)
36,0	Benzine (80/110)
7,0	Pigment Black 7 (Degussa Cl 77266)

Alkyl Polyglucosides

Product Properties

Soil Removal



Alkyl Polyglucosides
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Chemical Structure

Product Overview of Cognis APG®

Product Properties

- Soil Removal
- Emulsifier Potential
- Plastic Compatibility
- Foaming Properties
- Filming Properties
- Anti-Streaking
- Skin Compatibility

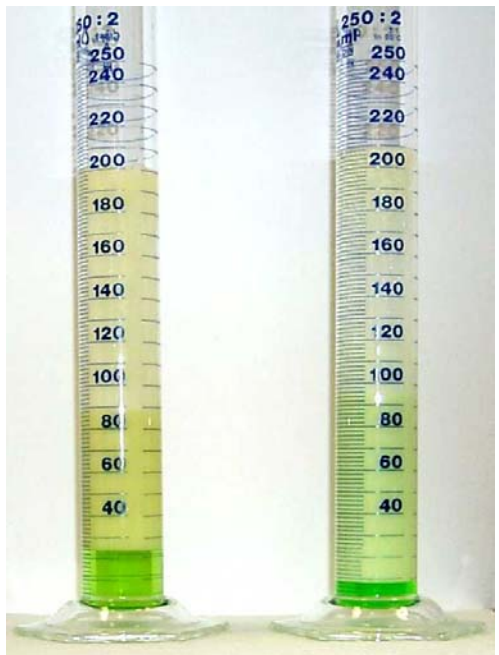
Summary

Alkyl Polyglucosides

Product Properties

Emulsifier Potential

Testing of Emulsification Properties by Observation of Mixture of Olive Oil and Surfactant Solution.



Test Method

50 ml of olive oil and 50 ml of surfactant solution (2% AM in water) is mixed 1200 +/-3 rpm for 2 minutes. After 1 and 4 hours observation of the level of remaining test solution.

