



TATE & LYLE



Nouryon

Spotlight
Rheology Modifiers

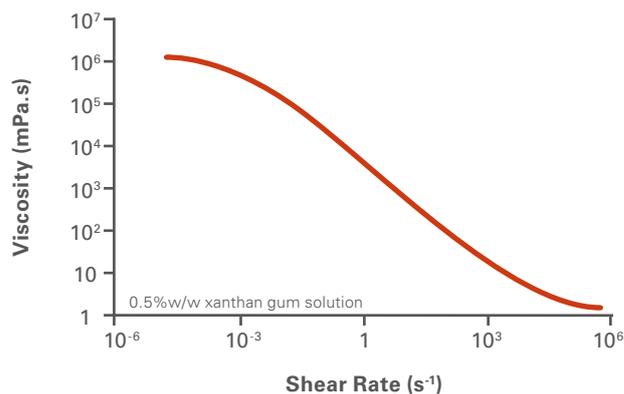
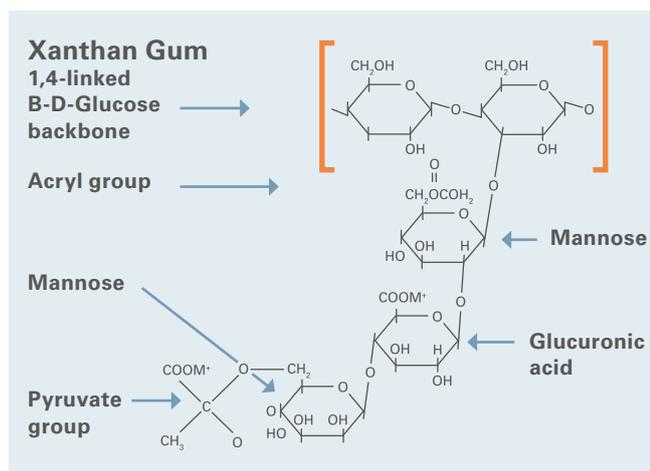
Tate & Lyle



With over 200 years' experience in the manufacturing, manipulation and application of multiple hydrocolloids, Tate & Lyle has a deep understanding of the use of its products, enabling it to provide the results customers expect from their finished product. It supplies nature-based ingredient solutions and has over 85 years of experience working with food, consumer and industrial product manufacturers worldwide.

The Tate & Lyle Quality Standard ensures the production of safe, high-quality ingredients for the company's customers. The new global regulatory environment requires elevated compliance and harmonized audit procedures, and requires accountability and visibility to external parties.

