



«AMYLOMER» Products



GRÄFECHEMIE

ADDITIVES FROM PLANT-BASED RAW MATERIALS



Outline



1. Introduction
Gräfe Chemie



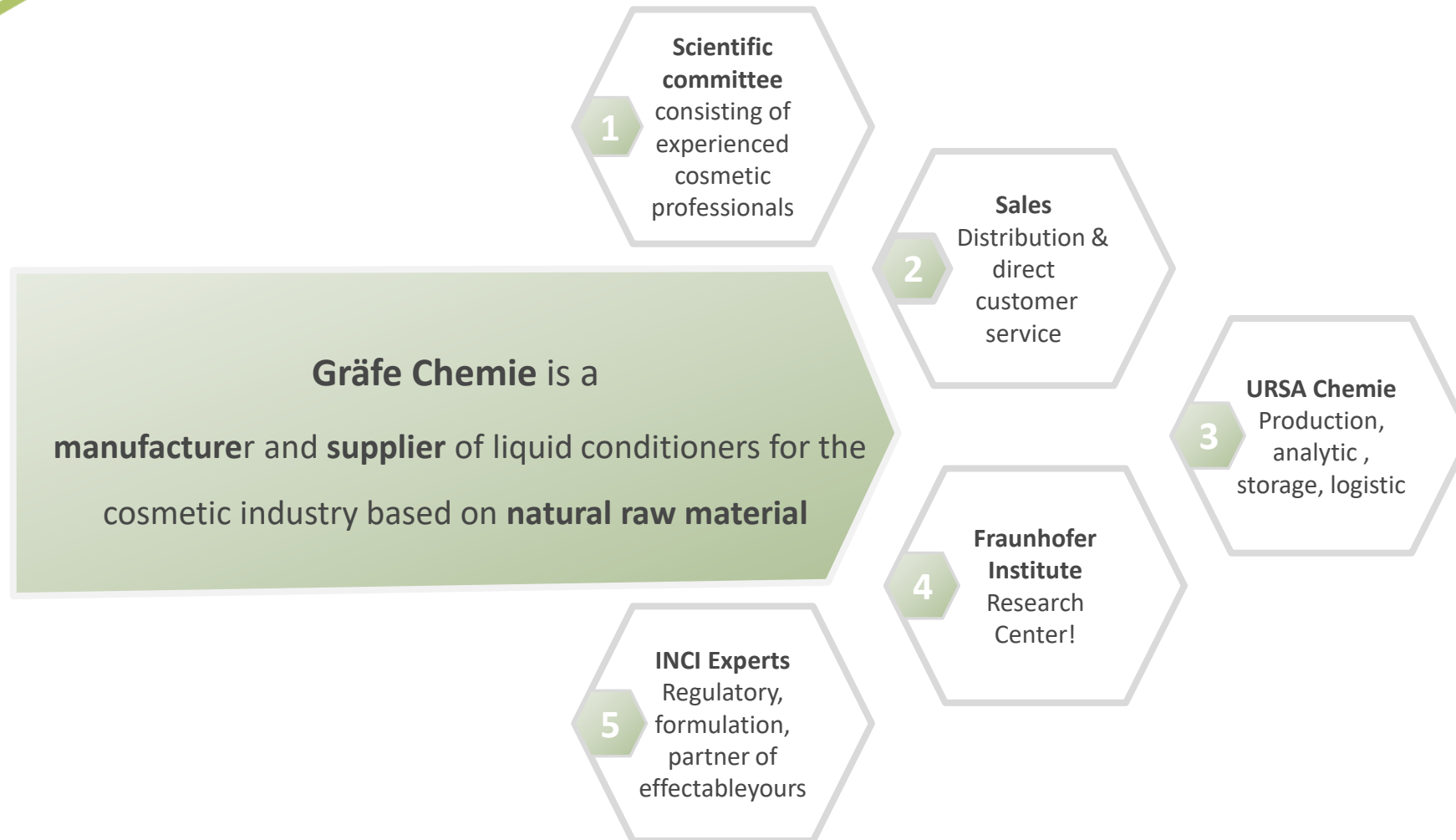
2. What are
Amylomer-Products?



3. AMYLOMER
Results



Gräfe Chemie GmbH





Amylomer™ - Starch Special Features

Amylomer is **very versatile** due to different modifications that allow to meet the consumer's needs as well as cosmetic acceptance criteria.



Special feature

Charge

- Non-Ionic, Anionic, **Cationic**

Modification

- Ether and/or ester groups

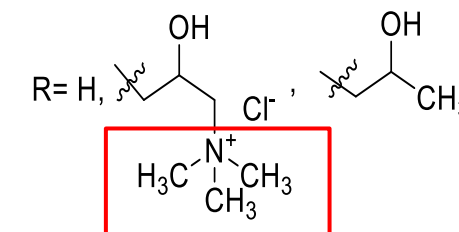
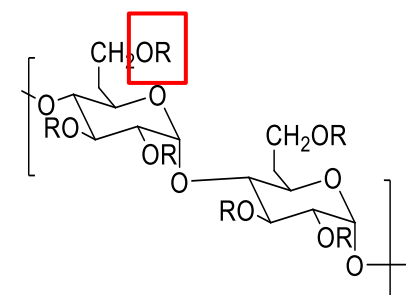
Degree and type of substitution

- 0,2 – 0,75

Molecular weight

- Very low to very high

Raw Material: potato starch +



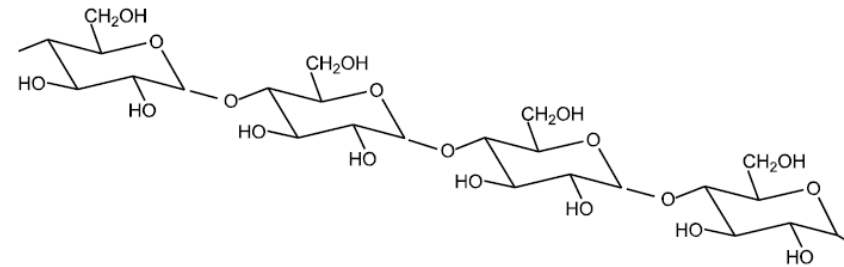


Amylomer-Starch-Products

Starch is based on amylopectin and amylose.

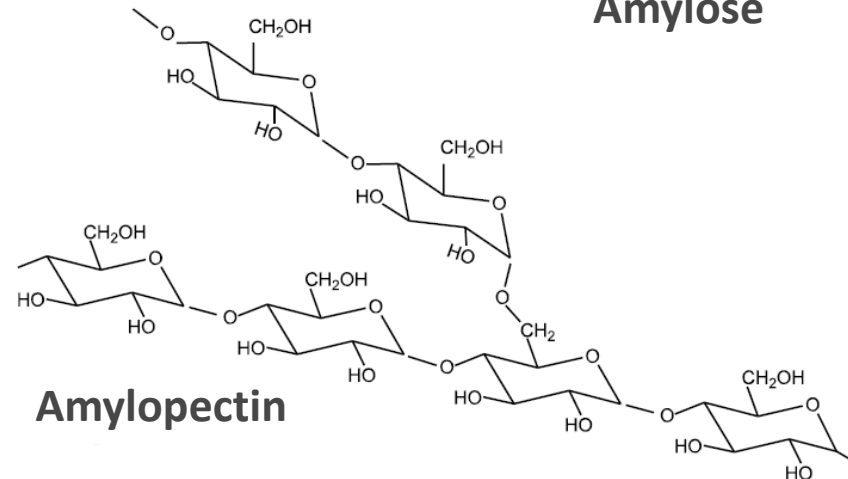
Depending on the modification, the respective proportions may vary.

Generally the proportion is 30% amylose and 70% amylopectin.



Amylose

Amylose linear
 α 1,4 glycosidically
linked



Amylopectin

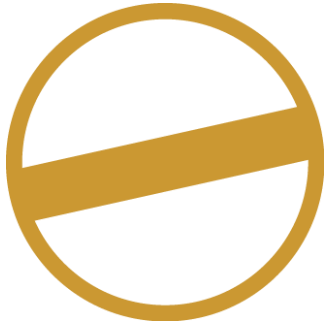
Amylopectin branched
 α 1,6 glycosidically
linked



Why AMYLOMER™ products?

from plant-based raw materials*

- *Declaration according to:
- gluten
 - halal
 - GMO
 - nanoparticles
 - vegan
 - origin



No parabens · alcohol · animal testing · GMO · microplastic free



Products are organic · sustainable · non-toxic





Benefits of Amylomer-Products In Hair, Body and Skin Cleansing

Fine / Stable Foam

- Improves foam quality and texture
- Improves foam stability
- Prevents hair from mechanical damage
- Reduces scalp irritation from surfactants

Sensory

- Improves finger combability (Shampoos, Rinse-Off, wet and dry hair)
- Gives sensorial feel
- Gives the hair more grip
- Protects hair from chemical damage by surfactants

Conditioner Effects/Treatment

- Gives sensorial feel (light to rich)
- Makes the hair easier to comb without weighing it down
- Prevents build up
- Protects hair from damage by hair dryer

Hair Styling

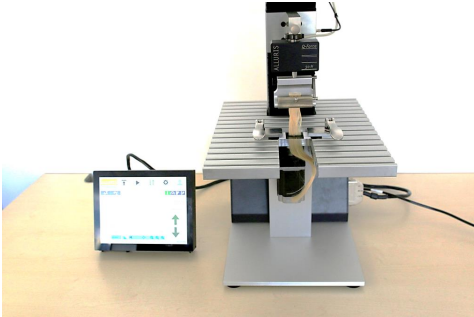
- Gives conditioning effect to hair
- More flexibility
- Gives sensorial feel



