

Technical Information

February 2014

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Last change WF-No. 3554

® = Registered trademark of BASF

Pluriol® E types

Pluriol® E 200

Pluriol® E 300

Pluriol® E 400

Pluriol® E 600

Pluriol® E 1000

Pluriol® E 1500 E

Pluriol® E 1500 Powder K

Pluriol® E 1500 Flakes

Pluriol® E 3400 Powder

Pluriol® E 3400 Flakes

Pluriol® E 4000 E

Pluriol® E 4000 Powder

Pluriol® E 4000 Flakes

Pluriol® E 6000 E

Pluriol® E 6000 Powder

Pluriol® E 6000 Flakes

Pluriol® E 8000 E

Pluriol® E 8000 Powder

Pluriol® E 8000 Flakes

Pluriol® E 9000 Powder

Polyethylene glycols for the chemical and allied industries

Chemical nature

The Pluriol® E types are polyethylene glycols that conform to the general formula $\text{HO}(\text{CH}_2\text{CH}_2\text{O})_n\text{H}$.

The degree of polymerization n determines the average molar mass of each product and the properties it displays.

PRD-Nos.*

30044100	Pluriol® E 200
30044124	Pluriol® E 300
30044134	Pluriol® E 400
30044074	Pluriol® E 600
30044107	Pluriol® E 1000
30044072	Pluriol® E 1500 E
30044070	Pluriol® E 1500 Powder K
30044099	Pluriol® E 1500 Flakes
30059028	Pluriol® E 3400 Powder
30074934	Pluriol® E 3400 Flakes
30044102	Pluriol® E 4000 E
30044135	Pluriol® E 4000 Powder
30044103	Pluriol® E 4000 Flakes
30044092	Pluriol® E 6000 E
30044125	Pluriol® E 6000 Powder
30044118	Pluriol® E 6000 Flakes
30044119	Pluriol® E 8000 E
30450836	Pluriol® E 8000 Powder
30074961	Pluriol® E 8000 Flakes
30044094	Pluriol® E 9000 Powder

*BASF's commercial products numbers.

Properties

Pluriol® E 200, E 300 and E 400 are clear, colorless liquids at 23 °C.

Pluriol® E 600 can have the consistency of a clear, colorless liquid, a milky white liquid or a semi-solid, depending on the ambient temperature. It has a setting point of approx. 20 °C.

Polyethylene glycols with a molar mass of approx. 600 or more are solid at 23 °C. They are supplied in the following forms.

E = Product supplied as cast solids in drums or in liquid form in heated road tankers.

Powder = White or slightly yellowish micronized granules with a particle size predominately in the 0.2 – 1 mm range.

Flakes = White or slightly yellowish flakes with various particle sizes.

Product data

Pluriol®			E 200	E 300	E 400	E 600	E 1000
	Method	Unit					
Physical form			Liquid	Liquid	Liquid	Liquid/Solid	Solid
Average molar mass (calculated from the OH number according to DIN 53240)		g/mol	200	300	400	600	1000
pH value (5% in water at 23 °C)	EN 1262		approx. 7	approx. 7	approx. 7	approx. 7	approx. 7
Density (23 °C)	DIN 51757	g/cm ³	approx. 1.12	approx. 1.12	approx. 1.13	approx. 1.14	approx. 1.09 (50 °C)
Bulk density Powder Flakes	ISO 697	kg/l kg/l					
Clear melting point		°C	approx. -40	approx. -10	approx. 0	approx. 20	approx. 40
Viscosity at 20 °C at 50 °C at 99 °C	DIN 51562	mm ² /s mm ² /s mm ² /s	approx. 60 approx. 15 approx. 4	approx. 85 approx. 20 approx. 5	approx. 110 approx. 30 approx. 6.5	– approx. 40 approx. 10	– approx. 70 approx. 25
Water content	EN 13267	%	<0.3	<0.3	<0.3	<0.3	<0.5
Ash content	DIN 51575	%	max. 0.05	max. 0.05	max. 0.05	max. 0.05	max. 0.05
Flash point	ISO 2592	°C	>170	>200	>250	>250	>250

