

Waterborne Epoxy Solutions for Protective Coatings 用于防护涂料的水性环氧解决方案

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The Coating Resins Company

Agenda

- ❖ **WB Epoxy & Hardener Technology**
水性环氧及固化剂技术
- ❖ **Typical WB Epoxies and Hardeners**
典型的水性环氧及固化剂
- ❖ **WB Epoxy Solutions for Protective Coatings**
用于防护涂料的水性环氧解决方案
- ❖ **Successful Industries and Cases**
成功应用领域及案例
- ❖ **About allnex**
关于湛新



Epoxy emulsified technology:

环氧乳化技术:

Reactive emulsifier vs. traditional emulsifier

反应型乳化剂 vs. 传统乳化剂

Internally emulsified vs. externally emulsified

内乳化 vs. 外乳化

Shear stable vs. shear unstable

剪切稳定 vs. 剪切不稳定

Flexibilized vs. standard

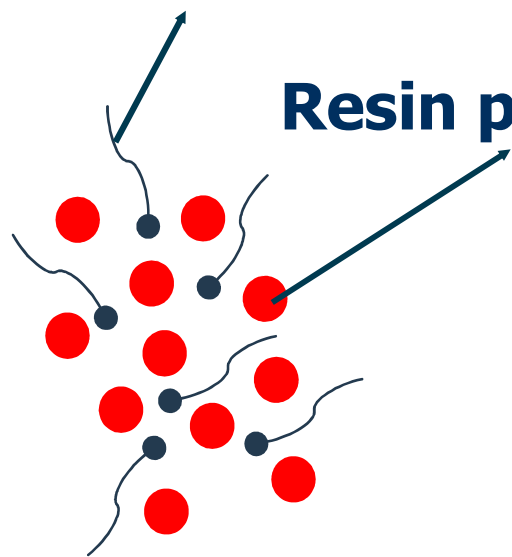
内柔韧化 vs. 常规

Zero VOC

不含挥发性有机化合物

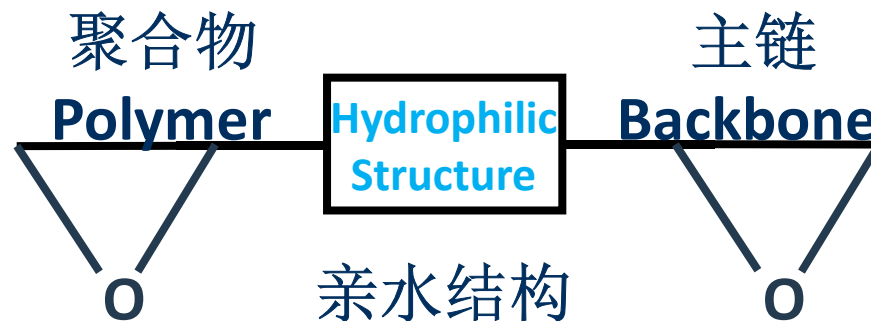
Emulsification of Epoxy Resins 环氧树脂的乳化

Surfactant 乳化剂



Resin particle 树脂颗粒

Externally emulsified
外乳化



Internally emulsified 内乳化
(self-emulsifying 自乳化)

WB Epoxy/Hardener Technology

水性环氧/固化剂技术

Waterborne epoxy hardener technology:

水性环氧固化剂技术

Visual end of pot life

活化期终点可视

Hydrophobic, free of volatile basic amine

疏水结构，不含挥发性游离胺

Good chemical resistance to, e.g. styrene, skydrol...

良好的耐化学品性，如苯乙烯，skydrol...

Good anticorrosion performance on poorly pretreated or greased steel

在低表面处理或有油污的底材上仍具有很好的防腐性能

Wide application window

施工窗口宽泛

Fast dry & long pot life & stable viscosity, cost effective...

快干&长适用期&粘度稳定，高性价比.....

WB Epoxies 水性环氧

BECKOPOX™	EP 147w	EP384w /53WAMP	EP385w /56WA	EP387w /52WA	EP2384w /57WA
Type 类型	Liquid 液体	Type 1 1型	Type 1, flexible 1型, 柔韧	Type 1, flexible 1型, 柔韧	Type 1 1型
Solids content 固体含量	100%	53%	56%	52%	57%
Shear stable 剪切稳定	----	Yes 是	No 否	Yes 是	Yes 是
Emulsification 乳化	Reactive emulsifier 反应型乳化剂	Internal 内乳化	Internal 内乳化	Internal 内乳化	Internal 内乳化
Key features 主要特点	High crosslinking 高交联密度	Standard, fast dry 标准型, 快干	Good flexibility 柔韧性好	Good flexibility 柔韧性好	Extremely low VOC, fast dry 极低VOC, 快干

WB Hardeners 水性环氧固化剂

BECKOPOX™	EH613w /80WA	VEH2849w /80WA	VEH2106w /80WA	VEH2188w /55WA	EH2189w /50WA
Type 类型	Aliphatic polyamine adduct 脂肪胺加成物	Aliphatic polyamine adduct 脂肪胺加成物	Aliphatic polyamine adduct 脂肪胺加成物	Aliphatic polyamine adduct 脂肪胺加成物	Polyamine adduct 胺加成物
Active matters 有效分	80%	80%	80%	55%	50%
HEW (on fod) 活泼氢当量 (供货形式) g/mol	145	134	142	380	138
Reactivity 反应活性	High 高	High 高	High 高	Low 低	Extremely high 非常高
Key features 主要特点	Standard, fast dry 标准,快干	Fast dry, good wetting and antisagging 快干,良好的润湿和防流挂	Fast dry, visual end of pot life 快干,活化期终点可视	Hydrophobic, good flexibility 疏水,柔韧性好	Extremely fast dry 极快干燥

