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## Technical Information

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September 2007  
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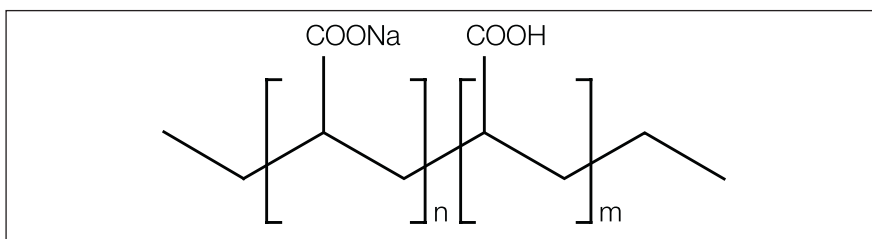
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# Luvigel<sup>®</sup> EM

® = Registered trademark  
of BASF Aktiengesellschaft

**Thickener for the production of cosmetic products.**

**Cosmetic Solutions**

**Structural formula****Chemical description**

Partially neutralized and crosslinked polyacrylic acid in a polar oil (Caprylic/Capric Triglyceride) and Water

**Composition**

Polymer content: 23 - 27%  
 Water: 48 - 51%  
 Caprylic/Capric Triglyceride: ad 100%

**Form**

25% W/O emulsion

**INCI name**

Caprylic/Capric Triglyceride, Sodium Acrylates Copolymer

**CAS-No.**

65381-09-1, 73398-61-5 (Oil component)  
 9033-79-8 (Polymer component)

**PRD-No.**

30071072

**Properties**

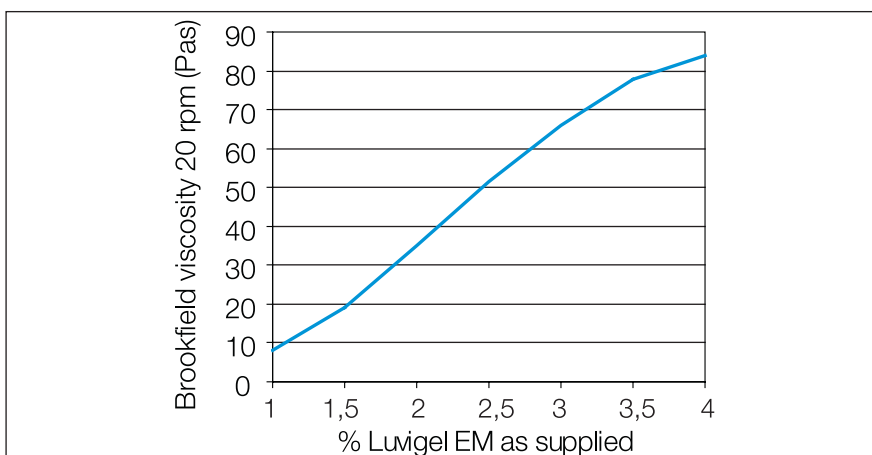
Appearance white, milky emulsion  
 Odor weak characteristic  
 Creamgel (2% Luvigel EM in water)  
 - viscosity: 20,000 - 40,000 mPas  
 - pH: 6 - 7

**Specification**

See separate document: "Standard Specification (not for regulatory purposes)" available via BASF's WorldAccount: <https://worldaccount.basf.com> (registered access).

**Technical properties****Recommended concentration**

It is recommended to use Luvigel EM in concentrations of 1.0 - 2.5%, in cosmetic formulations.

