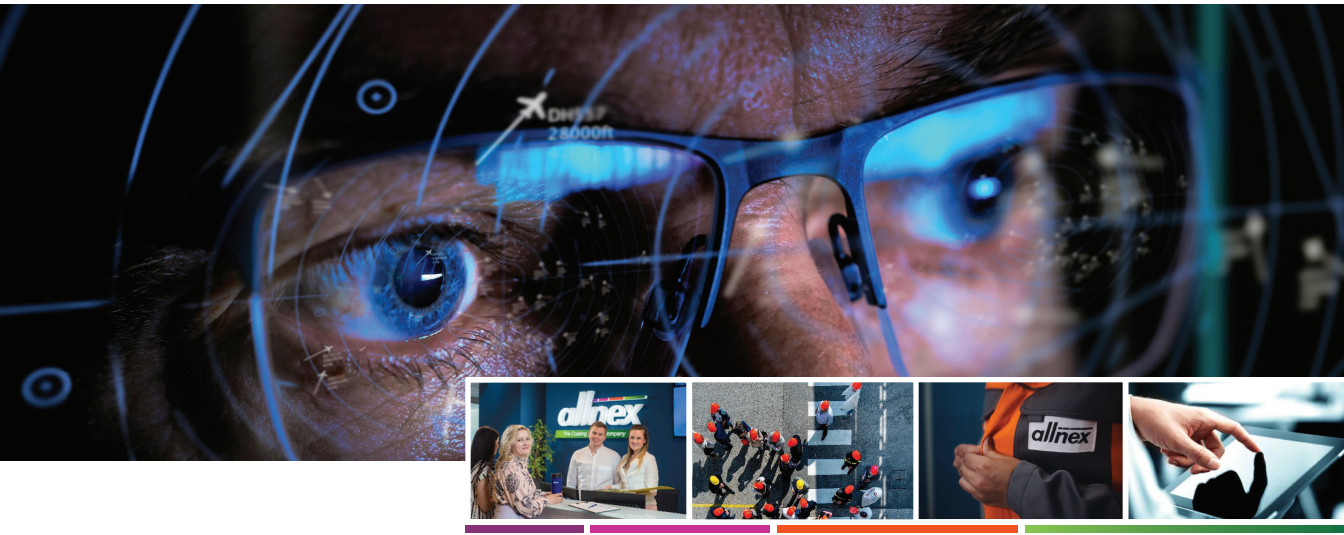
UV-CURABLE ADDITIVE FINDER



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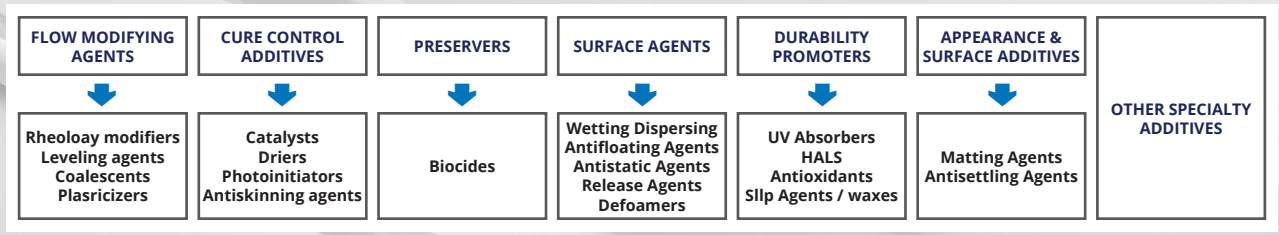
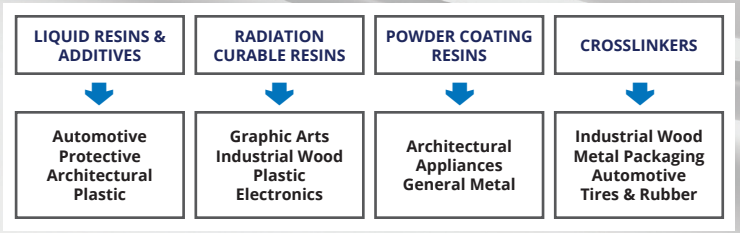
The Coating Resins Company

Additive Categories

→ Substances added to modify and improve properties of the finished coating (Rheology, film-formation behavior, mechanical and surface properties)