WB Solutions for Protective Coatings 防护涂料的水性解决方案

Recommended combination 推荐配套

BECKOPOX™

EP 384w/53WAMP

**Type-1 epoxy dispersion,
1型环氧分散体**

**Fast dry and shear stable
快干，剪切稳定**

BECKOPOX™

EP 387w/52WA

**Type-1 epoxy dispersion
1型环氧分散体**

**Flexible and shear stable
柔韧，剪切稳定**

BECKOPOX™ EH 616w/67WA

Aliphatic polyamine adduct

**Good anticorrosive performance
脂肪胺加成物，防腐性好**

BECKOPOX™ EH 613w/80WA

Aliphatic polyamine adduct

**Fast dry
脂肪胺加成物，快干**

**Good anticorrosion performance 防腐性好
High performance/cost 性价比高**

WB Solutions for Protective Coatings 防护涂料的水性解决方案

Recommended combination 推荐配套

BECKOPOX™ EP 2384w/57WA

Type-1 epoxy dispersion 1型环氧分散体
Zero VOC, shear stable 0 VOC, 剪切稳定

+

BECKOPOX™ VEH 2188w/55WA

Aliphatic polyamine adduct 脂肪胺加成物
Hydrophobic, free of volatile basic amines
疏水, 不含游离胺

=

Excellent anticorrosion performance

优异的防腐性能

Low VOC 低VOC

WB Solutions for Protective Coatings 防护涂料的水性解决方案

Recommended combination 推荐配套

BECKOPOX™ EP 386w/52WA

Type-1 epoxy dispersion 1型环氧分散体
Flexibilized, shear stable 柔韧, 剪切稳定

+

BECKOPOX™ VEH 2188w/55WA

Aliphatic polyamine adduct 脂肪族胺加成物
Hydrophobic, free of volatile basic amines
疏水, 不含游离胺

=

Excellent anticorrosion performance 防腐性优异

without anticorrosive pigments 不含防腐颜料

high P/B=2.5 possible 高颜基比可能

Good adhesion to some difficult substrates

对于一些难附着的基材上,如不锈钢,附着力好

WB Solutions for Protective Coatings 防护涂料的水性解决方案

Recommended combination 推荐配套

BECKOPOX™ EP 2384w/57WA

Type-1 epoxy dispersion 1型环氧分散体
Zero VOC, shear stable 0 VOC, 剪切稳定

+

BECKOPOX™ VEH 2849w/80WA

Aliphatic polyamine adduct 脂肪胺加成物
Fast drying and good anti-sagging
快干和良好的抗流挂

=

Pinhole free 无针孔膜厚 >200μm
Good sagging resistance 良好的抗流挂性

WB Solutions for Protective Coatings 防护涂料的水性解决方案

Recommended combination 推荐配套

BECKOPOX™ EP 2384w/57WA

Type-1 epoxy dispersion 1型环氧分散体
Zero VOC, shear stable 0 VOC, 剪切稳定

+

BECKOPOX™ EH 2189w/50WA

Polyamine adduct 胺加成物
Extremely high reactivity 超高活性

=

Very fast drying 超快干
Early sandability 较早打磨

WB Solutions for 2K Zinc Rich Primer 双组分环氧富锌底漆的水性解决方案

Zinc in Epoxy 锌粉在环氧里

BECKOPOX™ EP 2391w/70MP
Type-1 epoxy, emulsifiable, fast dry
1型环氧, 可乳化, 快干

BECKOPOX™ EP 2392w/70MP
Type-1 epoxy, emulsifiable, flexible
1型环氧, 可乳化, 柔韧

+

BECKOPOX™ EH 613w/80WA
Aliphatic polyamine adduct
Lower cost
脂肪胺加成物, 低价

BECKOPOX™ VEH 2849w/80WA
Aliphatic polyamine adduct
Better pigment wetting
脂肪胺加成物, 颜料润湿性好