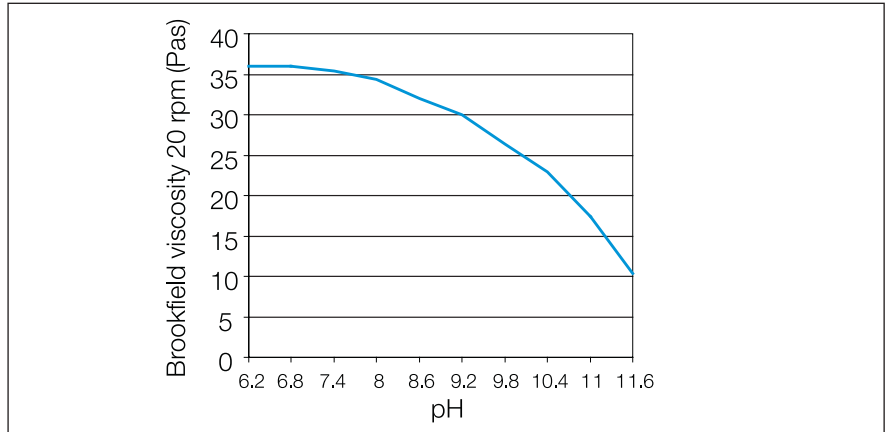


**Fig. 1: Viscosity as a function of Luvigel EM concentration (formulation: aqueous gel)**

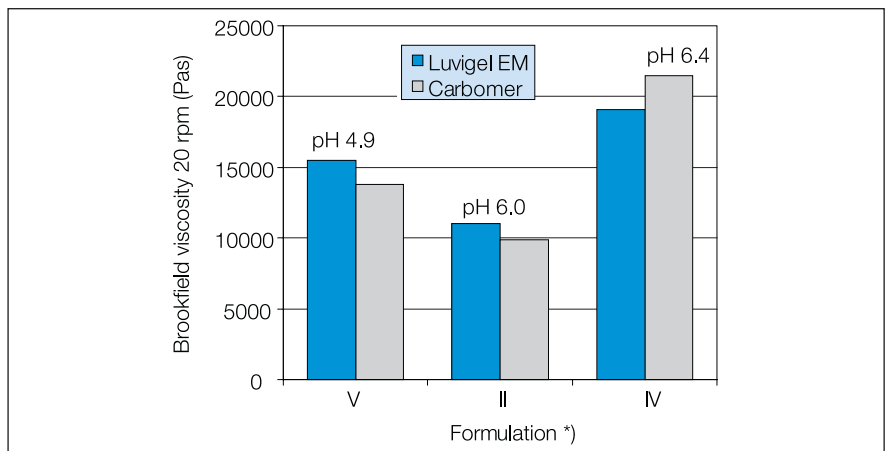
The thickening effect (Fig. 1) of 1.0% Luvigel EM lies in the 10,000 - 20,000 mPas range. A concentration of 2.5% gives a viscosity of about 50,000 mPas. A further addition rises the viscosity to the 80,000 - 100,000 mPas range.

**pH-value**

Over a pH range of 6-9, the viscosity lies between 30,000 and 40,000 mPas (Fig. 2a).



**Fig. 2a: Viscosity of a 1% aqueous gel as a function of pH**



**Fig. 2b: Formulations with Luvigel EM at different pH values**

\*) See Typical formulations

**Stabilized with**

approx. 0.2% Cetareth-6, Stearyl Alcohol

approx. 1.0% Sorbitan Oleate

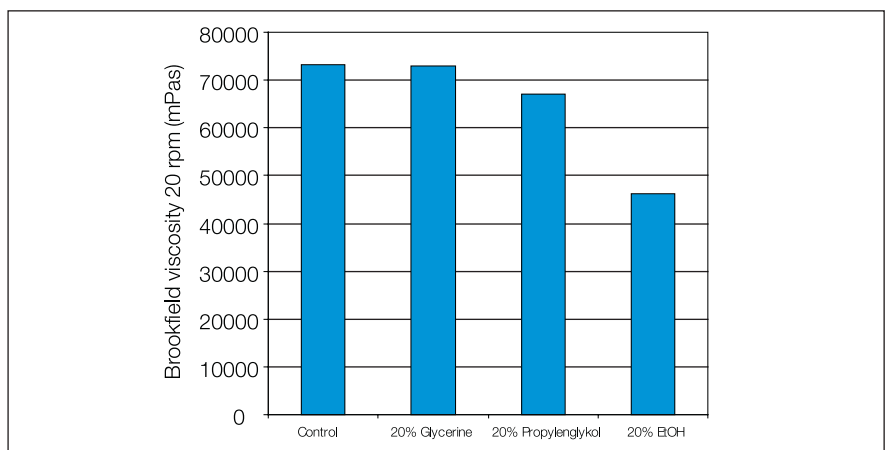
approx. 1.4% PEG-30 Dipolyhydroxystearate

**Stability to salts**

In common with other carbomer thickeners, Luvigel EM is sensitive to electrolytes.