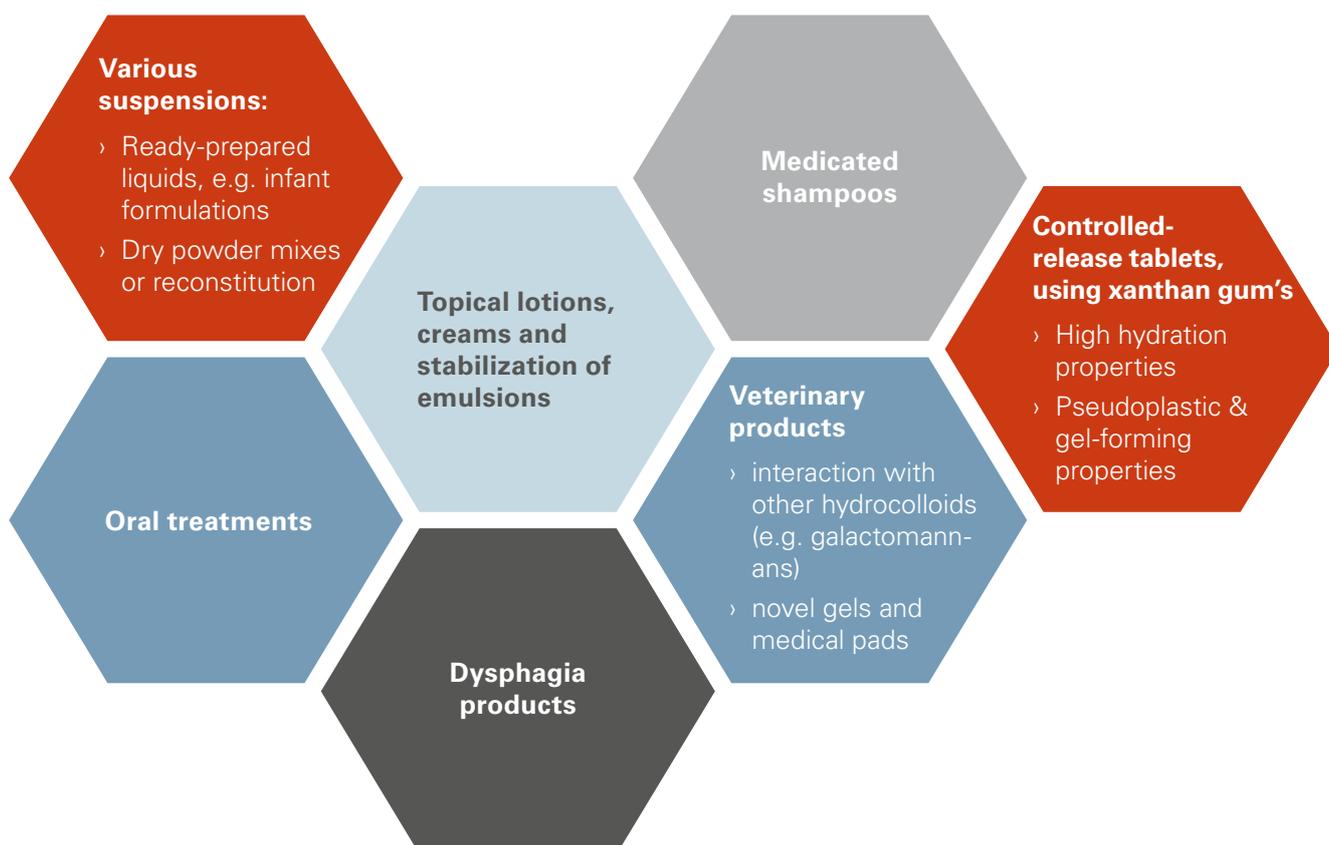
Chemical background



The rheology of xanthan solutions is typically

- Highly pseudoplastic, i.e.
 - › Very high viscosity under low shear
 - › Low viscosity under high shear
- Gel-like at rest
- NOT thixotropic – responds rapidly to changes in shear
- Unaffected by temperature

It can be used for the production of:



For pharmaceutical and medical applications we offer three different grades of Xantural:

	Particle Size	Transparent Solutions	Dust-Free Easy to Disperse	Typical Applications
XANTURAL®75	75µm	√		e.g. Sustained release
XANTURAL®180	180µm	√		e.g. Ready-to-use suspensions
XANTURAL®11K	1.1 mm	√	√	e.g. Ready-to-use suspensions

In addition to Xantural we also offer other nature-based ingredients from Tate & Lyle:

Carrageenan:

- › Forms thermally reversible gels
- › Wide range of textures
- › Inhibits syneresis
- › Stable under neutral and alkaline conditions
- › May replace sythetics in gels and lotions
- › Gelatin alternative

Pectin:

- › Forms gels under acid conditions
- › Blinds water
- › Forms films
- › Buffers to natural skin pH
- › USP-compliant

Gellan Gum:

- › High gel strength
- › Excellent stability
- › Process flexibility and tolerance
- › Sparkling clarity
- › Range of textures available
- › Flexibility in melting and setting point
- › Suspension efficiency
- › USP-compliant



