Technical Information

July 2005
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MEMC 050417e-00/Page 1 of 8

Luviskol® Plus

® = Registered trademark
of BASF Aktiengesellschaft

Nonionic film-forming agent for hair setting products.

cosmetic SOLUTIONS

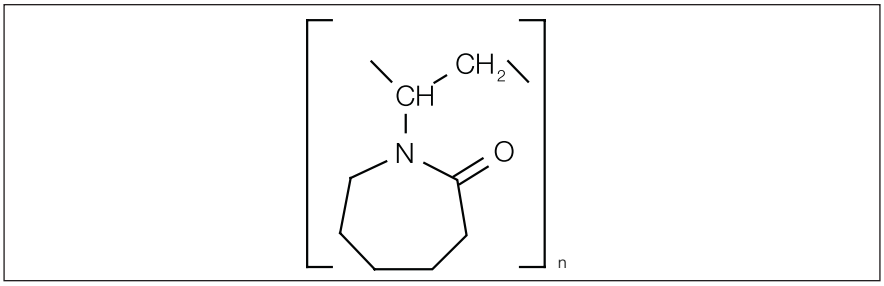
- Hair Care
- Skin Care
- Oral Care

BASF
The Chemical Company

Chemical nature

Vinylcaprolactam homopolymer

Structural formula



INCI name

Polyvinylcaprolactam

Form supplied

40% solution in ethanol

Physical properties

Propellant compatibility

An alcoholic solution (in ethanol abs. or isopropanol) of Luviskol® Plus with a solids content of 3 % can be combined with the following maximum quantities of propellant.

	-20°C	0°C	+25°C
DME	90%	90%	90%
Propane/Butane	70%	70%	70%
HFC 152a	40%	40%	40%
HFC 134a	40%	40%	40%

The above are maximum values and the values obtained in practice may be lower, depending on the quality of the alcohols and propellants used.

With ethanol 96%, the maximum quantity of DME or propane/butane that can be used without problems is approx. 50 %. At very low temperatures, the quantity may be less.

Solubility

Luviskol® Plus is soluble in ethanol, isopropanol and water/alcohol mixtures.

It is soluble in water only within a temperature range of 0°C to 33°C.
At temperatures over approx. 33°C, the polymer precipitates out of the aqueous solution. If the mixture is cooled below 33°C, the polymer can be redissolved by stirring.

Aqueous solutions are slightly basic.

Clear aqueous/ethanolic solutions are obtained between -20°C and 50°C, if the solution contains at least 35% ethanol.

Viscosity

Solutions of Luviskol® Plus in water, ethanol or isopropanol and solutions of Luviskol® Plus in mixtures of water and ethanol or isopropanol have a low viscosity. Such solutions therefore give a fine spray with conventional spray valves.

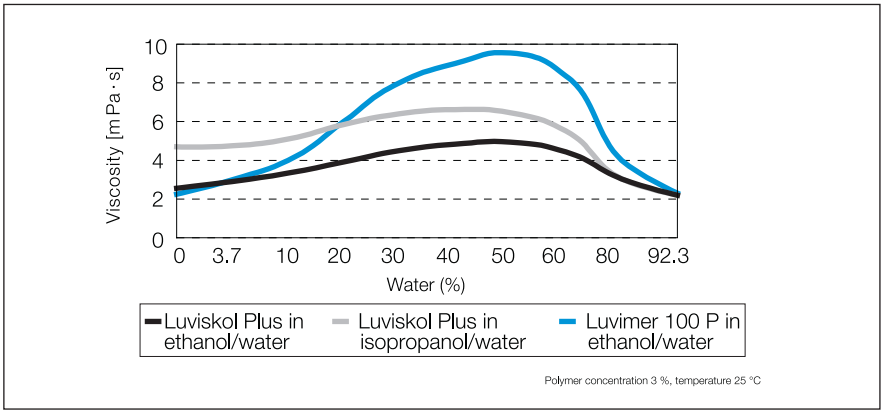


Fig. 1: Viscosity of a solution of Luviskol® Plus in water/ethanol and water/ isopropanol

Because the polymer solution has such a low viscosity, fine spray droplets can be obtained even with a high solids content and /or a high water content.