=

2K epoxy zinc rich primer
双组分环氧富锌漆

Good storage stability 储存稳定性好
Excellent anticorrosion performance 防腐性优异

WB Solutions for 2K Zinc Rich Primer 双组分环氧富锌底漆的水性解决方案

Zinc in Hardener 锌粉在固化剂里

BECKOPOX™ EH 2150w/70EP

Aliphatic polyamine adduct, emulsifiable
fast physical dry

脂肪胺加成物，可乳化，快干

+

BECKOPOX™ EP 384w/53WAMP

Type-1 epoxy dispersion

1型环氧分散体

Fast dry and shear stable

快干，剪切稳定

BECKOPOX™ EP 387w/52WA

Type-1 epoxy dispersion

1型环氧分散体

Flexible and shear stable

柔韧，剪切稳定

=

2K epoxy zinc rich primer

双组分环氧富锌漆

Ease of mixing 易于混合

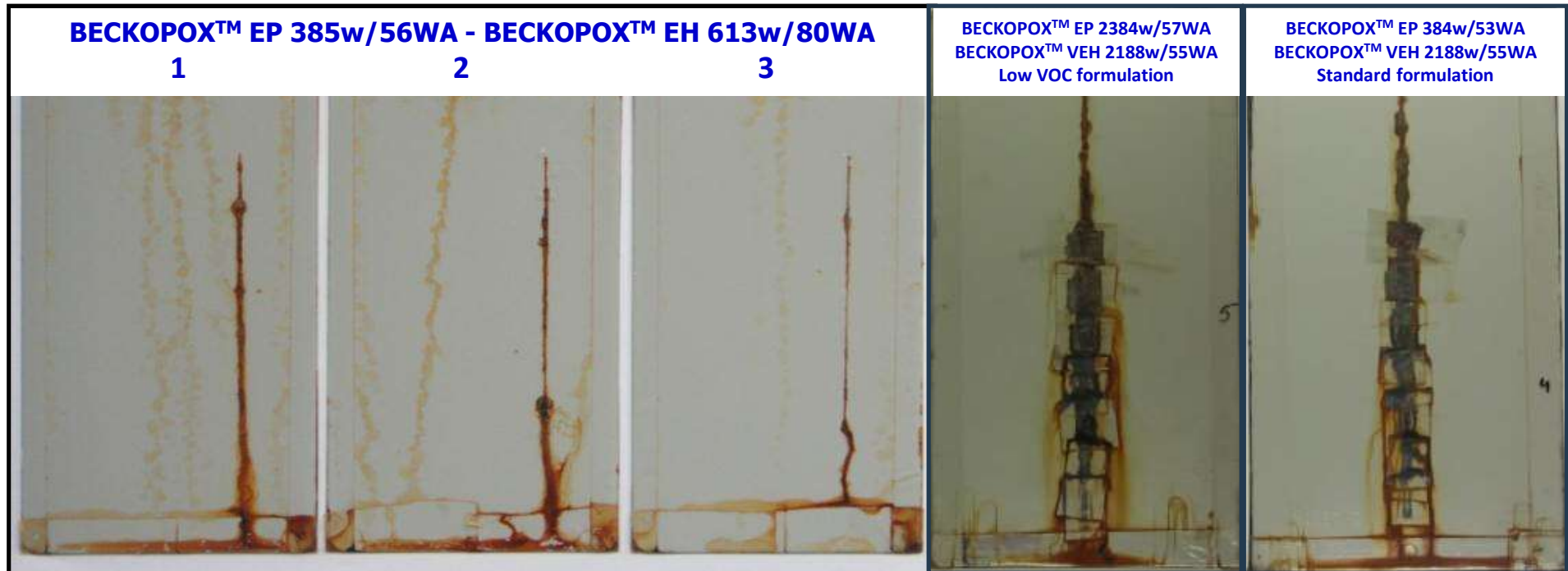
Excellent anticorrosion performance 防腐性优异

Performance of WB 2K Epoxy Coatings

双组分水性环氧涂料的性能表现

WB 2K Epoxy Primer

双组分环氧底漆



Salt Spray Resistance 耐盐雾性 820h
Substrate底材: Q-Panel, R-36;
DFT干膜厚: ~60 μm

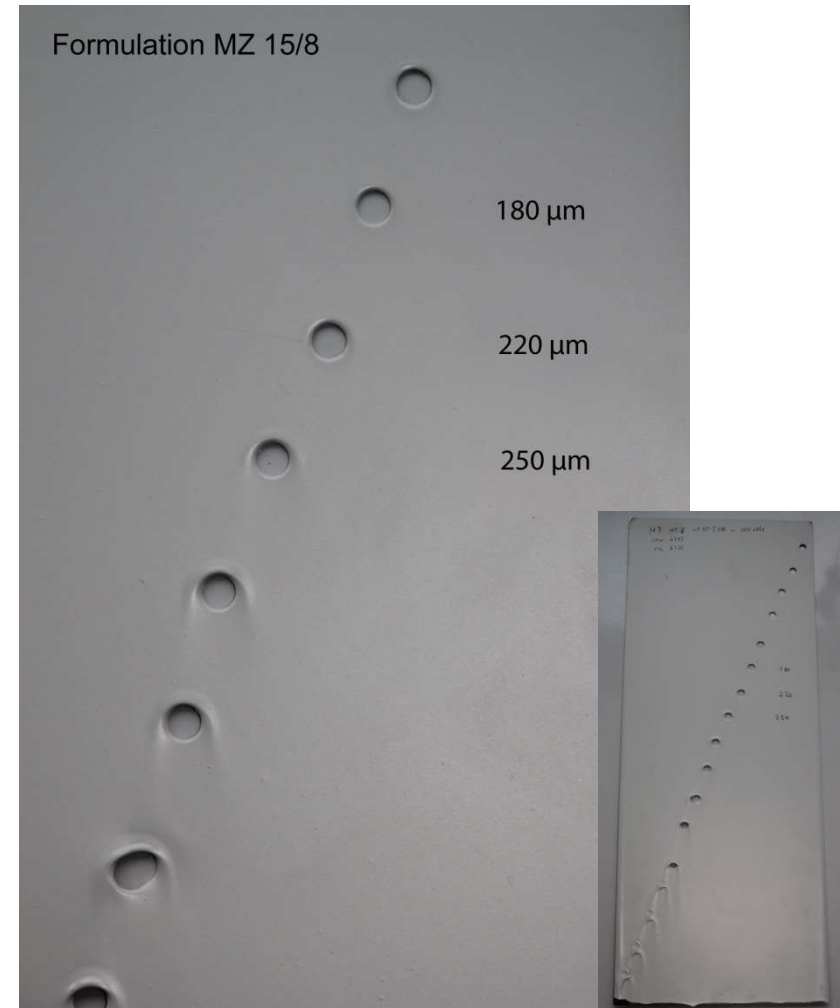
Salt Spray Resistance 耐盐雾性 1000h
Substrate底材: steel钢板;
DFT干膜厚: ~60 μm

Performance of WB 2K Epoxy Coatings

双组分水性环氧涂料的性能表现

BECKOPOX™ EP 2384w/57WA+ BECKOPOX™ VEH 2849w/80WA

Guiding formulation MZ 15/8	High sagging resistance
Pot life VLN 267	ca. 1,5 h
Dry degree DIN 53 150, clear coat after 24 hours after 7 days	6 7
Pendulum hardness (König) DIN EN ISO 1522, clear coat after 24 hours after 7 days	143 s 187 s
Cupping test (Erichsen) DIN EN ISO 1520, 50µm After 7 days at RT 7 days at RT+7 days at 50° C	1,2 mm 1,0 mm
Impact test ASTM D 2794	20 i/p
Cross cut test DIN EN ISO 2409 Untreated steel after 7d at RT	GT0