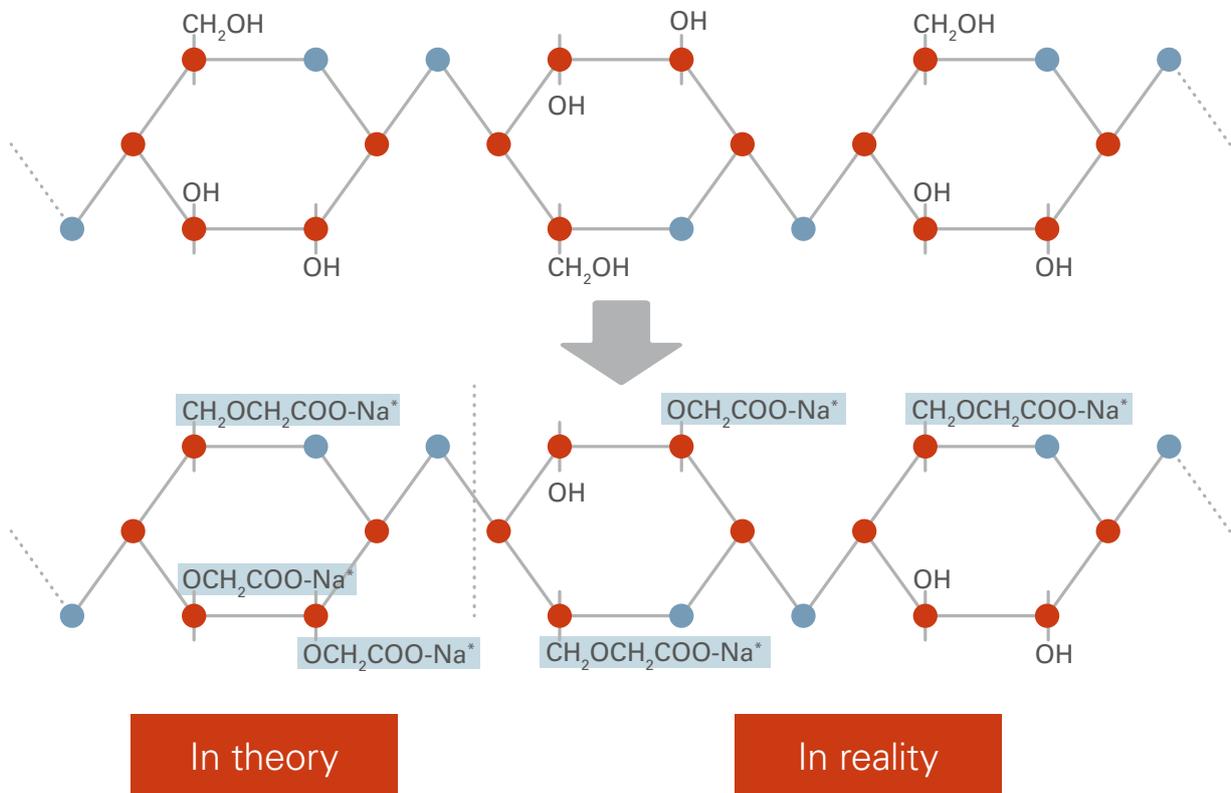
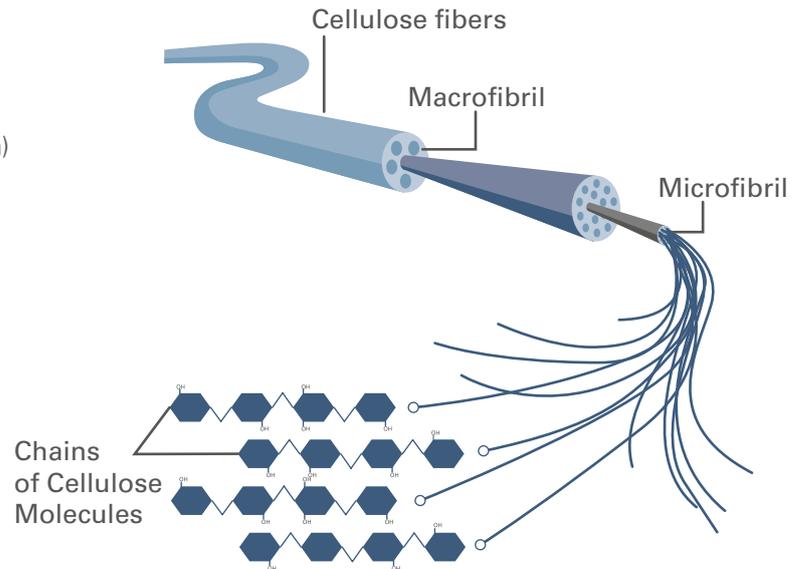
Nouryon



Nouryon manufactures a range of products for applications in the pharmaceutical industry. It works according to the highest international standards and continuously carries out product testing to ensure these standards are met. Today, with sustainability and green values being the key drivers in product innovations, CEKOL® cellulose gum is a preferred choice as a bio-based and biodegradable hydrocolloid. By selecting the right raw materials and adjusting the production process steps, it is possible to tailor the functionality of specific CEKOL® grades to different applications. CEKOL® cellulose gum is a water-soluble polymer derived from wood or cotton cellulose and produced to minimum 99.5% purity. Products manufactured from wood cellulose satisfy GMO-free requirements. The product hydrates and dissolves readily in hot and cold water. By choosing the right CEKOL® type, the formulator can achieve the desired rheology for any aqueous system, including suspensions and emulsions. Besides controlling the rheology, CEKOL® cellulose gum is known for its excellent water-retaining and film-forming capacity.

