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English Version

## Surface active agents - Bio-based surfactants - Overview on bio-based surfactants

Agents de surface - Agents tensioactifs biosourcés -  
Vue d'ensemble des agents tensioactifs biosourcés

Tenside - Biobasierte Tenside - Übersicht über  
Biobasierte Tenside

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## European foreword

This document (CEN/TR 17557:2020) has been prepared by Technical Committee CEN/TC 276 “Surface Active Agent”, the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

## Introduction

Bio-based raw materials have been used for millennia in the manufacture of surfactants, e.g. the first surfactant used by mankind was already completely bio-based – soap. With the advent of modern surfactants in the early 20th Century, petrochemical-based raw materials also became of interest. They offered the opportunity to tune the surfactant properties, in a broader sense, to their various applications.

The last decades have seen the emergence of new bio-based raw materials for surfactants. Some of the reasons for the increased interest lie in the bio-based products' potential benefits in relation to the depletion of fossil resources and climate change.

Acknowledging the need for common standards for bio-based products, the European Commission issued mandate M/492<sup>1</sup>, resulting in a series of standards developed by CEN/TC 411, with a focus on bio-based products other than food, feed and biomass for energy applications.

The standards of CEN/TC 411 “Bio-based products” provide a common basis on the following aspects:

- Common terminology<sup>2</sup>;
- Bio-based content determination;
- Life Cycle Assessment (LCA)<sup>3</sup>;
- Sustainability aspects<sup>4</sup>;
- Declaration tools.

It is important to understand what the term “bio-based product” covers and how it is being used. The term “bio-based” means “derived wholly or partly from biomass”. It is essential to characterize the amount of biomass contained in the product by, for instance, its (total) bio-based content or bio-based carbon content.

The bio-based content of a product itself does not provide information on its environmental impact or sustainability, which may be assessed through Life Cycle Inventory (LCI), LCA and sustainability criteria. In addition, transparent and unambiguous communication within bio-based value chains is facilitated by a harmonized framework for certification and declaration.

Breaking down the horizontal standards to bio-based products like bio-based surfactants, the European Commission issued mandate M/491, resulting in standards developed by CEN/TC 276. This Technical Specification has been developed with the aim to fulfil part of the Mandate to describe the technical requirements of bio-based surfactants. The criteria for “bio-based surfactants” published in this Technical Specification are complementary to the horizontal standards by CEN/TC 411.

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1 A Mandate is a standardisation task embedded in European trade laws. M/492 Mandate is addressed to the European Standardisation bodies, CEN, CENELEC and ETSI, for the development of horizontal European Standards for bio-based products. M/491 mandate is addressed to the development of European standards for bio-solvents and bio-surfactants.

2 EN 16575

3 EN 16760

4 EN 16751

Surfactants are products which have the ability to reduce interfacial/surface tension, wet surfaces, suspend materials or emulsify oils and fats. In Europe, thousands of producers, manufacturers and nearly every inhabitant in Europe use surfactants every day in consumer or industrial applications. The surfactant-producing industry is composed of mainly multinationals. Downstream users are found in multinationals as well as SME's.

Surfactants may be produced from both fossil and renewable carbon feedstock (Ref. EN 16575:2014 nomenclature). The amount of crude oil used for surfactant production is, however, low with less than 1 % of the total world's crude oil consumption.

Finally, the approach for these Technical Reports/Specifications/Standards intends to strengthen and harmonize the reputation of "bio-based surfactants" and the confidence of the customer in this product group.

## 1 Scope

The aim of this document is to summarize the actual situation regarding many aspects regarding bio-based surfactants and their relation to any other surfactant regardless of its origin. It will describe existing raw material sources with regard to their current usage in surface active agents, their source identification and conformation, and the options for communication same.

It also includes the current work on surfactants regarding their performances, their sustainability, the LCA approaches and end of life options.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16575 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

### 3.1

#### **surfactant**

organic substance, possessing surface activity which, dissolved in a liquid, particularly water, lowers the surface or interfacial tension, by preferred adsorption at the liquid/vapour surface, or other interfaces

Note 1 to entry: “substance” as defined in REACH [14]

[SOURCE: ISO 862:1984, surface active agent 1.1 modified]

### 3.2

#### **bio-based surfactant**

surfactant wholly or partly derived from biomass (based on biogenic carbon) produced either by chemical or biotechnological processing

[SOURCE: EN 16575:2014, bio-based surfactant 3.2]

### 3.3

#### **bio-surfactant**

surfactant wholly based on biomass (based on biogenic carbon) produced either by chemical or biotechnological processing

[SOURCE: EN 16575:2014, bio-surfactant 3.3]

### 3.4

#### **degradation**

transformation of a compound into smaller component parts due to the physico-chemical environment. This may occur due to abiotic processes such as oxidation and UV adsorption

[SOURCE: EN 16575:2014, degradation 3.4]