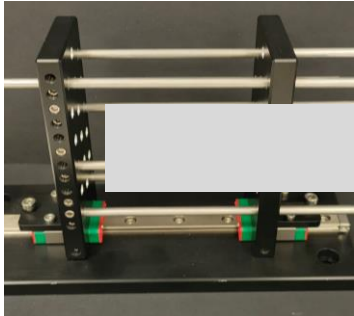
Methods to proof the performance



Objective Measurement



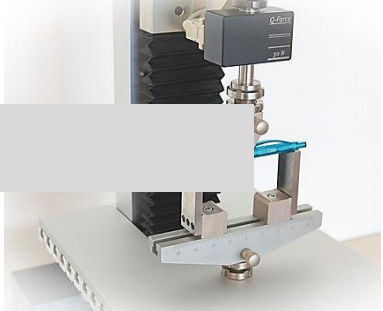
Combing force



Suppleness




Frictional force




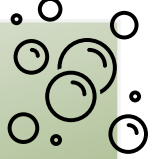
Bending strenght

Work in process

Subjective Measurement

Curl Retention 

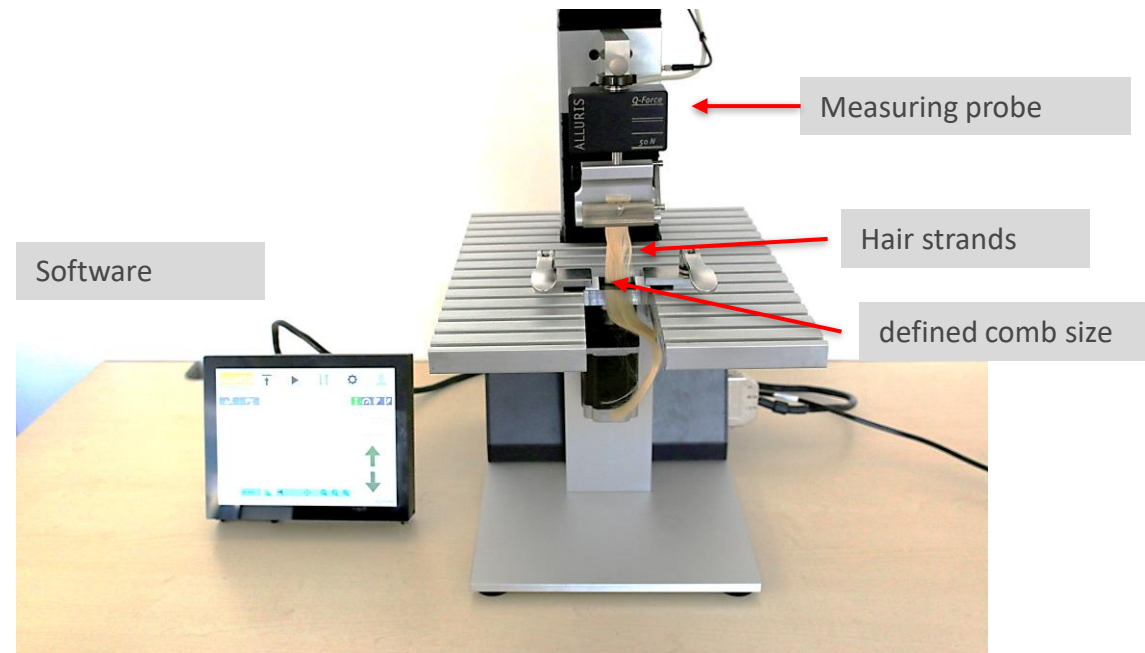
Feeling 

Foam quality 



Combing Force

Evaluated Methods

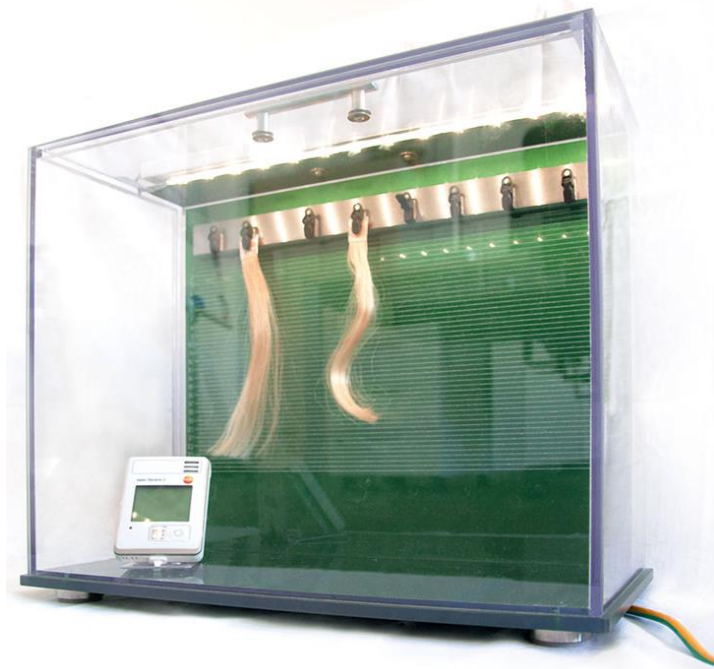


Combing force- in wet and dry hair



Curl Retention Method

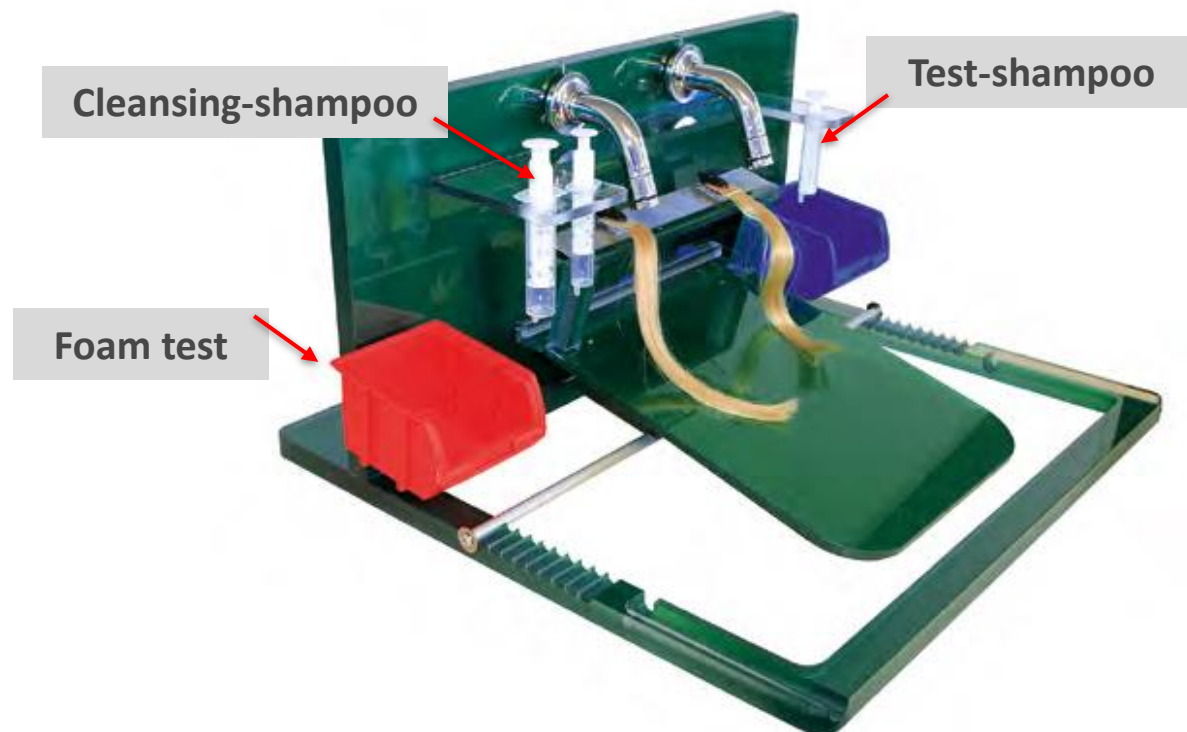
Evaluation Methods



- Left: Climate Chamber
 - Curl Retention Method – Length measurement of hair strands treated with different conditioner



Synchronious Wash Basin Evaluation Methods



Synchronious wash basein - initiates a half page comparison



Lather Quality- Hart De-Georg Blender Method

Evaluation Methods

Hart De-Georg Blender Method

- Place the letter drainage apparatus on the top of a beaker.
- A 200mL body wash/shampooing solution is agitated in a blender for one minute.
- The foam is then poured into a funnel placed on a sieve.
- Record the time from the Initiation of the pouring until the metal wire can be seen. This time is the drainage time.





Foam Volume And Stability Evaluation Methods

Flash Foam Method (modified from Gräfe-Chemie)

- 10 grams of a 10% solution of body wash/shampoo are added to 90 grams of water (1:10).
- The solution is agitated for 10 seconds (1400 rpm/s).
- The foam is poured into a 250 mL graduated beaker (Ø 60mm, 120 mm high) and the volume is measured. (flash foam)
- After 5 minutes the position of the foam water interface and the foam volume are recorded. (Ultimate Foam)





Amylomer Product Portfolio

Amylomer Products



Cationic Amylomer
(STARCH Hydroxypropyl-
Trimonium Chloride)

CAT 531

CAT 531 AS+

Care 25

Cationic Amylomer
(STARCH Hydroxypropyl-PG-
Trimonium Chloride)

HA-CAT 75

HA-CAT 005

Non-Ionic Amylomer
(Sodium Hydroxypropyl Oxidized
STARCH Succinate)

HA-NI

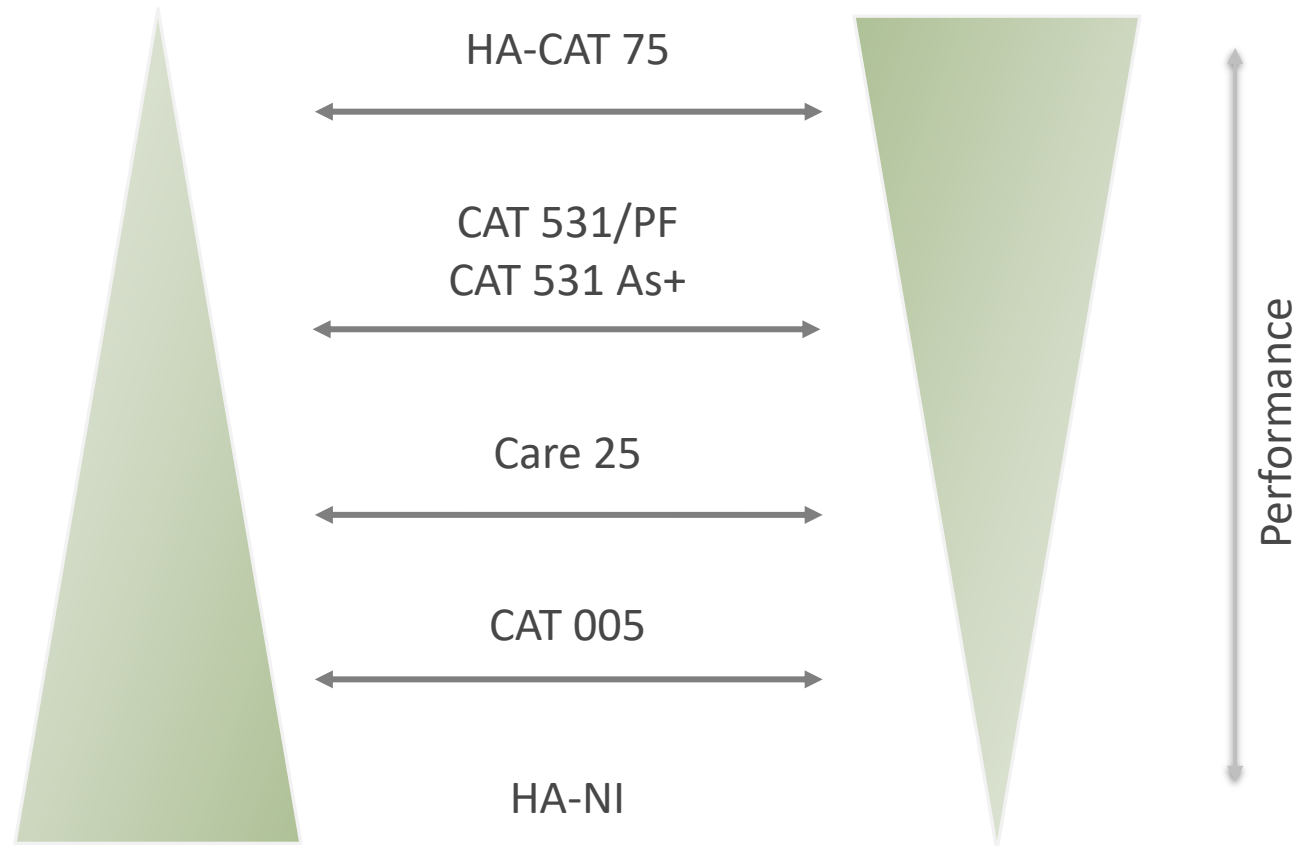




Amylomer Range

Biodegradability

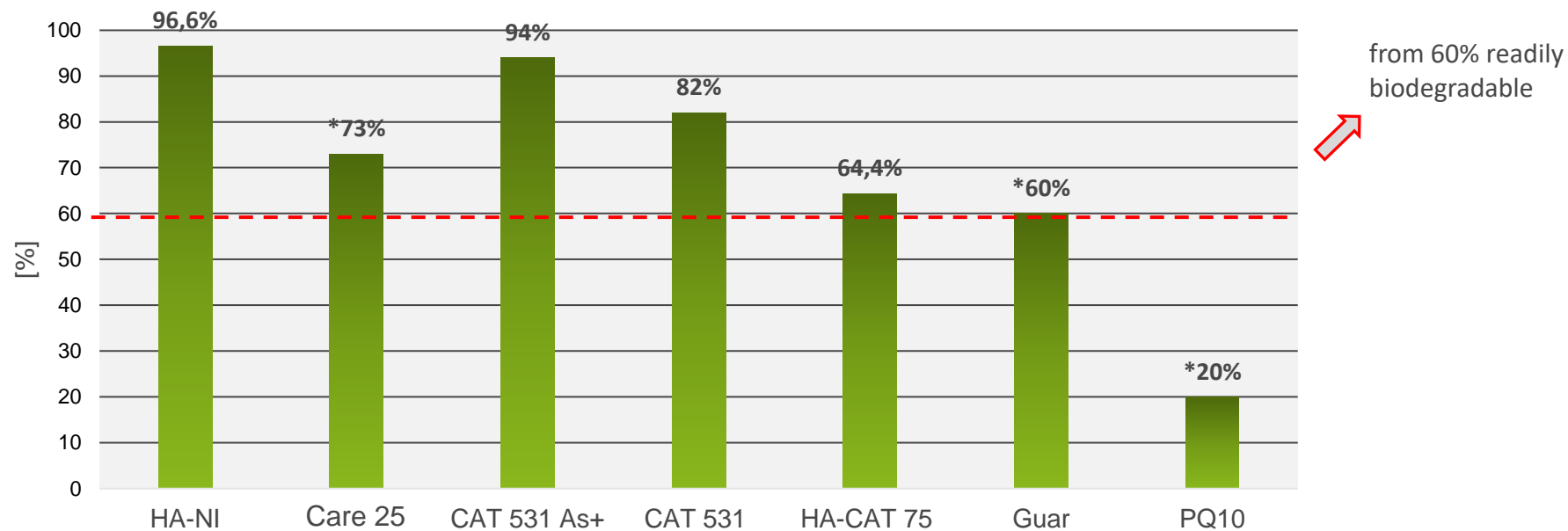
DS-Value





Biodegradability

Biodegradeability Amylomer products vs.
Guar HP and PQ 10



*Guar and PQ from external research

*Amylomer Care 25 OECD 301F

Biodegradability according to OECD 308B (Zahn-Wellens-test)





Amylomer

Product Portfolio



Cationic Amylomer
(STARCH Hydroxypropyl-
Trimonium Chloride)

