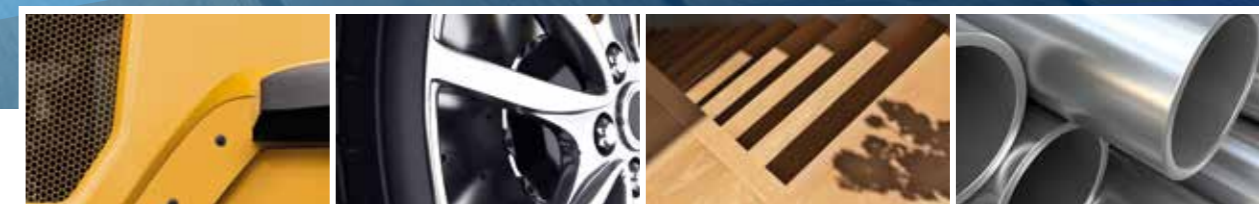


LIQUID RESINS AND ADDITIVES

Environmental friendly and sustainable coatings resins and additives
(Automotive OEM, Industrial Metal, Wood and Decorative Applications)



Corporate Center
Frankfurt
The Squire
Am Flughafen
D 60549 Frankfurt am Main
Germany

The operating allnex group is legally owned by Allnex Holdings S.à r.l., a company based in Luxembourg, which also provides long term strategic decisions relating to its investment in allnex.

www.allnex.com



www.allnex.com



About allnex



Facts & Figures

- Global company with over €2.1 billion in sales
- Broad Technology portfolio: liquid coating resins, energy curable resins, powder coating resins, crosslinkers and additives, composites and construction materials
- Approximately 4000 employees
- Customers in more than 100 countries
- 33 manufacturing facilities
- 23 research and technology centers
- 5 ventures
- Extensive range of solutions for key coating segments: automotive, industrial, packaging coating and inks, protective, industrial plastics and specialty architectural

Table of Contents

Introduction	4
Sustainability and innovation at allnex.....	5
Green technologies for automotive OEM and refinish	6
allnex automotive portfolio by layer	7
Solutions for industrial metal, marine and protective applications.....	8
High solid acrylic and polyester polyols	9
Waterborne epoxy systems for container coatings.....	10
Waterborne epoxy systems for rail, commercial vehicles, ACE and protective coatings	11
BECKOCURE® - the waterborne that works like solventborne.....	12
One-component direct-to-metal for light duty applications.....	13
Broad portfolio of waterborne technologies for industrial wood applications.....	14
High performance environmental friendly solutions for niche applications in decorative, construction and textiles.....	15
Other Technologies: ACURE®.....	16
Other Technologies: Crosslinkers.....	17

With manufacturing, R&D and technical facilities located throughout Europe, North America, Asia Pacific and Latin America, allnex offers global and reliable supply of resins and additives combined with local, responsive customer support.

Introduction

allnex is a leading producer of liquid coating resins and additives (LRA). The LRA business provides a comprehensive range of environmental friendly and sustainable products with its core technologies including both water and solventborne: Alkyds, Acrylics, Epoxies, Polyesters, Polyurethane Dispersions and Additives for use in water borne, high solids and solvent free paint and coatings. Our products lend themselves to be used in multiple end-user segments including Automotive OEM, Vehicle Refinish, Marine & Protective, Rail, ACE, Container, Industrial Wood, Decorative and Construction. Additionally, we enable our customers and end users to reduce energy consumption through low temperature, fast curing resins.

allnex sees tremendous potential in developing technologies reducing VOC-content, energy consumption and toxicity aspects of coatings. Bio-sourcing and enhanced environmental performance are of paramount importance to our R&D and Marketing strategies. Recent developments such as BECKOPOX™ (water epoxy dispersion and hardeners), ACURE™ (fast drying and non-isocyanate system) and ultra low bake systems, exemplify our focus on these areas.

We continue to invest heavily to further improve and expand our product offering through research and development (R&D) activities at our 23 R&D centres across the world. Our 2 R&D and application centres and 5 production facilities in China focus on the unique requirements of the Chinese market and enable us to serve our customers effectively with increased speed to market.

allnex portfolio

Environmental friendly coating (EFC) classification

- Water based
- High solid
- Solvent free
- Powder
- Radcure
- Crosslinkers

Sustainability and innovation at allnex

At allnex we take a multi-pronged approach to developing resin systems that extend the life span of coatings, protect assets and are safe for the environment and applicators. In developing systems which reduce VOC we also try to use both renewable and recycled materials, avoid chemicals of high concern and reduce carbon footprint.

Low VOC Solutions

allnex supplies a variety of products that are low VOC, including High Solid, Waterborne, UV and Powder.