→ Additives are used across all kind of Technologies & Markets



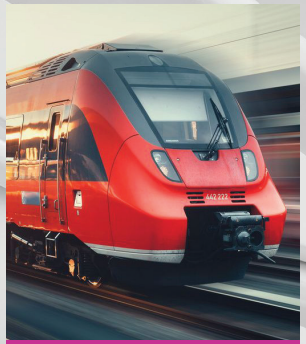
Product Portfolio

CATEGORY	BRAND NAMES
→ Flow & leveling additives	*EBECRYL®*
→ Wetting & Dispersing additives	
→ Rheology modifiers	*ADDITOL®*
→ Catalysts & mixed driers	
→ Defoamers & deaerators	
→ Customer specific	*MODAFLOW®*

- Comprehensive portfolio
- Focus on Unique, Universal & differentiated materials
- Among the few suppliers offering both resins and additives
- Broad capabilities & strengths in Automotive, Architectural & Industrial coating

All the Additives your paints will need...

Flow-Leveling and Substrate Wetting

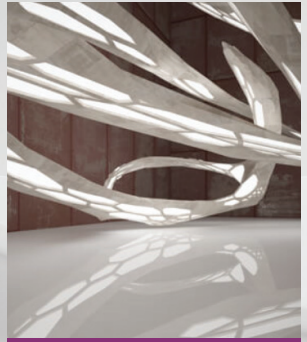


ADDITOL® XL 482
- Balanced -

- Micro-structure control
- Improves orange peel control
- Excellent compatibility with with resin systems
- Low dosage requirements
- FDA possible

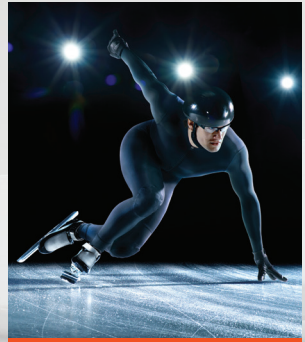
MODAFLOW® LAMBDA
- Highest Brilliance -

- Ultimate brilliancy, sharpness and DOI control
- Polymeric flow promoter locked into the paint
- Controls orange peel & coating micro-structure



ADDITOL® XW 6586
- Ultimate Beauty -

- Multi purpose silicone for improved appearance, gloss and surface slip
- 100% active for aqueous, solvent and 100% systems
- FDA possible

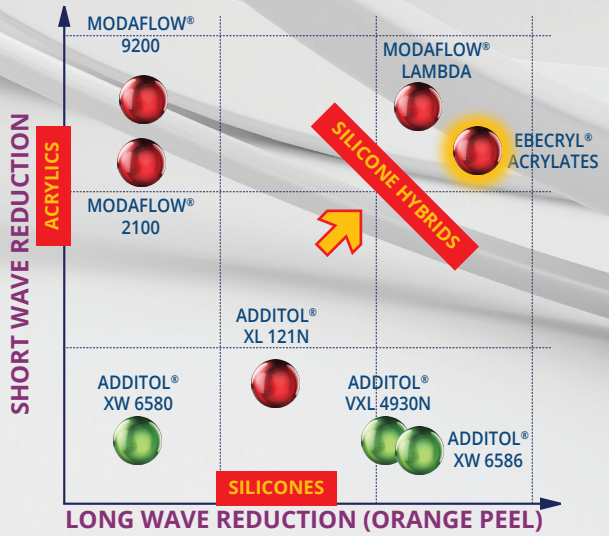


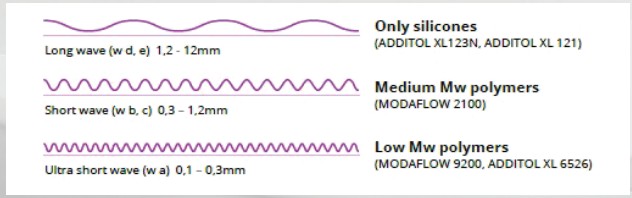
EBECRYL® 1365
- Scratch Eliminator -

- Excellent scratch & Mar resistance with the highest transparency & gloss
- Low dosage requirements
- No silicone migration
- Acrylate functionality

Flow – Leveling and Substrate Wetting

- Perfect surface = Combination of additives
- Silicone modified Acrylic copolymers (HYBRIDS) are an interesting route to resolve issues related to microstructure and Orange peel (Modaflow Lambda)



