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# Technical Information

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# Agnique® CSO 35

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® = Registered trademark of BASF in many countries.

<b>Chemical nature</b>	Castor oil ethoxylate
<b>PRD-Nos.*</b>	30634576  * BASF's commercial product numbers.
<b>Storage</b>	<ol style="list-style-type: none"><li>a) Agnique® CSO-35 should be stored in its original packaging, which should be kept tightly sealed, in a dry place. Storerooms must not be overheated.</li><li>b) Avoid a humid environment, because the product is hygroscopic and, being readily soluble in water, absorb moisture immediately. For this reason, it is advisable to reseal drums tightly without delay each time material is taken from them.</li><li>c) The congealing point of Agnique® CSO-35 must be taken into consideration when determining the storage temperature.</li><li>d) Agnique® CSO-35 can become slightly cloudy if it is stored at low temperatures, but this has no effect on the product properties. The cloudiness can be reversed at 50 – 60 °C.</li><li>e) Product that has solidified or that shows signs of precipitation should be heated to 50 – 70 °C and homogenized before use.</li><li>f) Product in drums that has solidified or that shows signs of precipitation should be melted or heated gently in a heating cabinet or heated chamber; the temperature should not exceed 50 – 70 °C, depending on the particular congealing or melting point. This also applies if electric drum heaters are used. Internal electrical elements are unsuitable for heating owing to the high heat load in some places.</li><li>g) If Agnique® CSO-35 is stored in heated tanks at 50 – 70 °C (depending on the particular congealing or melting point), care must be taken to ensure that it does not come into contact with air (blanket with nitrogen). Constant gentle stirring prevents it from overheating or becoming discolored as a result of prolonged contact with the heating elements or external heating jacket.</li></ol>
<b>Materials</b>	The following materials can be used for tanks and drums: <ol style="list-style-type: none"><li>a) Stainless steel 1.4541 – AISI 321 stainless steel (X6 CrNiTi 1810)</li><li>b) Stainless steel 1.4571 – AISI 316 Ti stainless steel (X6 CrNiMoTi 17122)</li><li>c) Stainless steel 1.4306 – AISI 321 L stainless steel (X2 CrNi 1911)</li></ol>
<b>Shelf life</b>	Agnique® CSO-35 has a shelf-life of at least 24 months, provided it is stored in its original packaging and kept tightly sealed.
<b>Application</b>	Agnique® castor oil ethoxylates are biodegradable and derived from natural sources. Typically, they are used as non-ionic emulsifiers often matched with anionic counterparts such as CaDDBS to give optimum stability in formulations such as EC, EW, SE, and OD. In addition, Agnique CSO products show wetting and adjuvancy properties.

## Properties

Agnique® CSO-35 is a cloudy, yellow liquid.

The most important properties of Agnique® CSO-35 is listed in the table below.

Agnique® CSO-35	Unit	
Physical form (23°C)		liquid
Concentration	%	approx. 100
Water content (EN 13267)	%	approx. 0.3
Cloud point (EN 1890)*		
Method A	°C	> 100
Method B	°C	approx. 67
Method C	°C	approx. 57
Method D	°C	approx. 72
Method E	°C	approx. 72
pH** (EN 1262, Solution B)		approx. 7
Density (DIN 51757, Method 1) (23 °C)	g/cm <sup>3</sup>	approx. 1.04
Dropping point (DIN 51801)	°C	approx. 20
Congealing point (ISO 2207)	°C	approx. 5
Pour point (ISO 3016)	°C	approx. 2
Melting point	°C	–
Viscosity (EN 12092, Brookfield LVT) 23 °C	mPa·s	approx. 600
Acid value (ISO 2114)	mg KOH/g	approx. 0.5
Saponification value (ISO 3681)	mg KOH/g	approx. 68
Surface tension*** (EN 14370, 1 g/l surfactant in distilled water, 23 °C)	mN/m	approx. 41
Hydrophilic-lipophilic balance (W.C. Griffin)		approx. 13

The above figures reflect the situation at the time of going to press and do not necessarily form part of the product specification.

The specified test characteristics are set out in the relevant product specification, which can be requested from the local BASF representative.

\* Cloud point according to EN 1890:

Method A: 1 g of surfactant + 100 g of distilled water

Method B: 1 g of surfactant + 100 g of NaCl solution (c = 50 g/l)

Method C: 1 g of surfactant + 100 g of NaCl solution (c = 100 g/l)

Method D: 5 g of surfactant + 45 g of diethylene glycol monobutyl ether solution (c = 250 g/l)

Method E: 5 g of surfactant + 25 g of diethylene glycol monobutyl ether solution (c = 250 g/l)

\*\* The pH of the Agnique® types can decrease during storage, but this does not have any effect on their performance.

\*\*\* Applying Harkins-Jordan correction.

**Solubility**

Details on the solubility of Agnique® CSO 35 in various solvents is given in the table below:

**Solubility of 10% solutions of Agnique® CSO-35 at 23 °C**

Distilled water	+
Potable water (2,7 mmol Ca <sup>2+</sup> -ions/l)	+
Caustic soda (5%)	-
Hydrochloric acid (5%)	+
Salt solution (5%)	+
Mineral oil	-
Ethanol Isopropanol	+
Aromatic hydrocarbons	+

+ = *clear solution*

± = *sparingly soluble (insoluble sediment)*

- = *insoluble (phase separation)*

o = *forms an opaque soluble, homogeneous emulsion*

**Viscosity**

The relationship between viscosity and temperature is always an important point to consider when Agnique® CSO-35 is stored or shipped. This is shown in the following table (Brookfield LVT):

Temperature at °C	Viscosity (mPa·s)
0	>10 <sup>5</sup>
10	10 <sup>5</sup>
20	>10 <sup>5</sup>
23	approx. 7300
30	approx. 660
40	approx. 360
50	approx. 190
60	approx. 120

The rate at which Agnique® CSO-35 dissolve can be increased by adding alcohols, glycols and other solubilizers.

Agnique® CSO-35 may form a gel when they are diluted with water, as can be seen from the following table.

Viscosity (mPa·s) at 23 °C after the addition of water

Water content (%)	Viscosity (mPa·s)
0	approx. 600
10	approx. 1200
20	approx. 1700
30	approx. 2800
40	>10 <sup>5</sup>
50	approx. 14000
60	approx. 550
70	approx. 40
80	approx. 10
90	<10

**Safety**

We know of no ill effects that could have resulted from using Agnique® CSO-35 for the purpose for which it is intended and from processing it in accordance with current practice. According to the experience we have gained over many years and other information at our disposal, Agnique® CSO-35 do not exert any harmful effects on health, provided that it is used properly, does attention is given to the precautions necessary for handling chemicals, and the information and advice given in our Safety Data Sheets are observed.

**Labelling**

Please consult the current Safety Data Sheets for information on the classification and labelling of our products and other information relevant to safety.

**Note**

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