
Technical Information

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MEMC 050101e-02/Page 1 of 18

Luviset[®] Clear

Luviset[®] Clear E

® = Registered trademark
of BASF Aktiengesellschaft

**Non-ionic high performance film-forming agents for clear hair gels,
mousses and styling lotions**

Cosmetic Solutions

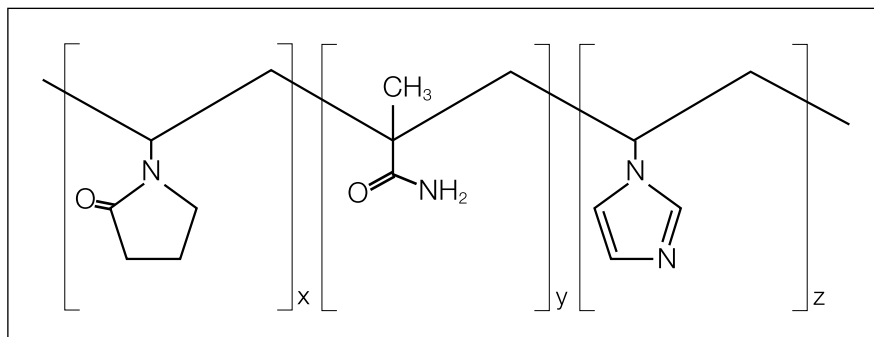
- Hair Care
- Skin Care
- Oral Care

Description and application

Luviset Clear and Luviset Clear E are high performance hair styling polymers designed primarily for clear gels. They work equally well in mousses, setting lotions and alternative styling products. They provide crystal clear, non-tacky, humidity resistant properties.

Chemical composition

Luviset Clear and Luviset Clear E are copolymers of N-vinylpyrrolidone, methacrylamide and N-vinyl imidazole.

Structural formula**INCI name**

VP/Methacrylamide/Vinyl Imidazole Copolymer

CAS No.

38139 – 93 – 4

Physical properties**Appearance**

Luviset Clear: Solution of approx. 20% polymer in water stabilized with 1.0% Phenonip.¹

Luviset Clear E: Solution of approx. 20% polymer in water stabilized with 15%-18% ethanol.

Solubility

Luviset Clear and Luviset Clear E (10% polymer content) give a clear solution in water and water/ethanol mixtures up to 35% ethanol.

Polymer compatibility

Luviset Clear and Luviset Clear E are compatible with thickening polymers, e.g. Carbomer, Acrylates/C10-30 Acrylate Crosspolymer and Acrylates / Beheneth-25 Methacrylate Copolymer.

Luviset Clear is compatible with many other hair setting polymers, such as Polyvinylpyrrolidone, VP/VA copolymers, Polyvinylcaprolactam, Acrylates Copolymers and Cationic polymers, like Polyquaternium –4, –10, –11, –16, –44, –46.

Molecular weight (Mw)

Weight average (Mw: 270 000 g/mol)
Number average (Mn: 64 000 g/mol)
(determined with SEC – Method)²

Specification

Fig. 1: **Specification Luviset Clear**

Property	Range
Solids content (%)	19.0 – 21.0
Color (Gardner)	max. 2
pH-Value 10% solids in water basis	6.0 – 7.5
Viscosity (mPas) Brookfield Sp. 4 / 20 RPM, 23°C	700 – 2000 mPas
N-Vinylpyrrolidone (residual monomer in ppm)	max. 50
Methacrylamide (residual monomer in ppm)	max. 10

Fig. 2: **Specification Luviset Clear E**

Property	Range
Solids content (%)	19.0 – 21.0
Color (Gardner)	max. 2
pH-Value 10% solids in water basis	6.0 – 7.5
Viscosity (mPas) Brookfield Sp. 4 / 20 RPM, 23°C	700 – 3000 mPas
N-Vinylpyrrolidone (residual monomer in ppm)	max. 50
Methacrylamide (residual monomer in ppm)	max. 10
Ethanol (wwt %)	15-18%

Glass transition temperature (T_g)

The glass transition temperatures of Luviset Clear and Luviset Clear E are significantly higher than those of PVP. A glass transition temperature above room temperature (25°C) is a requirement for good setting performance. The glass transition temperatures of Luviset Clear and Luviset Clear E remain significantly above room temperature at high humidity (fig. 3).

Fig. 3: **Glass transition temperature of Luviset Clear/Luviset Clear E compared to PVP at different relative humidity in °C (DSC-Method)**

Relative humidity (%)	Luviset Clear (°C)	PVP (°C)
0%, dry film	219°C	172°C
52%	85°C	50°C
76%	51°C	24°C

Mechanical properties

Polymer films of Luviset Clear and Luviset Clear E exhibit a higher tensile strength at break (fig. 4) than PVP. Nanoindentation measurement is a powerful tool to measure mechanical properties of polymer films at different relative humidities (Ref. 3-5).