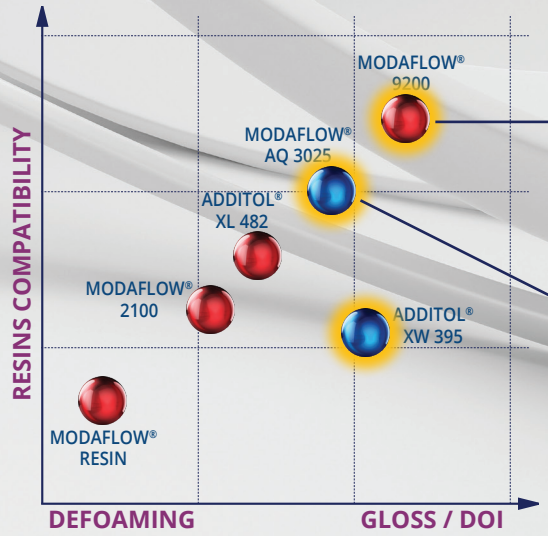


- Acrylic flow modifiers have an excellent effect on leveling (short wave issues) but have little effect on surface tension (Not critical on dosage)
- Silicones and Fluoro Modified acrylics overcome surface tension problems (Critical on dosage) and Improve Long wave issues (orange peel)

Non-Silicone Flow – Leveling and Substrate Wetting Polyacrylate Polymers

- → Ultimate leveling performance across the board
- → No influence on dosage (Silicone free)
- → FDA approved

100% & SB Systems
WB and UVPUD Systems
Performance Universal

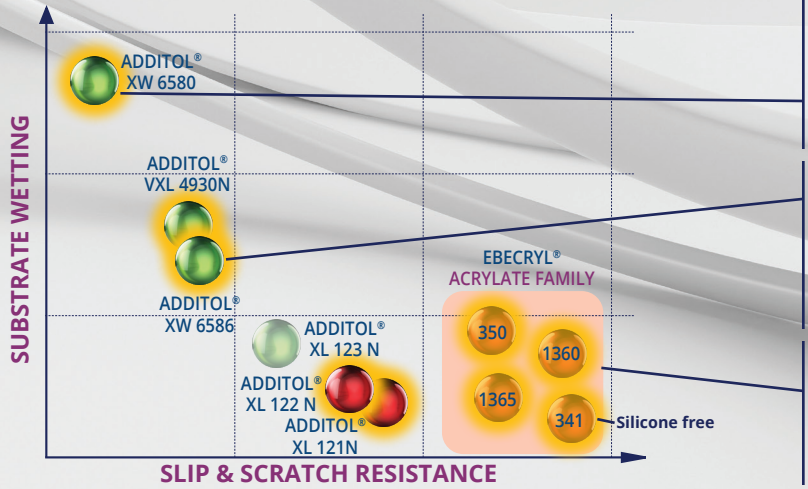


- Straight acrylic – low MW
- Premium gloss and brilliancy in top & clear coats
- FDA approved
- Very good compatibility & high performance in radcure systems

- Easy to incorporate flow additive for aqueous coatings (UV PUDs)
- Compatible with a broad range of chemistries
- Promotes flow, leveling and provides surface defect control
- Recommended to be used in high gloss formulations based on new UCECOAT 7856

Flow – Leveling and Substrate Wetting Silicone Polymers

- → Preferred for difficult substrates
- → They reduce surface tension
- → Only silicones can bring slip & scratch resistance
- → (Recommended for TOPCOATS not for primers)



- Universal use
- Best in class for dynamic surface tension reduction
- Defect free surfaces
- No impact on slip
- Low foam stabilization
- Low impact on intercoat adhesion despite very low surface tension

- Universal use
- Very compatible polyether modified silicone substrate wetting & leveling additive
- 100% Active

- Acrylate slip / flow / wetting additives.
- In OPV applications gives best slip, blocking, and scratch resistance
- Silicone fixed & non-migrating

Flow-Leveling and Sub- strate Wetting ADDITOLS®

Product	TS %	Visc cps	Dosage %	Basis	Chemistry	Solvents	MW	Cross Linkable
ADDITOL® XL 121 N	50	–	0.05-0.5	Total	Silicone	SNA	M	–
ADDITOL® XL 122 N	50	–	0.05-0.5	Total	Silicone	SNA	M	–
ADDITOL® XL 123 N	50	–	0.05-0.5	Total	Silicone	SNA	M	–
ADDITOL® XW 395	58	1400	0.2-1.0	Binder Resin	Acrylate	BuOH, MP	M	–
ADDITOL® XL 482	100	–	0.2-1.0	Total	Acrylate	–	M	–
ADDITOL® XW 6580	100	60	0.05-0.5	Total	Silicone	–	L	–
ADDITOL® XW 6586	100	<1500	0.25-0.5	Total	Silicone	–	M	–

typical values (not specifications)