**Compatibility with solvents**

Quantities of 20% (w/w) ethanol, 1,2-propylene glycol and glycerine were added to a 3% aqueous gel (Control gel Fig. 3), and its viscosity was determined.

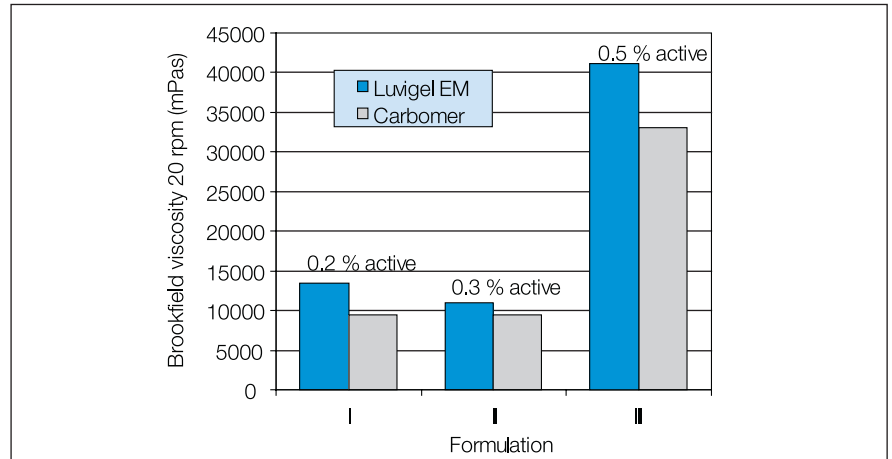


**Fig. 3: Effect of polar solvents on the viscosity of a 3% aqueous gel**

Glycerin has no effect on the viscosity, while ethanol reduces it.

## Thickening effect in formulations

Cosmetic formulations (Examples I-IV) with different Luvigel EM contents were prepared, and their viscosities determined.



**Fig. 4: Thickening effect of Luvigel EM in cosmetic formulations**

It can be seen from Fig. 4 that Luvigel EM provides an excellent thickening effect at different concentrations (active ingredient) in contrast to established thickening systems (e.g. Carbomer).

## Processing

There are several ways to prepare **Emulsions** with Luvigel EM.

### Method 1:

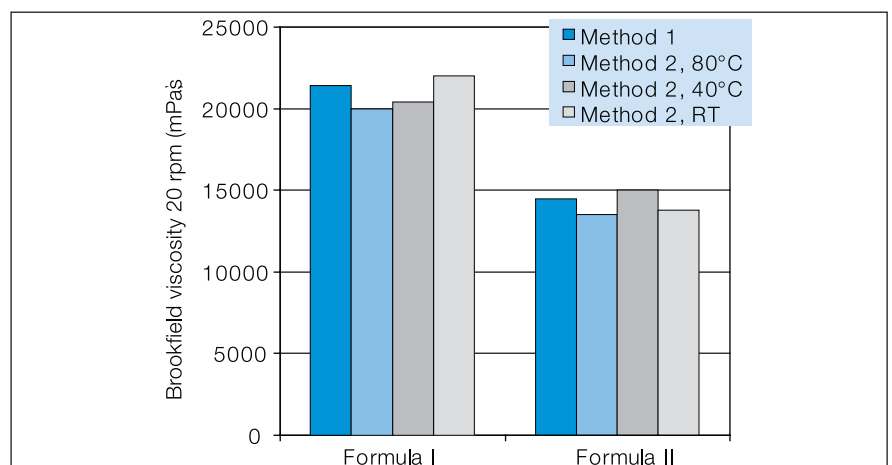
1. Dispersion of Luvigel EM in the oily phase
2. Addition to the aqueous phase with stirring
3. Homogenization of the emulsion

Luvigel EM can be readily metered, as it does not cake or form dust. It is not necessary to wait for the thickener to swell, or to neutralize the gel. The polyacrylic acid is already neutralized and automatically gives the desired viscosity.