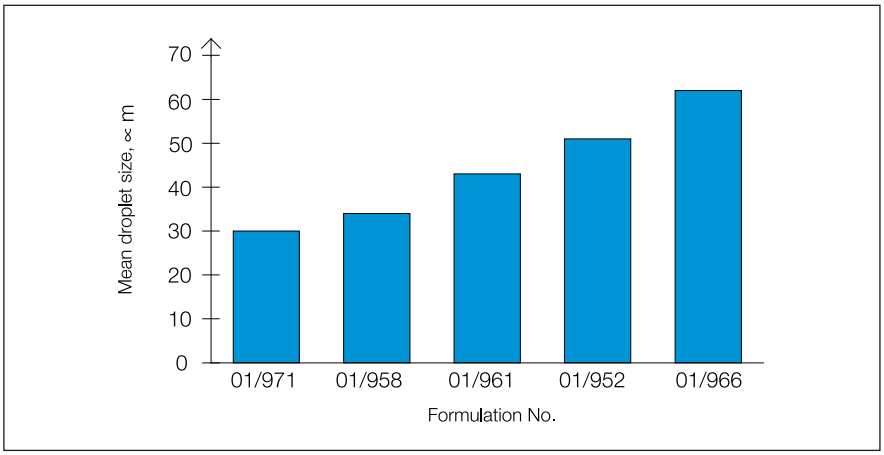


Fig. 2: Droplet size obtained with different formulations

Technical properties

Tack

Films of Luviskol® Plus do not become tacky even at high humidities.

Setting effect

Luviskol® Plus has good holding power as demonstrated by the stiffness test. These results are confirmed in the half-head test.

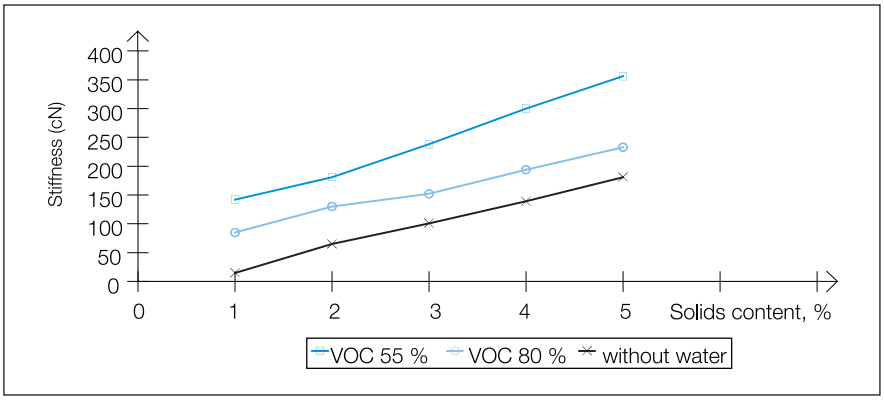


Fig. 3: Setting effect of Luviskol® Plus in alcoholic and aqueous/alcoholic solutions in the stiffness test, at a relative humidity of 65% and a temperature of 20°C

Curl retention

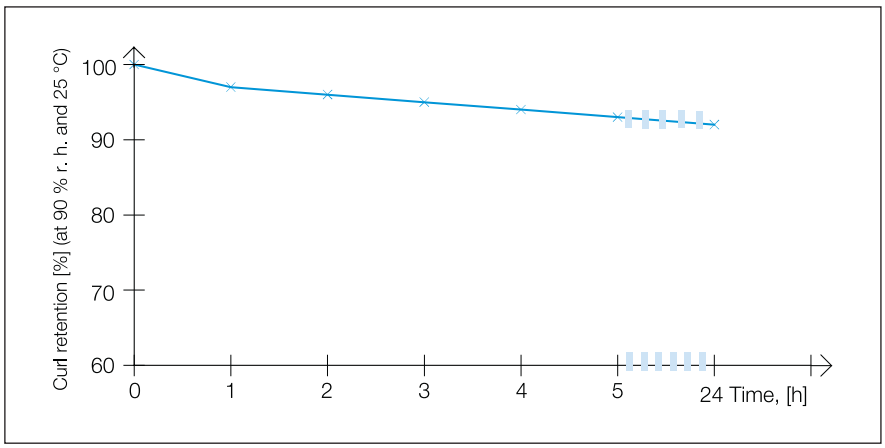


Fig. 4: shows how the fixative effect is largely maintained even at high humidities

Specifications

	Method No.	Specification
K value	02/0019.00	40-46
Solids content	02/0020.00	38.0-42.0
Vinylcaprolactam	02/0021.00	≤ 20 ppm
Water (Karl Fischer)	02/0037.00	≤ 0.5%
Propane/butane compatibility (-15°C)	02/0012.00	passes test
Ethanol content, %vol., calc.	–	66-71

Applications

Luviskol® Plus is suitable for aerosol sprays, pump sprays and lotions.

Depending on the fixation effect required, solids contents of 2-6 % are recommended.

Luviskol® Plus is nonionic and therefore requires no neutralization.

Luviskol® Plus can be combined with other fixative and conditioner polymers over a wide range of proportions. The formulation section under Point 5 gives examples. Further polymers that can be used in combination with Luviskol® Plus are given in EP 734 717.

Typical formulations

Hairspray **No. 01/00954**

	%	Ingredients	Supplier	INCI name
A	7.00	Luviskol® Plus	(1)	Polyvinylcarpollactan
	28.00	Ethanol abs.		Alcohol
	q.s.	Perfume		
B	65.00	iso-Butane		iso-Butane

Procedure: Weigh the components of phase A and stir until a homogeneous solution is obtained. Fill into apporitate containers and charge with phase B.