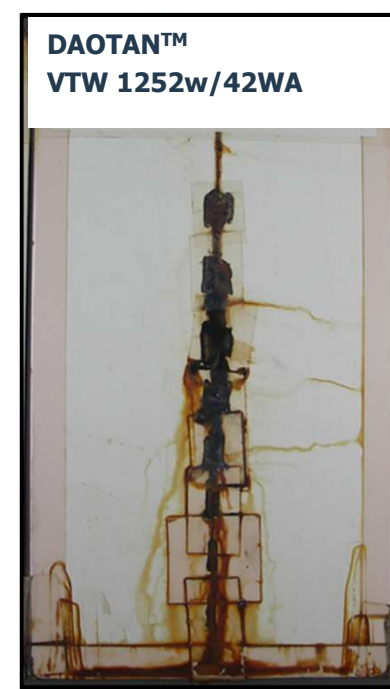
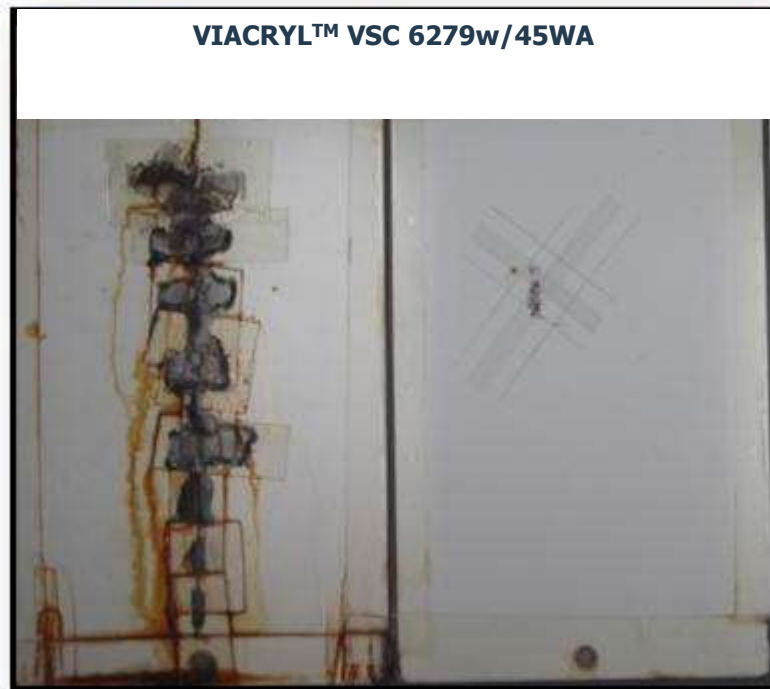


Performance of WB 2K Epoxy Coatings

双组分水性环氧涂料的性能表现

Paint system: 2K epoxy primer + 1K topcoat

防腐配套: 双组分环氧底漆/单组分量漆



Salt Spray Test 耐盐雾: 1000h;

Substrate底材: Q-Panel, R-36

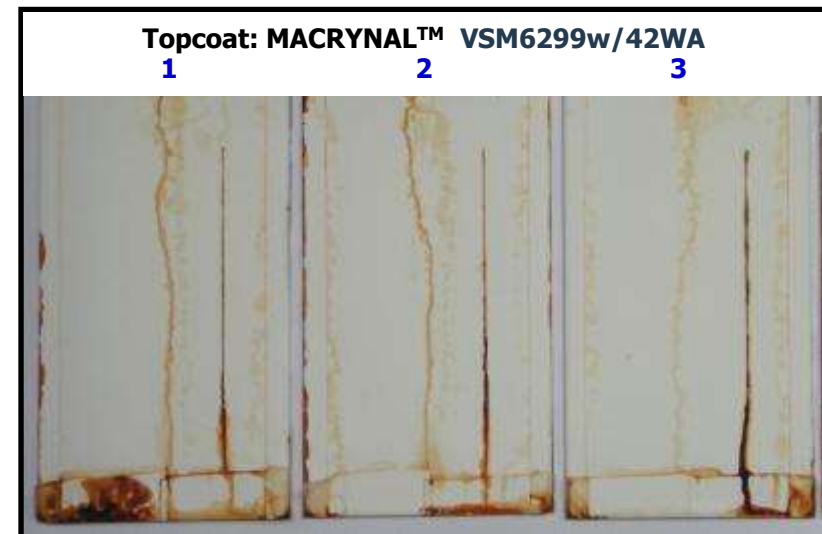
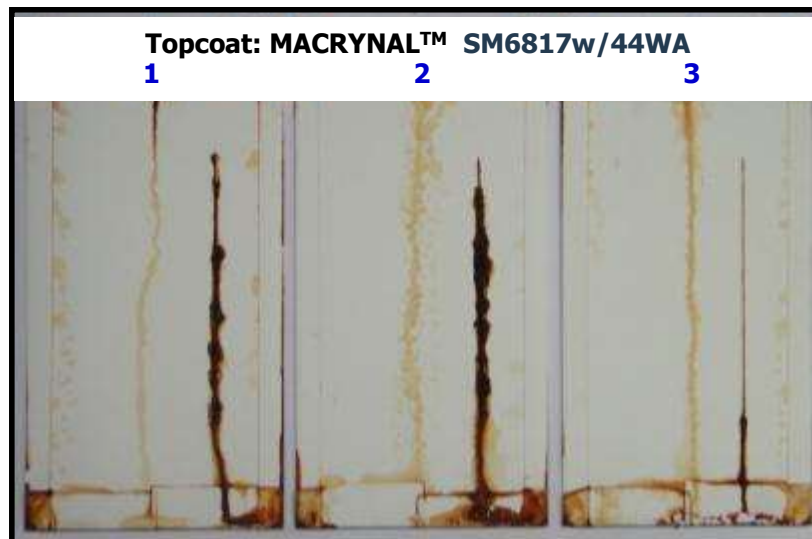
Primer底漆: BECKOPOX™ EP386w/52WA-BECKOPOX™ VEH2188w/55WA

