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## Technical Information

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# Luviset<sup>®</sup> CA 66

® = Registered trademark  
of BASF Aktiengesellschaft

**Copolymer with carboxyl groups for the production of hair sprays  
and hair setting preparations.**

## Cosmetic Solutions

- Hair Care
- Skin Care
- Oral Care

<b>Composition</b>	Copolymer prepared from vinyl acetate and crotonic acid in the ratio 90 : 10
<b>INCI name</b>	VA/Crotonates Copolymer
<b>CAS No.</b>	25609-89-6
<b>Product number</b>	10096003
<b>Appearance</b>	Luviset CA 66 is available as fine, transparent beads.

**Properties** Solutions of Luviset CA 66 in anhydrous ethanol can be prepared by neutralization or partial neutralization with amines or amino alcohols.

The rates of dissolution are determined by the temperature of the solvent, the rate of stirring, and the mechanical design of the vessel.

The solubility of Luviset CA 66 in aqueous alcoholic systems is dependent on the degree of neutralization, the alcohol used, and the temperature.

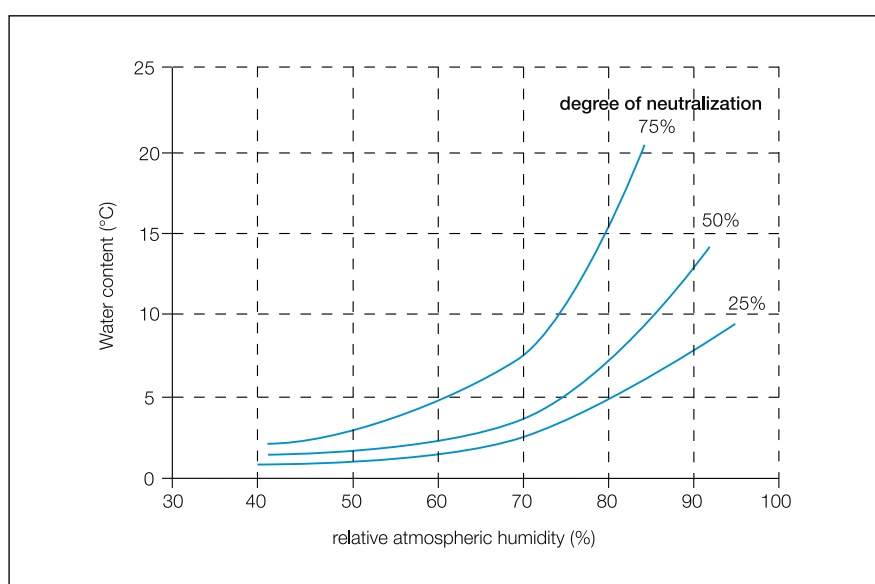
### Specifications

Parameter	Method No.	Specification
K-value (1% in THF)	02/0015.00	33.0-41.0
Drying loss	02/0013.00	≤ 1.5%
Acid number (mg KOH/g)	02/0014.00	62.0-70.0
Residual monomers VAC	02/0017.00	≤ 100 mg/kg

### Applications

In its neutralized form, Luviset CA 66 can be used as a film former in aerosol sprays, pump sprays, lotions and hair setting foams. The properties of Luviset CA 66 can be varied considerably by changing the degree of neutralization. Films of greater flexibility are obtained as the degree of neutralization increases; at the same time hygroscopicity and water solubility increase.

The following diagram illustrates the relationship between the degree of neutralization of Luviset CA 66 and the water uptake of the films prepared from it in relation to the relative atmospheric humidity at 20°C. AMP (2-amino-2-methylpropan-1-ol) was used as neutralizing agent.



The degree of neutralization of Luviset CA 66 for normal hair is 75%.

The required amount of neutralization agent is calculated as follows:

At an acid number  $y$ , the following amount of neutralizing agent  $N$  in grams is required to establish a neutralization grade of  $Z\%$  for  $x$  kg of Luviset CA 66.

$$N = x \cdot y \cdot \frac{Z}{100} \cdot A$$

The factor A is

for AMP 1.59  
for DEPA 2.32  
for TIPA 3.41

Example

The following amount of neutralization agent is required for the neutralization of 1 kg of Luviset CA 66 with an acid number of 66 to a degree of neutralization of 75% with AMP as the neutralizing agent:

$$N = 1 \cdot 66 \cdot \frac{75}{100} \cdot 1.59 \text{ g}$$

$N = 78.7 \text{ g}$  of AMP

The amounts of DEPA and TIPA required are  $N = 114.8 \text{ g}$  and  $N = 168.8 \text{ g}$ , respectively.

The following are examples of materials that can be used as softening and conditioning additives:

diethylphthalate  
Luvitol® EHO  
silicone fluid DC 556 (Dow Corning)  
isopropyl myristate  
squalane

In general, the additives should not amount to more than 10% of the amount of film former.

Luviset CA 66 can be combined with other polymers, for example, Luviskol® Plus.

In contrast, combinations with acrylates are not obtainable. Thus, mixtures with Luvimer® 100 P in all ratios give turbid films.