Chemical background

Raw material (cellulose from wood/cotton)



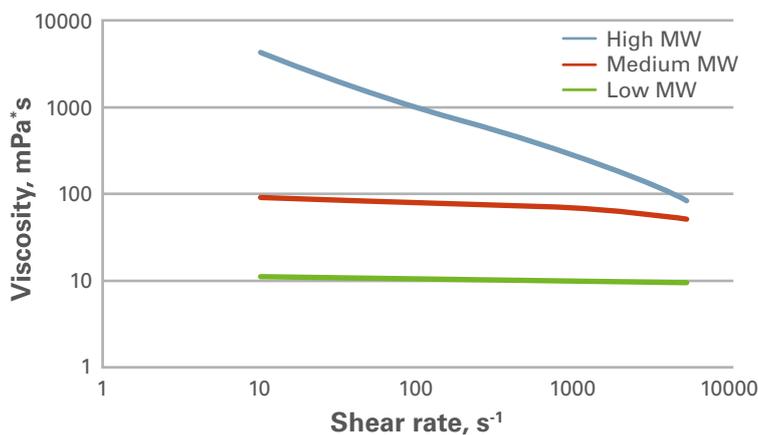
- CMC has a cellulose backbone with carboxymethyl groups on some of the C2, C3 and C6 positions
- Number and distribution of carboxymethyl groups influence solution rheology, stability and viscosity

Rheology modification:

- CMC influences flow properties
- Behaviour in the application depends on
 - › CMC grade
 - › Other ingredients
 - › Process conditions

Besides rheology modification, it has additional properties:

- Water binding
- Surface activity (anionic polymer – hydrogen bonding / charge interaction / crosslinking reaction)
- Film-forming agent

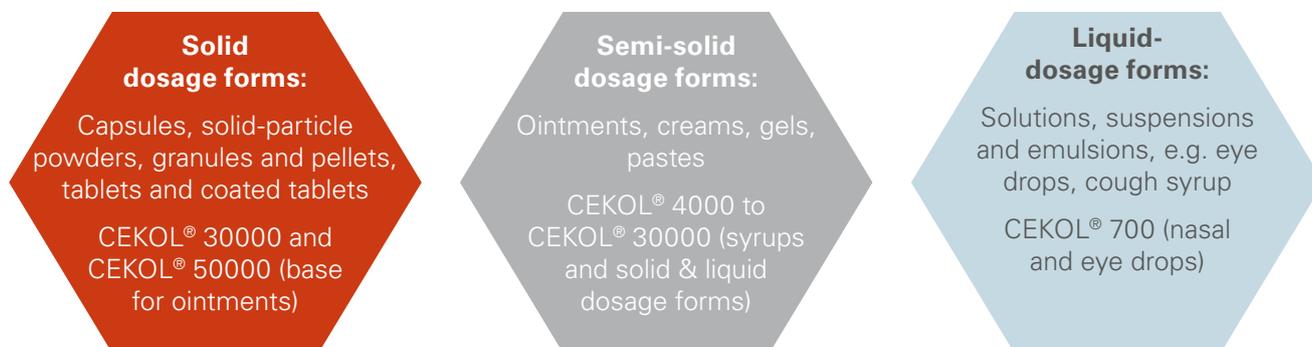


For pharmaceutical and medical applications we offer three different grades of Cekol (99.5% pure CMC):

Product	Viscosity, mPas	Solution concentration %	Powder form			DS Range	
			Granular (G)	Standard (Std)	Fine (P)		
CEKOL 30	25-50	2		•		0.80 – 0.90	Low viscosity
CEKOL 150	150-300	2		•	•	0.75 – 0.85	
CEKOL 150 A	150-300	2		•		0.85 – 0.95	
CEKOL 700	500-900	2		•	•	0.75 – 0.85	Medium viscosity
CEKOL 2000	1500-2500	2	•	•	•	0.75 – 0.85	
CEKOL 2000 A	1500-2500	2	•	•	•	0.85 – 0.95	
CEKOL 4000	300-700	1		•	•	0.75 – 0.85	
CEKOL 10000	1000-1500	1		•	•	0.75 – 0.85	
CEKOL 20000	1500-2500	1		•	•	0.75 – 0.85	High viscosity
CEKOL 30000	2500-3500	1	•	•	•	0.75 – 0.85	
CEKOL 30000 A	2500-3500	1		•	•	0.85 – 0.95	
CEKOL 40000	3500-4500	1		•	•	0.75 – 0.85	
CEKOL 50000 W	4000-6000	1		•	•	0.75 – 0.85	
CEKOL 50000	4500-7500	1		•	•	0.80 – 0.90	
CEKOL 100000	7500-10000	1		•	•	0.80 – 0.90	