Examples of products include:

- High solid acrylic and polyester polyol
- High solid thermalsetting acrylic
- High solid methylated amino
- ACURE™ Technology
- Wide Waterborne product portfolio
 - Waterborne Alkyds, Polyester
 - Waterborne 1K/2K Acrylic Emulsion
 - Waterborne Epoxy/Amine
 - PUD & PAD
- UV/EB Curable Resins
- Powder Resins



Reducing Energy Consumption

allnex offers a range of technologies that allow processes to run faster or at ambient temperatures.

Examples of products & projects include:

- EBECRYL® UV/EB Curable Resins
- SETALUX® Fast Cure Resins
- Low Temperature Curing CED
- Low Temperature Curing Powder
- ACURE Technology
- PUD/PAD for OEM Compact Process



Renewable and Recycled Raw Materials

allnex offers a range of resins containing renewable or recycled raw materials that replace traditional fossil fuel based feedstock.

Examples of products include:

- RESYDROL® and SETAL® Alkyd Resins
- CRYLCOAT® Powder Resins
- SETATHANE® Hydrophobic Polyol



Reducing Chemicals of Concern

allnex supplies a variety of products that are free of chemicals of concern, including tin-free, formaldehyde-free, isocyanate-free.

Examples of products include:

- CYMEL® NF Crosslinking Resins
- EBECRYL LEO UV/EB Curable Resins
- SETALUX High Solid Resins
- BECKOPOX™ & BECKOCURE™ resins
- ACURE Technology



Longevity

allnex offers products that increase the lifespan and reduce the maintenance frequency of the coated items.

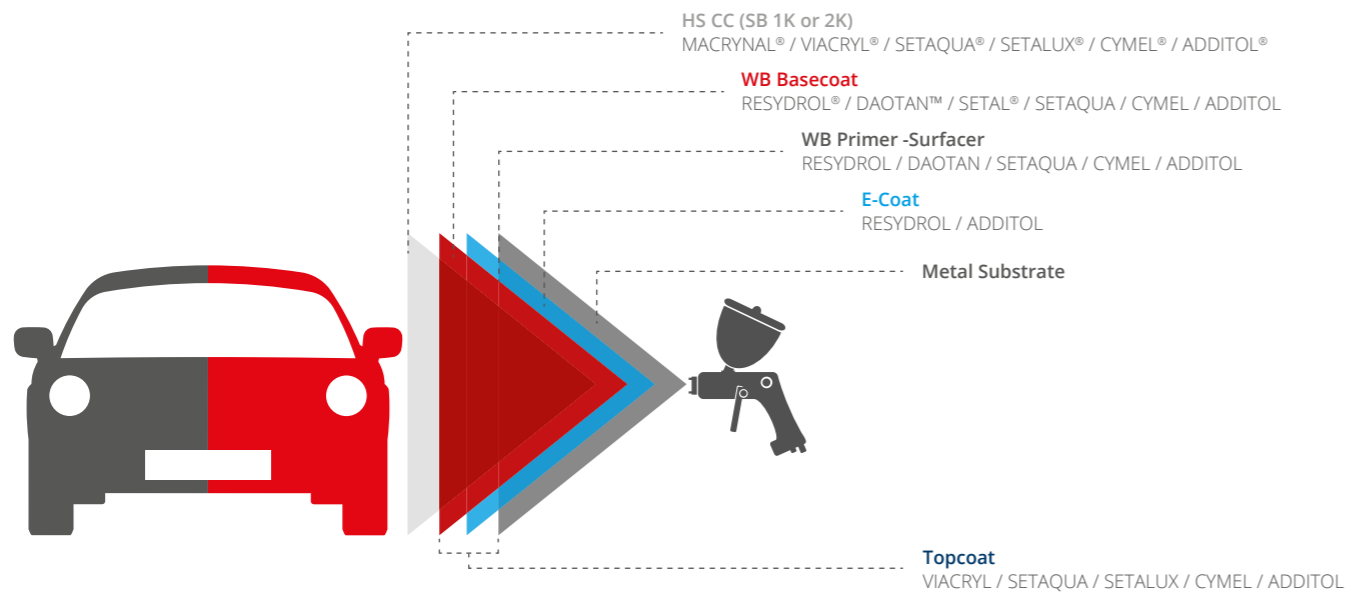
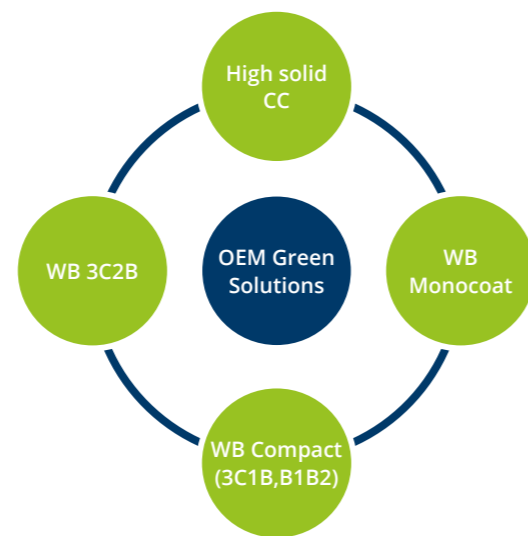
Full product range, e.g.:

- BECKOPOX Epoxy Dispersions
- CRYLCOAT Powder Resins
- SETAL Alkyd Resins
- SETAQUA® Acrylic resins

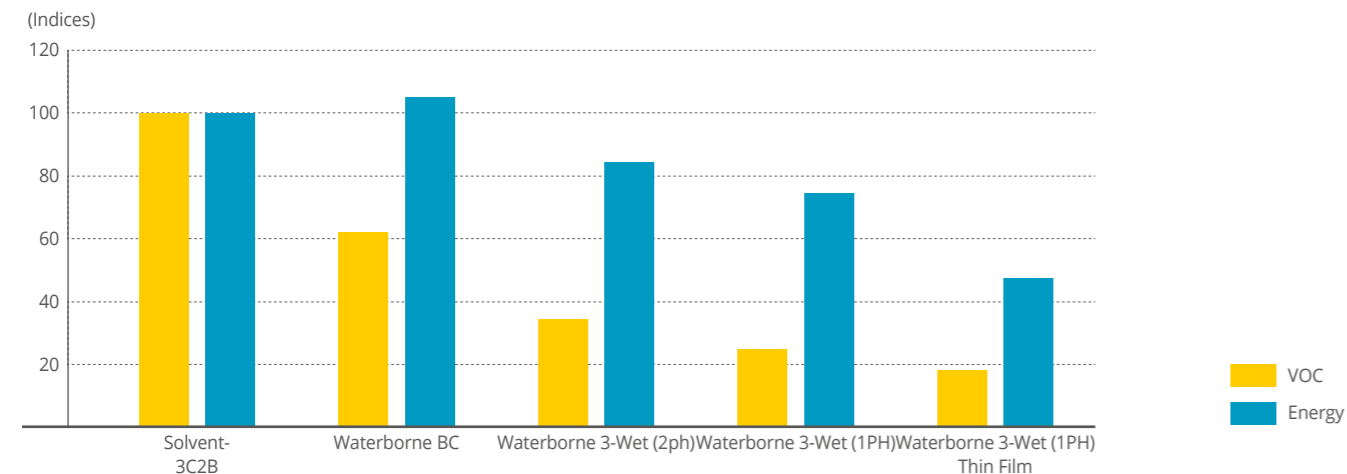


Green technologies for automotive OEM and refinish

Automotive coatings are one of the most challenging applications, demanding high end performance and energy efficiency. Reduced solvent content and increased energy efficiency are key drivers for the automotive industry. We work closely with our customers to develop solutions for each layer in Automotive OEM coatings systems, from electrocoat to clearcoat, enabling our customers to meet the most stringent performance and regulatory requirements. Our every layer presence enables us to provide not just layer solutions but system solutions. Our spectrum of technologies includes high solids, waterborne resins and rheology agents, all suitable for use in compact processes.

