
Technical Information

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Lutensol® XA types

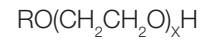
Lutensol® XA 40
Lutensol® XA 50
Lutensol® XA 60

Nonionic surfactants for detergents and cleaners, and for the chemical and allied industries

Chemical nature

The Lutensol® XA types are nonionic surfactants. They are alkyl polyethylene glycol ethers based on C₁₀-Guerbet Alcohol and ethylene oxide. These products contain also higher alkylene oxides in small amounts.

They conform to the following formula:



$$R = \text{C}_{10}\text{H}_{21}$$

$$x = 4, 5, 6$$

PRD-No.*

30190154	Lutensol® XA 40
30190155	Lutensol® XA 50
30190156	Lutensol® XA 60

* BASF's commercial product numbers.

Properties

Lutensol® XA 40, XA 50 and XA 60 are clear to cloudy yellowish to pink liquids at room temperature and they tend to form a sediment.

Lutensol®		XA 40	XA 50	XA 60
Physical form (23 °C)		Liquid	Liquid	Liquid
Degree of ethoxilation		approx. 4	approx. 5	approx. 6
Concentration	%	approx. 100	approx. 100	approx. 100
Cloud point (EN 1890)*				
Method A	°C	<5	<5	<5
Method B	°C	<5	<5	<5
Method C	°C	<5	<5	<5
Method D	°C	approx. 54	approx. 64	approx. 69
Method E	°C	approx. 43	approx. 58	approx. 65
pH (EN 1262, solution B)**		approx. 7	approx. 7	approx. 7
Density (DIN 51757, 23 °C)	g/cm ³	approx. 0.95	approx. 0.97	approx. 0.98
Dropping point (DIN 51801)	°C	<0	<0	<0
Congealing point (ISO 2207)	°C	<0	<0	<0
Viscosity (EN12092, 23 °C, Brookfield, 60 rpm)	mPa·s	approx. 40	approx. 50	approx. 60
Hydroxylnumber (DIN 53240)	mgKOH/g	approx. 150	approx. 130	approx. 115
HLB value		approx. 10.5	approx. 11.5	approx. 12.5
Flash point (DIN ISO 2592)	°C	>170	>190	>200
Wetting (EN 1772, distilled water, 23 °C, 2 g Soda ash/l)		–	–	–
2 g Soda ash/l)				
0.5 g/l	s	approx. 50	approx. 50	approx. 40
1 g/l	s	approx. 30	approx. 20	approx. 10
2 g/l	s	approx. 20	approx. 5	approx. 5
Foam volume (EN 12728, 40 °C, 2 g/l water at a hardness of 1.8 mmol Ca-ions/l, after 30 s)	cm ³	approx. 10	approx. 200	approx. 240
Surface tension (EN 14370, 1 g/l in distilled water, 23 °C)***	mN/m	approx. 27	approx. 27	approx. 27

The above information is correct at the time of going to press. It does not necessarily form part of the product specification.

A detailed product specification is available from your local BASF representative.

* *Cloud point EN 1890:*

Method A: 1 g of surfactant + 100 g of dist. 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 butyldiglycol solution (c = 250 g/l)

Method E: 5 g of surfactant + 25 g of butyldiglycol solution (c = 250 g/l)

** *The pH can decrease during storage, but this does not have any effect on their performance.*

*** *Applying Harkins-Jordan correction.*

Solubility

Details on the solubility of the Lutensol® XA types in various solvents are given in the table below.

Solubility of the Lutensol® XA types (10% at 23 °C)

	Distilled water	Potabl water (2.7 mmol Ca ²⁺ -ions/l)	Caustic soda (5%)	Hydrochloric acid (5%)	Salt solution (5%)	Solvent naphta	Ethanol Isopropanol	Aromatic hydrocarbons
Lutensol® XA 40	–	–	–	–	–	±	±	+
Lutensol® XA 50	○	○	–	+	○	±	±	+
Lutensol® XA 60	+	+	○	+	–	±	±	+

+ = clear solution

± = sparingly soluble (insoluble sediment)

– = insoluble (phase separation)

○ = forms an opaque soluble, homogeneous emulsion

Viscosity

The relationship between viscosity and temperature is always an important point to consider when Lutensol® XA types are stored or shipped.

This is shown in the following table (mPa·s, Brookfield LVT):

Viscosity at °C	0	10	20	23	30	40	50	60
Lutensol® XA 40	120	60	50	40	20	20	20	10
Lutensol® XA 50	200	110	60	50	40	30	20	10
Lutensol® XA 60	250	120	80	60	50	40	30	10

The products Lutensol® XA 50 and XA 60 can form fairly stiff gels at certain concentrations when water is added. The figures below were measured using a Brookfield-viscosimeter at 23 °C and 60 rpm.

The viscosity of the Lutensol® XA types at 23 °C as a function of concentration in water (all values in mPa·s)

Water content in %	Lutensol® XA 40	Lutensol® XA 50	Lutensol® XA 60
0	40	50	60
10	50	70	90
20	70	80	100
30	80	>10 ⁵	>10 ⁵
40	160 ¹⁾	>10 ⁵	>10 ⁵
50	300 ¹⁾	50000	500 ¹⁾
60	50 ¹⁾	500 ¹⁾	100 ¹⁾
70	30 ¹⁾	100 ¹⁾	50
80	30 ¹⁾	70 ¹⁾	30
90	10 ¹⁾	60 ¹⁾	10

¹⁾ Two separate phases are formed

The numbers reported have to be regarded as maximum values; the values measured immediately after mixing will be lower than the numbers reported.

Storage

- a) The Lutensol® XA types should be stored indoors in a dry place. Storerooms must not be overheated.
- b) The Lutensol® XA types are hygroscopic due to their good solubility in water, with the result that they may absorb moisture very quickly. Drums must be resealed each time they are opened.
- c) The storage temperature should not be allowed to fall substantially below 20 °C. The setting points of these products also need to be taken into account.
- d) Lutensol® XA types are clear to cloudy liquids at room temperature.
- e) Liquid that has solidified or that shows signs of sedimentation should be heated to 50 – 60 °C and homogenized before it is processed.
- f) Drums that have solidified or that have begun to precipitate should be reconstituted by gentle heating, preferably in a heating cabinet. The temperature must not be allowed to exceed 60 °C. This also applies if drums are heated by external electrical elements.
Internal electrical elements should not be used because of the localized anomalies in temperature that they cause.
- g) The Lutensol® XA types must be blanketed with nitrogen if they are stored in heated tanks (at 50 – 60 °C) to prevent them from coming into contact with air. Constant, gentle stirring helps to prevent them being discoloured as a result of prolonged contact with electrical elements or external heating coils.
- h) The pink color would disappear by addition a small amount of HCl. Pink coloration do not have impact in performance.

Materials

The following materials can be used for tanks and drums:

- a) AISI 321 stainless steel (X6CrNiTi1810)
- b) AISI 316 Ti stainless steel (X6CrNiMoTi17122)

Shelf life

Provided they are stored properly and drums are kept tightly sealed, the Lutensol® XA types have a shelf life of at least two years in their original packaging.

Safety

We know of no ill effects that could have resulted from using Lutensol® XA types for the purpose for which it is intended and from processing it in accordance with current practices.

According to the experience that we have gained over many years and other information at our disposal, Lutensol® XA types do not exert harmful effects on health, provided they are used properly, due 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 refer to latest Safety Data Sheet for detailed information on product safety.

Note

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