### Method 2:

1. Preparation of the aqueous and oily phases (without thickener)
2. Conventional preparation of the emulsion
3. Addition of Luvigel EM with homogenization

With this method, Luvigel EM can be added at any temperature.



**Fig. 5: Different formulations and their viscosities**

The viscosity of the formulations is independent of the method of manufacture.

It is possible to correct the viscosity of a thickened emulsion by adding more Luvigel EM.

In the manufacture of aqueous Gels (e.g. hair gels) it is recommended to add a small quantity of an solubilizer such as Cremophor CO 40. This facilitates the release of the thickener and gives a homogeneous gel structure.

## Typical formulations

## Protecting body care cream with Luvigel® EM

No. 50/00135

	%	Ingredients	Supplier	INCI name
A	2.00	Cremophor® A 6	(1)	Ceteareth-6, Stearyl Alcohol
	2.00	Cremophor® A 25	(1)	Ceteareth-25
	3.00	Imwitor 960 K	(11)	Glyceryl Stearate SE
	6.00	Grape Seed Oil		Grape (Vitis Vinifera) Seed Oil
	2.00	Lanette O	(27)	Cetearyl Alcohol
	0.50	Abil 350	(44)	Dimethicone
	8.00	Luvitol® EHO	(1)	Cetearyl Ethylhexanoate
	0.10	Oxydex 2005	(20)	BHT, Ascorbyl Palmitate, Citric Acid, Glyceryl Stearate, Propylene Glycol
B	3.00	1,2-Propylene Glycol Care	(1)	Propylene Glycol
	2.00	Glycerin 87%	(20)	Glycerin
	1.00	D-Panthenol USP	(1)	Panthenol
	q.s.	Preservative		
	68.80	Water dem.		Aqua
	0.10	Edeta® BD	(1)	Disodium EDTA
C	1.00	Luvigel EM	(1)	Caprylic/Capric Triglyceride, Acrylates Copolymer
D	0.50	Vitamin E Acetate	(1)	Tocopheryl Acetate
	q.s.	Perfume		

**Production:**

Heat phases A and B separately to about 80°C.  
 Stir phase B into phase A whilst homogenizing.  
 Stir phase C into phase A+B and homogenize.  
 Cool to about 40°C, add phase D and homogenize again.

**Properties:**

Viscosity: 23 000 mPa·s Brookfield RVD VII+  
 pH value: 6.0

**Cream base with Luvigel® EM****No. 50/00148**

	%	Ingredients	Supplier	INCI name
A	2.00	Cremophor® A 6	(1)	Ceteareth-6, Stearyl Alcohol
	2.00	Cremophor® A 25	(1)	Ceteareth-25
	12.00	Paraffin Oil		Mineral Oil
	5.00	Luvitol® EHO	(1)	Cetearyl Ethylhexanoate
	3.00	Lanette O	(27)	Cetearyl Alcohol
B	3.00	1,2-Propylene Glycol Care	(1)	Propylene Glycol
	q.s.	Preservative		
	72.10	Water dem.		Aqua
C	0.90	Luvigel EM	(1)	Caprylic/Capric Triglyceride, Acrylates Copolymer

**Production:** Heat phases A and B separately to about 80°C.  
Stir phase B into phase A and homogenize.  
Stir phase C into phase A+B and homogenize  
Cool to about 40°C.  
Homogenize for a short time.