CAT 531

CAT 531 AS+

Amylomer Care25

Cationic Amylomer
(STARCH Hydroxypropyl-PG-
Trimonium Chloride)

HA-CAT 75

HA-CAT 005

Non-Ionic Amylomer
(Sodium Hydroxypropyl Oxidized
STARCH Succinate)

HA-NI





Amylomer Difference



Amylomer CAT 531 Specification

Appearance	Clear to slightly hazy Liquid
Active content	20%
Cationic D.S.	~ 0,5
Molecular Weight	~1400-2200 kDa
Good aquatox OECD	Good
Natural Index ISO 16128	93,64%



Amylomer CAT 531 AS+ Specification

Appearance	Light Opaque
Active content	~ 22 %
Cationic D.S.	~ 0,5
Molecular Weight	~5700kDa
Good aquatox OECD	Good
Natural Index ISO 16128	93,64 %



Amylomer Care25/PF Specification

Appearance	Yellowish, hazy
Active content	~ 20 %
Cationic D.S.	~ 0,25
Molecular Weight	~1800 kDa
Good aquatox OECD	Good
Natural Index ISO 16128	93 %

- ⇒ The Application concentration is 0,5 -2 %
- ⇒ Add in any production step / cold process

- ⇒ Compatible with salt
- ⇒ Transparent formulas

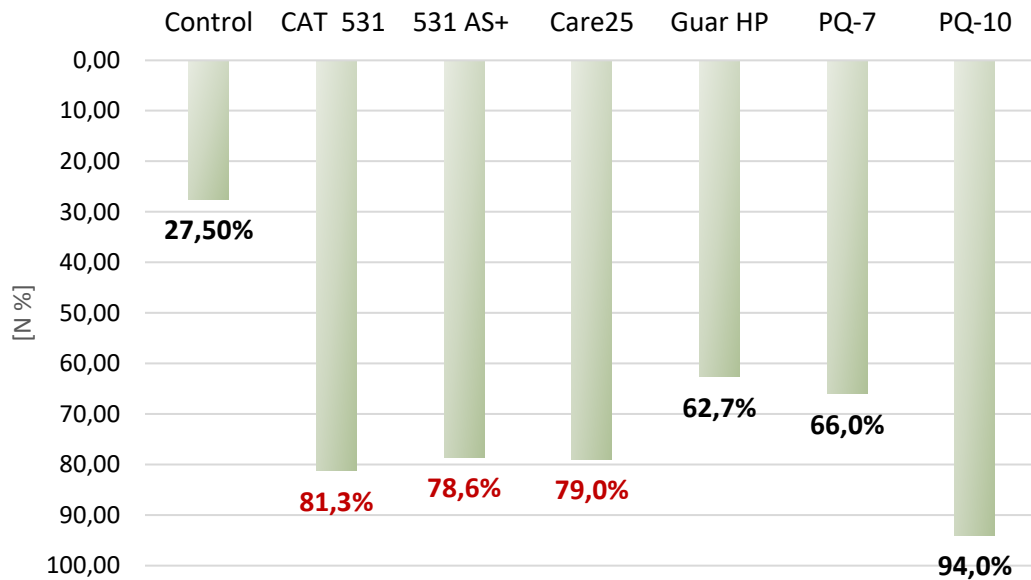


Combing Force Results

CAT 531, CAT 531 AS+ and Care25

Combing force in wet hair

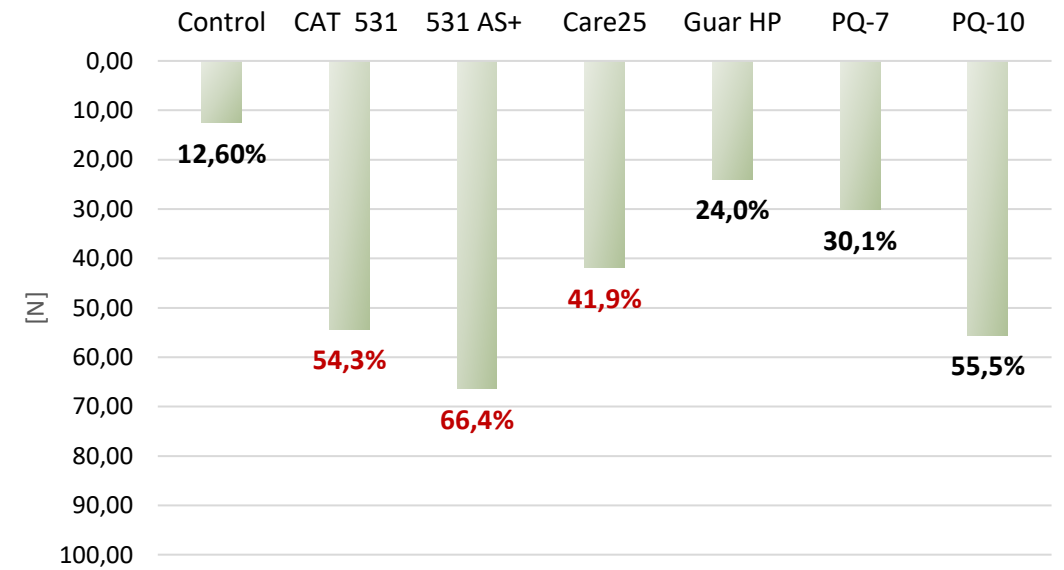
Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



CAT 531 and Care25 shows the most combing reduction in wet hair

Combing force in dry hair

Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



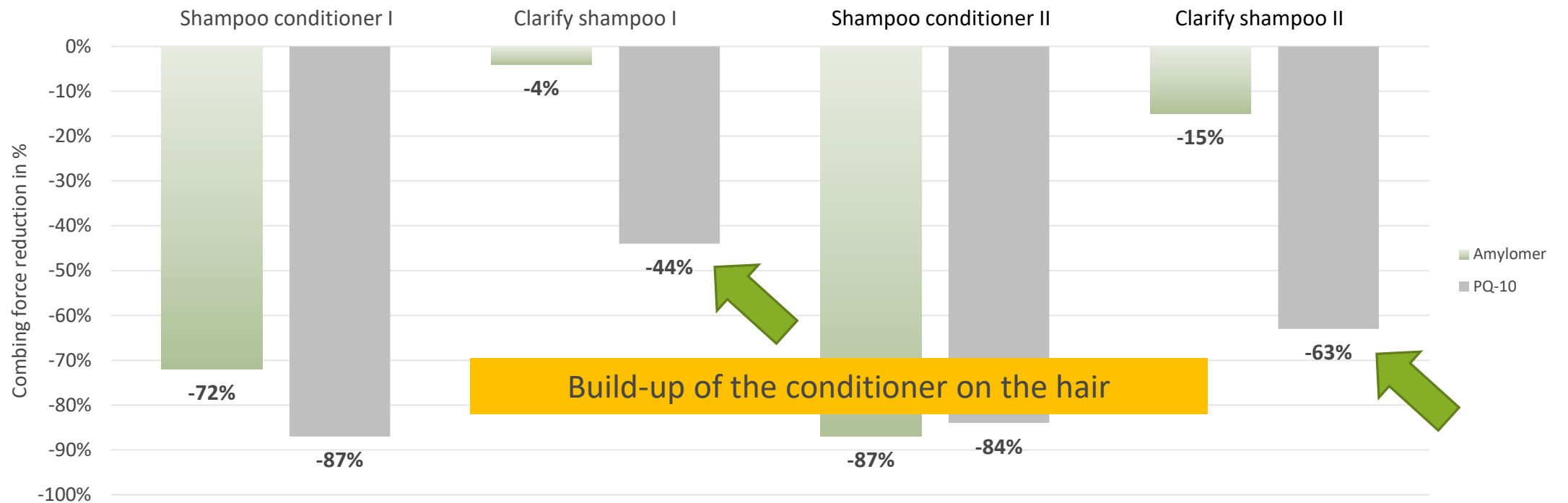
CAT 531 AS+ shows the most combing reduction in dry hair