Performance of WB 2K Epoxy Coatings

双组分水性环氧涂料的性能表现

Paint system: 2K epoxy primer + 2K PU topcoat

防腐配套: 双组分环氧底漆 / 双组分聚氨酯面漆



Salt spray resistance 耐盐雾, 820h

Substrate底材: Q-Panel, R-36

DFT干膜厚度: primer底漆 50~60um + topcoat面漆40~50um

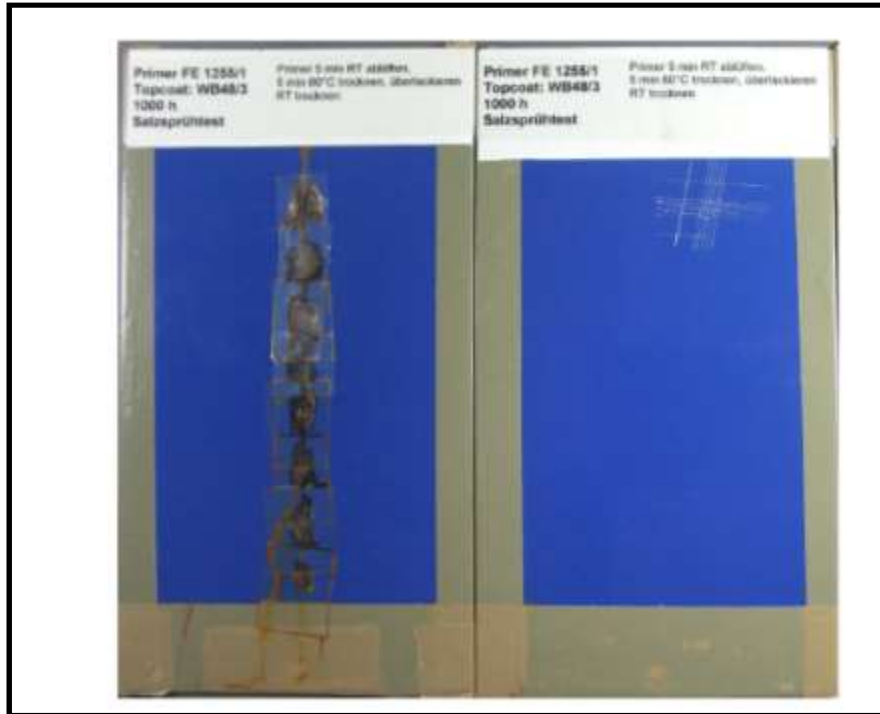
Primer 底漆: BECKOPOX™ EP385w/56WA- BECKOPOX™ EH613w/80WA

Performance of WB 2K Epoxy Coatings

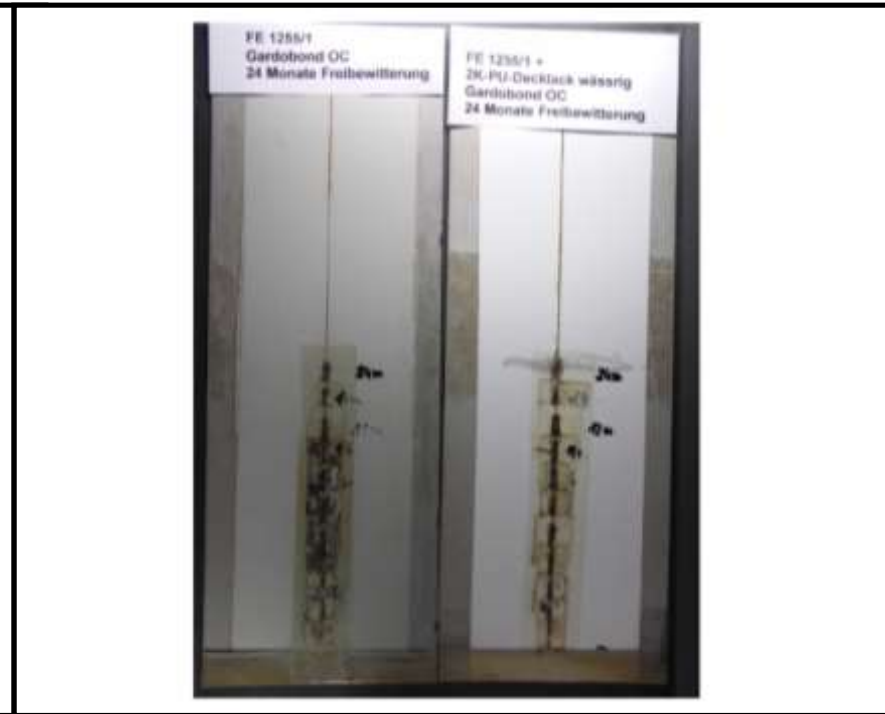
双组分水性环氧涂料的性能表现

Paint system: 2K epoxy primer + 2K PU topcoat

防腐配套: 双组分环氧底漆 / 双组分聚氨酯面漆



Salt spray resistance 耐盐雾, 1000h
BECKOPOX™ EP386w/52WA- BECKOPOX™
VEH2188w/55WA底漆+
MACRYNAL™ VSM6810w/42WA面漆



Outdoor durability 室外曝晒, 2yrs
BECKOPOX™ EP386w/52WA-
BECKOPOX™ VEH2188w/55WA底漆+
MACRYNAL™ VSM6299w/42WA面漆