Flow-Leveling and Substrate Wetting EBECRYLS® and MODAFLOWS®

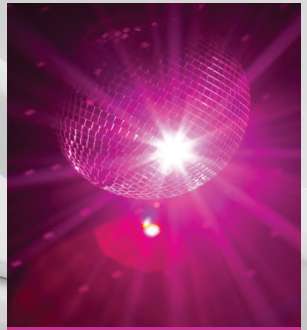
Product	TS %	Visc cps	Dosage %	Basis	Chemistry	Solvents	MW	Cross Linkable
EBECRYL® 341	80	50	1-10	Total	Acrylate	TPGDA	L	Acrylate
EBECRYL® 350	100	350	0,5 -3	Total	Silicone diacrylate	–	L	Acrylate
EBECRYL® 1360	100	2100	0,5-3	Total	Silicone hexa-acrylate	–	L	Acrylate
EBECRYL® 1365	100	2500	1-10	Total	Silicone hexa-acrylate	Tri-functional monomer	L	Acrylate
MODAFLOW® 2100	100	8500	0.1-1.0	Total	Acrylate	–	M	–
MODAFLOW® 3025	25	150	1.0-2.0	Total	Acrylate	–	H	–
MODAFLOW® 9200	100	4000	0.1-0.5	Total	Acrylate	–	L	OH
MODAFLOW® Resin	100	100000	0.5-3.0	Total	Acrylate	–	H	–
MODAFLOW® Lambda	100	20000	0.05-0.4	Total	Acrylate Hybrid Grafted	NA	L	OH

typical values (not specifications)

Pigment Dispersing Highlights

ADDITOL® XL 6590
- Excellent Stability -

- 60% active in OTA 480
- Pigment affinic end groups in special block copolymer architecture
- Broad compatibility across binders
- High pigment loading for all pigments & fillers



ADDITOL® XW 6588
- Controlled Migration -

- "Low ion migration" technology improves paint corrosion resistance
- Low viscosity direct grinds & concentrates
- High pigment loading for all pigments & fillers

ADDITOL® XL 6592
- Broad Use -

- 100% active
- Pigment dispersion & stabilization across broad range of oligomers & binder systems
- Effective with all pigments and fillers
- Aqueous & 100% Systems

EBECRYL® 331
– United Pigments –

- Acid modified dispersant
- Highly effective to grind inorganic pigments, fillers and matting agents
- Diluted in OTA 480
- Tin free

Dispersing Additives for Inorganic Pigments

- Radcure designed materials
- Best in class additive for Inorganic pigments & fillers

- Acidic group containing polymer
- VOC Free wetting agent
- Very low viscosity pigment pastes
- Excellent shelf life stability pastes

EBECRYL® 331

EBECRYL® 331 in 65% OTA 480

Tin free version of EBECRYL® 330

100% UV systems

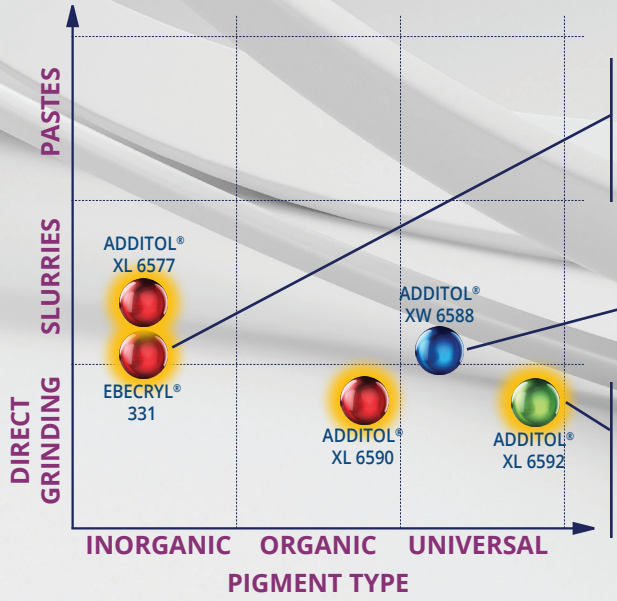
Dispersing Additive for Inorganic pigments (TiO2) – fillers

