Personalized resins
Since 1947

Thixotropic Direct To Metal Coatings

The relation between layer thickiness, and corrosion resistance

Synres
Coating Resins for
Solvent Based
Paints
and Coatings

Slachthuisweg 30
3151 XN Hoek van Holland
The Netherlands

Synres History

1947
Synres (SYNthetic RESins) is Established in Hoek van Holland Initial focus: Production of alkyds

1962
Synres launched` styrene-modified alkyd resins

1963
Start production of amino resins

1970
Synres became part of DSM

1973
Solvent-borne acrylic resins are added to the portfolio

1982
Start production of Thixotropic resins

1983
DSM acquired the Scado resin group from Unilever, further boosting the capabilities and output of Synres.

1985
Acrylic resins for printing inks and alkyd emulsions were introduced, reinforcing Synres' brand recognition in an increasingly crowded market.

1991
Launch of first generation of high solid alkyd resins

2008
Launch second generation of high solid alkyd resins

A tradition of excellence in synthetic resins

Our end-user segments

Your markets, our support

Decorative

Industrial wood

Agriculture, Construction & Earthmoving

Car refinish

Marine & Protective

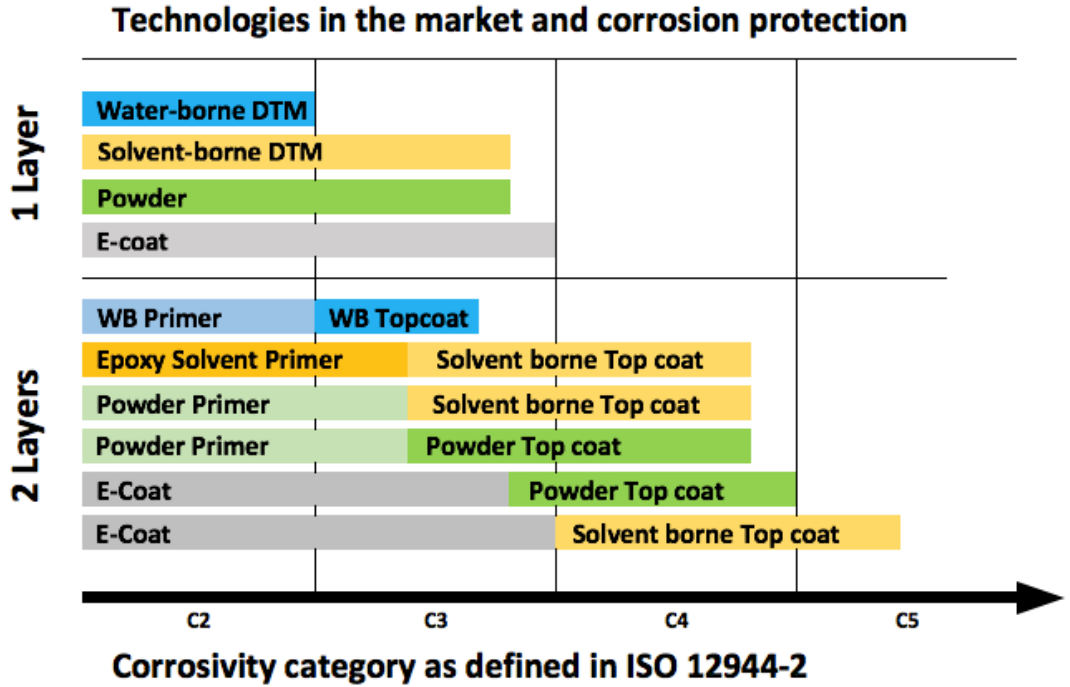
Thixotropic Direct To Metal Coatings

The relation between layer thickiness, and corrosion resistance

How to increase performance of DTM Coatings?

Bench mark: epoxy primer in combination with solvent borne 2 K topcoat

ACE Technical market analysis | Technologies in the market

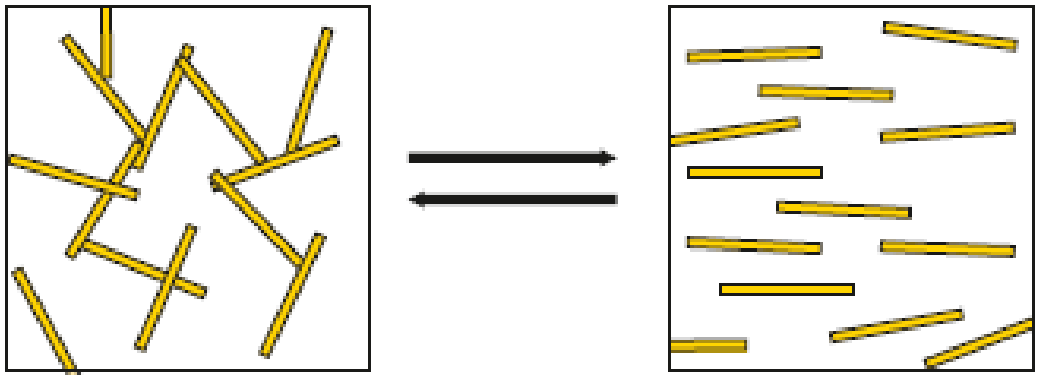


Poly-Urea modified thixotropic resins

Figure 6. Portfolio Urathix products.