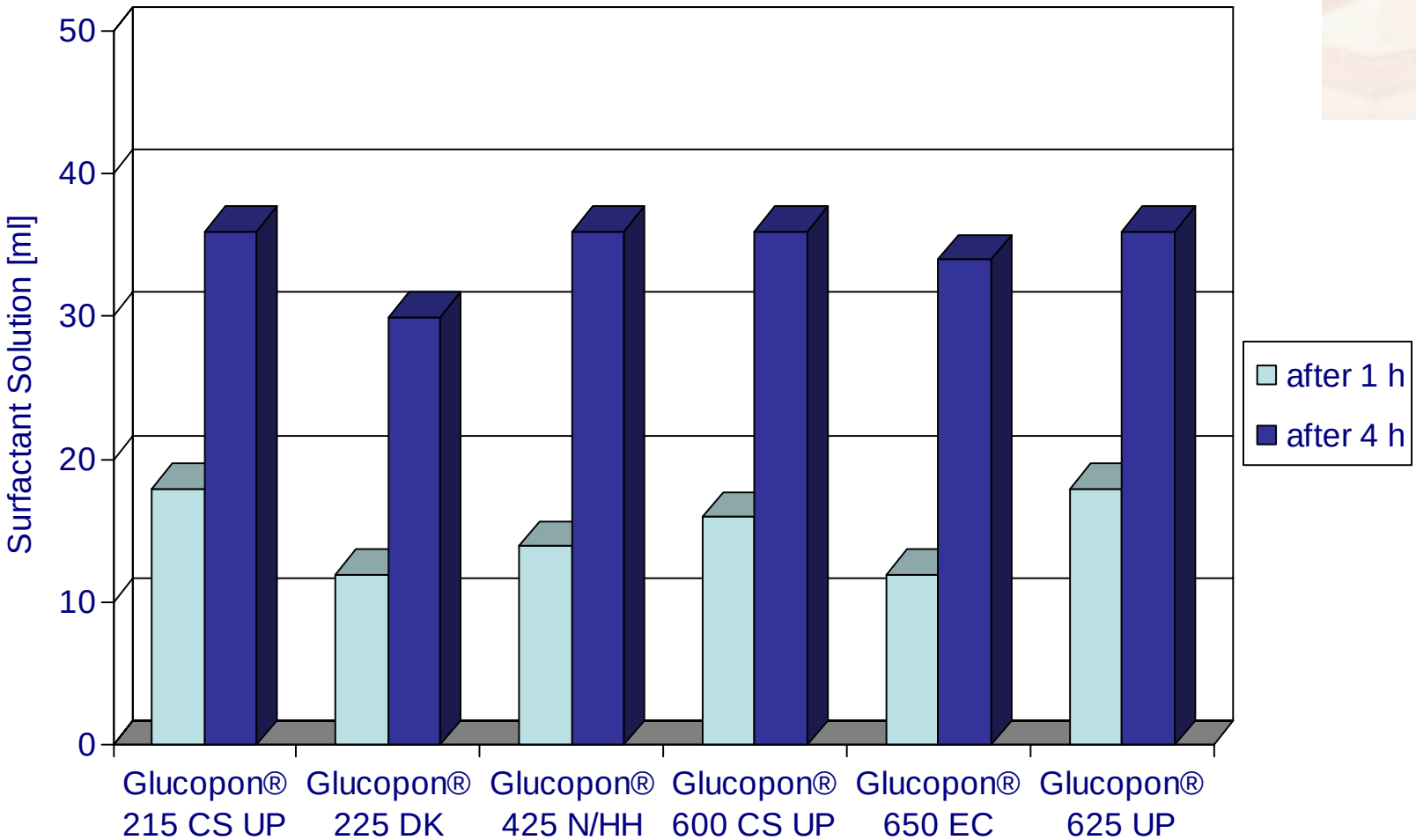
Principle

The lower the remaining level, the better the emulsification properties of the test solution.

Alkyl Polyglucosides

Product Properties

Emulsifier Potential



Alkyl Polyglucosides
Content

Alkyl Polyglucosides

Product Properties

Plastic Compatibility

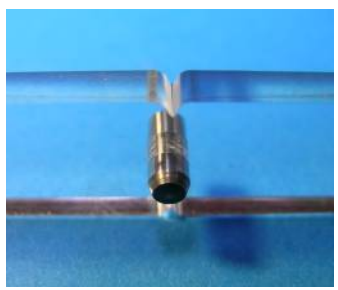
Testing of Plastic Compatibility Spline / Corrosion Test According to the Hansgrohe Method

Methodology

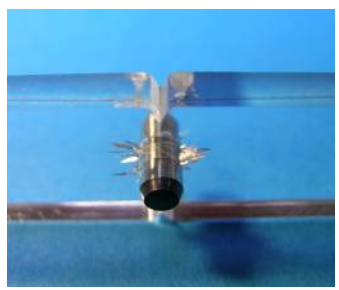
The plastic test stripe, containing a stainless steal pin in a hole (tension), is dipped five days in a row shortly into the test solution. The test strip is checked visually after

- 4 hours
- 3 days
- 7 days and
- 14 days test period.

