

## Technical Information

## TEGO® Feel C 10

## Taking sensory from nature

## Intended use

Cosmetic powder, sensory additive

## Benefits at a glance

- Natural cellulose from sustainable European forestry
- Eco-friendly alternative to microplastics in leave-on applications
- Improves absorption and reduces oiliness of cosmetic formulations on skin
- Absorbs human sebum and provides a mattifying effect
- Compatible with oil in water as well as water in oil formulations and water-free systems

## INCI (PCPC name)

Cellulose

## Chemical and physical properties (not part of specifications)

Form	powder
Color	white to off-white

## Further product information (might contain other parameters than specification)

Source	beech and spruce from sustainable European forestry
Bulk density (g/L)	180 – 300
Average particle size	30 µm
Content of cellulose	≥ 99%

## Properties

- Readily biodegradable (OECD-Test 301 F, > 60%)
- Non-toxic to aquatic organisms (OECD-Test 202, Daphnia)

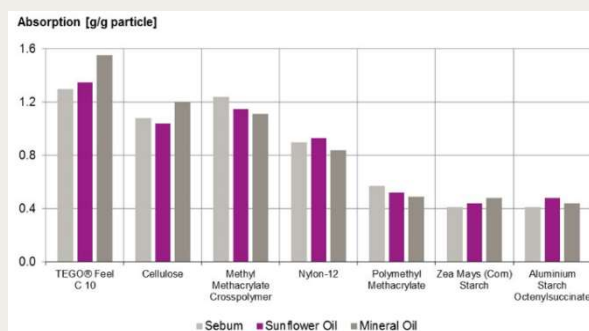
- Certificates: Cosmos, Halal
- Vegan according to the definition of the European Union

TEGO® Feel C 10 is a natural cellulose fiber without derivatization or chemical modification. Sustainably sourced from forests all over Europe, mainly beech and spruce are processed to cellulose fibers with an average particle size of 30 µm, using a procedure employing renewable energy.

## OUR studies based on TEGO® Feel C 10

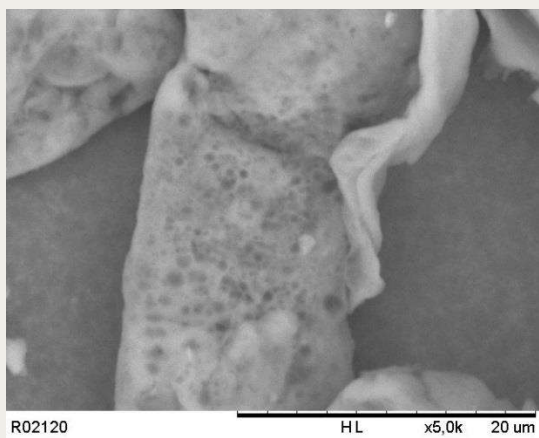
In an *in vitro* study the absorption of human sebum (human model sebum according to Bey), sunflower oil and mineral oil was assessed.

For this study two grams of particles were weighed in a petri dish and oil was added slowly until no more fluid could be absorbed. The point of maximum absorption was visually assessed. The absorption capacity is indicated in gram oil per gram particle.



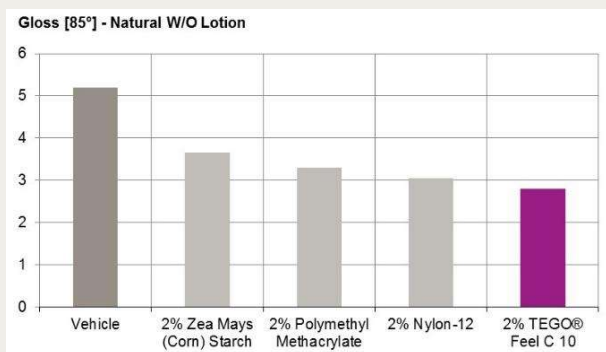
**Figure 1:** Sebum and oil absorption capacity [g/g particle].