**Properties:** Viscosity: 28 000 mPa·s Brookfield RVD VII+  
pH value: 7.0

**Anti-Wrinkle cream****No. 50/00150**

	%	Ingredients	Supplier	INCI name
A	2.00	Cremophor® A 25	(1)	Ceteareth-25
	2.00	Cremophor® A 6	(1)	Ceteareth-6, Stearyl Alcohol
	8.00	Paraffin Oil		Mineral Oil
	7.00	Luvitol® EHO	(1)	Cetearyl Ethylhexanoate
	6.00	Cutina GMS	(27)	Glyceryl Stearate
	0.20	Abil 350	(44)	Dimethicone
	1.00	Lanette 16	(27)	Cetyl Alcohol
B	1.00	D-Panthenol 50 P	(1)	Panthenol, Propylene Glycol
	3.00	1,2-Propylene Glycol Care	(1)	Propylene Glycol
	5.00	Sodium Lactate	(20)	Sodium Lactate
	q.s.	Preservative		
	63.30	Water dem.		Aqua
C	1.30	Luvigel® EM	(1)	Caprylic/Capric Triglyceride, Acrylates Copolymer
D	0.20	Bisabolol nat.	(1)	Bisabolol
	q.s.	Perfume		

**Production:** Heat phases A and B separately to about 80°C.  
Stir phase B into phase A whilst homogenizing.  
Stir phase C into phase A+B and homogenize.  
Cool to about 40°C, add phase D and homogenize again.

**Properties:** Viscosity: 13000 mPa·s Haake Viscotester VT-02  
pH value: 5.5

**Relaxing Sportgel with Luvigel® EM****No. 65/00070**

	%	Ingredients	Supplier	INCI name
A	0.30	Menthol	(20)	Menthol
	q.s.	Perfume		
	3.00	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil, Water
	2.50	Luvigel EM	(1)	Caprylic/Capric Triglyceride, Sodium Acrylates Copolymer
B	q.s.	FD&C Blue No. 1	(1)	C.I. 42090, FD&C Blue No. 1
	76.20	Water, dem.		Aqua
C	15.00	Ethanol 96%		Ethanol
	3.00	Glycerin 87%	(20)	Glycerin

**Production:**

Mix the components of phase A.  
 Stir phase B into phase A and mix it until it is a homogeneous.  
 Stir phase C slowly into the mixture of phases A and B.

**Properties:**

Viscosity: 12 000 mPa·s (Brookfield)  
 pH value: 6.5

**Suppliers**

1. **BASF Aktiengesellschaft**  
 67056 Ludwigshafen, Germany  
 Tel.: +49 (621) 60-0  
 Fax: +49 (621) 60-42525
11. **Sasol Germany GmbH – Witten**  
 Arthur-Imhausen-Str. 92, D-58453 Witten/Ruhr, Germany  
 Phone: + 49 (2302) 925-537  
 Fax: + 49 (2302) 925-358
20. **Merck KGaA**  
 Frankfurter Straße 250, 64293 Darmstadt, Germany  
 Tel.: +49 (6151) 72-7869  
 Fax: +49 (6151) 72-28333
27. **Cognis Deutschland GmbH – Care Chemicals**  
 Henkelstraße 67, 40191 Düsseldorf, Germany  
 Tel.: +49 (211) 7940-22889  
 Fax: +49 (211) 798-2016
44. **Goldschmidt GmbH**  
 Goldschmidtstraße 100, 45127 Essen, Germany  
 Tel.: 0201/173-0  
 Fax: 0201/173-3000

**Stability/Storage**

The product is stable for at least 1 year in the original sealed containers at room temperature. Protect from frost. The emulsion can form a sediment and it is recommended to stir it before use.

**Toxicology**

The product has been investigated, and no evidence of harmful effects was found for the recommended concentrations and fields of application. However, because of the wide range of possible applications, often in combination with other products, processors must conduct their own safety assessment on their products.

**Safety Data Sheet**

A Safety Data Sheet is available for Luvigel EM.

**Literature**

P. Neumann, „A new liquid thickener for all kind of cosmetic emulsions“, Conference Proceedings, PCIA , 08.04.1999, p 68 ff.

Conference Proceedings, In-Cosmetic, 20.04.1999, p. 158 ff.

**Note**

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