Properties:

Cloud point: -35°C
Density: 0.6430 g/ml
Pressure: 3.6 bar
Droplet size*: 29 µm

Hairspray with Luviskol® Plus **No. 01/00960**

	%	Ingredients	Supplier	INCI name
A	14.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	36.00	Ethanol abs.		Alcohol
	q.s.	Perfume		
B	50.00	Propane/Butane		Propane/Butane

Production:

Weigh out the components of phase A and stir until a homogeneous solution is obtained. Fill into appropriate containers and charge with phase B.

Properties:

Pressure: 4.0 bar
Density: 0.6750 g/ml
Cloud point: -35°C still clear
Droplet size: 41 µm

Hairspray VOC 80 with Luviskol® Plus normal hold **No. 01/00966**

	%	Ingredients	Supplier	INCI name
A	7.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	17.20	Water dem.		Aqua
	q.s.	Perfume		
	35.80	Ethanol		Alcohol
B	40.00	Dimethylether		Dimethyl Ether

Production:

Weigh out the components of phase A and stir until a homogeneous solution is obtained. Fill into appropriate containers and charge with phase B.

Properties:

Pressure: 3.5 bar (20°C)
Density: 0.8204 g/ml
Cloud point: -35°C clear

Hairspray with Luviskol® Plus **No. 01/00968**

	%	Ingredients	Supplier	INCI name
A	14.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	46.00	Ethanol abs.		Alcohol
	q.s.	Perfume		
B	40.00	DME		Dimethyl Ether

Production:

Weigh out the components of phase A and stir until a homogeneous solution is obtained. Fill into appropriate containers and charge with phase B.

Properties:

Pressure: 3.3 bar
Density: 0.7900 g/ml
Cloud point: -35°C still clear
Droplet size: 57 µm

Hairspray with Luviskol® Plus and HFC 152a **No. 01/00972**

	%	Ingredients	Supplier	INCI name
A	7.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	53.00	Ethanol abs.		Alcohol
	q.s.	Perfume		
B	40.00	HFC 152a		Hydrofluorocarbon 152 a

Production: Weigh out the components of phase A and stir until a homogeneous solution is obtained. Fill into appropriate containers and charge with phase B.

Properties:

Pressure: 3.9 bar
Density: 0.8800 g/ml
Cloud point: -35°C still clear
Droplet size: 57 µm

Pump-Setting-Spray with Luviskol® Plus in VOC 80 **No. 01/00931**

%	Ingredients	Supplier	INCI name
7.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
75.80	Ethanol		Alcohol
17.20	Water, dem.		Aqua
q.s.	Perfume		

Production: Weigh out the components and stir until a homogeneous solution is obtained.

Pump-Setting-Spray with Luviskol® Plus **No. 01/00930**

%	Ingredients	Supplier	INCI name
14.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
86.00	Ethanol		Alcohol
q.s.	Perfume		

Production: Weigh out the components and stir until a homogeneous solution is obtained.

Hairspray with Luviskol® Plus and Ultrahold® 8, normal hold **No. 01/00994**

	%	Ingredients	Supplier	INCI name
A	4.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	0.14	AMP	(56)	Aminomethyl Propanol
	54.36	Ethanol		Alcohol
B	1.50	Ultrahold® 8	(1)	Acrylates/t-Butylacrylamide Copolymer
C	40.00	Propane/Butane		Propane/Butane

Production:

Weigh out the components of phase A and stir until a homogeneous solution is obtained. Add phase B and stir until a homogeneous solution is obtained.
Fill into appropriate containers and charge with phase C.

Properties:

Pressure: 4.1 bar (20°C)
Density: 0.7080 g/ml
Cloud point: -35°C clear

Hairspray with Luviskol® Plus and Ultrahold® Strong **No. 01/00993**

	%	Ingredients	Supplier	INCI name
A	0.14	AMP	(56)	Aminomethyl Propanol
	54.32	Ethanol		Alcohol
	q.s.	Perfume		
B	4.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	1.50	Ultrahold® Strong	(1)	Acrylates/t-Butylacrylamide Copolymer
C	40.00	Propane/Butane		Propane/Butane

Production:

Weigh out the components of phase A and stir until a homogeneous solution is obtained. Add phase B into phase and stir until a homogeneous solution is obtained. Fill into apporiate containers and charge with phase C.

Properties:

Cloud point: -35°C still clear
Pressure: 4.0 bar
Density: 0.7160 g/ml

Stability

The product can be stored for at least one year in the original containers at 25°C.

Toxicology

Luviskol® Plus has been toxicologically assessed for its suitability in cosmetic preparations. On the basis of information at our disposal and provided that the recommended concentrations and fields of application are adhered to, there is no evidence of any toxicological risks associated with its use. We will gladly supply you with details of the investigations under Secrecy Agreement.

Safety Data Sheet

A Safety Data Sheet is available.

Suppliers

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