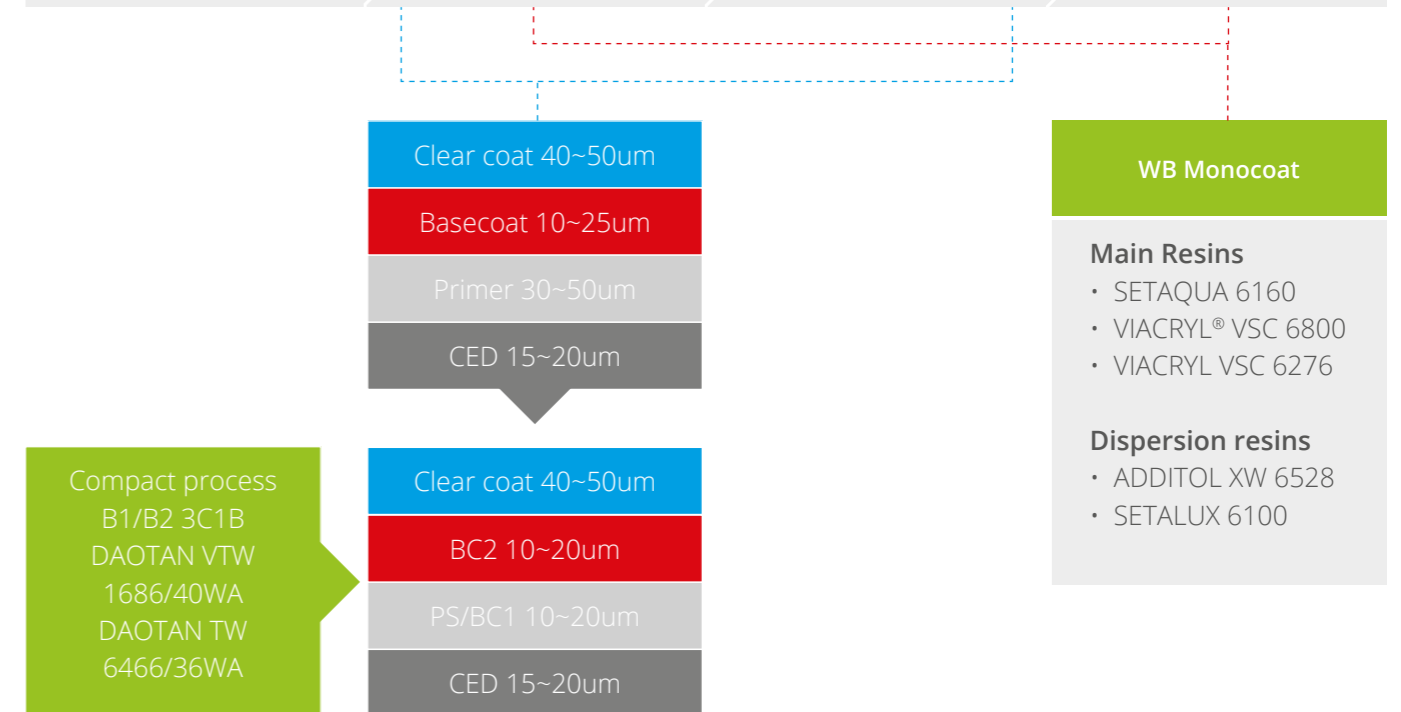


Environment Impact measures



allnex automotive portfolio by layer

CED (DFT 20um)	WB Primer-surfacer (DFT 30-40um)	WB Base coat (DFT 12-18um)	SB HS CC (DFT 30-40um)
Main Resin Standard (Tin free) • RESYDROL® EZ 6635WCAT/35WA Thermal Stable (no yellowing) • RESYDROL EZ 6645WCAT/35WA Additive Resin Edge protection • BECKOPOX™ EM 2120w/45WA • RESYDROL EZ 6639w/32WA	Main Resin • RESYDROL AZ 541w/42WA Additive Resin • DAOTAN™ VTW 1225/40WA Depersion Resin • RESYDROL VAF5540w/70MP • SETAQUA® E-270 Crosslinker • CYMEL® 327 • CYMEL 1130	PUD • DAOTAN VTW 6462 • DAOTAN VTW 6463 • DAOTAN TW 6464 PAD • SETAQUA 6801, 6802, 6803 Additive Resin Dispersion Resin • ADDITOL® XL 250 • SETAL® 6306 Improve stone-chip and adhesion • DAOTAN VTW 1237 • DAOTAN VTW 6434 • DAOTAN TW 6490 • DAOTAN VTW 1236 • DAOTAN TW 6450	1K • SETALUX® 1795 • SETALUX 1921 • SETAL 1606 • RCA Setal 10-6266 • SCA Setal 91796 • HS Amino 2KPU • SETALUX 1918 • SETALUX n1921 • SETALUX 1901 • SETAL 1603 • DUROFTAL® 2803 • SCA



WB Monocoat

Main Resins

- SETAQUA 6160
- VIACRYL® VSC 6800
- VIACRYL VSC 6276

Dispersion resins

- ADDITOL XW 6528
- SETALUX 6100

Solutions for industrial metal, marine and protective applications

Based on our strong partnership with customers and understanding of the metal and plastic coatings, we are positioned to help customers achieve high quality, high performance coatings which not only protect assets but are also safe for the environment and end user. allnex has a comprehensive portfolio of waterborne and high solids resins for primer, basecoat, topcoat, clearcoats and direct to metal applications, based on acrylic, alkyd, polyester and epoxy technologies. Our strong technical service team can help you transition to waterborne systems for Rail, ACE, Container, Commercial Vehicles and other industrial metal protective applications.