Luviset Clear/Luviset Clear E are not tacky at high humidity (fig. 5), and their surface has a low friction coefficient (fig. 6). These properties correlate with the application properties on hair, e.g. high setting, low tackiness and good combing behavior, as well as high resistance against mechanical damage of the film on hair, e.g. touch, wind, brush.

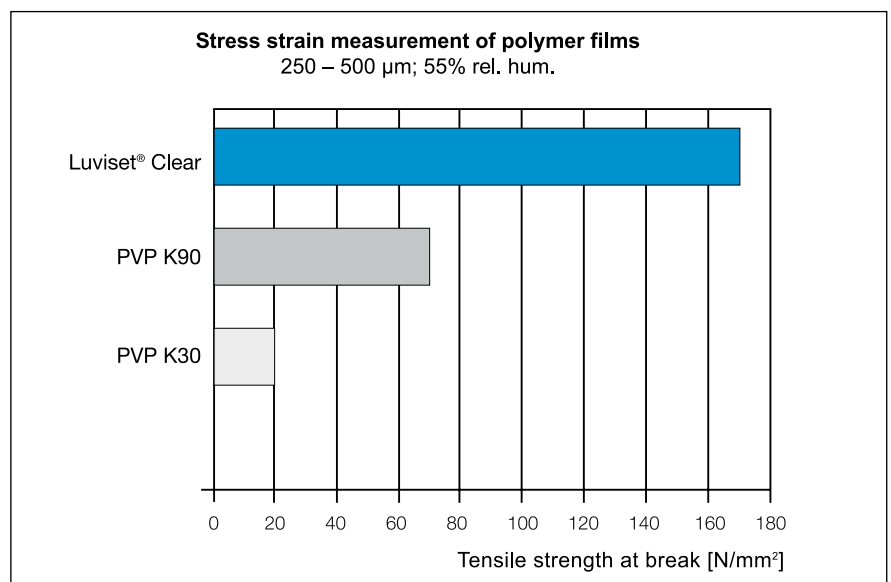
Fig. 4: **Tensile strain at break (stress strain measurement of polymer films at 55% relative humidity)**

Fig. 5: Tack measurement with Hysitron nanoindenter

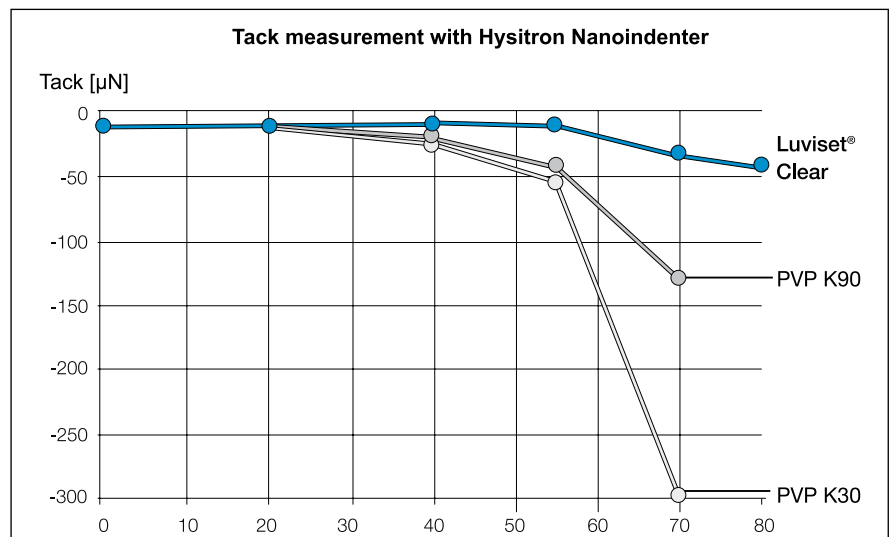
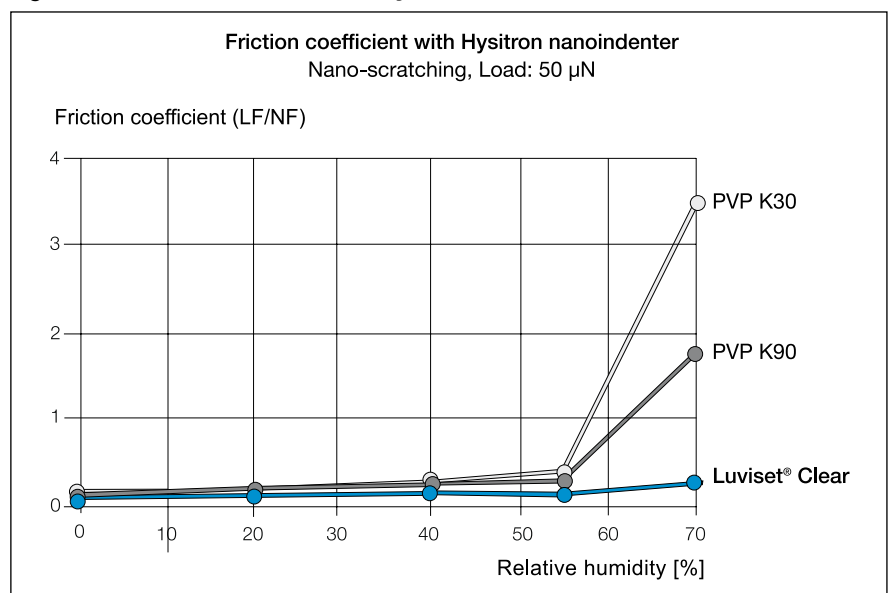