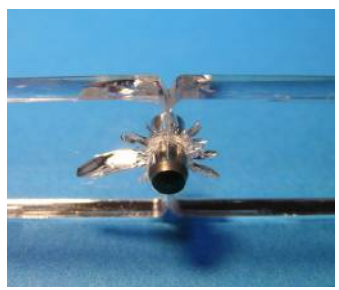
Assessment Range



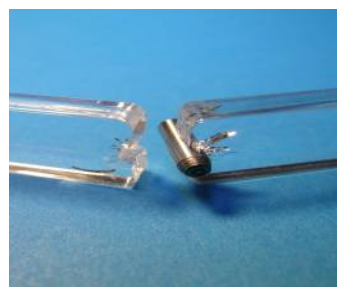
unchanged



fissures



through-cracks

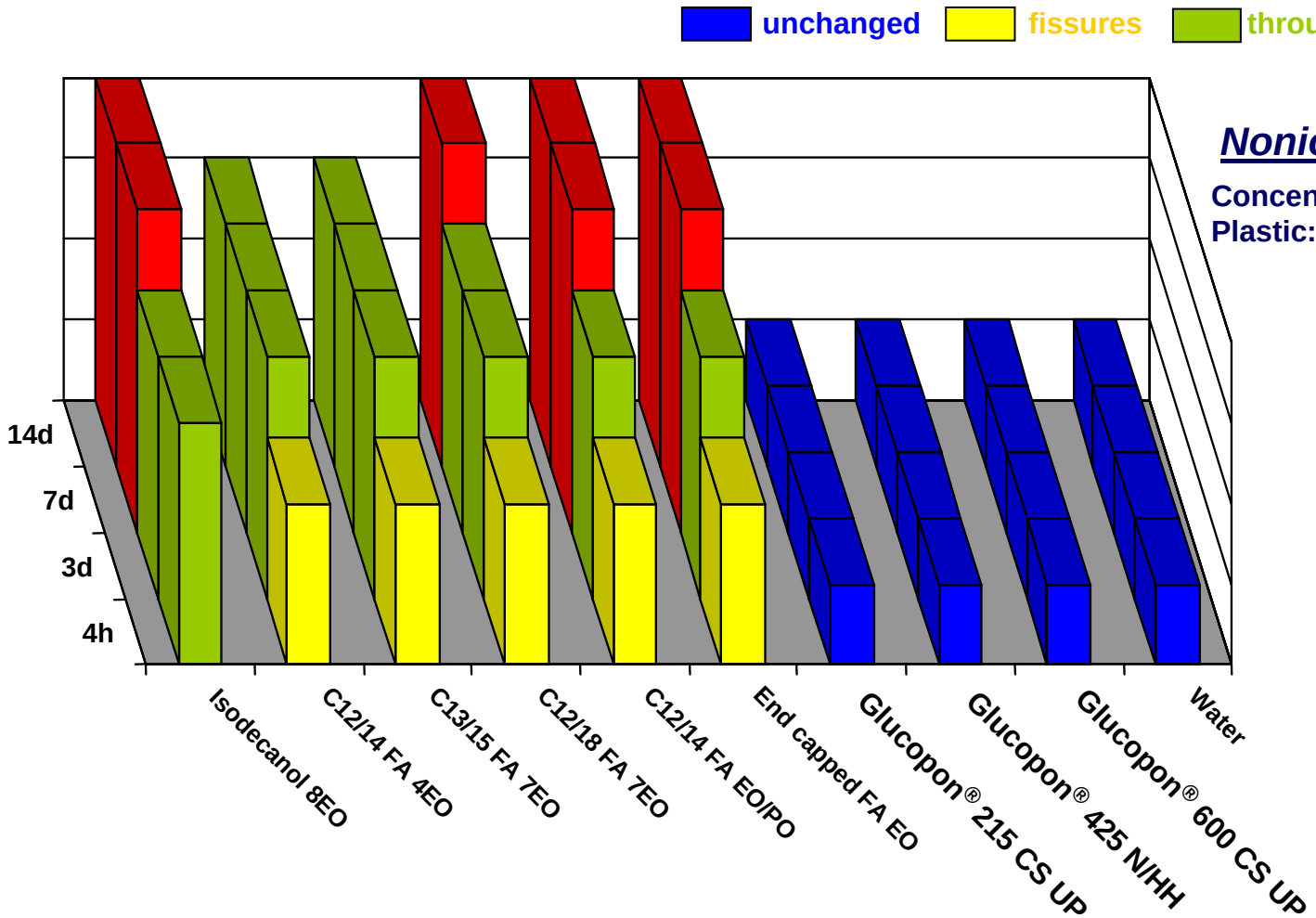


fraction

Alkyl Polyglucosides

Product Properties

Plastic Compatibility



Nonionic surfactants

Concentration: 5 % active substance
Plastic: Plexiglas (PMMA)

Alkyl Polyglucosides

Actual Adverts

Plastic Compatiblity

Plastic is a common element in nowadays households. APG® perfectly matches the necessity for plastic compatibility of household cleaner.