With values ranging from 1.3–1.6 g/g particle, TEGO® Feel C 10 efficiently absorb human model sebum as well as commonly used cosmetic emollients. This absorption ability is due to the porous structure of TEGO® Feel C 10.



**Figure 2:** High resolution scanning electron microscopy (SEM) image of TEGO® Feel C 10 showing its porous structure.

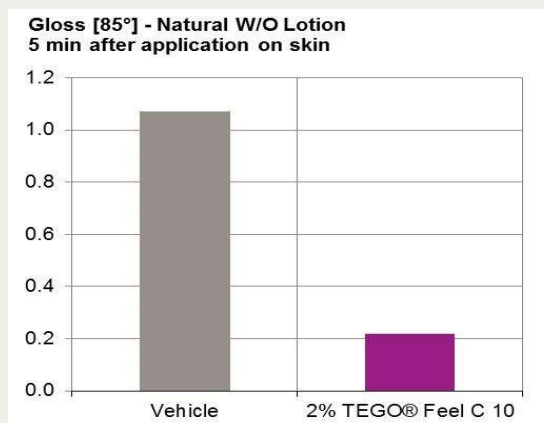
In another *in vitro* study the mattifying effect was evaluated. 2 mg/cm<sup>2</sup> of a natural W/O test formulation with and without 2% TEGO® Feel C 10 were applied on PMMA plates. The increase in gloss value was determined with a Byk–Gardner Micro–TRI–Gloss glossmeter five minutes after application of the test formulations. Cosmetically relevant (matte) gloss is determined at an angle of 85°.



**Figure 3:** Gloss values at 85° angle on PMMA plates determined five minutes after application of test formulations.

As can be seen, a mattifying effect is achieved when particles are added into the formulation. By adding 2% of TEGO® Feel C 10 into the natural W/O test formulation, the gloss on PMMA plates was reduced by 46%.

In an *in vivo* study the gloss of a formulation with and without 2% TEGO® Feel C 10 was evaluated on the volar forearm. 2.5 mg/cm<sup>2</sup> of the test formulation was applied on either arm. The increase in gloss value at 85° was determined with a Zehntner ZGM 1130 glossmeter five minutes after application.



**Figure 4:** Gloss values on volar forearm determined at 85° angle five minutes after application of formulations.

The usage of 2% TEGO® Feel C 10 in the tested natural W/O formulation lead to an 80% reduction of gloss values on the forearm compared to the lotion without the fibers.

In a second *in vivo* study, a half side test was conducted on the face of 10 panelists. On each side of the face 300 µL of a W/O lotion formulation with and without 2% TEGO® Feel C 10 was applied. Images were taken by VISIA–CR photography before and five minutes after application of the test formulations.