Particle Size Distribution	STD grades 40 – 75% on 75µm	G grades max 85% on 75µm	P grades: max 20% on 75µm
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Cekol can be used for the following pharmaceutical applications:



Additionally it can be used for wound care products. The absorbent and adhesive internal layer is made of carboxymethyl cellulose.

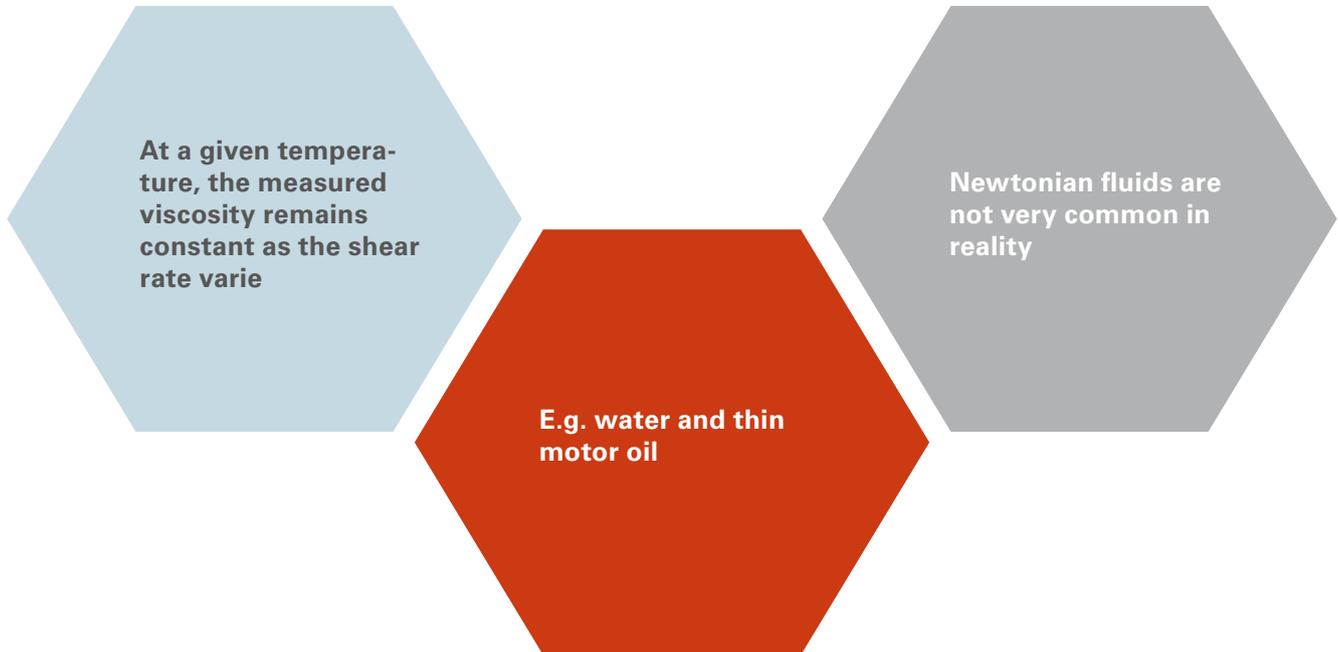


Rheology = the science of the deformation and flow of matter

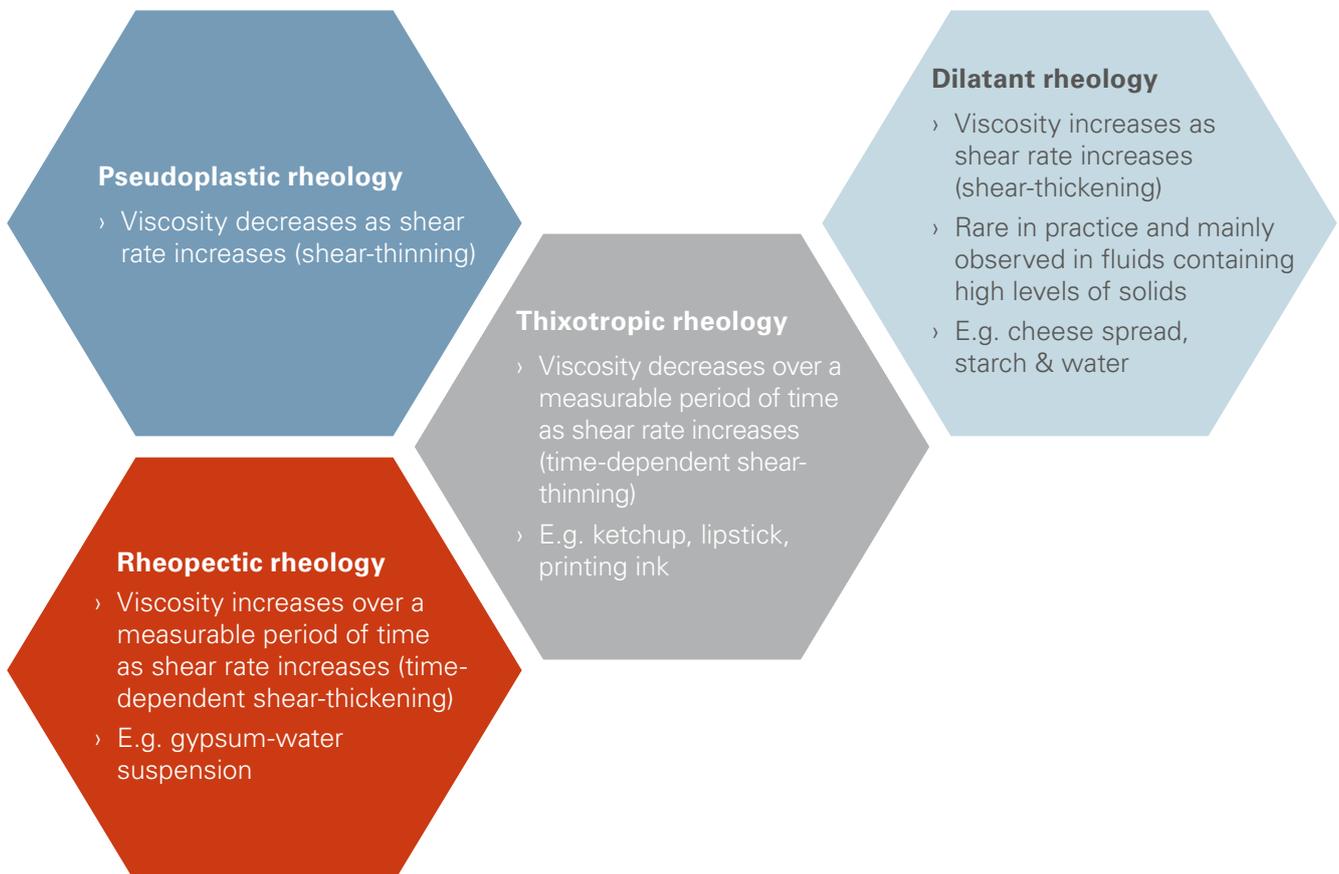
It describes the relationship between force, deformation and time.

Types of rheology:

Newtonian fluid:



Non-Newtonian fluid:



Rheology modifiers

What is a Rheology Modifier?

Rheology modifiers act as thickeners or viscosity modifiers. A good rheology modifier is able to structure the formulation and can become flowable if a force is applied. They help in controlling shelf stability, ease of application, open time/wet edge and sagging.

Biesterfeld Offers

Biesterfeld offers a range of rheology modifiers from our suppliers Tate & Lyle and Nouryon. These serve several functions including thickening, suspension, stabilization, and gelation for different aspects of rheology control.



Lab & Innovation Centre

At our Lab and Innovation Centre in Hamburg we work with our customers to develop tailored solutions. We can provide a selection of sample formulations to serve as a good starting point for your project. By including additives from our wide-ranging portfolio, we can also enhance existing formulations.

If you have an idea for a project get in touch:
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Contact

For more information feel free to reach to the Healthcare experts at Biesterfeld at healthcare@biesterfeld.com

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