• TPGDA	27%
• Hombitan R210	70%
• EBECRYL 331	3%

General paste: can be used both in IC and GA applications

Dispersing Additives

→ Selection of additives giving best performances for inorganic and organic pigments



100% & SB Systems
WB and UVPUD Systems
Performance Universal

- High efficient dispersant
- For inorganic pigments & fillers
- Highest pigment load

- Non ionic dispersant
- High performance
- High pigment loading & Low viscosity
- Strong color development
- Suitable for WB UV systems
- Perfect pigment paste stabilization

- 100% active dispersant for all types of pigments and fillers
- High performance in fast curing binders
- High pigment load

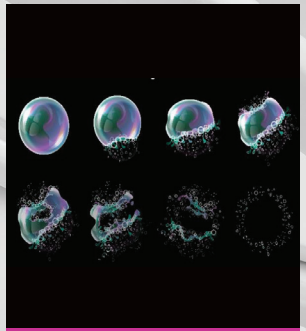
Suitable for 100% UV formulations

Wetting and Dispersing Additives

Product ADDITOL®	TS* %	Visc* Cps	Inorganic on Pigment %	Organic on Pigment %	Chemistry	Solvents	ACID #*	Amine #*
XL 6577	52	50	0.3-3	–	Polyester	MPAC/SNA	60	–
XW 6588	47	2500	See TDS	See TDS	Comb Polymer	Water	17	–
XL 6592	100	25000	See TDS	See TDS	Comb Polymer	No solvent	28	–
XL 6590	100	250	See TDS	See TDS	Polyester	OTA-480	–	23
EBECRYL® 331	100	400	0.5-5	–	Polyester	OTA-480	70	–

* typical values (not specifications)

Defoamer Highlights

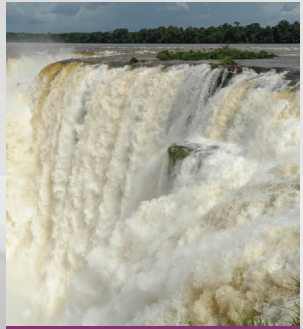


ADDITOL® XL 6531
– Knock out –

- Solution of foam destroying polymers for 100% or Solvent systems
- Highly effective
- Pigmented or clear systems

ADDITOL® XW 6584
- Letdown -

- Silicone emulsion defoamer
- Emulsifier free technology
- Good compatibility
- VOC free
- For water based systems
- 20% silicone content



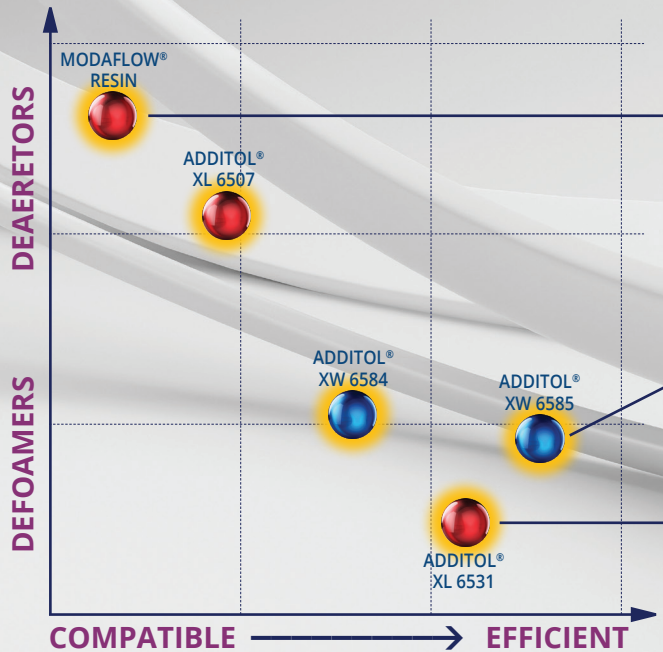
ADDITOL® XW 6585
- Grind or let down -

- Silicone emulsion defoamer
- Highly effective
- Emulsifier free technology
- Low dosage
- VOC free
- 25% silicone content

MODAFLOW® Resin
- Airless -

- Polymer defoamer and deareator for 100% systems
- Silicone free, reflow effect avoids crater formation
- Excellent compatibility