Alkyl Polyglucosides
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- Foaming Properties *new*
- Filming Properties
- Anti-Streaking
- Skin Compatibility

Summary

Alkyl Polyglucosides

Product Properties

Foaming Behavior

Test Conditions

Trigger spray application.
Formulations were tested on ceramic tiles.
Observation of foaming behavior without rinsing and wiping the test solution.

Time Intervals

- after application
- after 50 seconds
- after 2 minutes
- after 3 minutes

Comparative Foaming Test

Formulation 1		Formulation 2
with Fatty Alcohol Ethoxylate (FAEO)	**vs.**	with Glucopon® 215 CS UP

Alkyl Polyglucosides

Product Properties

Foaming Behavior

Used test formulations

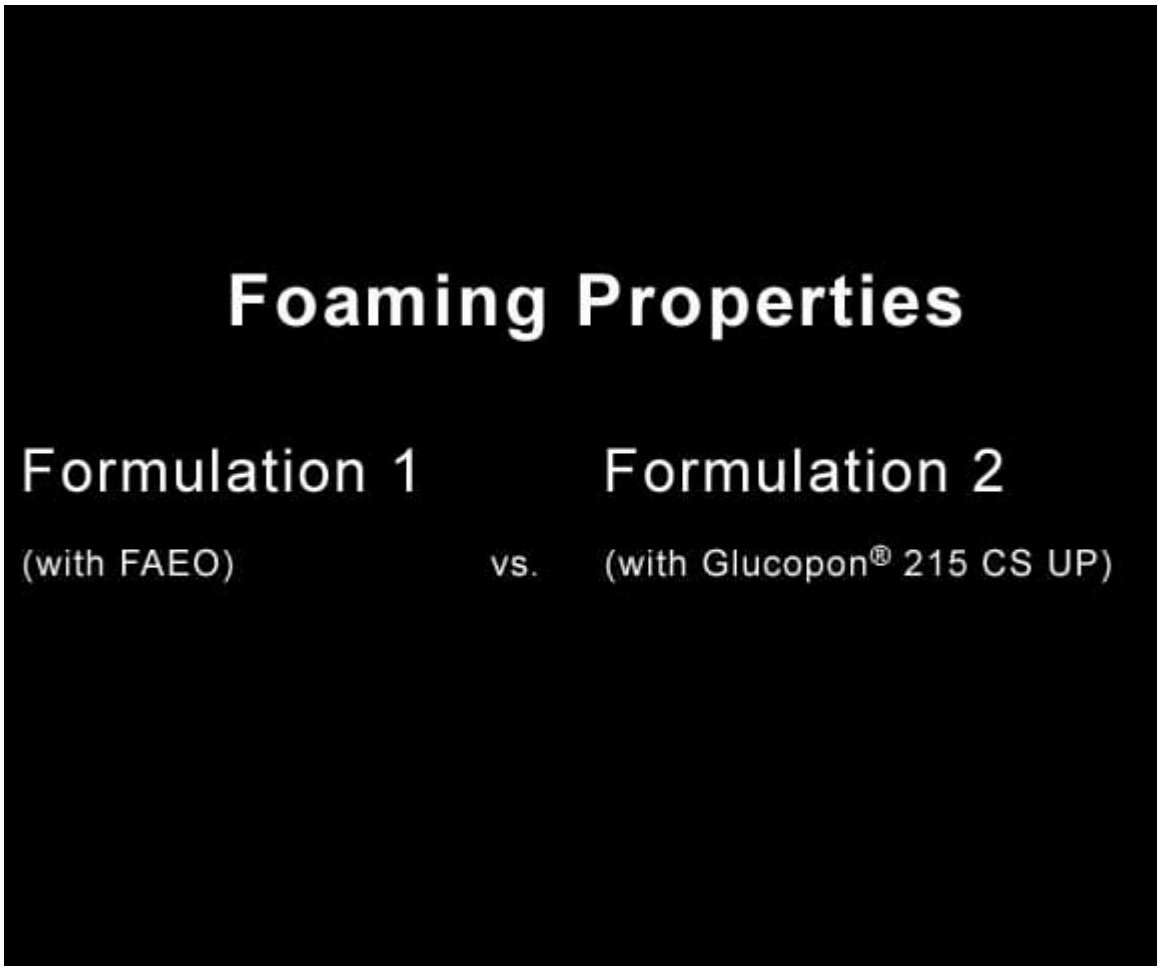
Ingredients	Formulation 1	Formulation 2
Fatty Alcohol Ethoxylate (C9-11, 8EO)	**2,0**	-
Glucopon® 215 CS UP	-	**3,0**
Citric Acid	4,0	4,0
NaOH (31%)	2,2	2,2
IPA (Isopropyl Alcohol)	2,0	2,0
Colour, Fragrance, Preservative	q.s	q.s.
De-ionized Water	add to 100	add to 100
Total Active Matter [%]	2	2