Performance of WB 2K Epoxy Coatings

双组分水性环氧涂料的性能表现

**Heavy duty paint system: 2K epoxy (zinc rich) primer
+ 2K epoxy mid-coat + 2K PU topcoat**

重防腐配套：环氧(富锌)底漆/环氧中间漆/聚氨酯面漆



Salt spray resistance

耐盐雾, **2000h**

DFT干膜厚度: ~50um

**BECKOPOX™ EP2390w/75MP-
BECKOPOX™ VEH2849w/80WA**

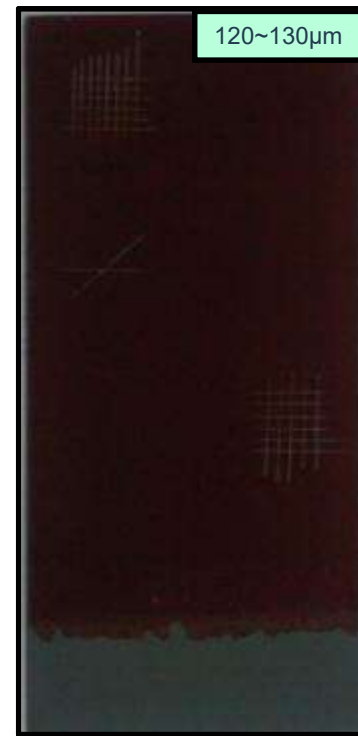


Salt spray resistance

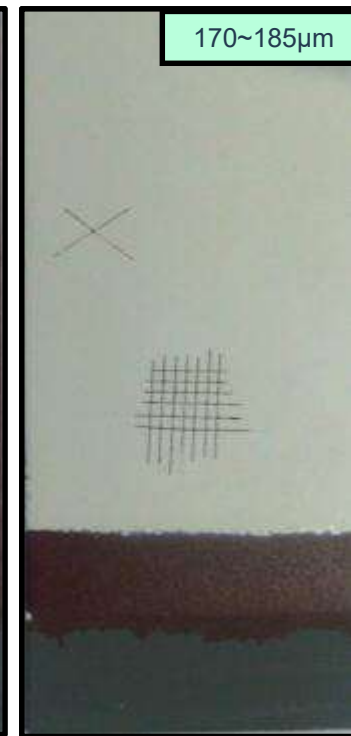
耐盐雾, **2500h**

DFT干膜厚度: ~200um

Layers层数: 3



120~130µm



170~185µm

Adhesion test

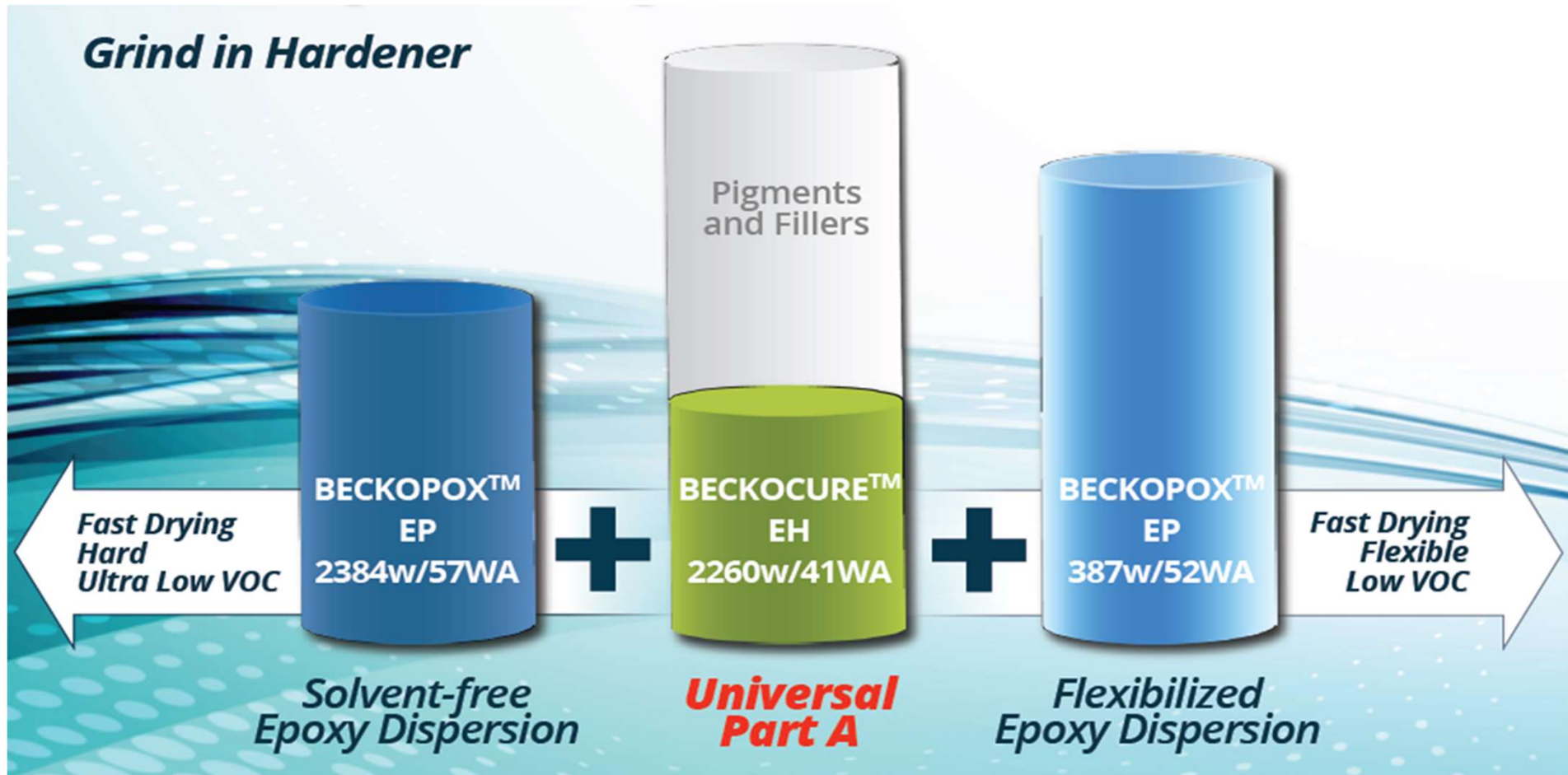
**BECKOPOX™ EP2391w/70MP-BECKOPOX™
VEH2849w/80WA + BECKOPOX™ EP2384w/56WA-
BECKOPOX™ VEH2188w/55WA + MACRYNAL™
VSM6299w/42WA**

The Easy Cure System

The waterborne that works like a solventborne!