Waterborne two component acrylic polyols

- Rail
- Commercial Vehicles (CV)
- ACE
- Container
- Protective

<p>SETAQUA® 6510 42% Solid Content 4.2% OH Content Good Water resistance, chemical resistance</p>	<p>SETAQUA 6511 42% Solid Content 4.2% OH Content Excellent appearance, layer thickness</p>	<p>SETAQUA 6515 45% Solid Content 3.3% OH Content Appearance,pot-life</p>	
<p>SETAQUA 6516 40% Solid Content 3.5% OH Content Drying, adhesion</p>	<p>MACRYNAL® SM 6826w/44WA 44% Solid Content Matte Acrylic polyol Dependency of gloss on dry film thickness and cure temperature</p>	<p>MACRYNAL VSM 6299w/42WA 42% Solid Content 4.1% OH Content High hardness (>=2H) and gloss</p>	<p>MACRYNAL VSM 6810w/42WA 42% Solid Content 4.1% OH Content Broad application windows</p>

High solid acrylic and polyester polyols



Waterborne epoxy systems for container coatings

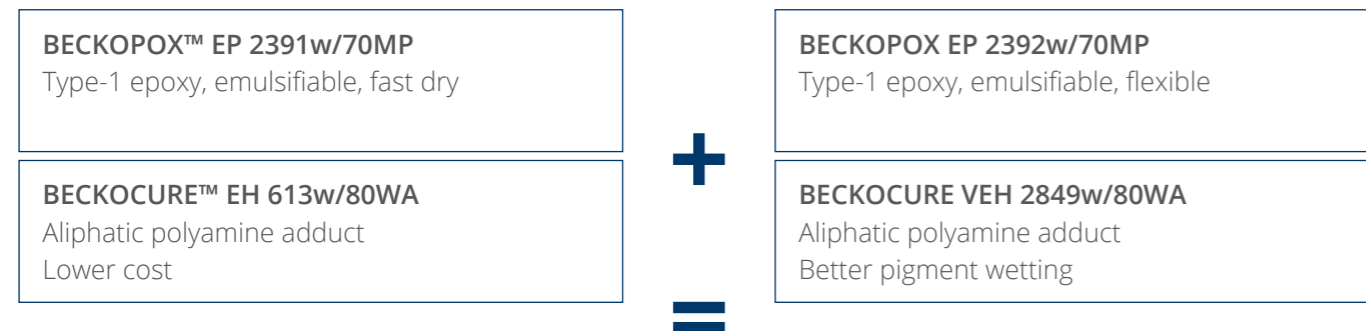
Reducing VOC's in China on Container Coatings

China produces 2 -3 millions shipping containers annually. Each container uses 80 – 100 Kg of coating, which has traditionally solvent – based. This makes container production one of the largest sources of the VOCs in China. allnex has been perfecting waterborne container coating technology without VOCs since 2004. We produce key waterborne epoxy dispersions and hardeners in our China facilities and are poised to take advantage of new regulations which mandate the use of waterborne coatings on containers. Our solutions are a key component to the expected drastic reduction in VOCs by the container production industry.



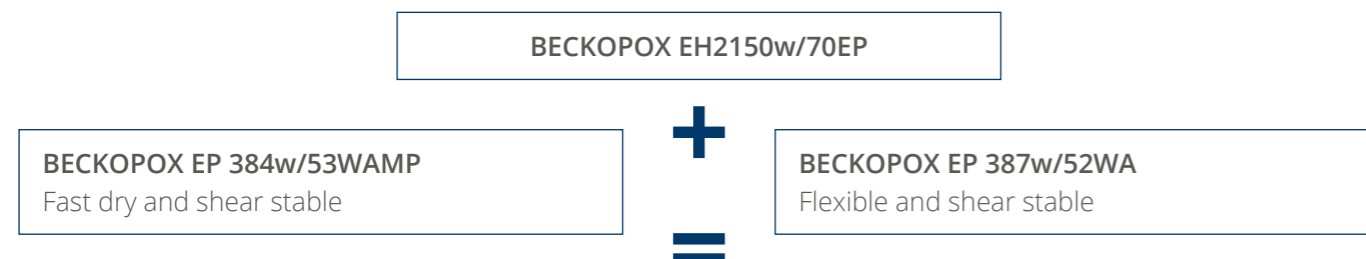
ALLNEX SOLUTIONS FOR CONTAINER COATINGS

Zinc primer (Zinc in Epoxy)



2K epoxy zinc rich primer • Good storage stability • Excellent anticorrosion performance