Both formulations are clear liquid in their appearance and have a pH value of 3.0 - 3.5.

Alkyl Polyglucosides

Product Properties

Foaming Behavior



Alkyl Polyglucosides

Product Properties

Foaming Behavior

Results

- Foaming behavior of formulation with Glucopon® 215 CS UP is better than the formulation containing FAEO. Foam is relatively stable throughout the tested time interval.

- Formulation with Glucopon® 215 CS UP left nearly no residues on ceramic tile after foam has finally disappeared, while the formulation with FAEO clearly left spots and stains of the test solution.

Alkyl Polyglucosides

Actual Adverts

Foaming Behavior

Stable foaming behavior of product to promote better cleaning properties

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- Filming Properties *new*
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- Skin Compatibility

Summary

Alkyl Polyglucosides

Product Properties

Filming Behavior

Test Conditions:

Tests were performed on ceramic tiles.

Observation of filming behavior by placing one drop of test solution and dispersing it on the surface with the same systematic.

Comparative Filming Tests:

I.	Formulation 1 with Glucopon® 215 CS UP	vs.	Formulation 2 with Sodium Alkane Sulfate (SAS)
II.	Formulation 1 with Glucopon® 215 CS UP	vs.	Formulation 3 with Sodium Lauryl Ether Sulfate (SLES)
III.	Formulation 1 with Glucopon® 215 CS UP	vs.	Formulation 4 with Fatty Alcohol Ethoxylate (FAEO)
IV.	Formulation 1 with Glucopon® 215 CS UP	vs.	Formulation 5 with Alkyl Polyglucoside (APG®)

Alkyl Polyglucosides

Product Properties

Filming Behavior

Used test formulations

Ingredients (% AM)	Formulation 1	Formulation 2	Formulation 3	Formulation 4	Formulation 5
Glucopon® 215 CS UP **Alkyl Poly Glucoside (APG®)**	**3,1**	-	-	-	-
Sodium Alkane Sulfate (SAS)	-	**3,3**	-	-	-
Texapon® N 70 **Sodium Lauryl Ether Sulfate (SLES)**	-	-	**2,8**	-	-
Fatty Alcohol Ethoxylate (FAEO) with 8 EO	-	-	-	**2,0**	-
Glucopon® 650 EC **Alkyl Poly Glucoside (APG®)**	-	-	-	-	**3,6**
IPA (Isopropanol Alcohol)	3,0	3,0	3,0	3,0	3,0
Water	93,9	93,7	94,2	95,0	93,4
Dye	q.s.	q.s.	q.s.	q.s.	q.s.
Total Active Matter [%]	2	2	2	2	2

All formulations have a pH value of 7.0 – 8.0.

Alkyl Polyglucosides

Product Properties

Filming Behavior

Filming Properties

Formulation 1		Formulation 2
(with Glucopon® 215 CS UP)	VS.	(with SAS)

Alkyl Polyglucosides

Product Properties

Filming Behavior

Results

Formulation with Glucopon® 215 CS UP shows the best filming behavior. The test formulation spreads equally on the surface / ceramic tile.