The solubility of Luviset CA 66 is dependent on the degree of neutralization. The higher the degree of neutralization, the higher the water solubility. AMP, DEPA (diethylaminopropylamine), or TIPA (trisopropanolamine) can be used as neutralizing agents.

In order to dissolve Luviset CA 66, the neutralizing agent is added to the solvent or solvent mixture. Luviset CA 66 is added portionwise with good stirring. The dissolution process can be accelerated by warming the solvent.

It is useful to filter the solution of the active material before any is drawn off in order to remove any small amounts of insoluble material that may be present.

The curl retention at a degree of neutralization of 75% is ca. 30% (determined at 90% rel. atmospheric humidity). It falls with increasing degree of neutralization owing to the increased water uptake by the polymer.

### Compatibility with propellant gas

The use of DME (dimethyl ether) as a propellant gas is recommended. For a 3% solution in ethanol (abs.) the compatibility is 75% (at ambient temperatures, 0°C, and -20°C).

A combination of DME with propellant gas 152a is recommended for aqueous-alcoholic formulations, especially in VOC 55 formulations.

In contrast, the compatibility with propane/butane is severely limited. It is 19% at room temperature and 11% at 0°C. There is zero compatibility at -20°C.

**Suggested formulations****Hair spray 55% VOC with Luviset® CA 66, strong hold****No. 01/00559**

	%	Ingredients	Supplier	INCI name
A	0.44	AMP	(56)	Aminomethyl Propanol
	10.00	Water, dem.		Aqua
	33.56	Ethanol		Alcohol
	q. s.	Perfume		
B	6.00	Luviset CA 66	(1)	VA/Crotonates Copolymer
C	20.00	Dimethyl Ether		Dimethyl Ether
D	30.00	Propellant gas 152 a		Hydrofluorocarbon 152 a

**Production:** Weigh out the components of phase A and mix them. Add phase B into phase and stir until a clear solution is obtained. Fill into appropriate containers and charge with phases C and D one after another.

**Properties:** Pressure: 4.1 bar  
Density: 0.8560 g/ml  
Cloud point: -32°C

**Hairspray VOC 80, strong hold****No. 01/00547**

	%	Ingredients	Supplier	INCI name
A	0.50	AMP	(56)	Aminomethyl Propanol
	33.50	Ethanol		Alcohol
	20.00	Water dem.		Aqua
	q.s.	Perfume		
B	6.00	Luviset® CA 66	(1)	VA/Crotonates Copolymer
C	40.00	Dimethyl Ether		Dimethyl Ether

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

**Properties:** Pressure: 3.2 bar (20°C)  
Density: 0.7970 g/ml  
Cloud point: -35°C clear

**Hairspray VOC 80, normal hold****No. 01/00679**

	%	Ingredients	Supplier	INCI name
A	0.14	AMP	(56)	Aminomethyl Propanol
	20.00	Water dem.		Aqua
	26.86	Ethanol		Alcohol
	q.s.	Perfume		
B	3.00	Luviset® CA 66	(1)	VA/Crotonates Copolymer
C	50.00	Dimethyl Ether		Dimethyl Ether

**Production:** Weigh out the components of phase A and mix them. Add phase B to phase A and stir until a clear solution is obtained. Fill into appropriate containers and charge with phase C.

**Properties:** Pressure: 4.3 bar (20°C)  
Density: 0.8069 g/ml  
Cloud point: -35°C clear

**Hairspray with Luviset® CA 66****No. 01/00948**

	%	Ingredients	Supplier	INCI name
A	0.24	AMP	(56)	Aminomethyl Propanol
	q.s.	Perfume		
	0.15	Uvinul® MC 80	(1)	Ethylhexyl Methoxycinnamate
	0.15	DL-alpha-Tocopherol	(1)	Tocopherol
	5.00	Water dem.		Aqua
	41.46	Ethanol		Alcohol
B	3.00	Luviset CA 66	(1)	VA/Crotonates Copolymer
C	10.00	n-Pentane		Pentane
D	40.00	Dimethyl Ether		Dimethyl Ether

**Production:**

Weigh out the components of phase A and mix them. Add phase B to phase A and stir until a clear solution is obtained. Add phase C and stir again. Fill into appropriate containers and charge with phase D.

**Properties:**

Pressure: 2.5 bar (20°C)  
 Density: 0.7460 g/ml  
 Cloud point: -35°C clear

**Hairspray with Luviset® CA 66, Luviskol® Plus****No. 01/00985**

	%	Ingredients	Supplier	INCI name
A	4.00	Luviskol Plus	(1)	Polyvinylcaprolactam
	0.12	AMP	(56)	Aminomethyl Propanol
	54.38	Ethanol		Alcohol
	q.s.	Perfume		
B	1.50	Luviset CA 66	(1)	VA/Crotonates Copolymer
C	40.00	Dimethyl Ether		Dimethyl Ether

**Production:**

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

**Properties:**

Pressure: 3.2 bar (20°C)  
 Density: 0.7804 g/ml  
 Cloud point: -35°C clear

**Hairspray with Luviset® CA 66****No. 01/00654**

	%	Ingredients	Supplier	INCI name
A	0.35	AMP	(56)	Aminomethyl Propanol
	35.65	Ethanol		Alcohol
	4.50	Water dem.		Aqua
	q.s	Perfume		
B	4.50	Luviset CA 66	(1)	VA/Crotonates Copolymer
C	15.00	Propane/Butane		Propane/Butane
D	40.00	Dimethyl Ether		Dimethyl Ether

**Production:**

Weigh out the components of phase A and mix them. Add phase B and stir until a homogeneous solution is obtained.