Freedom to Formulate 配方易控

Compatibility with a wide range of pigments and fillers



The Easy Cure System

The waterborne that works like a solventborne!

Improved Productivity 高效生产

High Performance with Forgiveness!

- *Fast Drying for Early Recoatability*

- **快干、快速重涂**

Recoat in less than 1 hour

- *High Sagging Resistance*

- **厚涂**

Apply 2 coat thickness in 1 coat

- *Adhesion to Oily Substrate*

- **油污表面**

Robustness in performance

- *Unmatched Surface Appearance*

- **表面平整**

No sanding required



Additives for WB 2K Epoxy Coatings

- ❖ Recommend to use high molecular weight nonionic dispersant
建议采用高分子量非离子型分散剂
- ❖ 2K WB epoxy zinc rich primer: water-free additive pack
双组分水性环氧富锌底漆的锌粉组分需要助剂不含水



Dispersant selection tips for 2K WB epoxy coatings

双组分水性环氧涂料分散剂选择提示

Ionic dispersants would destruct epoxy resins via activating oxirane ring, resulting in loss of performance of the final paint

离子型分散剂会促进环氧开环，从而影响涂料性能

Successful Industries and Cases

成功应用领域及案例

Marine coatings 船舶涂料

- Bulk carrier, naval vessel, cruise, yacht, etc.
货轮，舰艇，游艇等
- Coastal & offshore platforms & oil rigs
海上平台及油塔
- Jetties, ports & cranes
港口、码头、港机等
- Cargo containers 集装箱



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The Coatings Resins Company



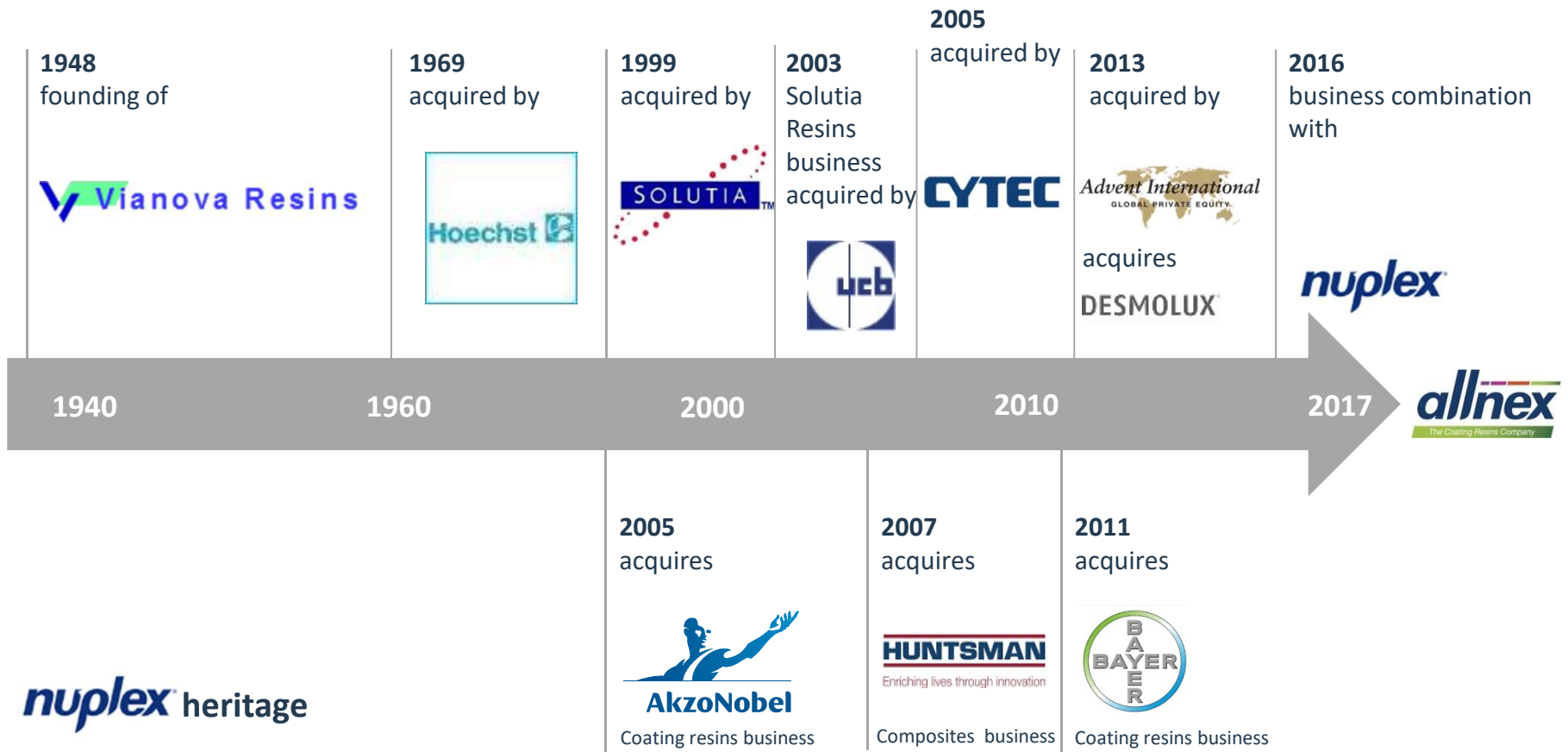
Protective coatings 防腐涂料

- Civil infrastructures: airport, bridge, stadium, etc.
基础建筑：如机场、桥梁、体育馆等
- Chemical plants 化工厂
- Storage tanks and pipelines 储罐和管道
- Railway 轨道交通
- Agricultural and construction equipment
农业及工程机械
- Fossil fuel & nuclear & wind power plants, etc. 火电、风电及核电站等

