Ebecryl® 3639

a novel flexible epoxy acrylate

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Ebecryl® 3639 value proposition

Ebecryl 3639 is a special epoxy acrylate characterized by high flexibility, very good reactivity and outstanding scratch and chemical resistances, though still keeping the typical cost-effectiveness of epoxy-acrylate chemistry

Ebecryl® 3639 target applications

Graphics

- Flexo inks
- Screen inks
- Overprint varnishes

Industrial Coatings

- Resilient flooring
- Paper upgrading
- Coatings on plastics
- Coatings on wood

Ebecryl® 3639 benefits

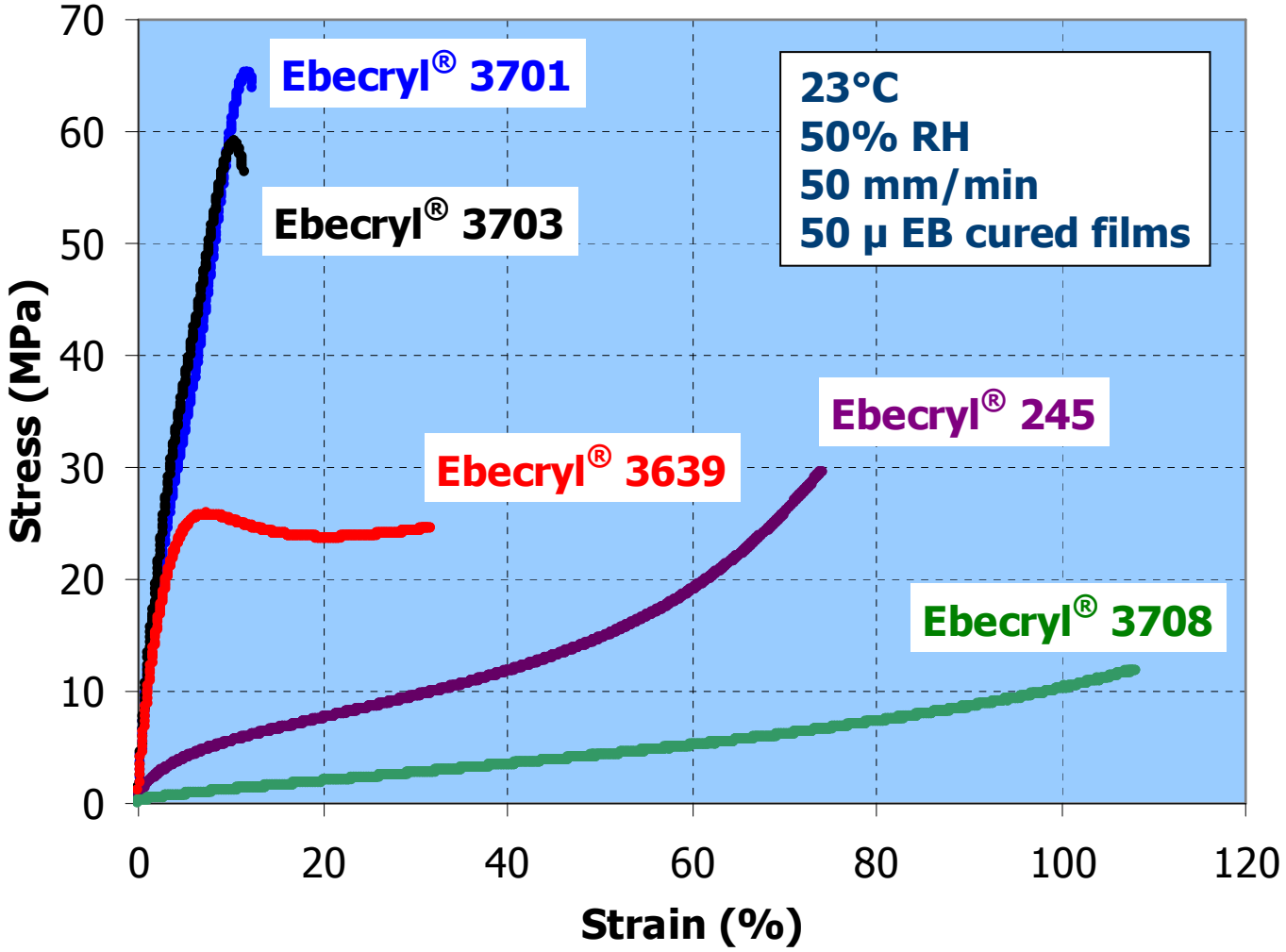
- High flexibility
- Very good reactivity
- Outstanding scratch resistance
- Excellent chemical resistance