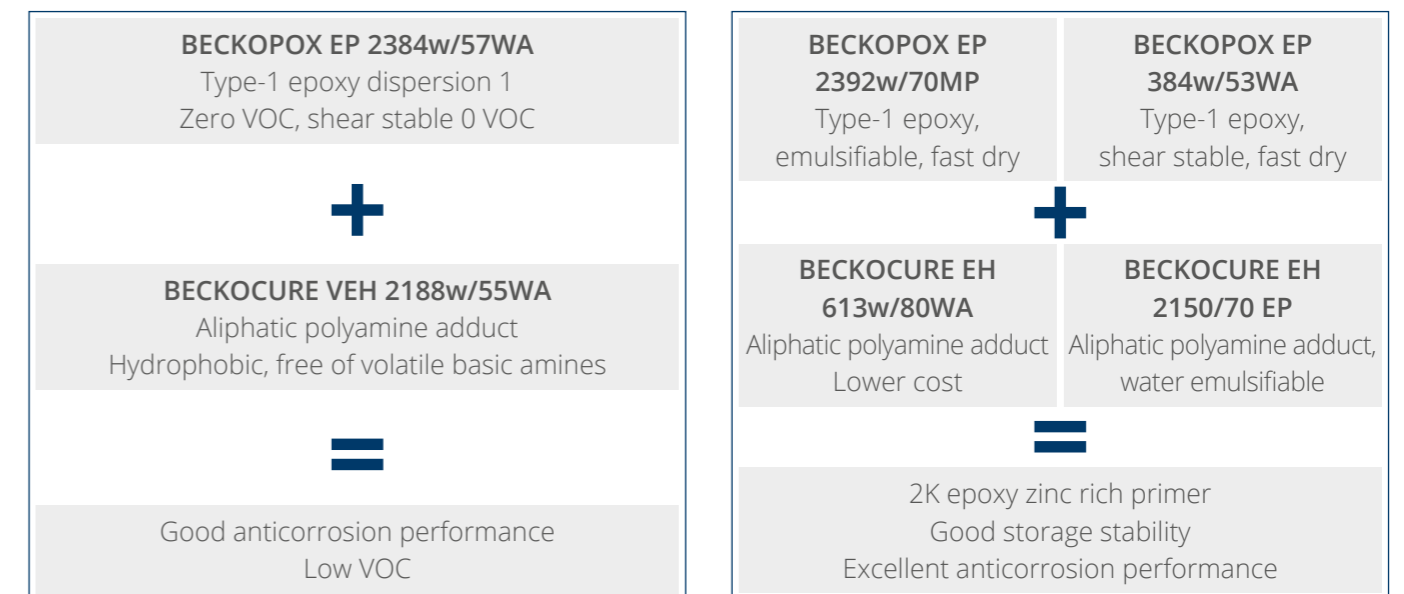
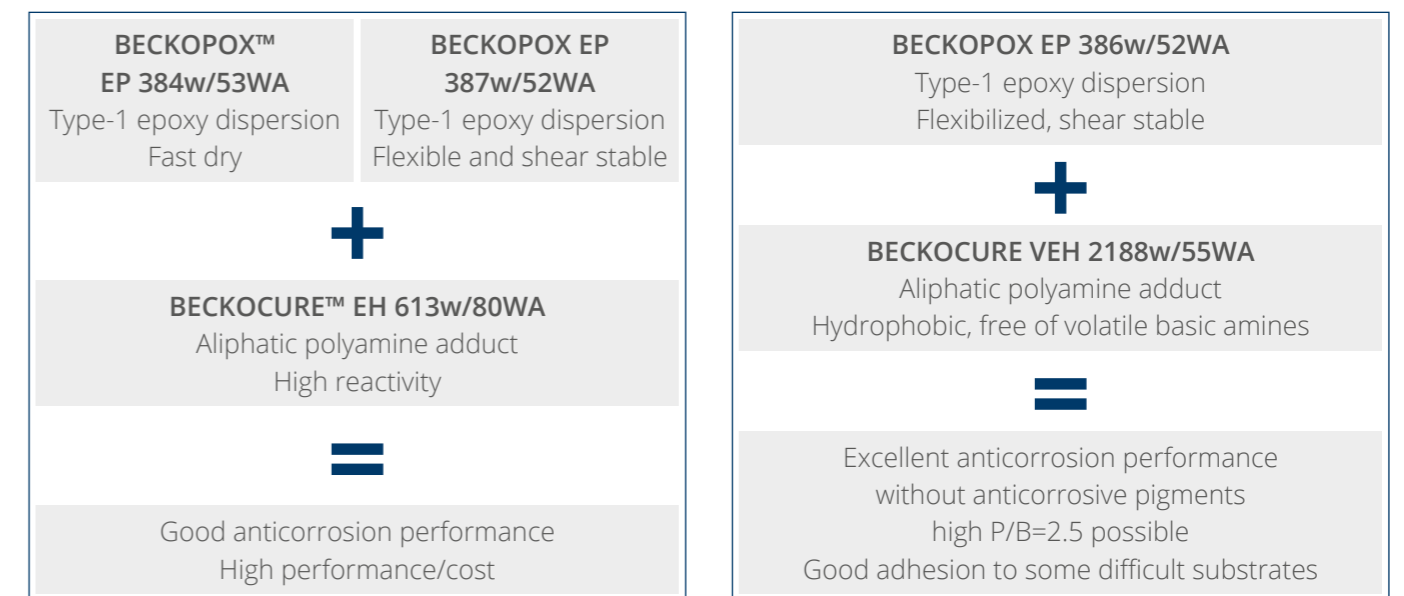
Zinc primer (Zinc in Hardener)