A Success Story 成功故事

allnex has a strong heritage in leading chemicals companies globally

allnex heritage
The Coating Resins Company

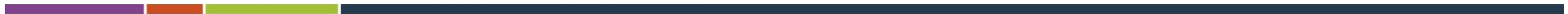


allnex Overview 湛新纵览

allnex is a leading producer of resins, additives and crosslinkers for use in various industrial coating resins applications

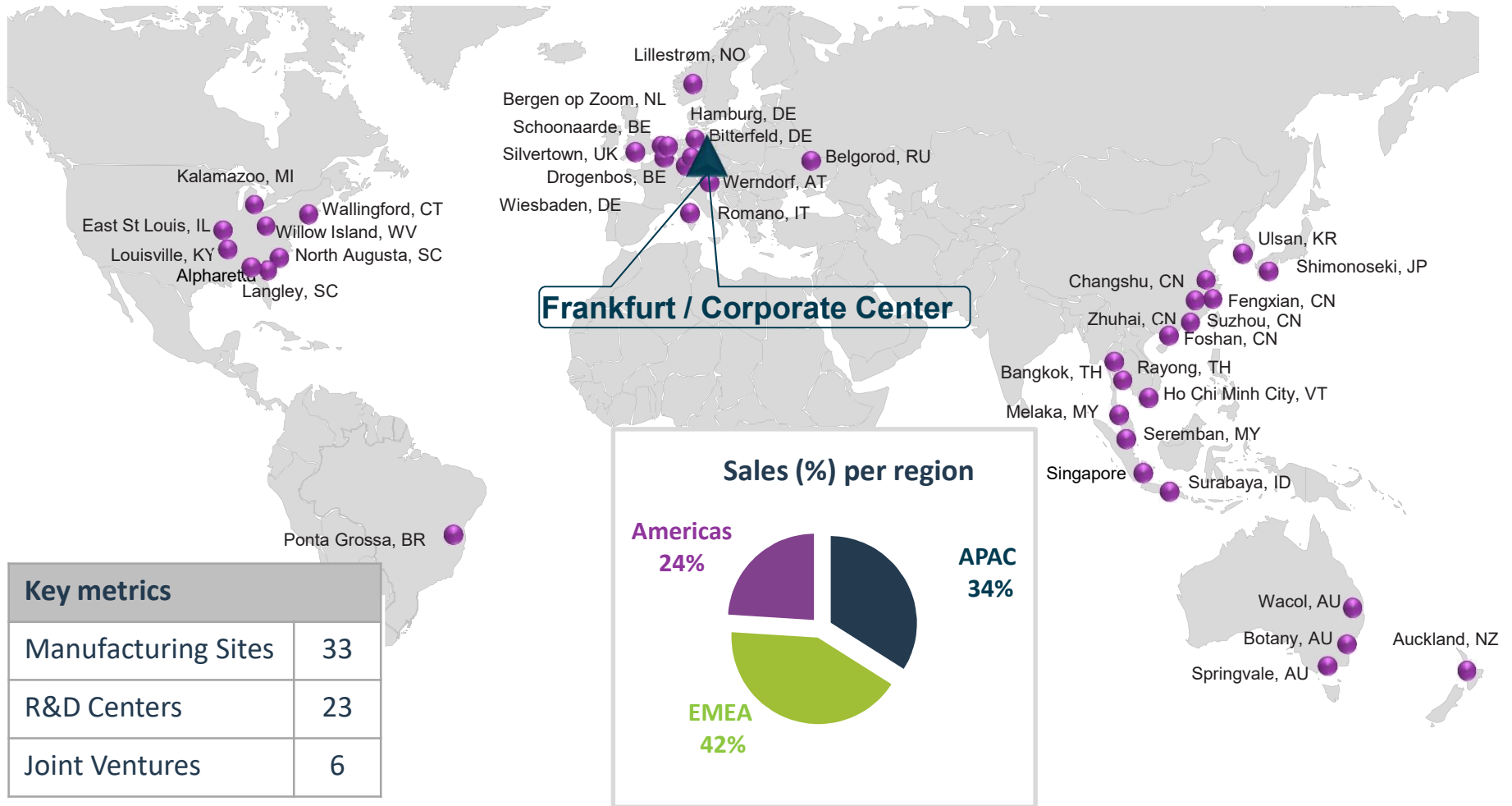
	LIQUID RESINS & ADDITIVES	PERFORMANCE RESINS		
		RADIATION CURABLE RESINS	CROSSLINKERS	POWDER COATING RESINS
Key Technologies	<ul style="list-style-type: none"> Waterborne <i>PUD, Alkyds, Epoxies, Acrylics</i> <i>CED Resins</i> Solventborne <i>Alkyds, Acrylics, Polyester, SCA</i> Coating Additives Urethane Specialties 	<ul style="list-style-type: none"> Oligomers <i>Urethane Acrylates, Epoxy Acrylates, Polyester Acrylates, Amino Acrylates, UV-PUD</i> Monomers UVEKOL® Glass Lamination VANCRYL® Acrylics 	<ul style="list-style-type: none"> Amino Crosslinkers Formaldehyde-free Crosslinkers Phenolic Coating Resins Technical Phenolics 	<ul style="list-style-type: none"> Polyester Resins Hybrid, Standard Durable Super Durable UV Powder Resins Additives Master batches
Key Segments	<ul style="list-style-type: none"> Automotive and refinish Industrial Wood Protective & General Metal Architectural Plastic 	<ul style="list-style-type: none"> Inks & Overprint Varnishes Industrial Wood Electronics Plastic 	<ul style="list-style-type: none"> Industrial Wood Metal Packaging Automotive Tires & Rubber Product 	<ul style="list-style-type: none"> Architectural Extrusions Domestic Appliances General Metal 
% of Revenue	56%	15%	15%	14%

Global Player with €2bn Sales and a Leading Product Portfolio



Global Footprint 全球布局

Following the merger with Nuplex, allnex has 33 manufacturing sites across the world. allnex now has its Corporate Center in Frankfurt.



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.

Thank you

Any questions?



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