Ebecryl® 3639 typical values

Cone & plate viscosity at 25°C	15.500 mPa.s
Colour	2 Gardner
Density	1.15 g/ml
DPGDA content	30 to 35%
Functionality	2

Ebecryl® 3639 mechanical properties

Stress-strain curves comparing Eb3639 with other flexible radiation-curable oligomers



Ebecryl® 3639 reactivity

In Graphics applications

Oligomer	Chemistry*	Pure oligomer Viscosity (mPa.s)	% HDDA dilution used in OPV test formulation	Viscosity OPV (+ 5% Additol® BCPK)	Reactivity (m/min), 20 µm K-bar, 120 W/cm Hg
Ebecryl® 3639	**EA**	**15500**	**15**	**2100**	**70**
Ebecryl® 204	aromatic UA	28400	20	2150	2x20
Ebecryl® 205	aromatic UA	35700	19	2380	2x20
Ebecryl® 245	aliphatic UA	83000	25	2440	< 10x20
Ebecryl® 524	diluted PE	60000	20	2130	2x20
Ebecryl® 745	full acrylics	20000	23	2560	4x20
Ebecryl® 3701	EA	2000000	32	2490	2x20
Ebecryl® 3708	EA	170000	26	2590	2x20
Ebecryl® 5129	aliphatic UA	15300	15	2130	20

*** EA = epoxy-acrylate, UA = urethane-acrylate, PE = polyester**

Ebecryl® 3639 physical performances

In Graphics applications

Folding test: 60 µm EB cured free film, checking for cracks

Creasing test: same conditions as above

Scratch resistance: evaluated with Mickle rub tester on UV cured 15 µm film

Rating given from 0=poor to 5=very good

		Flexibility		
Oligomer	**Type***	**Folding test**	**Creasing test**	**Scratch resistance**
Ebecryl® 3639	**EA**	**4**	**3**	**4**
Ebecryl® 204	aromatic UA	3	3	3
Ebecryl® 205	aromatic UA	3	3	2
Ebecryl® 245	aliphatic UA	4	4	2
Ebecryl® 524	diluted PE	2	0	0
Ebecryl® 745	full acrylics	2	0	0
Ebecryl® 3701	EA	2	0	2
Ebecryl® 3708	EA	4	4	2
Ebecryl® 5129	aliphatic UA	0	0	4

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Ebecryl® 3639 chemical & scratch resistance

in Industrial Coatings applications

Formulation: 70/30/4 oligomer/HDDA/Additol® BCPK
15 µ applied on Leneta® paper, cured 2 x reactivity
16 h exposure to chemicals
rating given from 0=severe damage to 5=no trace

Oligomer	Type*	Distilled water	Ethanol (48 % in water)	Ammonia (10 %)	Oil	Scratch resistance (10 steel wool double rubs)
Ebecryl® 3639	**EA**	**5**	**5**	**4 to 5**	**5**	**4**
Ebecryl® 204	aromatic UA	**5**	**5**	**5**	**5**	**4**
Ebecryl® 205	aromatic UA	**5**	**5**	**5**	**5**	**2**
Ebecryl® 245	aliphatic UA	**5**	**5**	**5**	**5**	**3**
Ebecryl® 524	diluted PE	**5**	**1**	**4**	**5**	**1**
Ebecryl® 745	full acrylics	**5**	**5**	**5**	**5**	**1**
Ebecryl® 3701	EA	**5**	**5**	**5**	**5**	**3**
Ebecryl® 3708	EA	**5**	**5**	**4 to 5**	**5**	**3**
Ebecryl® 5129	aliphatic UA	**5**	**5**	**5**	**5**	**5**

*** EA = epoxy-acrylate, UA = urethane-acrylate, PE = polyester**

Ebecryl® 3639 conclusions

- **Ebecryl® 3639** shows **high flexibility:**

  Ebecryl® 245, 3708 > **Ebecryl® 3639** >> Ebecryl® 524, 745, 5129, 3701, 3703

- **Ebecryl® 3639** gives outstanding **scratch and chemical resistance** similar to hexafunctional urethane acrylates such as Ebecryl® 5129

- **Ebecryl® 3639** exhibits one of the **highest cure speed** among the radiation curable oligomers typically used in coatings and inks