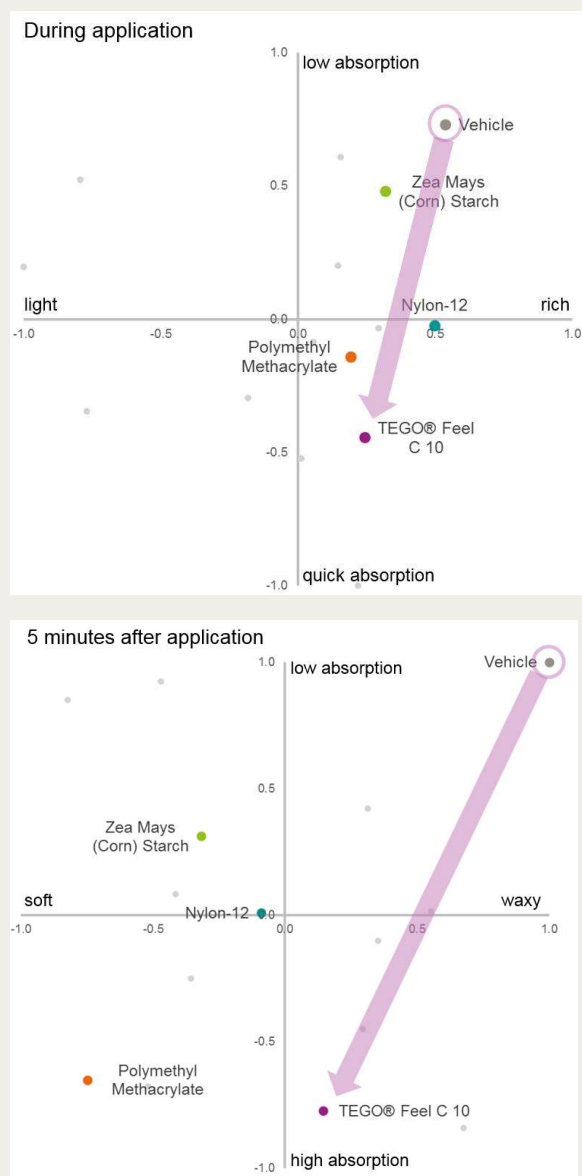


**Figure 5:** Images of an example panelist by VISIA–CR photography. On the left cheek vehicle and on the right cheek 2% TEGO® Feel C 10 formulation was applied.

The gloss is significantly reduced on the half face where the formulation with 2% TEGO® Feel C 10 was applied, compared to the vehicle formulation without cellulose. The average reduction of gloss value over the whole panel was 29%.

Cosmetic formulations containing TEGO® Feel C 10 are characterized by a quick absorption and reduced oiliness when applied on skin. Evonik's interactive online tool, Sensory Kaleidoscope 2.1, was used to put the effect into a sensorial context.

The sensory panel data of the test formulations which were also used in the *in vitro* and *in vivo* studies was analyzed and added to the sensory map of ISOLAN® GPS (Polyglyceryl-4 Diisostearate/ Polyhydroxy-stearate/Sebacate) to visualize the effect of the different particles on the skin feel.



**Figure 6:** Maps for ISOLAN® GPS taken from Sensory Kaleidoscope 2.1. These sensory maps visualize the skin feel during application and five minutes after application. The effect of 2% TEGO® Feel C 10 on skin feel is indicated by arrow. Light grey dots indicate other formulations based on ISOLAN® GPS from Sensory Kaleidoscope 2.1

As can be clearly seen in the sensory maps, the absorption could instantly be improved when adding TEGO® Feel C 10 into the W/O lotion. Five minutes after application, overall absorption is changed from a particularly low absorption of the vehicle emulsion to a very high absorption when containing 2% TEGO® Feel C 10, outperforming the other particles or fibers, respectively. This drastic

effect is in line with the superior sebum and oil absorption effect as shown in Figure 1. The relative effect is noticeably large for a system based on ISOLAN® GPS (Polyglyceryl-4 Diisostearate/ Polyhydroxystearate/Sebacate).

### Preparation

TEGO® Feel C 10 can be easily incorporated into O/W-, W/O-emulsions and anhydrous formulations. During processing of O/W systems, the fiber can be added to the water phase, the (hot) oil phase or, alternatively, after homogenization at approx. 40 °C. For W/O systems, TEGO® Feel C 10 is preferably added as last ingredient to the hot oil phase or, alternatively, after water addition to the pre-emulsion, before homogenization. In sun care formulations 0.05% EDTA prevents potential color changes. In water-free systems TEGO® Feel C 10 is blended with other powders/particles before addition of liquid ingredients. Then the mixture is well mixed and pressed, if required.

### Soft focus effect

TEGO® Feel C 10 itself does not provide a soft focus effect. However, Boron Nitride can provide such effect. Therefore, a combination of TEGO® Feel C 10 with Boron Nitride (e. g. 1% RonaFlair Boroneige SF-12 or 0.5% RonaFlair Boroneige SF-3 from Merck) is recommended as alternative to Nylon-12 to achieve a soft focus effect.