Build-Up Effect

Differences of Amylomer vs. Polyquaternium-10

Washing Test: film formation and film removal of Amylomer vs. PQ 10



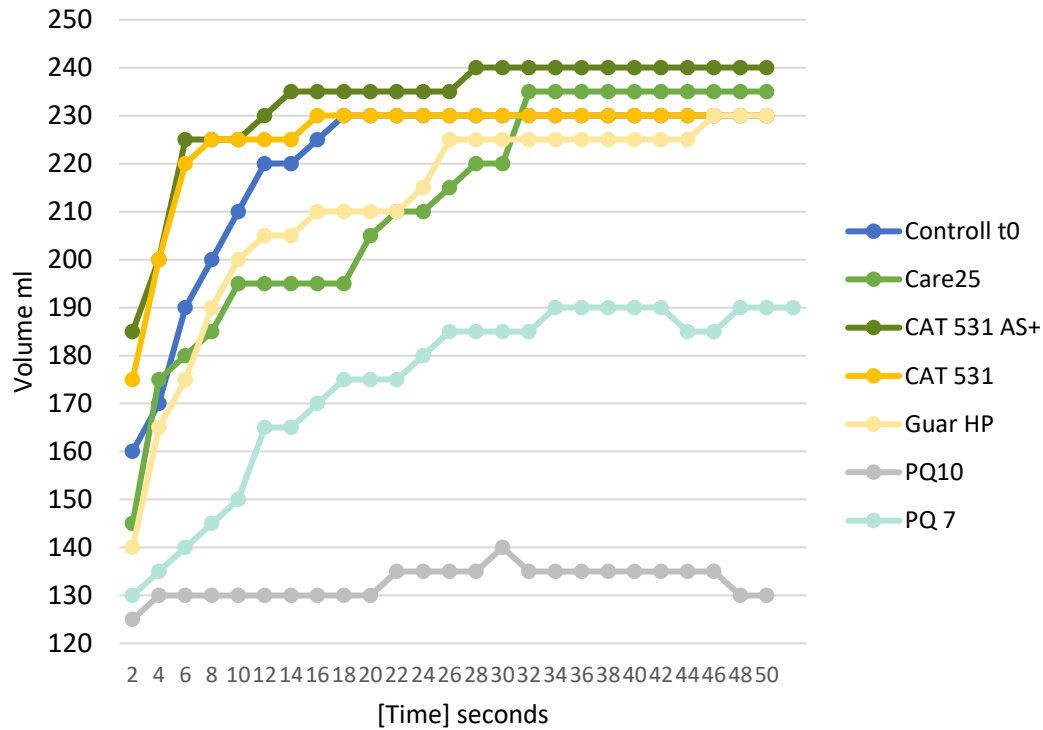


Foam Volume/Stability Results

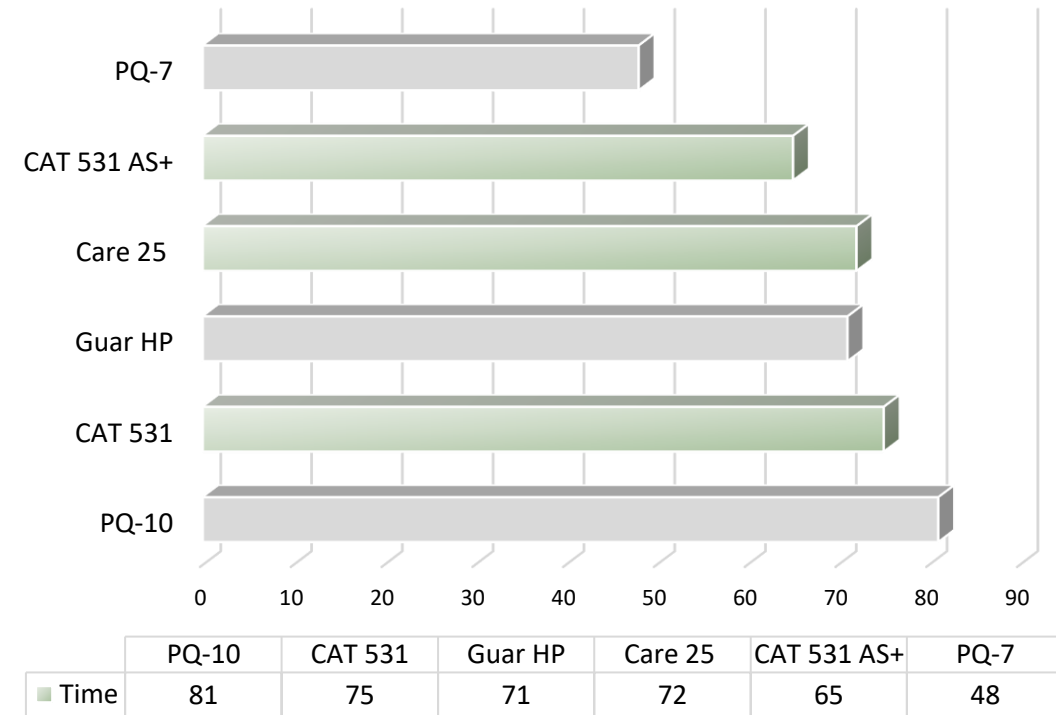
All Amylomer Products

*CAT 2531 HMW – Prototyp
The new trade Name is Amylomer Care25

Flash Foam



Drainage Time Foam



The highest foam volume: CAT 531 AS+; Care25

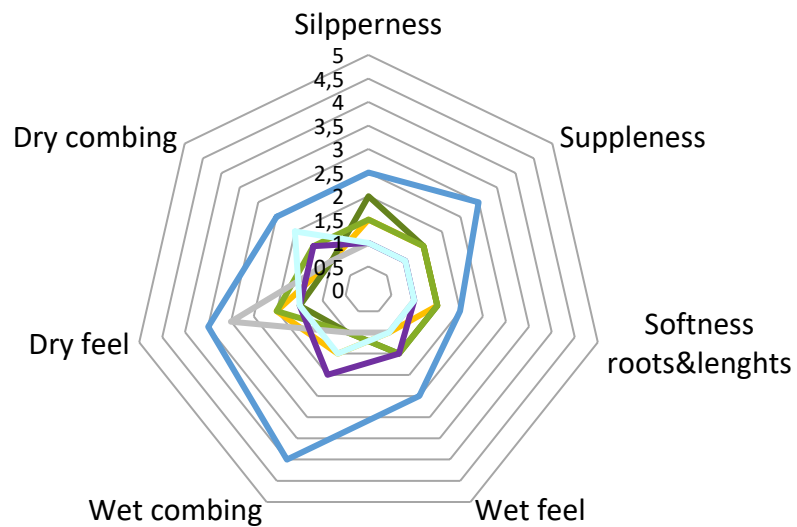
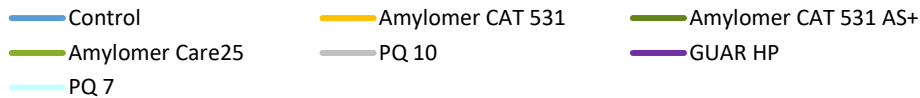
The best foam stability: CAT 531



Sensory Parameter

All Amylomer Products

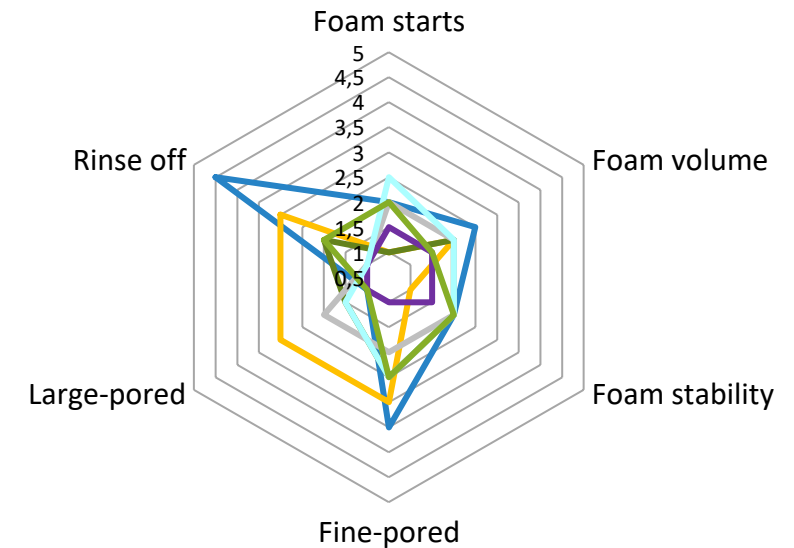
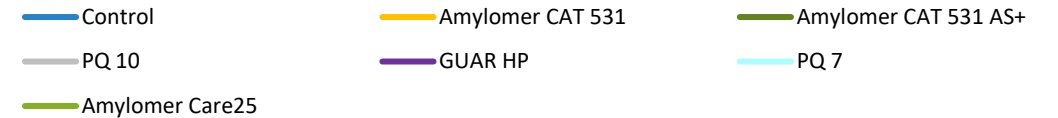
Sensory Parameter Amylomer™ vs. PQ 10- Guar HPTC- PQ7



Good detangling, wet feel and suppleness in all Amylomer products

16.02.2022

Foam assessment Amylomer™ vs. PQ 10 - GUAR HPTC - PQ 7

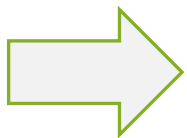


CAT 531 large pored, CAT 531 AS+ fine pored, Care25 both of them



Summary Products

		Properties					Application				
Product	INCI	 Foam Improvement	 Hair Conditioning	 Sensory effects on Hair	 Curl- Retention	Transparent systems	Conditionier	Shampoo	Body Wash	Liquid Soap	Facial Wash
Care 25	Starch hydroxypropyl trimonium chloride	xxx	xxx	xxx	-	xxx	xxx	xxx	xxx	xxx	xxx
CAT 531	Starch hydroxypropyl trimonium chloride	xxx	xxx	xxx	x	xxx	xxx	xxx	xxx	xx	x
CAT 531 AS+	Starch hydroxypropyl trimonium chloride	xxx	xxx	xxx	x	xxx	xxx	xxx	xxx	xx	x



Suitable for normal and fine hair



Amylomer

Product Portfolio



Cationic Amylomer
(STARCH Hydroxypropyl-
Trimonium Chloride)

CAT 531

CAT 531 AS+

Amylomer Care25

Cationic Amylomer
(STARCH Hydroxypropyl-PG-
Trimonium Chloride)

HA-CAT 75

HA-CAT 005

Non-Ionic Amylomer
(Sodium Hydroxypropyl Oxidized
STARCH Succinate)

HA-NI



Amylomer Difference



Amylomer HA-CAT 75 Specification

Appearance	Light yellow
Active content	29%
Cationic D.S.	~ 0,75
Molecular Weight	~1300 kDa
Good aquatox OECD	Good
Natural Index ISO 16128	88,83 %



Amylomer HA-CAT 005

Appearance	Yellowish, light opaque
Active content	~ 26 %
Cationic D.S.	~ 0,05
Molecular Weight	~1000kDa
Good aquatox OECD	Good
Natural Index ISO 16128	98,65 %

- ⇒ The Application concentration is 0,5 -2 %
- ⇒ Add in any production step / cold process

- ⇒ Compatible with salt
- ⇒ Transparent formulas



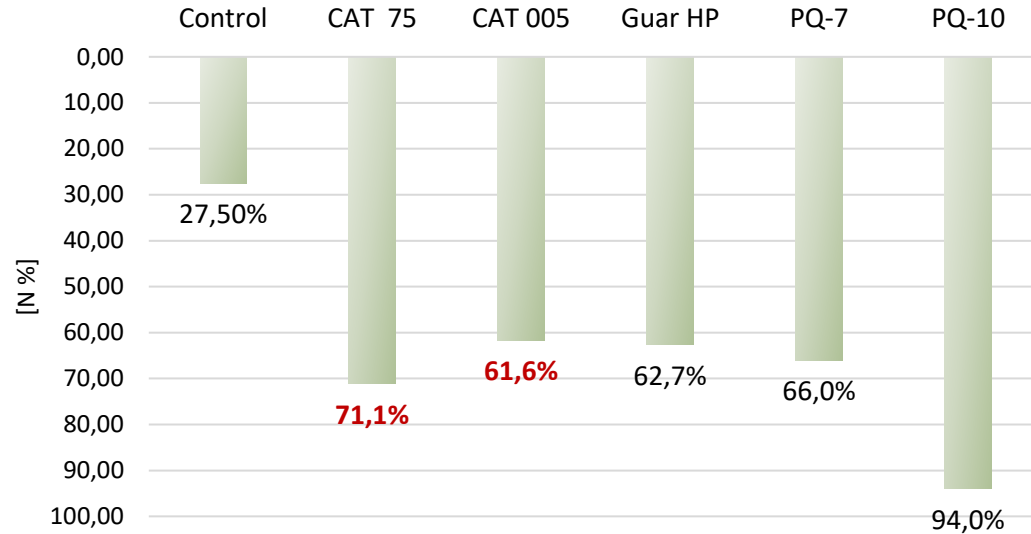
Combing Force Results

Amylomer HA-CAT 75 und HA-CAT 005

*CAT 2531 HMW – Prototyp
The new trade Name is Amylomer Care25

Combing force in wet hair

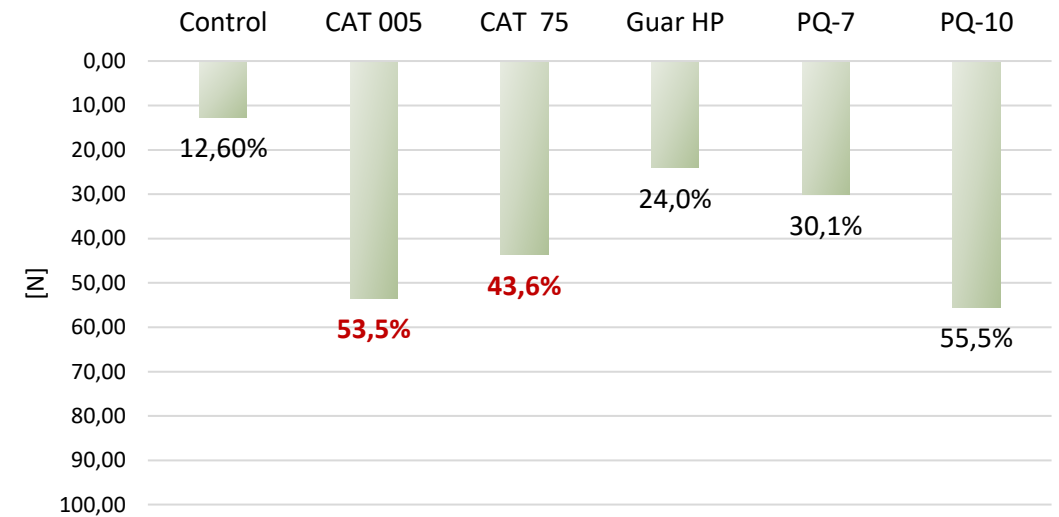
Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