Fig. 6: Friction coefficient with Hysitron nanoindenter



Application properties in hair gels

Luviset Clear and Luviset Clear E are recommended as fixative polymers in hair gel formulations. They are compatible with almost every commercially available cosmetic thickener. Absolutely clear gels can be achieved by using Acrylates / C10 – C30 Alkyl Acrylate Crosspolymer (Ultrez® 21, Noveon), Acrylates Beheneth-25 Methacrylate Copolymer (Aculyn® 28, Rohm & Haas) and Carbomer (Carbopol® 940, Noveon).

The standard way to produce clear gels with these thickeners based on polyacrylic acid is as follows:

- Prepare the thickener solution 0.4 – 0.5% Ultrez® 21 or Carbomer, or 1.0% Aculyn 28, respectively.
- Slightly overneutralize with triethanolamine to pH 7.1.
- Add 1.0 – 7.0% Luviset Clear (polymer content).

Gels with 3% Luviset Clear or 3% Luviset Clear E (polymer content) provide already very high setting effect. Luviset Clear/Luviset Clear E combine excellent hair setting up to 90% relative humidity with almost no tackiness together with the ability to form brilliant clear hair gels.

Fig. 7: **Properties of Luviset Clear/Luviset Clear E in gels**
(3% Luviset Clear/Luviset Clear E (polymer content); 0.5% Ultrez 21)

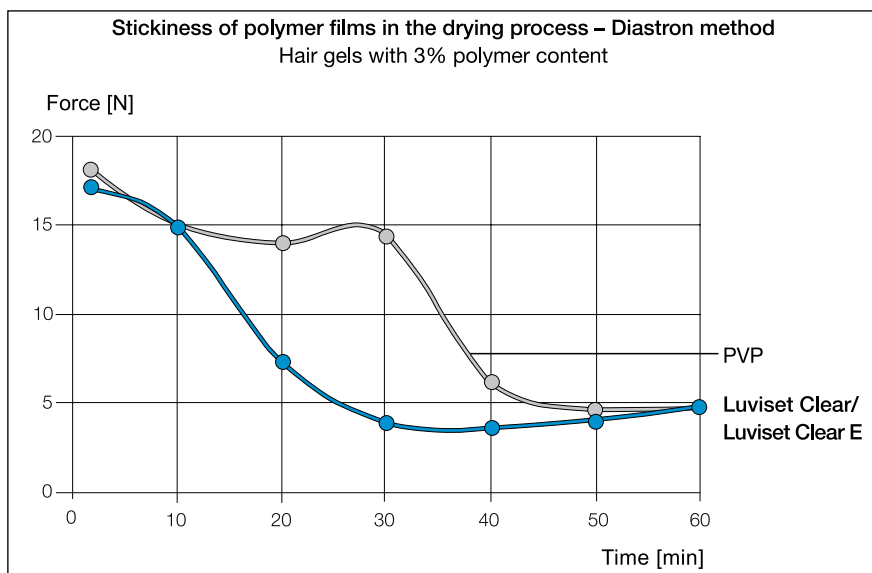
Properties of Luviset Clear/Luviset Clear E in hair gels 3% polymer content; 0,5% Ultrez 21			
	Luviset Clear/ Luviset Clear E	PVP K90	PVP K30
Clarity* T [%]	crystal clear 99.2	clear 96.8	clear 98.8
Tackiness**	0 – 1	3	3
Stiffness test [cN]	190 – 200	125 – 145	70 – 80
Curl retention 90% rel. hum. [%]	> 90	61	47

* Visually in 250 ml glass tubes, Transmission T [600nm] measured in Polystyrol-cuvettes