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- Soil Removal
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- Plastic Compatibility
- Foaming Properties
- Filming Properties
- Anti-Streaking new
- Skin Compatibility

Summary

Alkyl Polyglucosides

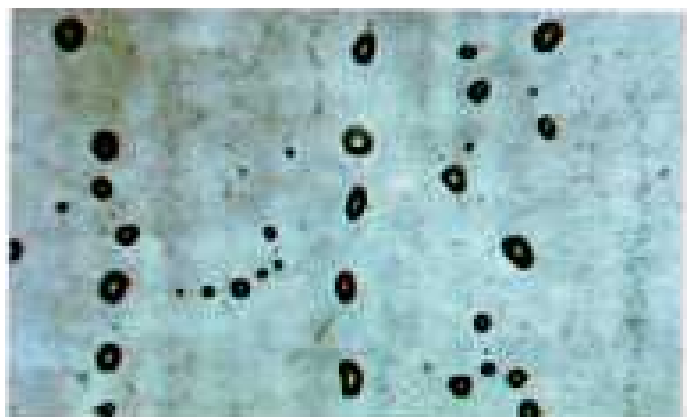
Product Properties

Anti - Streaking

Visibility of Residues

- Streaks are drops of surfactant aligned in rows.
- Streaks / droplets are always present on the treated surface.
- Constant / streak free films exhibit significantly smaller droplets.

APG® on glass, 10x



FAEO on glass, 10x

Alkyl Polyglucosides

Product Properties

Anti-Streaking

Comparative Anti-Streaking Test:

Formulation 1		Formulation 2
with Fatty Alcohol Ethoxylate (FAEO)	vs.	with Glucopon® 215 CS UP

Test Conditions:

Trigger spray application.

Formulations were tested on ceramic tiles.

Observation of streaking behavior by wiping the surface after application of the test solution.

Alkyl Polyglucosides

Product Properties

Anti-Streaking

Used test formulations

Ingredients	Formulation 1	Formulation 2
Fatty Alcohol Ethoxylate (C9-11, 8EO)	**2,0**	-
Glucopon® 215 CS UP	-	**3,0**
Citric Acid	4,0	4,0
NaOH (31%)	2,2	2,2
IPA (Isopropyl Alcohol)	2,0	2,0
Colour, Fragrance, Preservative	q.s	q.s.
De-ionized Water	add to 100	add to 100
Total Active Matter [%]	2	2

Both formulations are clear liquid in their appearance and have a pH-value of 3.0 - 3.5.

Alkyl Polyglucosides

Product Properties

Anti-Streaking

Streak-free Cleaning

Formulation 1		Formulation 2
(with FAEO)	vs.	(with Glucopon® 215 CS UP)

Alkyl Polyglucosides

Product Properties

Anti-Streaking

Results

- Formulation with Glucopon® 215 CS UP has better anti-streaking effects thatn the formulation containing FAEO.
- Formulation with Glucopon® 215 CS UP leaves nearly no streaks on ceramic tile after wiping, while the formulation with FAEO left clearly spots and stains of the test solution.

Alkyl Polyglucosides

Actual Adverts

Anti-Streaking

Anti-Streaking properties of window cleaner for easy cleaning and more convenience.

Alkyl Polyglucosides
Content

Alkyl Polyglucosides

Product Properties

Skin Compatibility (I)

Test Method:

Arm Flex Wash Test

Tested Surfactants:

1 = Sodium Lauryl Ether Sulfate (FAES)

2 = Sodium Lauryl Ether Sulfate : Decyl Glucoside (APG®) (3:1)

APG®: Glucopon® 600 CSUP

FAES: Texapon® NSO

Test Conditions:

Mode of Application: open, two times per day, for 30 seconds

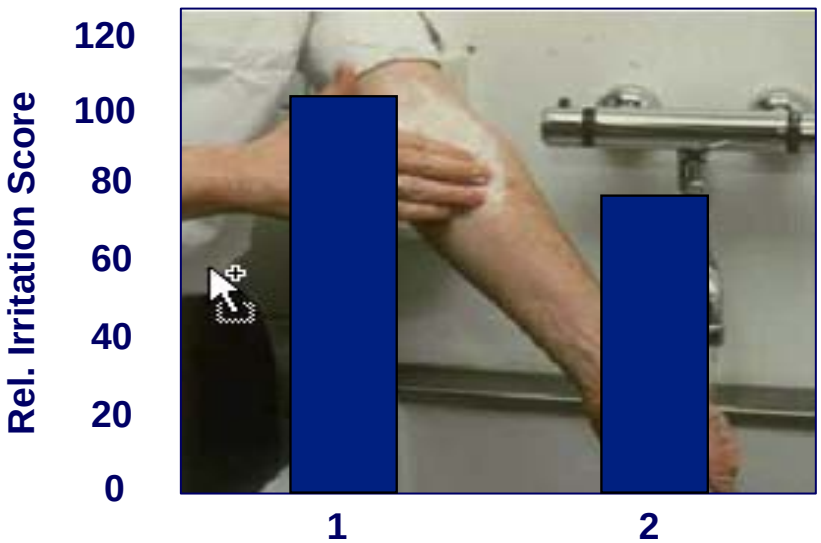
The concentration of the test solution was 1% active substance.

Alkyl Polyglucosides

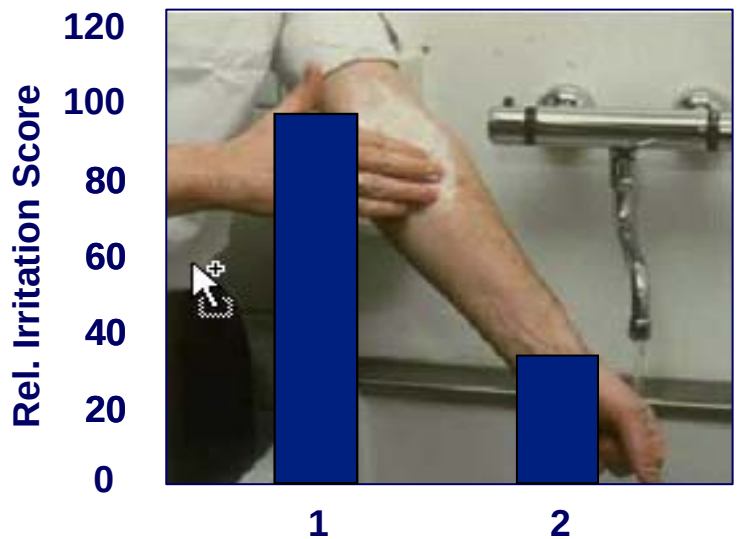
Product Properties

Skin Compatibility (I)

Erythema



Sensorial evaluation



Alkyl Polyglucosides

Product Properties

Skin Compatibility (II)

Test Method:

Modified Duhring - Chamber Test

Tested Surfactants:

- Alkyl Poly Glucoside - APG®
- Linear Alkylbenzene Sulphonate - LAS
- Fatty Alcohol Ether Sulfate - FAES
- Sodium Alkene Sulfate - SAS
- Fatty Alcohol Sulfate – FAS
- Mixtures of other surfactants with APG®

Test Conditions:

20 subjects (male and female).