HA-CAT 75 shows the strongest combing reduction in wet hair

Combing force in dry hair

Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



HA-CAT 75 shows the strongest combing reduction in dry hair

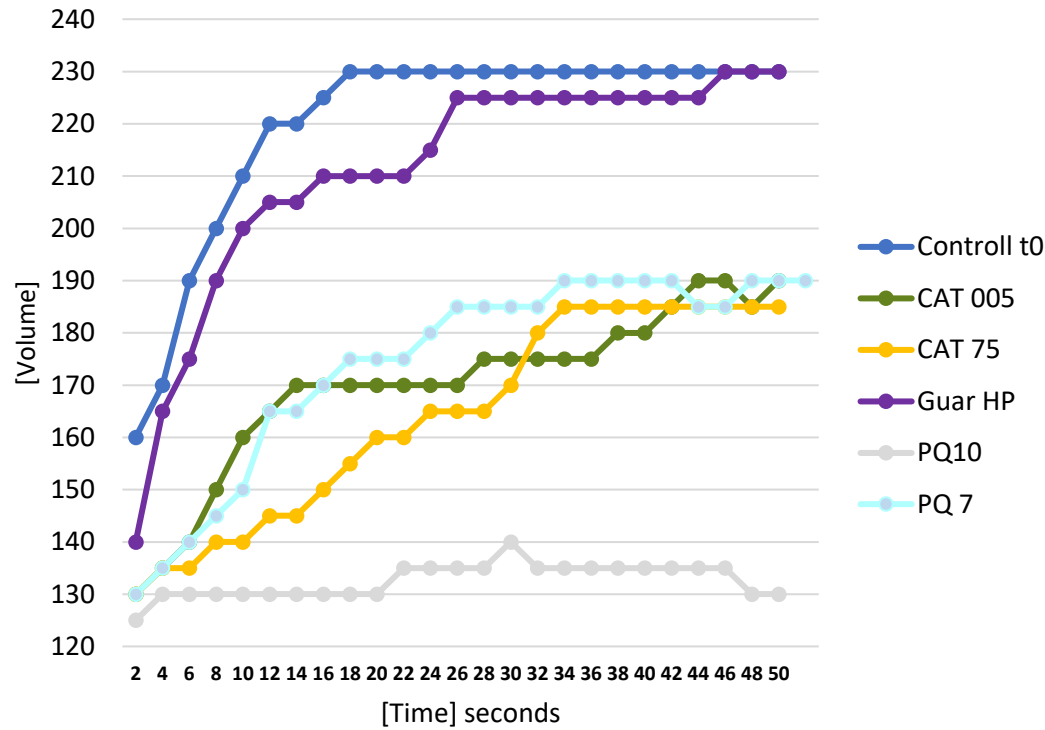


*CAT 2531 HMW – Prototyp
The new trade Name is Amylomer Care25

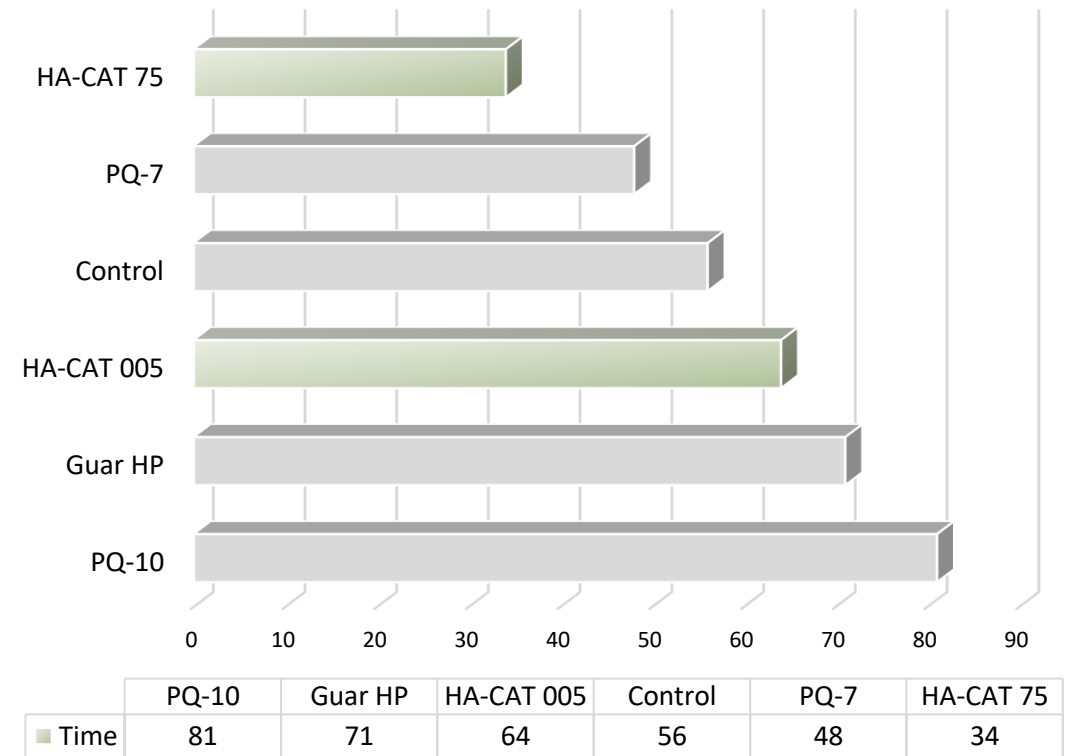
Foam Volume/Stability Results

Amylomer HA-CAT 75 und HA-CAT 005

Flash Foam



Drainage Time Foam



The highest foam volume: CAT 531 AS+; Care25

The best foam stability: CAT 531



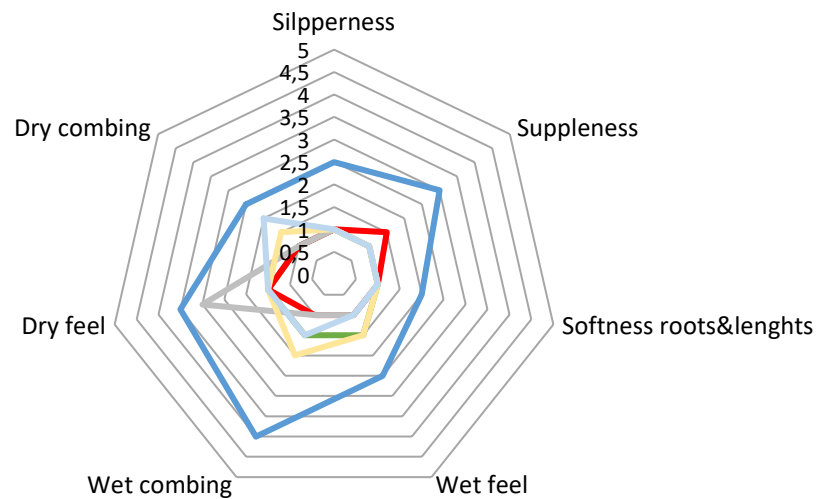
Sensory Parameter

Amylomer HA-CAT 75 und HA-CAT 005

*CAT 2531 HMW – Prototyp
The new trade Name is Amylomer Care25

Sensory Parameter Amylomer™ HA-CAT 75, 005 vs. PQ 10- Guar HPTC- PQ7

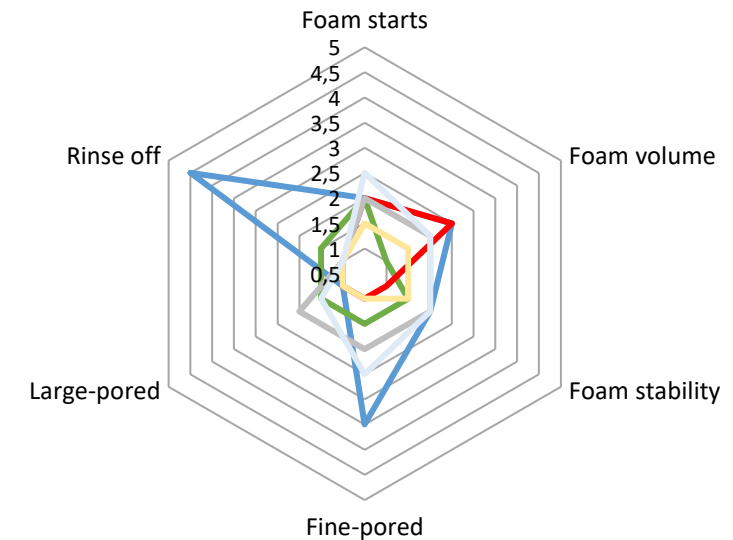
Control Amylomer HA-CAT 75 Amylomer HA-CAT 005
PQ 10 GUAR HP PQ 7



Good detangling, wet feel and slipperness in HA-CAT 75 and HA-CAT 005

Foam Assessment Amylomer™ HA-CAT 75, 005 vs. PQ 10 - GUAR HPTC - PQ 7

Control Amylomer HA-CAT 75 Amylomer HA-CAT 005
PQ 10 GUAR HP PQ 7

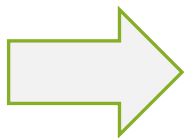


HA-CAT 75 large-fine pored, good foam volume
HA-CAT 005 fine pored, good foam start and stability



Summary Products

		Properties					Application				
Product	INCI	 Foam Improvement	 Hair Conditioning	 Sensory effects on Hair	 Curl- Retention	Transparent systems	Conditionier	Shampoo	Body Wash	Liquid Soap	Facial Wash
HA-CAT 75	Hydroxypropyl oxidized Starch PG-trimonium chloride	XX	XXX	XXX	X	XXX	XXX	XXX	XX	XX	X
HA-CAT 005	Hydroxypropyl oxidized Starch PG-trimonium chloride	XX	XX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX



Suitable for strong and normal Hair – HA-CAT 75



Amylomer

Product Portfolio



Cationic Amylomer
(STARCH Hydroxypropyl-
Trimonium Chloride)

CAT 531

CAT 531 AS+

Amylomer Care25

Cationic Amylomer
(STARCH Hydroxypropyl-PG-
Trimonium Chloride)

HA-CAT 75

HA-CAT 005

Non-Ionic Amylomer
(Sodium Hydroxypropyl Oxidized
STARCH Succinate)

HA-NI



Amylomer Difference



Amylomer HA-NI Specification

Appearance	Light yellow
Active content	24%
Gardner Colour	2
Cationic D.S.	< 0,02
Molecular Weight	~1000 kDa
Good aquatox OECD	Good
Natural Index ISO 16128	92,10 %

- ⇒ The Application concentration is 0,5 -4 %
- ⇒ Compatible with salt
- ⇒ Add in any production step / cold process
- ⇒ Add in any production step / cold process

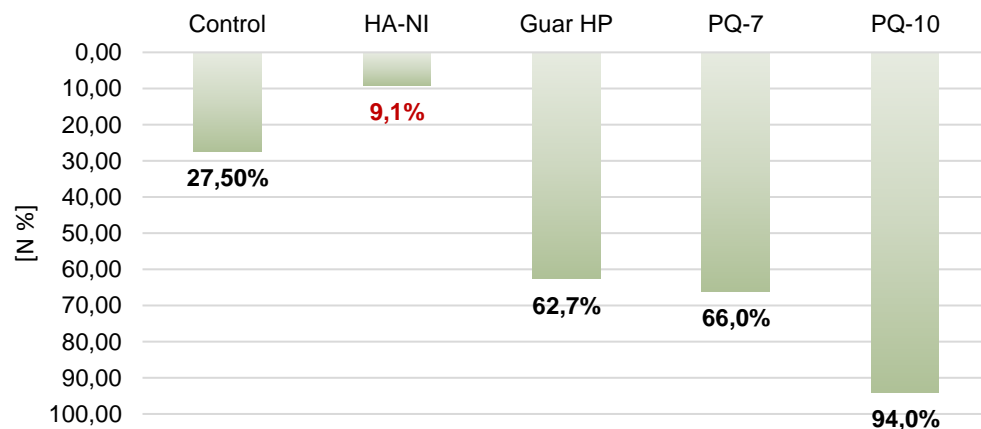


Combing Force Results

Amylomer HA-NI

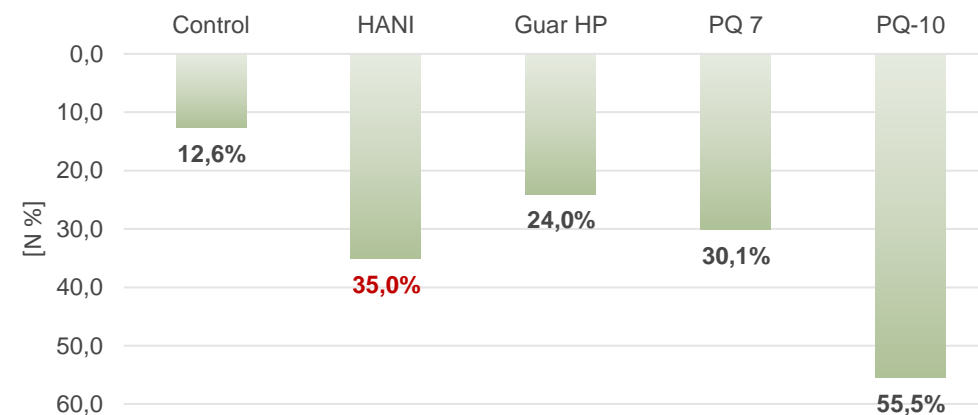
Combing force in wet hair

Comparison Amylomer HA-NI
Vs. PQ 10 - Guar (HPTC) – PQ 7



Combing force in dry hair

Comparison Amylomer HA-NI
Vs. PQ 10 – Guar (HPTC) – PQ 7



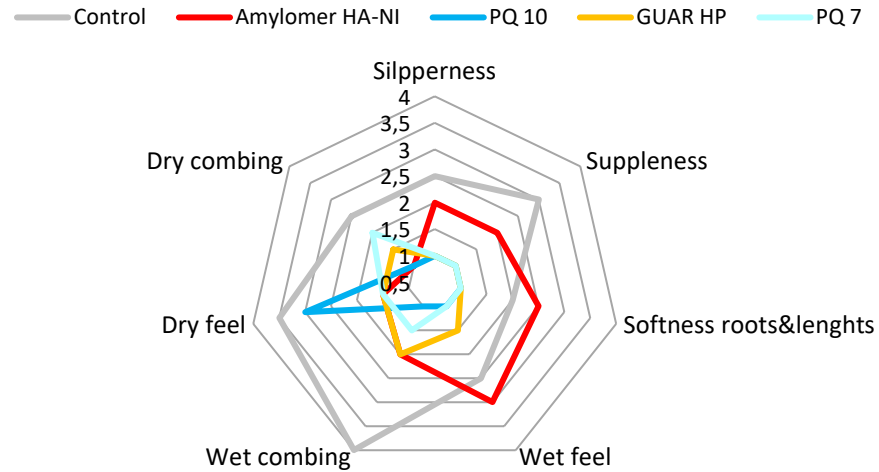
HA-NI shows a low combing reduction in wet hair. In dry hair it feels soft.