** 0= No tack, 5= Very tacky

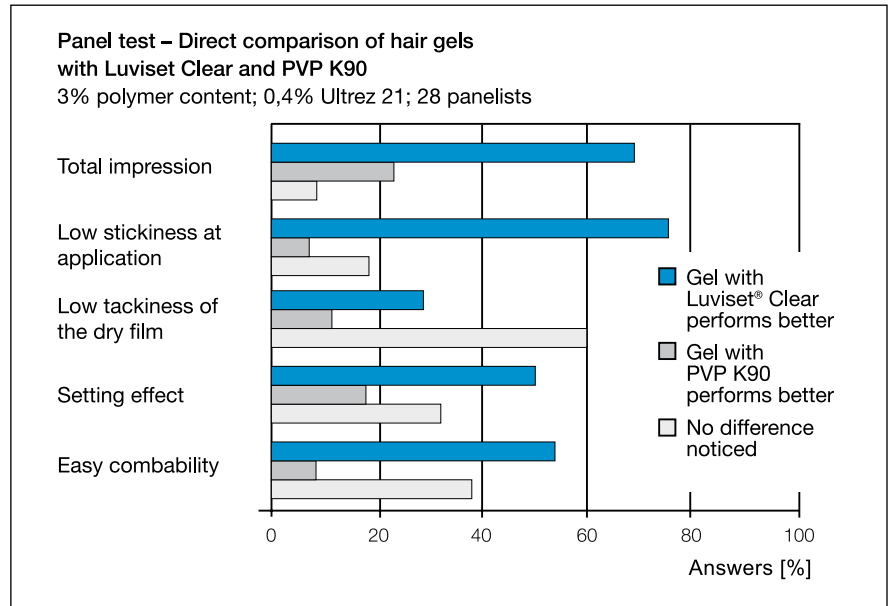
Luviset Clear/Luviset Clear E are significantly less tacky during drying compared to PVP in water-based formulations.

Fig. 8: **Tackiness of polymer films in the drying process – Diastron method**



A panel test confirms these objective measurements.

Fig. 9: **Panel test Luviset Clear versus PVP; 3% polymer content, 0.4% Ultrez 21**



Application properties in mousses

Luviset Clear and Luviset Clear E are recommended as fixative polymers in hair mousse formulations either as single polymers or in combination with cationic polymers like Luviquat® Hold or Luviquat® Style. The recommended use level of Luviset Clear/Luviset Clear E is 2 – 5% (polymer content) and 1 – 2% for Luviquat Hold or Luviquat Style (polymer content), respectively. The most highly recommended combination is Luviset Clear/Luviset Clear E plus Luviquat Hold. This formula provides the best setting properties with conditioning plus good curl retention (see figures 10-12).

Test formulation

3.00 g polymer / polymer combination (active content)
 2.00 g Luviquat Mono LS
 ad 100.00 g water
 q.s. preservative, perfume
 10.00 g propane / butane
 3.5 bar

Fig. 10: **Setting properties of mousse formulations with Luviset Clear/ Luviset Clear E**

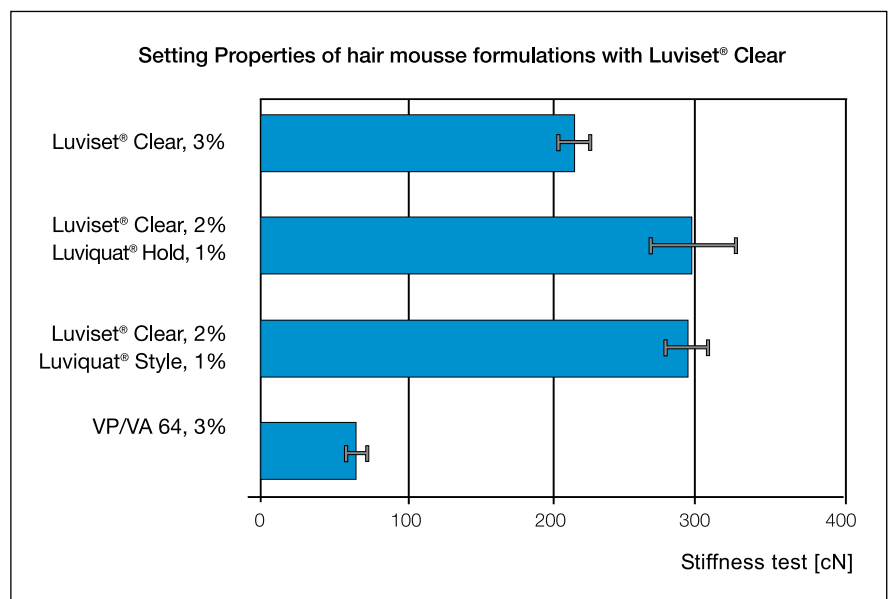


Fig. 11: **Curl retention of mousse formulations with Luviset Clear/ Luviset Clear E**