Pluriol®			E 1500 E	E 3400	E 4000 E	E 6000 E	E 8000 E	E 9000
	Method	Unit	Powder Flakes	Powder Flakes	Powder Flakes	Powder Flakes	Powder Flakes	Powder
Average molar mass (calculated from the OH number according to DIN 53240)		g/mol	1500	3400	4000	6000	8000	9000
pH value (5% in water at 23 °C)	EN 1262		approx. 7	approx. 7	approx. 7	approx. 7	approx. 7	approx. 7
Density	DIN 51757	g/cm ³	approx. 1.09 (60 °C)	approx. 1.09 (60 °C)	approx. 1.09 (60 °C)	approx. 1.09 (60 °C)	approx. 1.09 (70 °C)	approx. 1.09 (70 °C)
Buld density Powder Flakes	ISO 697	kg/l kg/l	approx. 0.6 approx. 0.45	approx. 0.6 approx. 0.45	approx. 0.6 approx. 0.45	approx. 0.6 approx. 0.5	approx. 0.6 approx. 0.5	approx. 0.6 approx. 0.45
Clear melting point		°C	approx. 45	approx. 55	approx. 55	approx. 60	approx. 63	approx. 65
Viscosity at 20 °C at 50 °C at 99 °C	DIN 51562	mm ² /s mm ² /s mm ² /s	– approx. 110 approx. 30	– approx. 85	– approx. 120	– approx. 350	– approx. 600	– approx. 900
Water content	EN 13267	%	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ash content	DIN 51575	%	approx. 0.05	approx. 0.05	approx. 0.05	approx. 0.05	approx. 0.05	approx. 0.05
Flash point	ISO 2592	°C	>300	>300	>300	>300	>300	>300

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.

Solubility

All of the Pluriol® E types are easy to dissolve in water, and their solubility is not affected by water hardness. Their solubility decreases to a certain extent as their molar mass increases. They are resistant to moderately strong acids, alkalis and salt solutions. Generally speaking, substances in this group are fairly inert, but they can react with vegetable and synthetic tanning agents and other substances that contain phenolic hydroxyl groups to form sparingly soluble addition products.

The Pluriol® E types with a low molar mass are soluble in alcohols, but their solubility decreases as their molar mass increases. They are soluble in most aromatic solvents, but they are virtually insoluble in aliphatic hydrocarbons and petroleum fractions.

Stability

The Pluriol® E types are thermally stable in the absence of oxygen.

Compatibility

The Pluriol® E types are freely intermiscible, which enables homogeneous mixtures with specific properties to be prepared.

They are compatible with nonionic surfactants such as our Lutensol®, Plurafac® and Pluronic® types. They are miscible to a greater or lesser extent with monomeric and polymeric substances of a largely hydrophilic nature – such as dyes and pigments, anionic and cationic surfactants, and animal, vegetable and synthetic glues and binders – and their compatibility is good. The miscibility of the Pluriol® E types with fats, fatty acids, alcohols and oils, natural and synthetic ester and hydrocarbon waxes, petroleum fractions and other substances of a predominantly hydrophobic nature is limited. Nevertheless, pseudomixtures or pasty dispersions can be made from some combinations of products by melting them into a vessel and allowing them to cool before stirring.

Solids, such as chromatic pigments, ceramic pigments, and abrasives in polishes and solid lubricants, can be ground into stable, homogeneous pastes with Pluriol® E types, providing that the solids are properly wetted, the viscosity is kept within reasonable limits, and the various ingredients are correctly proportioned.

Storage

- a) The Pluriol® E types should be stored indoors in a dry place. Storerooms must not be overheated.
- b) The Pluriol® E types are hygroscopic, and care needs to be taken to exclude moisture. Drums must be resealed each time they are opened.
- c) The storage temperature should not be allowed to fall below the melting point if at all possible.
- d) 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 70 °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.
- e) The Pluriol® E types must be blanketed with nitrogen if they are stored in heated tanks (at 60 – 70 °C) to prevent them from coming into contact with air. Constant, gentle stirring helps to prevent them being discolored as a result of prolonged contact with electrical elements or external heating coils.
- f) The Pluriol® E types supplied in the form of powder or flakes should be stored in a dry place at a temperature not exceeding 30 °C. They should be shielded from sunlight to prevent lumps from forming.
- g) Big Bags are not to be stacked during storage in order to prevent lumping/agglomeration due to weight compression.

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 Pluriol® E 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 the Pluriol® E types for the purpose for which they are intended and from processing them in accordance with current practice.

According to the experience we have gained over many years and other information at our disposal, the Pluriol® E types do not exert any harmful effects on health, provided that 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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