Sensory and Foam Parameter

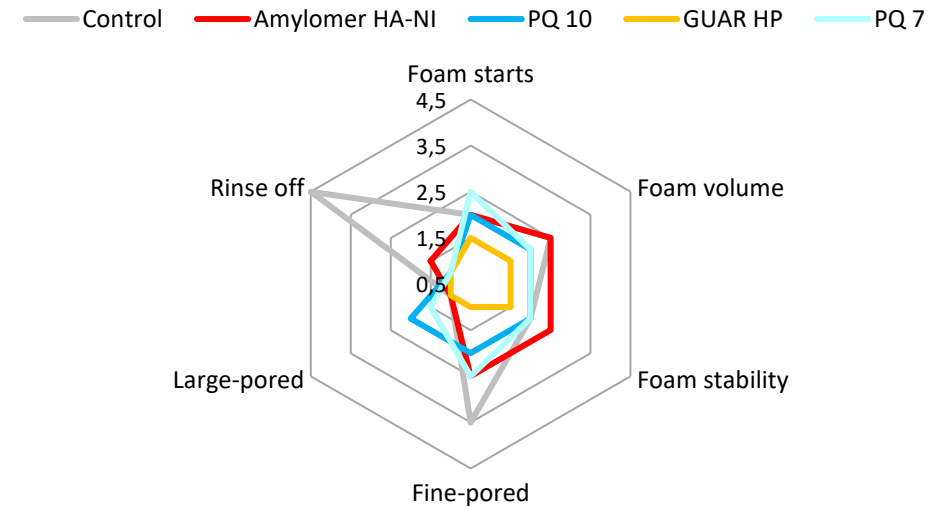
Amylomer HA-NI

Sensory Parameter Amylomer HA-NI vs. PQ 10- Guar (HPTC) - PQ7



HA-NI shows a good combing in dry hair

Foam Assessment Amylomer CAT HA-NI vs. PQ 10 – Guar (HPTC) - PQ 7

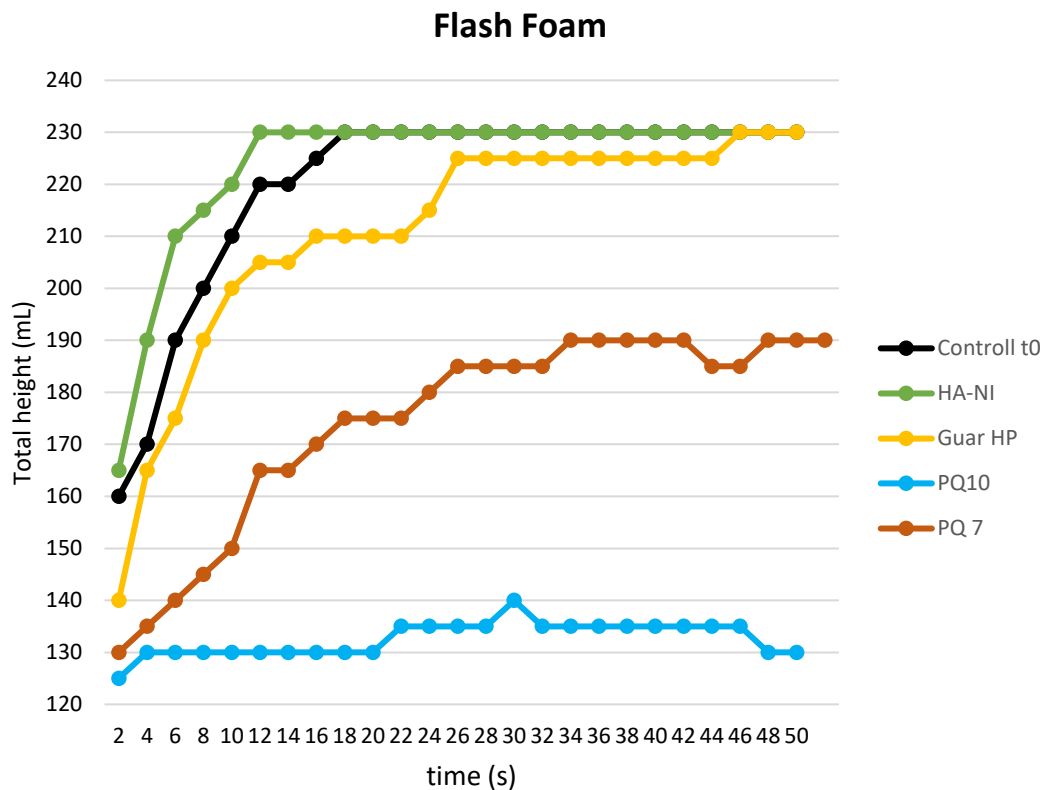


HA-NI is very good to rinse off and large pored

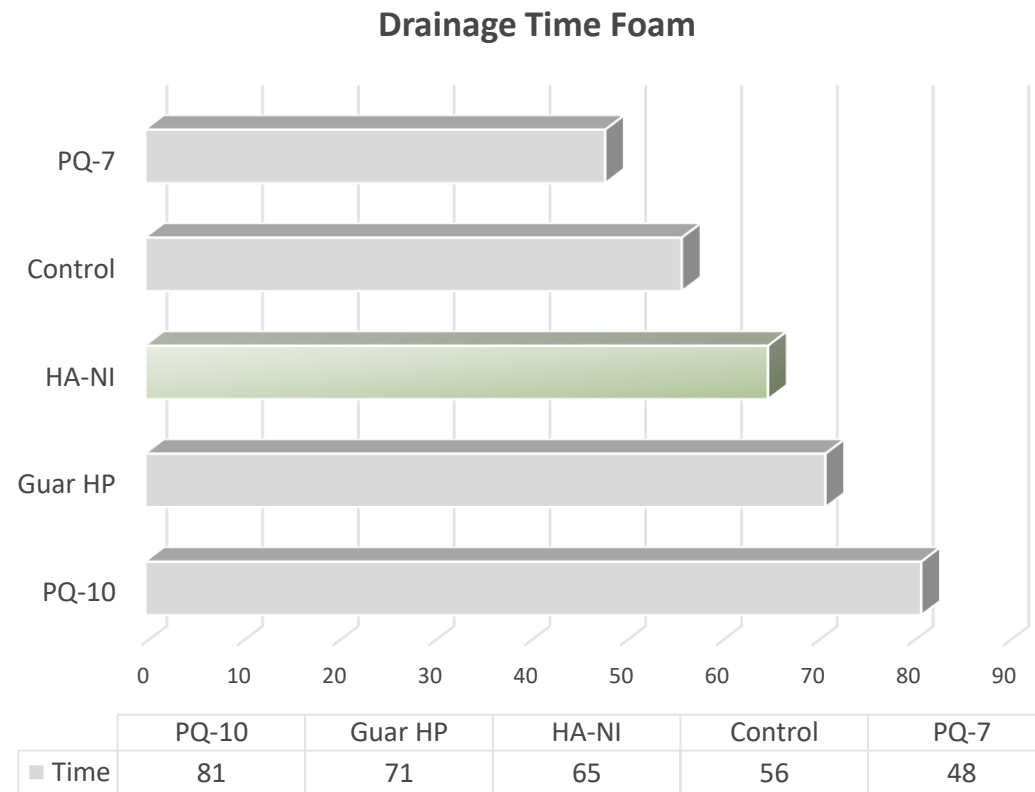


Foam Volume/Stability

Amylomer HA-NI



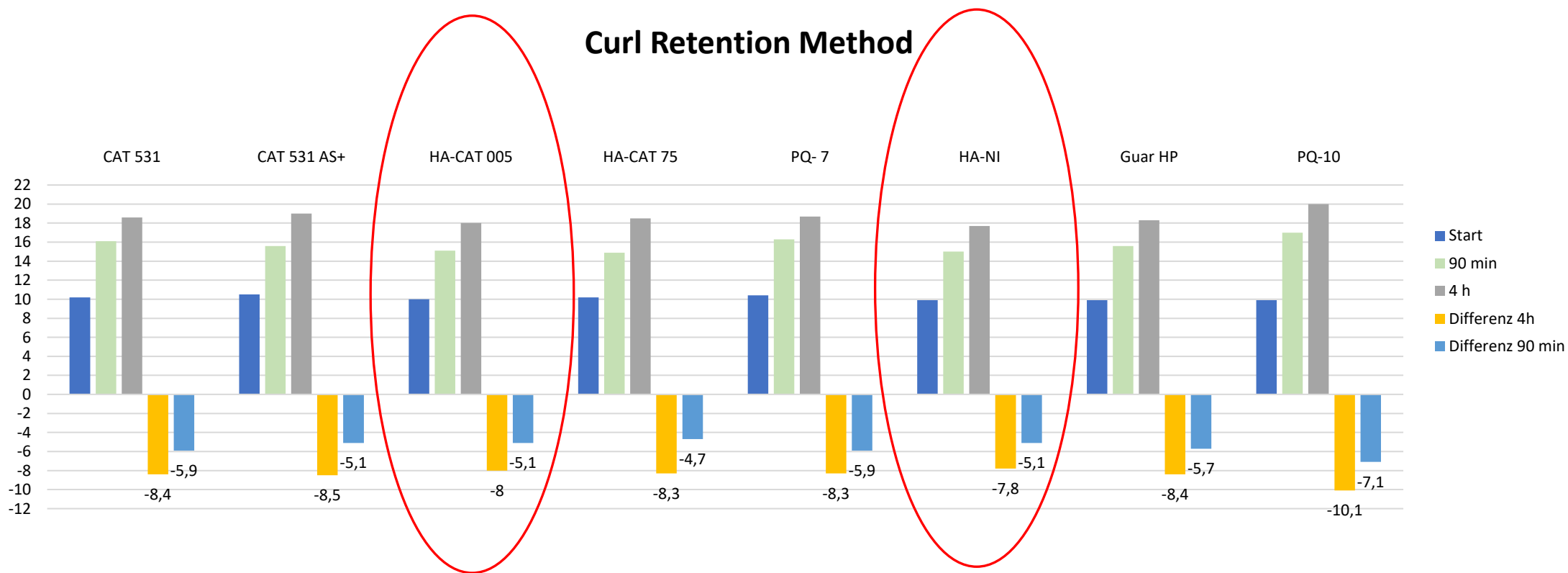
The highest foam volume: HA-NI



After 65 seconds the foam breaks in HA-NI







Curl-Retention Method Review

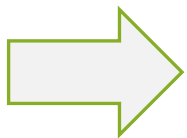


HA-CAT 005 and HA-NI gives the hair more grip and hold.



Summary Products

		Properties					Application				
Product	INCI	 Foam Improvement	 Hair Conditioning	 Sensory effects on Hair	 Curl- Retention	Transparent systems	Conditionier	Shampoo	Body Wash	Liquid Soap	Facial Wash
HA-NI	Sodium hydroxypropyl oxidized Starch succinate	xxx	x	xx	xxx	xxx	xxx	xxx	xxx	xxx	xxx



Suitable for fine Hair give more grip to the hair



Advantages of Amylomer

Effective conditioners from sustainable resources with a Natural Index ISO 16128



Different Amylomer types allow adaption of conditioning performance to different hair types



Combines with other conditioners



no pre-solution is required



Easy to use in laboratory and production



Small amount for an effective performance



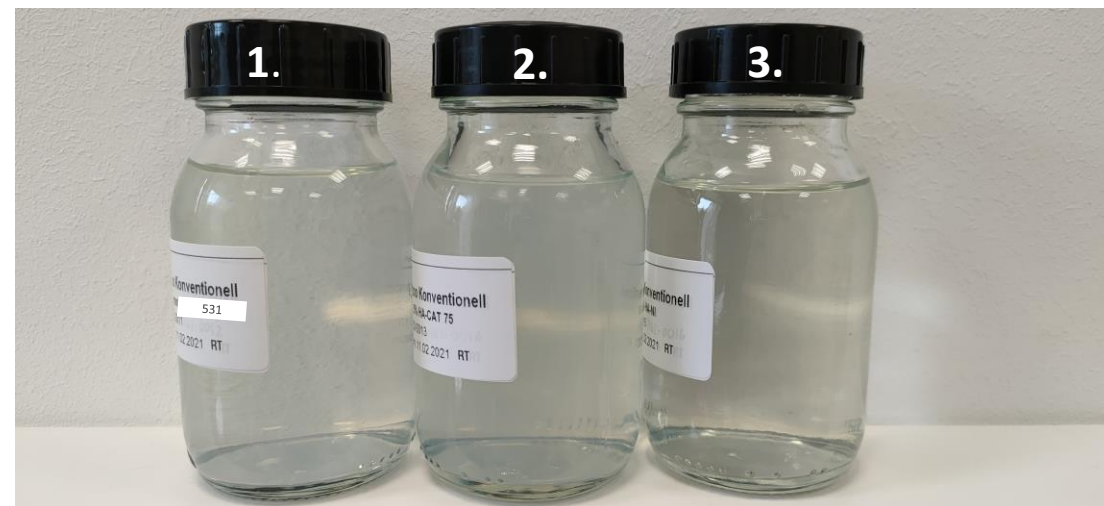
Improved biodegradability in comparison to synthetic conditioners.