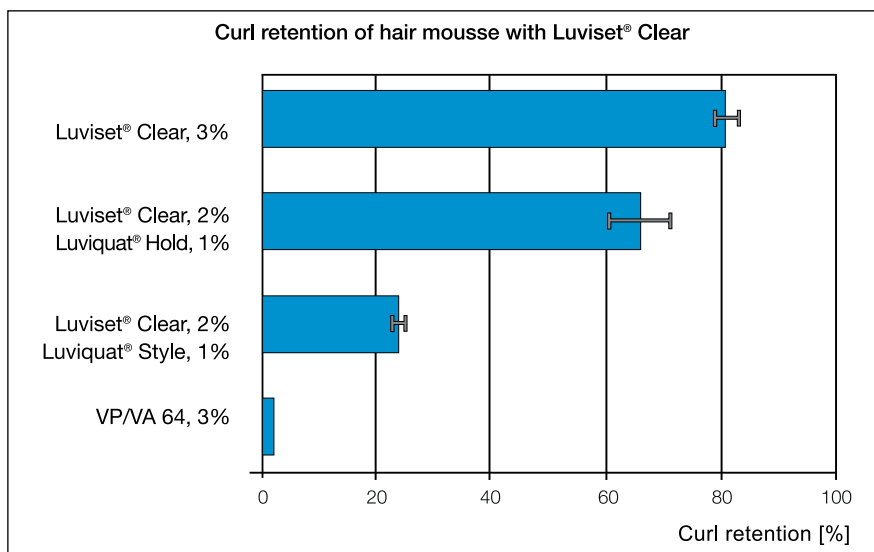
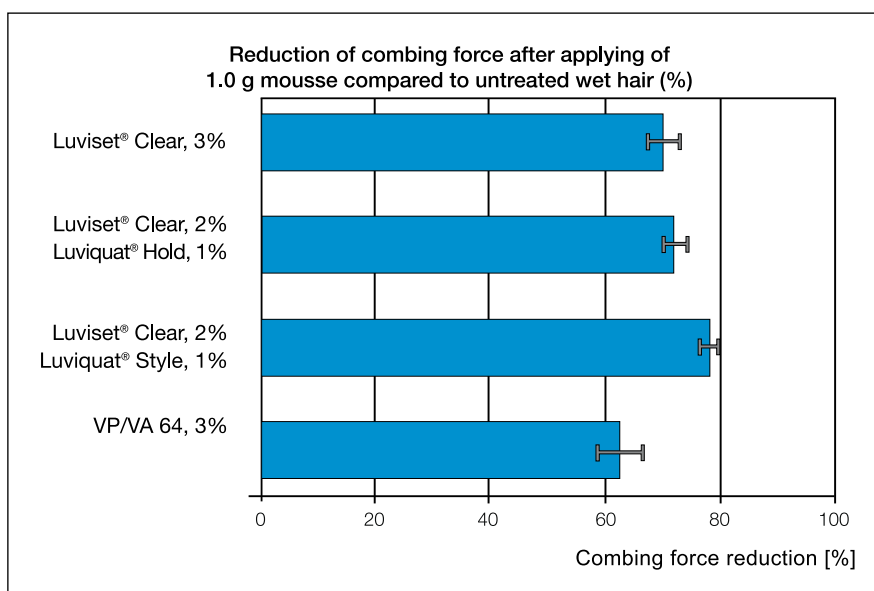


Fig. 12: **Combability of mousse formulations with Luviset Clear/ Luviset Clear E**



Other applications

Luviset Clear/Luviset Clear E can be used as styling polymers for water-based pump sprays, lotions, pomades, glazes, and styling aids based on cellulose and guar-derivatives as thickeners and other innovative formulation types. Luviset Clear/Luviset Clear E are not recommended for aerosol sprays.

Formulations

In the following formulations Luviset Clear can be exchanged by Luviset Clear E (calculated on the same solids content).

Hair gels

Ultra Hold Gel

No. 04/00120

	%	Ingredients	Supplier	INCI name
A	48.75	Water, dem.		Aqua dem.
	q.s.	Preservative		
B	0.50	Ultrez® 21	(6)	Acrylates/C10-30 Alkyl Acrylate Crosspolymer
C	0.75	Triethanolamine Care	(1)	Triethanolamine
D	25.00	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	22.20	Water, dem.		Aqua dem.
	2.00	Pluracare® E 400	(1)	PEG-8
	0.50	D-Panthenol USP	(1)	Panthenol
	q.s.	Perfume		
	0.10	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
	0.10	Uvinul® P25	(1)	PEG-25 PABA
	0.10	Dow Corning® 190 Surfatant	(16)	PEG/PPG-18/18 Dimethicone

Production:

Put phase A into a beaker, stir and disperse phase B into it until the particles sink to the bottom. Then add phase C and stir until a homogeneous gel has been formed. Prepare phase D and stir until dissolved. Then add phase D to the gel.

Properties:

pH value: 7.2
 Viscosity: 30500 mPa·s Brookfield RVDII+
 Transmission: 97.0% (600 nm)

General formulation guideline

It is necessary to slightly overneutralize gels based on cross-linked polyacrylic acid to pH 7.1 in order to get absolutely clear gels. It is also important that the whole amount of neutralization agent is used at once in the gel making process. Avoid to adjust the pH of the gel by adding some neutralization agent later as this could lead to hazy gels.

Structure Defining Gel**No. 04/00121**

	%	Ingredients	Supplier	INCI name
A	48.75	Water dem.		Aqua dem.
	q.s.	Preservative		
B	0.50	Ultrez® 21	(6)	Acrylates/C10-30 alkylacrylate crosspolymer
C	0.75	Triethanolamine Care	(1)	Triethanolamine
D	15.00	Luviset® Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
	26.20	Water dem.		Aqua dem.
	5.00	Glycerol 87%		Glycerin
	3.00	1,2 Propylene Glycol Case	(1)	Propylene Glykol
	0.50	Niacinamide		Niacinamide
	0.10	Uvinul® P25	(1)	PEG-25 PABA
	0.10	Dow Corning® 180 Surfactant	(16)	PEG/PBG-18/18 Dimethicone
	q.s.	Perfume		
	0.10	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil

Production:

Put phase A into a beaker, stir and disperse phase B into it until the particles sink to the bottom. Then add phase C and stir until a homogeneous gel has been formed. Prepare phase D and stir until dissolved. Then add phase D to the gel.