Defoaming Efficiency

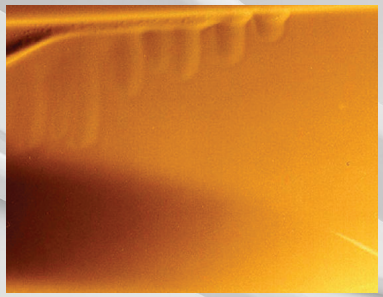


- Very efficient
- 100% deaerator
- Enhance flow
- Suitable for clear and pigmented systems

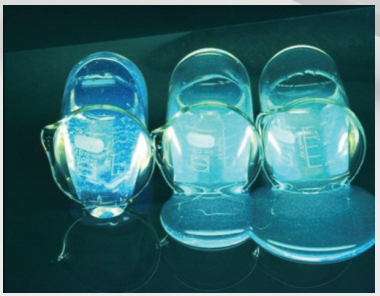
- SILICONE emulsion
- Better efficiency compared to other SI defoamers
- Emulsifier free
- Suitable for WB UV systems

- Silicone free
- High efficient defoamer
- 20% active (diluted in MPAC)
- Best overall result in radcure systems

Rheology modifiers



- → Create interactions with the diluting matrix
- → Modifications of performance profile (lengths of chains – strength of interactions – number of interaction sites (dosage)…
- → Interesting to increase shelf life in WB systems
- → ALWAYS NEED A GOOD PRE-DILUTION OF THE THICKENER



ADDITOL® VXW 6360: High shear PUR-thickener
For brushed or roller coater applied coatings

Additol® VXW 6388: Mid shear PUR-thickener
For spray applied coatings

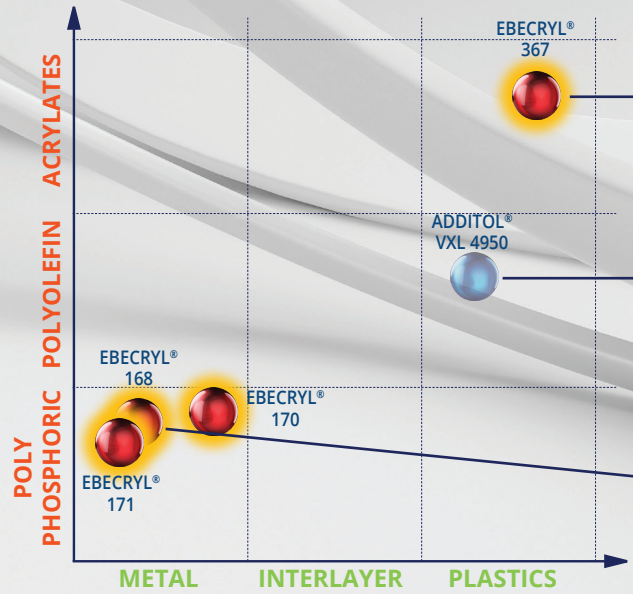
Rheology

Product	TS %	Visc cps	Dosage %	Chemistry	Solvents	Other
ADDITOL® XL 280	36	5500	5-10 Pigment	Pre-Activated Clay	SNA	Incorporate in grind.
ADDITOL® VXW 6360	30	9000	0.1-3 Total	Polyurethane	Water/BDG	Add to grind or letdown. Generally can be added neat.
ADDITOL® VXW 6387	60	100	0.1-5 Pigment	mod. fatty acid	MP	Add to grind with pigments preferred, also possible in letdown.
ADDITOL® VXW 6388	35	3000	0.1-3 Total	Polyurethane	Water/BDG	Add to grind or letdown. Best if pre-diluted before adding.
ADDITOL® XW 6536	50	1900	0.1-1 Total	Pre-Activated Clay	Water	Best added in the grind or early in the formulation where sufficient agitation exists.