Fill into appropriate containers and charge with phases C and D, one after another.

**Properties:**

Pressure: 3.5 bar (20°C)

Density: 0.7376 g/ml

Cloud point: -35°C clear

**Finish Spray with Luviset® CA 66, natural hold****No. 01/01091**

	%	Ingredients	Supplier	INCI name
A	56.49	Ethanol		Alcohol
	0.10	Perfume		
	0.03	Dowanol TPM	(16)	PPG-3 Methylether
	0.10	Dow Corning 344 Fluid	(16)	Cyclomethicone
	0.05	Dow Corning 190 Surfactant	(16)	PEG/PPG-18/18 Dimethicone
	0.23	AMP	(56)	Aminomethyl Propanol
B	3.00	Luviset CA 66	(1)	VA/Crotonates Copolymer
	10.00	n-Butane		n-Butane
C	30.00	Dimethyl Ether		Dimethyl Ether

**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 phases C and D one after another.

**Properties:**

Pressure: 3:2 bar (20°C)

Density: 0.7736 g/ml

Cloud point: -20°C clear

**Hairspray with Luviset® CA 66****No. 01/00636**

	%	Ingredients	Supplier	INCI name
A	0.40	AMP	(56)	Aminomethyl Propanol
	44.60	Ethanol		Alcohol
	q.s	Perfume		
B	5.00	Luviset CA 66	(1)	VA/Crotonates Copolymer
C	50.00	Dimethyl Ether		Dimethyl Ether

**Production:**

Weigh out the components of phase A and mix them. Add phase B and stir until a homogeneous solution is obtained.

Fill into appropriate containers and charge with phase C.

**Properties:**

Pressure: 3.6 bar (20°C)

Density: 0.7726 g/ml

Cloud point: -35°C clear

**Pump Setting Spray with Luviset® CA 66, normal hold****No. 01/00796**

	%	Ingredients	Supplier	INCI name
A	0.23	AMP	(56)	Aminomethyl Propanol
	6.00	Water dem.		Aqua
	90.77	Ethanol		Alcohol
	q.s.	Perfume		
B	3.00	Luviset CA 66	(1)	VA/Crotonates Copolymer

**Production:**

Weigh out the components of phase A and mix them. Add phase B into phase A and stir until a clear solution is obtained.

**Pump setting spray with Luviset® CA 66****No. 01/00453**

	%	Ingredients	Supplier	INCI name
A	0.40	AMP	(56)	Aminomethyl Propanol
	0.10	Perfume		
	0.10	Pluracare® E 400	(1)	PEG-8
	0.10	D-Panthenol USP	(1)	Panthenol
	0.10	Luvitol® EHO	(1)	Cetearyl Ethylhexanoate
	10.00	Water dem.		Aqua
	84.20	Ethanol		Alcohol
B	5.00	Luviset CA 66	(1)	VA/Crotonates Copolymer

**Production:**

Weigh out the components of phase A and mix them. Add phase B and stir until a homogeneous solution is obtained.

**Pump Setting Spray with Luviset® CA 66****No. 01/00641**

	%	Ingredients	Supplier	INCI name
A	0.56	AMP	(56)	Aminomethyl Propanol
	93.44	Ethanol 96%		Alcohol
	q.s.	Perfume		
B	6.00	Luviset CA 66	(1)	VA/Crotonates Copolymer

**Production:**

Weigh out the components of phase A and mix them. Add phase B and stir until a clear solution is obtained.

**Pump Setting Spray with Luviskol® Plus, Luviset® CA 66****No. 01/00999**

	%	Ingredients	Supplier	INCI name
A	4.00	Luviskol Plus	(1)	Polyvinylcaprolactam
	0.12	AMP	(56)	Aminomethyl Propanol
	94.38	Ethanol		Alcohol
	q.s.	Perfume		
B	1.50	Luviset CA 66	(1)	VA/Crotonates Copolymer

**Production:**

Weigh out the components of phase A and mix them. Add phase B into phase A and stir until a clear solution is obtained.



**Toxicity**

Luviset CA 66 has undergone toxicological testing for its use in cosmetic preparations. With regard to the recommended concentrations and applications, current knowledge gives no indication of toxicological risks. We would willingly make available to you under Secrecy Agreement, any data on the studies that have been carried out.

**Storage**

Luviset CA 66 should be kept in tightly sealed containers and can be stored for at least 2 years at 25°C in the original container.

**Safety Data Sheet**

A safety data sheet is available.

**Suppliers**

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