Properties:

pH value: 6.9
 Viscosity: 33850 mPa·s (Brookfield)
 Transmission: 98.1% (600 nm)

Clear Performance Hair Gel**No. 04/00137**

	%	Ingredients	Supplier	INCI name
A	43.50	Water, dem.		Aqua
	q.s.	Preservative		
B	0.40	Ultrez® 21	(6)	Acrylates/C10-30 Alkyl Acrylate Crosspolymer
C	0.60	Triethanolamine Care	(1)	Triethanolamine
D	15.00	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	40.10	Water, dem.		Aqua
	q.s.	Perfume		
	0.30	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
	0.10	Uvinul® P25	(1)	PEG-25 PABA

Production:

Weigh out phase A, give phase B into phase A and let it soak till it has sank down to the bottom. Neutralize with phase C. Solubilize phase D. Weigh out the compounds of phase E into phase D and stir till it dissolves. Stir the solution of phase D and E slowly into the mixture of phase A, B and C till homogenous.

Properties:

Viscosity: 24300 mPa·s
pH value: 7.3
Transmission: 97.9% (600nm)

Hair Styling Gel with Luviset® Clear**No. 04/00119**

	%	Ingredients	Supplier	INCI name
A	0.50	Carbopol® 940	(6)	Carbomer
	48.75	Water, dem.		Aqua
B	0.75	Triethanolamine Care	(1)	Triethanolamine
C	32.60	Water, dem.		Aqua
	q.s.	Perfume		
	0.10	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
D	15.00	Luviset Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	2.00	Glycerol 87%		Glycerin
	0.10	Dow Corning® 190 Surfactant	(16)	PEG/PPG-18/18 Dimethicone
	0.10	Uvinul® P25	(1)	PEG-25 PABA
	0.10	D-Panthenol USP	(1)	Panthenol

Production:

Let phase A swell and stir until homogeneous. Then neutralize with phase B. Solubilize phase C. Weigh phase D into phase C and stir until clearly dissolved. Stir phase C + D into phase A + B.

Properties:

Viscosity: 13000 mPa·s (Brookfield RVDII+)
pH value: 7.2
Transmission: 96.9% (600nm)

Wet Look Gel with Luviset® Clear**No. 04/00116**

	%	Ingredients	Supplier	INCI name
A	48.85	Water, dem.		Aqua
	q.s.	Preservative		
B	0.50	Ultrez® 21	(6)	Acrylates/C10-30 Alkyl Acrylate Crosspolymer
C	0.75	Triethanolamine Care	(1)	Triethanolamine
D	36.50	Water, dem.		Aqua
	q.s.	Perfume		
	q.s.	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
E	10.00	Luviset Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	2.00	Glycerin 87%		Glycerin
	1.00	Luviskol® K 30	(1)	PVP
	0.20	D-Panthenol USP	(1)	Panthenol
	0.10	SF® 1288	(195)	PEG-12 Dimethicone
	0.10	Uvinul® P25	(1)	PEG-25 PABA

Production:

Weigh out phase A, give phase B to phase A and let it soak till it has sank down to the bottom. Give phase C into the mixture of A+B and stir till homogenous. Solubilize phase D. Weigh out the compounds of phase E into phase D and stir till it dissolves. Stir the solution of phase D and E slowly into the mixture of phase A, B and C till homogenous.

Properties:

Viscosity: 47600 mPa·s
pH value: 6.9
Transmission: 97.5% (600nm)

Hold and Feel Gel with Luviset® Clear**No. 04/00117**

	%	Ingredients	Supplier	INCI name
A	40.00	Water, dem.		Aqua
	q.s.	Perfume		
	q.s.	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
B	15.00	Luviset Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	5.00	Aculyn® 28 Polymer	(61)	Acrylates/Beneth-25 Methacrylate Copolymer
	5.00	Glycerol 87%		Glycerin
	0.10	SF® 1288	(195)	PEG-12 Dimethicone
	0.10	Uvinul® P25	(1)	PEG-25 PABA
	q.s.	Preservative		
	34.20	Water, dem.		Aqua
C	0.60	Triethanolamine Care	(1)	Triethanolamine

Production: Solublize the components of phase A.
Weigh the compounds of phase B into phase A and stir till homogenous.
Neutralize with phase C and stir till homogenous.