### Recommended usage concentration

1 – 5 % in O/W and 1–2% in W/O emulsions (higher concentrations might lead to formulation destabilization, particularly in W/O emulsion, due to the high water binding efficacy of the fiber) 5 – 20% in water-free systems.

### Application

TEGO® Feel C 10 is especially suitable for

- Natural cosmetics
- Face care
- Color cosmetics
- Sun care
- Body care

### Hazardous goods classification

Information concerning

- classification and labelling according to regulations for transport of chemicals
- protective measures for storage and handling
- measures in case of accidents and fire
- toxicological and ecotoxicological effects

is given in our safety data sheets.

## Guideline formulations

If you are interested in guideline formulations please visit our homepage <https://personal-care.evonik.com>

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## Product specification

**Material** TEGO FEEL C10  
**Spec.Code** K00 STANDARD

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Inspection Characteristics	Method	Limits	Units	Z
Bulk density	GM_1671_02	180-300	g/l	X
Loss on drying 105°C	GM_0090_02	<=7.0	%	X
Cellulose	GM_1671_09	>=99.0	%	X
Appearance 25°C	GM_0170_00	OK		X
Sieve residue > 32 µm	GM_0155_09	<=2.0	%	X

Appearance 25°C OK

Report on inspection certificate: X = specific/actual value, C = unspecific value/conformity, T = not reported

Appearance 25°C: white to off white powder

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All warranty claims in respect of the conformity of our product are subject to our General Terms and Conditions of Sale and Delivery. The data listed above reflects the criteria for our internal quality tests. We do not hereby make any express or implied warranty, whether for specific properties or for fitness for any particular application or purpose. All values are valid for the product when despatched from the works.

The Standard Test Methods can be obtained from specialized publishers. Evonik's test methods are available on request.

## TEGO® Feel C 10

### Product data record (PDR)

#### 1. General information

##### 1.1 Supplier

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##### 1.2 Product Description

###### 1.2.1 Raw material category/function   Cosmetic Powder

###### 1.2.2 Ingredients according to INCI

Cellulose

###### 1.2.3 Composition (INCI)

Components	Source	Percentage
Cellulose	vegetable	100 %

This composition information serves for information of our customers only.  
It is neither relevant for the composition listing according to Regulation (EC) No 1223/2009, nor does it reflect the chemical composition according to the different chemical regulations in the world which is disclosed in the table "information on ingredients/hazardous components" in the relevant parts of the respective (Material) Safety Data Sheets.

###### 1.2.4 Solvents, preservatives and other additives

INCI	CAS No.	EINECS / EC No.	content	Function
no additives				

Unless mentioned in our PDR under section 2.1 (By products) or 2.2 (CMR), no components which are listed in Annex II of the Regulation (EC) No 1223/2009 and its modifications and updates are added to and are not to be expected in the above mentioned product due to the raw materials used and the production process.

## 2. Information on production process

General description of production process:

Cellulose pulp is suspended in diluted acid and depolymerized, the cellulose is then washed, neutralized, dried and classified to particle size.

The product is not irradiated.

TEGO® Feel C 10 is produced in the strictest absence of any animal derived material of any type.

Residual plant based source (dominant origin of main constituents): cellulose pulp. Main sources: Beech, spruce.

CITES:

TEGO® Feel C 10 is not based on raw materials from species listed in CITES appendices.

GMO-Status:

The item does not contain ingredients that might have been derived from GM sources.

### 2.1 By-products/Impurities

1,4-Dioxane	not applicable
Residual organic solvents	not applicable
Dichloroacetic acid	not applicable
Monochloroacetic acid	not applicable
Free amines	not applicable
Pesticides	excluded by origin and facilities, certified by suppliers
Nitrosamines	not applicable
Total heavy metals	max. 20 ppm
As, Cd, Co, Cr, Hg, Ni, Pb, Sb	each < 1 ppm
Latex	not to be expected in the product due to the raw materials used and the production process
VOC	< 3 % according to SR (Swiss Right) 814.018

Any by-products are not added intentionally during the process and are technically unavoidable.