2K epoxy zinc rich primer • Ease of mixing • Excellent anticorrosion performance

Int. topcoat & ext. midcoat EP387/EH613	Exterior topcoat emulsion SETAQUA® XSZ 1701 1G	Additives VXW6208/60, VXW6394, VXW6393
---	--	--

Waterborne epoxy system for Rail, commercial vehicles, ACE and protective coatings



BECKOCURE™ The waterborne that works like solventborne

Increasingly strict VOC regulations push formulators to move from solventborne (SB) and high solids formulations to waterborne (WB) technologies
Voice of Customers: What is needed in wb epoxy technology?

- Broader application window
- Fast return to service
- Low odor & Ultra low VOC
- Suitable for high compliance applications
- Easy handling

allnex solution

BECKOCURE: solvent free and high molecular weight, amine-based adduct hardeners for WB 2K-epoxy systems, contain very low residual low molecular amines (< 0,1%) resulting in fast drying, even at low temperatures.

- Excellent anticorrosion performance on flash rust susceptible substrates
- Excellent top coat acceptance in WB and SB technologies
- Easy to handle and formulate
- Close to zero VOC formulations possible
- No monomer amine – Low odor

BECKOCURE™ EH 2260w/41WA

- Faster cure;
- Adhesion on different substrates
- Best in class, premium product

BECKOCURE™ EH 2100w/44WA

- Universal for metal & concrete; Better on sandblasted steel
- Low temperature cure up to 5°C
- Cost friendly high performance

GENERAL INDUSTRY

- Adheres to oily substrate
- Smooth film surface, avoid sanding between coats
- Optimized for 2K spray guns
- Wet on wet application

RAILWAY

- Resistance to styrenated putty
- Smooth film surface, avoid sanding between coats
- High sag resistance; one layer application instead of two

MILITARY APPLICATIONS

- Adheres to oily substrate
- Compatible with wide range of top coats
- Safe for workers and environment

AGRICULTURE & CONSTRUCTION EQUIPMENT

- Resistance to styrenated putty
- Smooth film surface, avoid sanding between coats
- High sag resistance; one layer application instead of two

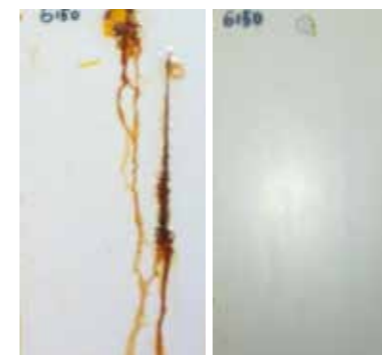
CORE FEATURES

- Excellent Corrosion Protection
- Label Free and Low VOC
- Early Recoatability
- Ease of Formulation

One component direct to metal for light duty applications

1K Alkyd: RESYDROL® AY 6150w/45WA

Good balance between corrosion resistance and gloss



Salt Spray Humidity Resistance

Substrate: Q-Panel, R-36
Gloss (60°): ~80
DFT: 70~80 um

1K Epoxy: BECKOPOX™ EM 2120w/45WA

High gloss and hardness build up, better salt spay resistance



Q-Panel Sandblasted Steel

Salt Spray Test: 295h;
Gloss (60°): 80 ~ 90
DFT: 40 ~50 um

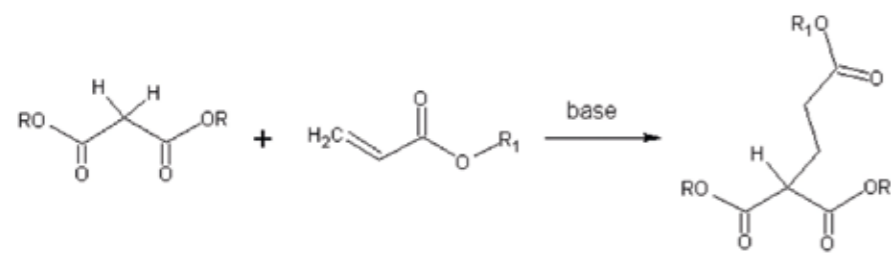
1K Acrylic:

Fast drying, durability, high gloss, adhesion and corrosion resistance

- SETAQUA® 6472
Standard 250g/L VOC
- SETAQUA 6491
Low VOC – 100g/L
- SETAQUA XCS 1701-1G
APEO free, early water resistance, high hardness and salt spray resistance