Properties: Viscosity: 90200 mPa·s Brookfield RVDII+
pH value: 7.0
Transmission: 97.0% (600nm)

„Fantasy“ Hair Gel**No. 04/00122**

	%	Ingredients	Supplier	INCI name
A	48.75	Water		Aqua dem.
	q.s.	Preservative		
B	0.50	Ultrez® 21	(6)	Acrylates/C10-30 alkyl acrylate rosspolymer
C	0.75	Triethanolamine Care	(1)	Triethanolamine
D	15.00	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	30.20	Water		Aqua dem.
	2.50	Luviquat® Hold	(1)	Polyquaternium-46
	2.00	1,2-Propylenglycol	(1)	Propylene Glycol
	q.s.	Perfume		
	0.10	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
	0.10	Uvinul® P25	(1)	PEG-25 PABA
	0.10	SF® 1288	(195)	PEG-12 Dimethicone

Production: Put phase A into a beaker, stir and disperse phase B into it until the particles sink to the bottom. Then add phase C and stir until a homogeneous gel has been formed. Prepare phase D and stir until dissolved. Then add phase D to the gel.

Properties: pH value: 7.25
Viscosity : 44000 mPa·s (Brookfield)
Transmission: 95.0% (600 nm)

Creme Gel**No. 04/00123**

	%	Ingredients	Supplier	INCI name
A	79.10	Water, dem.		Aqua dem.
	15.00	Luviset® Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
	3.00	Pluracare® E 400	(1)	PEG-8
	0.50	Niacinamide		Niacinamide
	0.20	D-Panthenol USP	(1)	Panthenol
	q.s.	Perfume		
	0.10	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
	q.s.	Preservative		
B	2.00	Natrosol® 250HR	(115)	Hydroxyethylcellulose

Production: Mix phase A and stir until dissolved. Then disperse phase B into phase A, and stir until a homogeneous gel is formed.

Properties: pH value: 6.9
 Viscosity: 23550 mPa·s (Brookfield)
 Transmission: 96.2% (600 nm)

Spray gel ultra hold with Luviset® Clear**No. 04/00124**

	%	Ingredients	Supplier	INCI name
A	0.20	Carbopol® 940	(6)	Carbomer
	50.00	Water, dem.		Aqua
B	0.30	Triethanolamine Care	(1)	Triethanolamine
C	14.40	Water, dem.		Aqua
	q.s.	Perfume		
	0.05	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
D	35.00	Luviset Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
	q.s.	Preservative		

Production: Let phase A swell and stir until homogeneous. Then neutralize with phase B. Solubilize phase C. Weigh phase D into phase C and stir until clearly dissolved. Stir phase C + D into phase A + B.

Properties: Viscosity: 1750 mPa·s
 pH value: 7.1
 Transmission: 94.2% (600nm)

Spray Gel ultra hold**No. 04/00125**

	%	Ingredients	Supplier	INCI name
A	84.10	Water		Aqua dem.
	0.05	Cremophor® CO 40	(1)	PEG-40 Hydrogenated Castor Oil
	0.05	Perfume		
B	15.00	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	0.30	D-Panthenol USP	(1)	Panthenol
	q.s.	Preservative		
C	0.40	Natrosol® 250HR	(115)	Hydroxyethylcellulose

Production: Solubilise phase A. Weigh phase B into phase A and stir until dissolved. Disperse phase C and stir until a homogeneous gel is formed.

Properties: pH value: 7.3
Viscosity : 120 mPa·s (Brookfield)
Transmission: 97.6% (600 nm)

Hair Mousses**„Stick ‘em up“ Spiking Glue****No. JB 1011A**

	%	Ingredients	Supplier	INCI name
A	0.50	Carbopol® 940	(6)	Carbomer
	56.15	Water, dem.		Aqua dem.
B	0.75	Triethanolamine Care	(1)	Triethanolamine
C	30.00	Luviset® Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
D	10.00	Luviskol® Plus	(1)	Polyvinylcaprolactam
	0.15	Vitamin E Acetate	(1)	Tocopheryl Acetate
	1.00	DL-Panthenol 50 W	(1)	Panthenol
	0.30	Dow Corning® 193 Surfactant	(16)	PEG-12 Dimethicone
	0.25	Dow Corning® 345 Fluid	(16)	Cyclopentasiloxane, Cyclohexasiloxane
	0.50	Opacifier 43.009	(234)	Styrene/Butadiene Copolymer
	q.s.	Perfume		
	q.s.	Preservative		

Production: Mix phase A and stir until dissolved. The neutralize with phase B. Slowly add phase C and D and continue mixing until batch is homogeneous.

Styling Hair Mousse**No. 02/00456**

	%	Ingredients	Supplier	INCI name
A	2.00	Luviquat® Mono LS	(1)	Cocotrimonium Methosulfate
	q.s.	Perfume		
B	76.40	Water, dem.		Aqua
	11.60	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	q.s.	Preservative		
C	10.00	Propane/butane 3.5 bar (20°C)		Propane/Butane

Production: Mix phase A and add the components of phase B one after the other until a clear solution is formed. Pressurize with phase C.