Formula Shampoo

Conventional Surfactant System

INCI	% w/w
Aqua	58,54
Cocamidopropyl Betaine	11
Sodium Laureth Sulfate	28
Sodium Benzoate	0,3
Potassium Sorbate	0,2
Amylomer	1,5
Citric Acid	0,46
Total	100



1. CAT 531 / 2. HA-CAT 75 / 3. HA-NI



Formula Shampoo

Natural Surfactant System

INCI	% w/w
Aqua	60,35
Coco-Glucoside	23
Sodium Coco-Sulfate	6
Cocamidopropyl Betaine	8
Sodium Benzoate	0,3
Potassium Sorbate	0,2
Amylomer	1,5
Citric Acid	1,10
Total	100



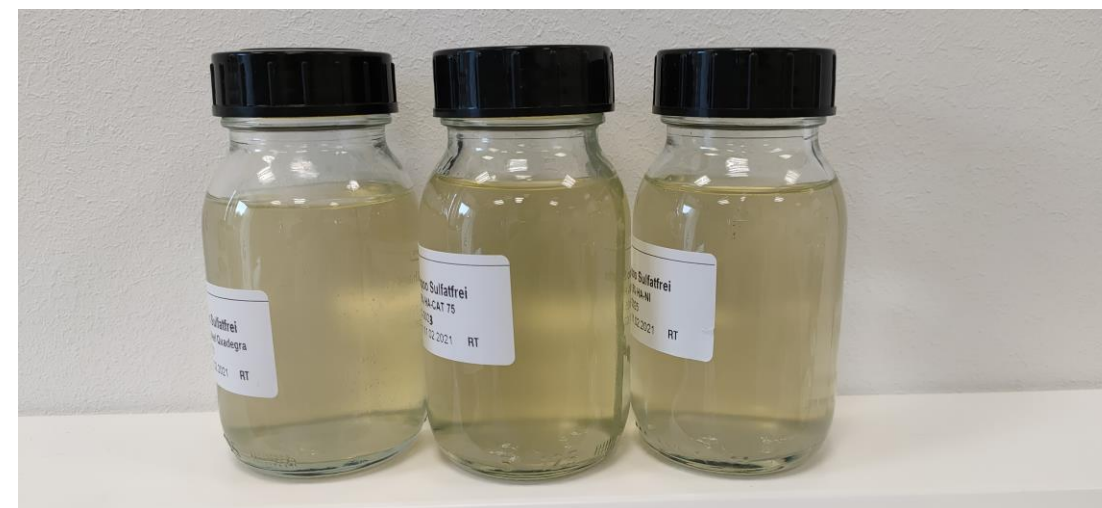
1. CAT 531 / 2. HA-CAT 75 / 3. HA-NI



Formula Shampoo

Sulphat-Free Surfactant System

INCI	% w/w
Aqua	52,88
Cocamidopropyl Betaine	11,0
Sodium Chloride, Sodium Cocoamphoacetate, Aqua	26,48
Disodium Lauryl Sulfosuccinate	6,71
Sodium Benzoate	0,3
Potassium Sorbate	0,20
Amylomer	1,0
Citric Acid	1,43
Total	100



1. CAT 531 / 2. HA-CAT 75 / 3. HA-NI



GRÄFECHEMIE

ADDITIVE AUS PFLANZLICHEN ROHSTOFFEN



Thank you

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Appendix

- HA-NI
 - Skin hydratation

- Foam Flash/Drainage Summary
 - All Amylomer

- Particle test
 - HA-NI / CAT 531 AS+

- Color protection measurement
 - Photography

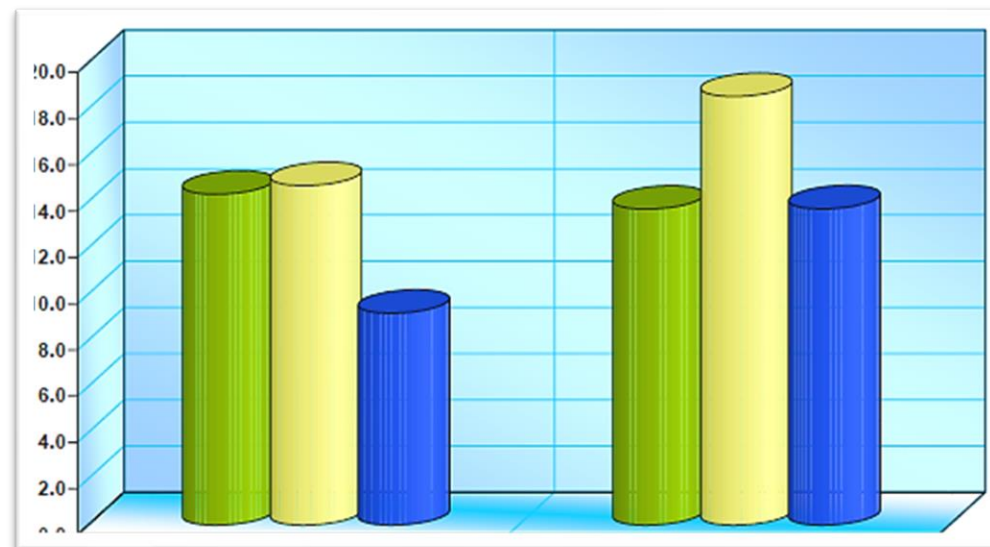
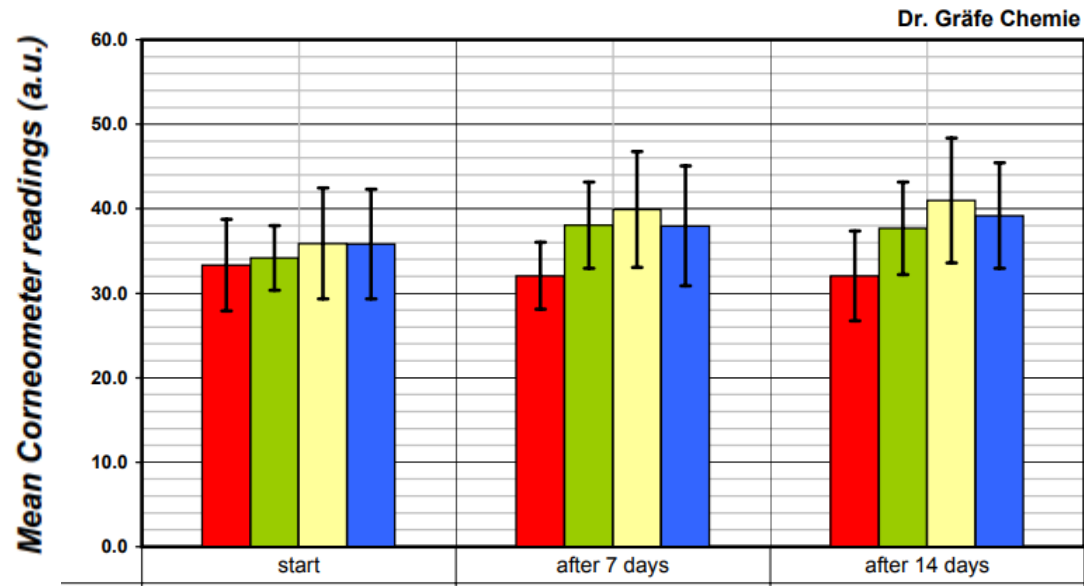


HA-NI

Extern skin study's

- HA-NI improves the skin hydration
- N= 25 humans

Experimental data of Skin Hydration



	After 7 days	After 14 days
1,5% Amylomer™ HA-NI	14.7	18.5
Placebo	9.2	13.7





Dermatology Application Study Test-Emulsion

26.04.2004

Phase	Trade Name	INCI	% w/w
A	Stabylen 30	Acrylates/Vinyl Isodecanoate Crosspolymer	0,3
	Water	Aqua	Add to 100
	Triethanolamin 99%	Triethanolamin 99%	0,18
	Amylomer	Aqua, Sodium Hydroxypropyl Oxidized Starch Succinate,	1,5
B	Crodamol GTCC	Caprylic/Capric Triglyceride	3
	Eutanol G	Octyldodecanol	2
	Crodacol CS-50	Cetearyl Alcohol	1,5
	Na Methylparabene		0,1
	Na Propylparabene		0,02

Preparation:

Heat water to 70C, add active ingredients A and mix well at 70 - 75C.

(without AMYLOMER)

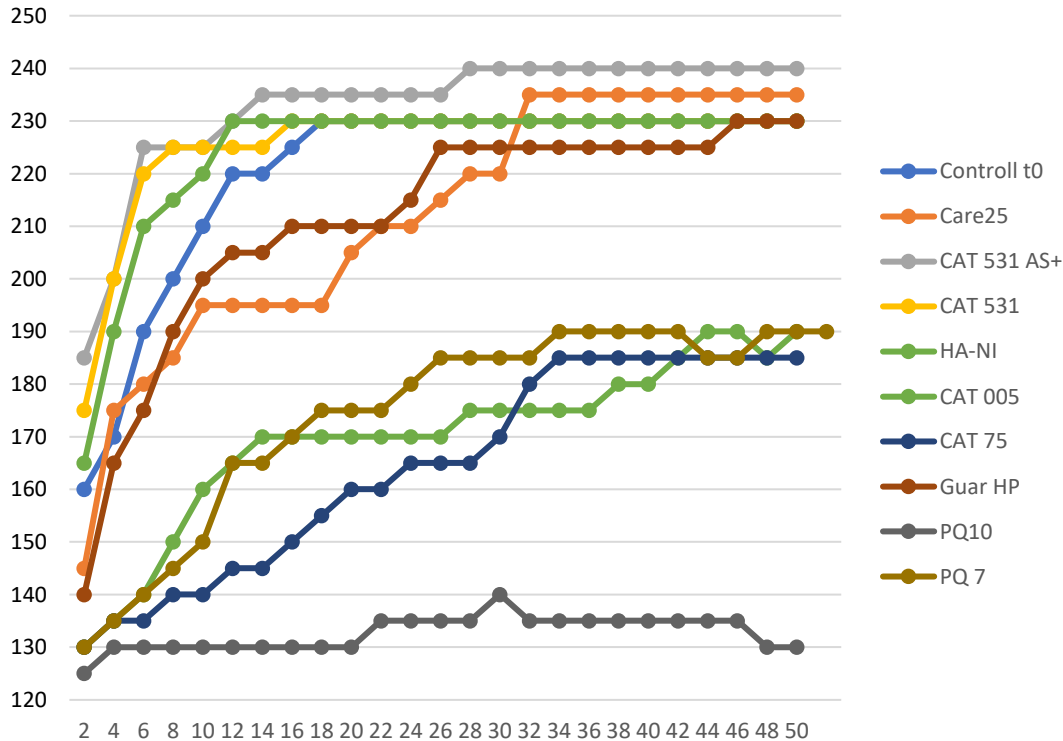
Mix active ingredients B, heat to 70C. When A and B look homogeneous, add B to A, mix well at 70C for 15 min. Add parabens and adjust pH with lactic acid.