* typical values (not specifications)

Adhesion Promotors

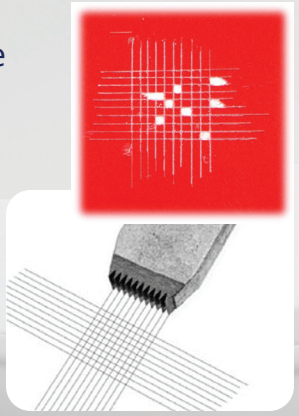
- Phosphoric acid based (meth)-acrylate additives
- Adhesion onto metals and difficult substrates such melamine



- Polyester acrylate based co resins
- Improve adhesion on corona treated plastics

- CPO based
- Flash primer suitable for various plastic substrates

- High efficiency adhesion promoters
- Chemical bridging between substrate and polymer film
- ACIDIC based
- Co reactive with UV systems

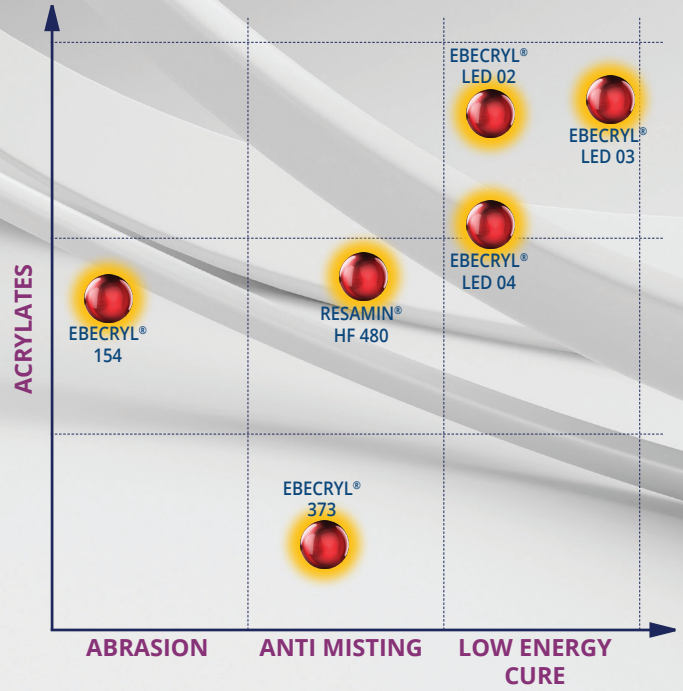


Adhesion Promotors

Product	TS %	Visc cps	Dosage %	Chemistry	Functionality	Other
ADDITOL® VXL 4950	43	450	Flash primer	CPO		Improves adhesion to plastic substrates. Pre-treatment primer. Not to be formulated into paint. Must be diluted 1:8 in toluene or xylene before application. Can be rolled, brushed, or sprayed.
EBECRYL® 168	100	1400	1-5% Total	Acidic Methacrylate	2	Excellent metal adhesion. Best compatibility. Acid value – 282.
EBECRYL® 170	100	3000	1-10% Total	Acidic Acrylate	2	Best reactivity. Acid value – 300.
EBECRYL® 171	100	1400	1-5% Total	Acidic Methacrylate	1.5	Best compatibility with acrylate diluents & oligomers. Acid value – 300.
EBECRYL® 367	100	1500	10% Total	Polyester Acrylate		Ink & varnish adhesion promoter. Low color & acid value. Excellent adhesion on corona treated polyolefin substrates.

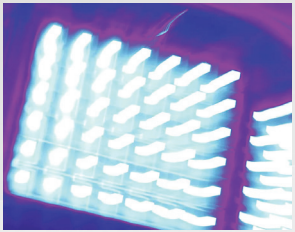
typical values (not specifications)

Other Specialty Additives



- Improve surface curing

- Good flexibility, good adhesion and low odor
- Improve surface curing



- Improve surface curing
- Replacement of aminobenzoate synergists

- Flexibilizer without losing chemical resistance
- Dosage up to 10%

- Outstanding hardness, chemical, scratch (Micro) and abrasion resistance

Other Specialty Additives

Product	TS %	Visc cps	Dosage %	Chemistry	Functionality	Other
EBECRYL® LED 02	100	106	>20% Total	Mercapto modified polyester acrylate	3	Acidic resins, such as some adhesion promoters, should not be used in combination with EBECRYL® LED series
EBECRYL® LED 03	100	450	5-20% Total	Amine modified polyether acrylate	2	
EBECRYL® LED 04	100	17500	5-20% Total	Acrylated polyamine	6	
EBECRYL® 154	50	2800	Can be used as main or modifying oligomer	Functionalized Nanocomposite Acrylate		Can be added at any stage of formulation
EBECRYL® 373	100		3-5% Total	Epoxy Acrylate in TPGDA	3	Reduces misting
RESAMIN® HF 480	>95	8500	<10% Total	Carbamic acid, butyl ester		Plasticizer with good compatibility

typical values (not specifications)

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