Properties: pH value: 6.9

Styling/Conditioning Hair Mousse**No. 02/00457**

	%	Ingredients	Supplier	INCI name
A	2.00	Luviquat® Mono LS	(1)	Cocotrimonium Methosulfate
	q.s.	Perfume		
B	73.00	Water, dem.		Aqua
	5.00	Luviquat® Hold	(1)	Polyquaternium-46
	10.00	Luviset® Clear	(1)	VP/Methacrylamide/ Vinyl Imidazole Copolymer
	q.s.	Preservative		
C	10.00	Propane/butane 3.5 bar (20°C)		Propane/Butane

Production: Mix phase A and add the components of phase B one after the other until a clear solution is formed. Pressurize with phase C.

Properties: pH value: 6.9

Volumizing Mousse (VOC 6)**No. JLB 1043A**

	%	Ingredients	Supplier	INCI name
A	10.00	Luviset® Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
	5.00	Luviquat® Hold	(1)	Polyquaternium-46
	47.50	Water, dem.		Aqua dem.
	q.s.	Preservative		
B	30.00	Water, dem.		Aqua dem.
	0.20	Cremophor® A 25	(1)	Ceteareth-25
	0.40	Luviquat® Mono LS	(1)	Cocotrimonium Methosulfate
	0.70	Laureth®-3	(41)	Rhodasurf L-3
	q.s.	Perfume		
C	6.00	Propane/butane (Propellant A70)		

Procedure:

Add ingredients of phase A in order listed with adequate agitation, making sure all components are completely dissolved before adding the next. Premix ingredients of phase B until homogeneous. Add phase B to phase A with adequate agitation. Fill into appropriate containers and charge with propellant (phase C).

Packaging info:

White Coated Aluminium Can (Peerless Tube Corporation).

Others**VOC 55 Pump spray with Luviset® Clear****No. 01/01253**

	%	Ingredients	Supplier	INCI name
A	30.00	Water, dem.		Aqua
	15.00	Luviset Clear	(1)	VP/Methacrylamide/Vinyl Imidazole Copolymer
	55.00	Ethanol		Alcohol
	q.s.	Perfume		

Production:

Weigh out the components of phase A and stir until dissolved.

Properties:

pH value: 7.5

Supplier

- (1) **BASF Aktiengesellschaft**
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- (6.) **Noveon, Inc.**
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Tel.: 1 216 447-5000
Fax: 1 216 447-5250
- (16) **Dow Corning Corporation**
2200 West Salzburg Road, MI 48686 Midland, USA
Tel.: (517) 496-6000
Fax: (517) 496-6974
- (41) **Rhodia-Home**
Personal Care and Industrial Ingredients
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Tel.: (609) 860-4758
Fax: (609) 860-0555
- (61) **Röhm & Haas GmbH**
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- (195) **GE Silicones**
260 Hudson River Road
12188 Waterford, New York, USA
Tel.: (518) 233-3330
Fax: (518) 233-2367
- (234) **Chemron, A Lubrizol Company**
CA 93447 Paso Robles, USA
Tel.: (805) 239-1550
Fax: (805) 239-8551

Handling and Storage

Luviset Clear and Luviset Clear E have a shelf life of 12 months in sealed containers and are supplied in 120 l plastic drums, in 1000 l containers and 0.5 kg samples.

PRD-Nos.:

Luviset Clear 30212375
Luviset Clear E 30282077

Microbiology**Health and Safety**

Luviset Clear and Luviset Clear E have been subjected to the DAB/Ph. Eur. Bacterial challenge test and found to be adequately resistant to attack.

Luviset Clear contains 1.0% Phenonip® (Phenoxyethanol (and) Methylparaben (and) Ethylparabene (and) Butylparaben (and) Propylparabene (and) Isobutylparabene) as a preservative.

Luviset Clear E does not contain any preservative. It contains only 15-18% denatured ethanol, which stabilize the product effective against microbes (Ph.Eur. challenge test).

Safety Data Sheet

A Safety Data Sheet for each product is available on request.

References

- ¹ Registered trademark of Nipa Laboratories GmbH; INCI: Phenoxyethanol (and) Methylparabene (and) Ethylparabene (and) Propylparabene (and) Isobutylparabene.
- ² SEC = Size Exclusion Chromatograph Sci 18 / 9 (1980) 409 – 429.
- ³ On the generality of the relationship between contact stiffness, contact area, and elastic modulus during indentation:
G. M. Pharr, W. C. Oliver, F. R. Brotzen, J. Mater. Res., Vol. 7, No. 3, (1992) p. 613.
- ⁴ An improved technique for determining hardness and elastic modulus using load and displacement sensing indentation:
W. C. Oliver, G. M. Pharr, J. Mater. Res., Vol. 7, No. 6, (1992) p. 1564.
- ⁵ Alternative technique for analyzing instrumented indentation data:
W. C. Oliver, J. Mater. Res., Vol. 16, No. 11, (2001) p. 3202.
- ⁶ A new multifunctional polymer:
P. Hoessel, Cosmetic & Toiletries 111 (1996) p. 73.

Note

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October 2006