### 2.2 CMR (Carcinogenic, Mutagenic or Reprotoxic)

The use in cosmetic products of substances classified as CMR substances, of category 1A or 1B or 2 under Part 3 of Annex VI to Regulation (EC) No 1272/2008 shall be prohibited.

Further Information:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:342:0059:0209:en:PDF>

Some of the CMR substances mentioned below and listed in Annex VI to Regulation (EC) No 1272/2008 may be used as starting materials or solvents for the production of our cosmetic raw materials and may require reporting under California Proposition 65 or the Safe Cosmetics Act, SB 484.

The presence of these prohibited substances has to be seen as non-intended. It is stemming from impurities of the starting materials or the manufacturing process which is technically



unavoidable in good manufacturing practice.

CMR substance	Starting material	max. concentration/Remark
Ethylene Oxide	no	
Propylene Oxide	no	
Octamethylcyclotetrasiloxane (D4)	no	
2-Ethylhexanoic Acid	no	
n-Hexane	no	
Methyl Chloride	no	
Dimethyl Sulphate	no	
Formaldehyde	no	Formaldehyde is a ubiquitous material and may be detected in small traces in almost all natural and synthetic products. For details, a separate statement is available on request.

### 2.3 "Allergens" according to the Regulation (EC) No 1223/2009

The presence of substances, the mentioning of which is required under the column 'Other' in Annex III, shall be indicated in the list of ingredients in addition to the terms perfume or aroma.

The cosmetic raw materials and the cosmetic actives supplied by Evonik Personal Care are manufactured without the use of perfumes and fragrances. An analytical proof for the absence in traces of the substances to be mentioned in addition to the terms perfume or aroma is not performed in cosmetic raw materials, which are chemically produced.

None of these substances have been intentionally added to our cosmetic raw materials or are formed during the manufacturing process according to our knowledge of the chemistry.

### 2.4 Food Ingredients listed in Annex II of Regulation (EU) No 1169/2011

None of these substances have been intentionally added to our cosmetic raw materials or are formed during the manufacturing process according to our knowledge of the chemistry.

### 2.5 Nanomaterial

The product is not a nanomaterial according to the Cosmetics Regulation (EC) No 1223/2009, the Commission Recommendation on the definition of nanomaterial 2011/696/EU and the French Decree No. 2012-232. For details, a separate statement is available on request.

## 3. Microbiological status

Total Viable Count	max. 100 cfu/g
Pathogens*	absent/10 g

\*Pathogens are: Enterobacteria, Pseudomonas, Enterococci, Candida albicans, Staphylococci

## 4. Shelf life / storage conditions

1080 days after production (unopened original packaging)



## 5. Regulatory Status

5.1	HS-Code	391290
	EU-CN-Code	39129090

### 5.2 Regulatory status (chemical regulations)

Europe

Components	REACH status	CAS No.	EINECS / EC No.
Cellulose	Polymer	9004-34-6	Polymer

Other countries/regions

Country		yes / no	Remark
Australia	AICS:	yes	
China	IECSC:	yes	
Canada	DSL: NDSL:	yes	CAS No. 9004-34-6 is on the Revised In Commerce List (ICL)
Taiwan	TCSI:	yes	

In the following countries the relevant authorities currently do not request pre-market approval for cosmetic raw materials:

Brazil, Japan, South Korea, Philippines, USA

#### 5.2.1 Regulatory status (cosmetic regulation)

Country		yes / no	Remark
China	CFDA:	yes	
Japan	JSQI: JCIA:	no yes	JCIA No. 551738

## 6. Toxicology and Ecotoxicology

Refer to summary of ecotoxicological and toxicological data

## 7. Packaging size

420 kg (28 x 15 kg bag)

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