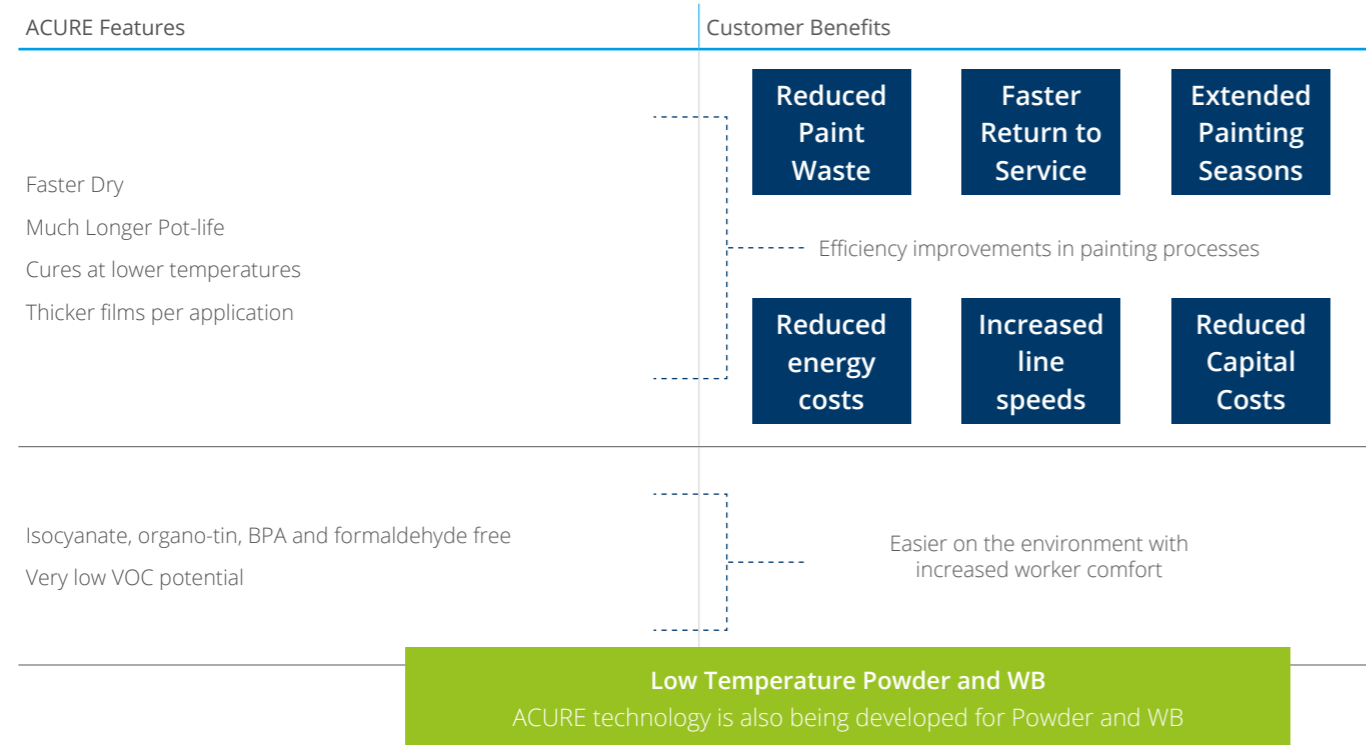


allnex offers other innovative technologies which reduce usage of chemicals of concern and improve efficiency ACURE™



- Low VOC
- Reduced energy consumption
- Reduced chemicals of concern

The Michael addition reaction in ACURE chemistry.



allnex also offers a broad range of formaldehyde free and water borne crosslinkers which can be used in combination with water borne resins for various automotive, metal and wood applications to provide a complete eco-friendly solution

Formaldehyde free

CYMEL® NF 2000

- Carbamate functional triazine crosslinker for high durability, heat cured applications
- Use in Auto OEM, Engineered Plastics, Coil and related applications

CYMEL NF 3041

- Modified urea crosslinker for air dry and forced dry, solvent soluble systems
- Wood coatings, primers and related general industrial markets

CYMEL NF 3030

- Modified urea crosslinker for air dry and forced dry, water soluble systems
- Use for industrial wood, encapsulation, textile, paper, etc.

Waterborne Amino

CYMEL 303 Highly methylated

- Free formaldehyde < 0.1%.

CYMEL 350 Highly methylated, complete water solubility

- 88% solid. Higher gloss. Fast cure. Does not require strong acid catalyst.

CYMEL 325 High Imino

- Fast cure response. Does not require strong acid catalyst. Low formaldehyde release.

CYMEL 327 High Imino, complete water solubility

- 90% solid. Fast cure and good stability. Does not require strong acid catalyst.

CYMEL 370 Partially methylated

- 88% solid, Fast cure, good flexibility. Does not require strong acid catalyst.