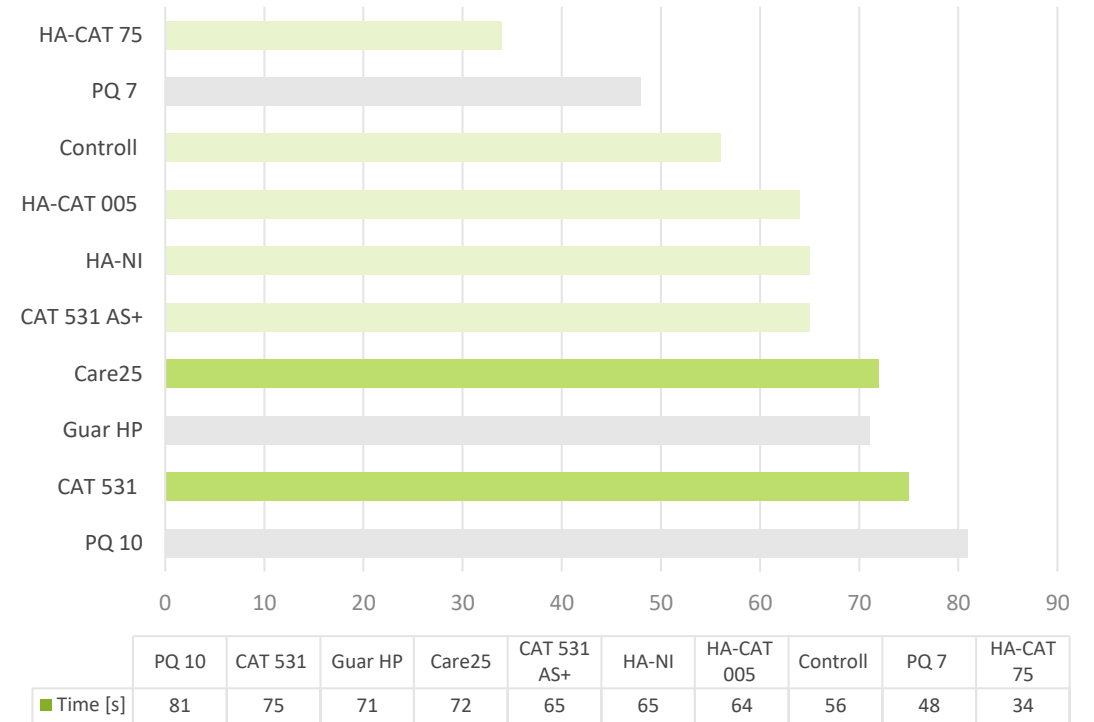
Foam Volume/Stability

All Amylomer Products

Flash Foam



Drainage Time Foam



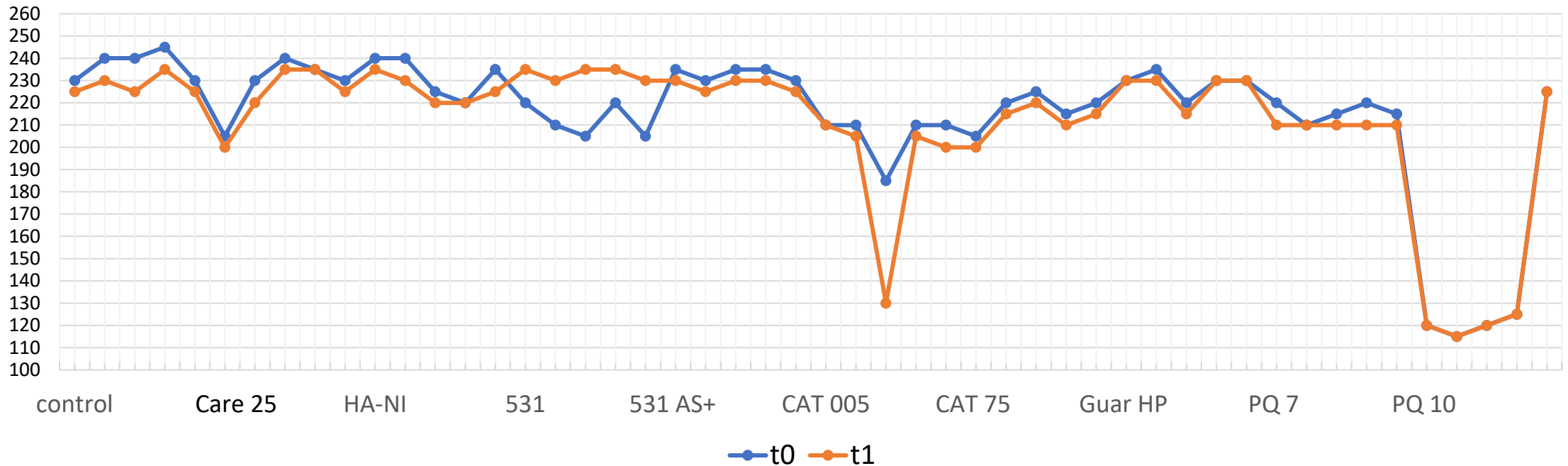
The highest volume and stability: CAT 531 AS+; CAT 531; HA-NI and CAT 005





Foam Stability in Aqua

Foam stability in liquid/aqua



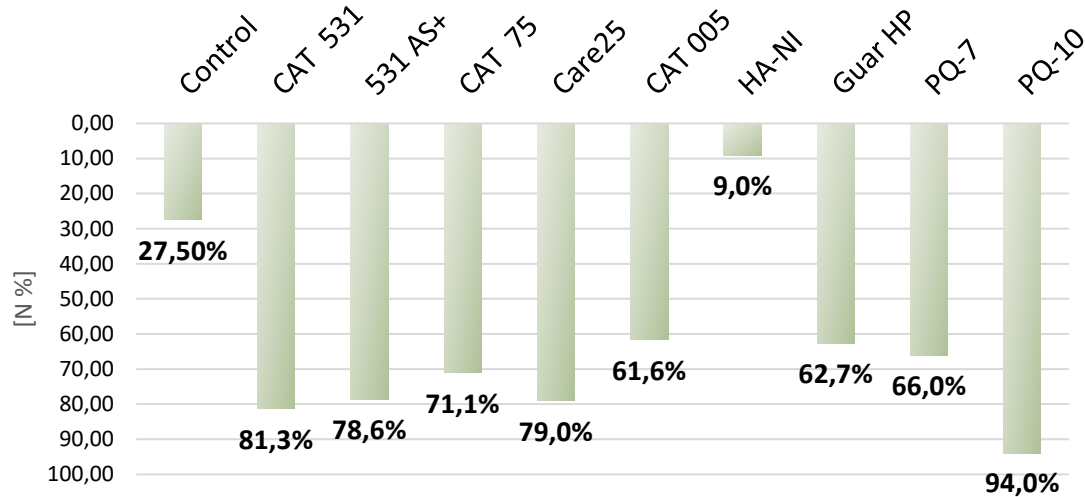


Foam Volume/Stability

All Amylomer Products

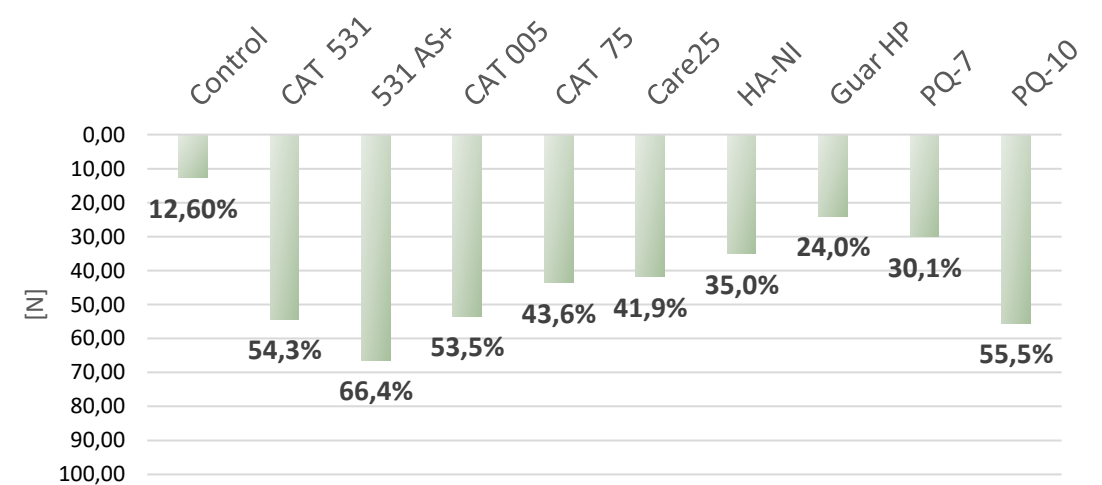
Combing force in wet hair

Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



Combing force in dry hair

Comparison Amylomer™ Products vs. PQ-7, PQ-10 and Guar (GHPTC) with an active Ingredient 0,4%



The highest volume and stability: CAT 531 AS+; CAT 531; HA-NI and CAT 005

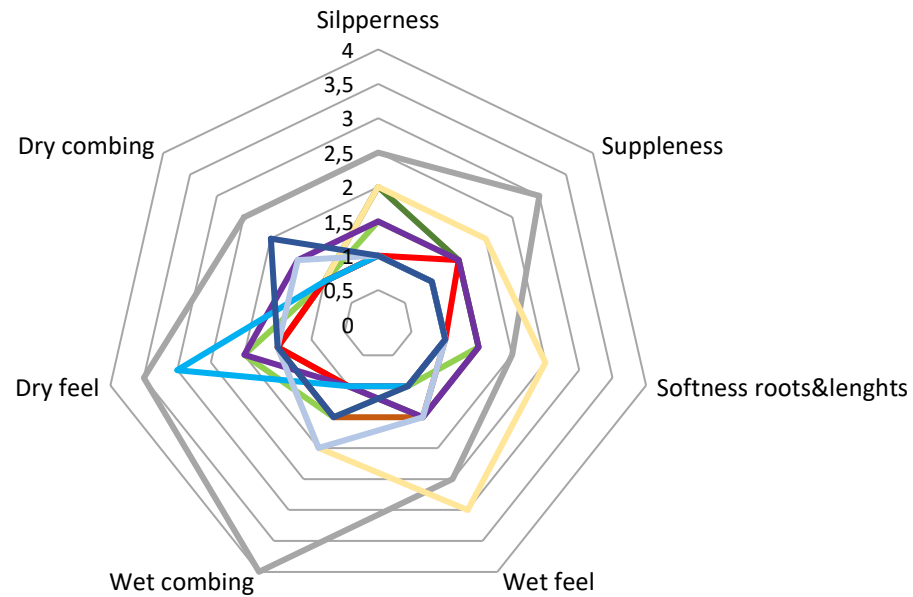
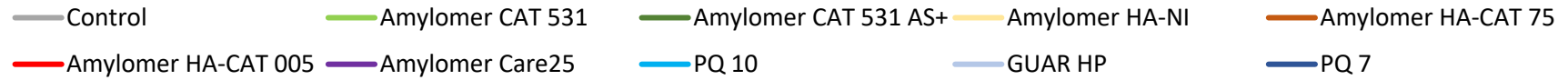




Sensory Parameter

All Amylomer Products

Sensory Parameter Amylomer™ vs. PQ 10- Guar HPTC- PQ7

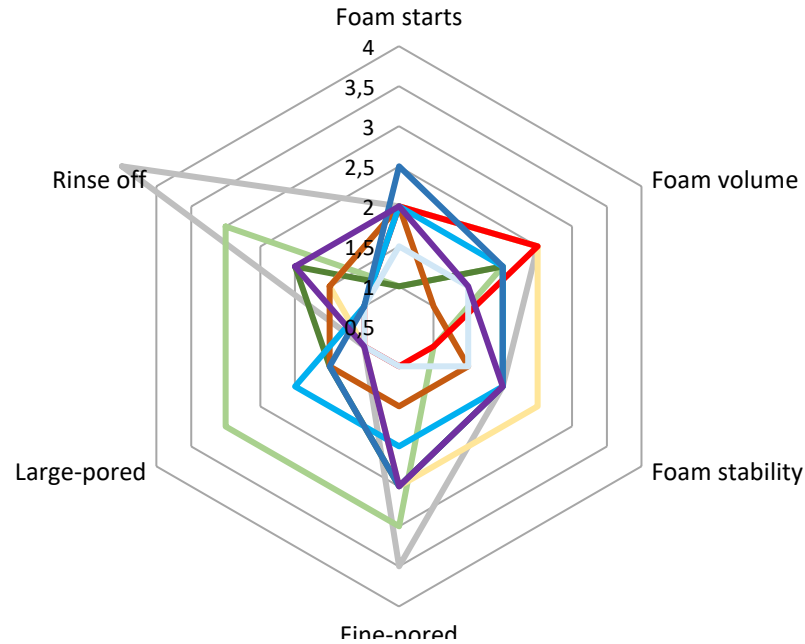
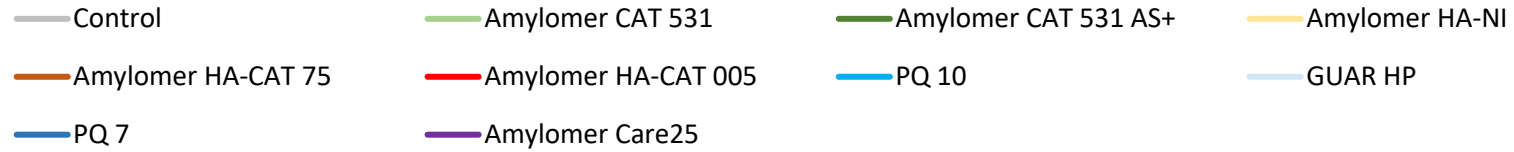




Sensory Foam Parameter

All Amylomer Products

Foam Assessment Amylomer™ + vs. PQ 10 - GUAR HPTC - PQ 7





Particle-Test

Amylomer HA-NI



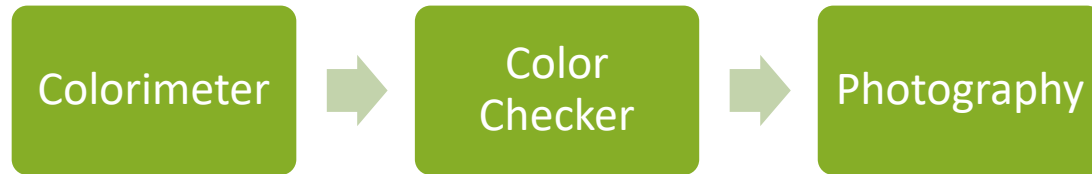
CAT 531 AS+



Different particle sizes: left 1500, 1290, 1260, 1330 μm



Color-Protect Method



A: Aqua 54,26%; Sodium Laureth Sulfate 32,14%; Cocoamidopropyl Betaine 8,1%; Glycerin; Aqua; Sodium Levulinate; Sodium Anisate 3,5%; **HYDROXYPROPYL OXIDIZED STARCH PG-TRIMONIUM CHLORIDE 2%**

B: Aqua 54,26%; Sodium Laureth Sulfate 32,14%; Cocoamidopropyl Betaine 8,1%; Glycerin; Aqua; Sodium Levulinate; Sodium Anisate 3,5%