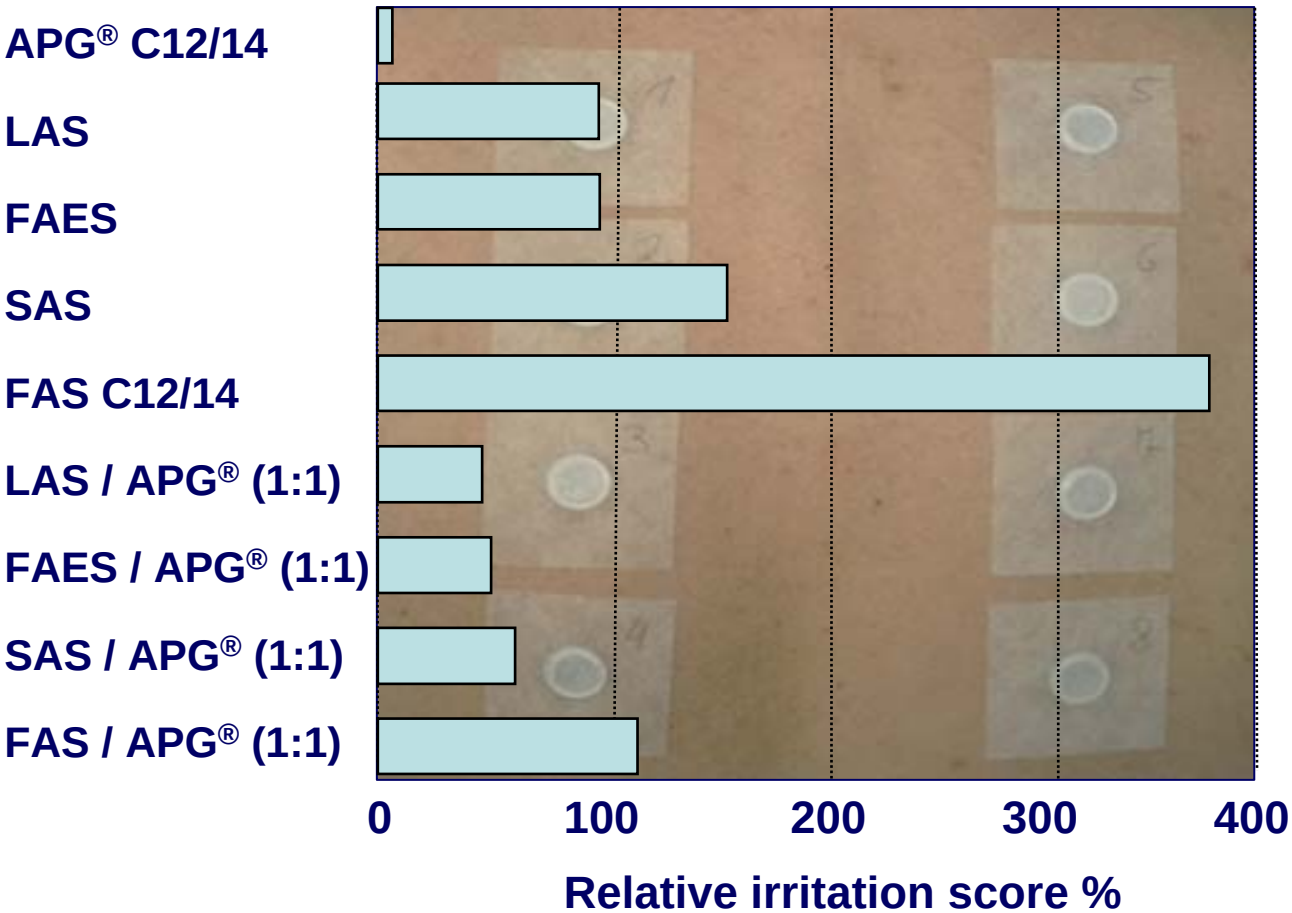
Mode of Application: once, occlusive, for 24 hours

The concentration of the test solution was 1% active substance.

Alkyl Polyglucosides

Product Properties

Skin Compatibility (II)



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Summary

Alkyl Polyglucosides
Summary

- Excellent cleaning performance.
- Perfect plastic compatibility by showing no stress-cracking behavior.
- Foaming properties of Glucopon® are significantly better than these of FAEO – not only when being applied on a surface, but also afterwards.
- Tests show the excellent filming behavior of Glucopon® -types in contrast to other nonionic surfactants by equally covering the surface / spreading over the surface.
- Significant anti-streaking properties of Glucopon® is proven by wiping the surface after application of the test solution. No streaks on the treated surface.
- Glucopon® surfactants are significantly less skin irritating than comparable nonionic surfactants. Moreover Glucopon® has the property to even reduce the skin irritation factor of other surfactants when being used in combination. Perfect mildness to skin.


cognis.
we know how