Resin	Acid value (mg KOH/g solid resin)	OH % (on solid resin)	Base resin	OH % base resin (on solid resin)
Acrylate				
Urathix F1200 60X-BAc	0-5	1.0	Uracron F12 60X-BAc	1.3
Urathix F1204 60X-BAc	Below 10	1.0	Uracron F12 60X-BAc	1.3
Urathix F2200 60BAc	0-5	1.9	Uracron F22 60BAc	2.2
Urathix F2200 60X	Below 5	1.9	Uracron F22 60X	2.2
Urathix F2702 60SOLA	Below 5	2.5	Uracron F27 60SOLA	2.7
Urathix F2702 60X	0.5	2.5	Uracron F27 60X	2.7
Urathix F3300 70 BAc	Max. 5	3.2	Uracron CY134-E70	3.4
Alkyd				
Urathix NT5002 60BAc	0-12	4.7	Uralac NT50 60BAc	5
Urathix B3200 60BAc	Below 15	1.7	Uralac B32 75BAc	1.9
Urathix B3201 60X	0-15	1.7	Uralac B32 60X	1.9

Mechanism of Poly-Urea modified thixotropic resins



CONTROLLED FLOCCULATION
(low shear)

NON FLOCCULATED
(high shear)

Solventborne resins
ACE | Alkyds

1K & 2K ALKYDS - MAINLY USED FOR ACE

	SUPPLY FORM	Viscosity (dPa.s @ 23°C)	ACID VALUE (MG KOH/G SOLID RESIN)	OH% ON SOLID RESIN	OIL LENGTH (%)	OIL TYPE	DESCRIPTION
Urakyd™ AM351 X-50	50X	20-30	26-32		32	TOFA	Phenolic modified short oil alkyds
Urakyd™ AM356 X-60	60X	60-85	10-20		34	Linseed	phenolic modified short oil alkyd
Urakyd™ AM352 X-60	60X	52-58	max 25		37	TOFA	Phenolic modified short oil alkyd
Urakyd™ B-32 75BAC	75BAC	75-110	<15	2.4	32	SOFA	Chain stopped Short oil alkyd
Urakyd™ AK429 X-60	60X	34-45	5-10	2.7	40	Conjugated/ SOFA	Chain stopped medium oil alkyd
Urakyd™ AK436 W-55	55WS	60-80	5-10	1.9	49	SOFA	Chain stopped medium oil alkyd

Urakyd AK429 X-60 and Urathix B3201 60X were combined to provide excellent properties for direct to metal application, like adhesion to multiple types of steel, sag resistance and quick drying. Even after 1000 hours of salt spray test blistering and delamination was nihil, which is shown below.

Test specimen of Urakyd AK429 X-60 and Urathix B3201 60X (AK15050) after 1000 h corrosion test: adhesion, blistering and delamination results are shown.

80 microns dry layer
Salt spray 1000 h
Field: 2S3 blisters

“Corrosion class 3”

Code: AK15050
Starting formulation for: DTM primer top coat for transportation (semi gloss)
Based on: Urakyd AK429 X-60 / Urathix B3201 60X

Personalized resins
Since 1947

Raw materials	Weight%	Volume%	Function	Supplier
Urathix B3201 60X	12,08	14,22	binder	Synres
Durham Nuodex Calcium 5	0,34	0,38	Drier	Venator
Anti terra U	1,01	1,17	Dispersing agent	BYK Chemie
Solvesso 100 S	2,01	2,52	Solvent	Exxon Chemical
Bayferrox 130 M	10,06	2,20	Colour pigment	Lanxess
Pigmentan 465 M	5,03	2,49	Anti corrosive pigment	Pigmentan
Finntalc M15	2,01	0,81	Extender	Mondo Minerals
Durcal 2	2,01	0,80	Extender	Omya
Urad AF 21	0,08	0,09	Anti-Foaming agent	Synres B.V.
Disperse at high speed Add while stirring				
Urakyd AK429 X-60	25,76	28,15	Binder	Synres
Nuodex Drycoat	0,10	0,14	Drier	Venator
Durham Nuodex Zirconium 12	0,60	0,67	Drier	Venator
Solvesso 100 S	6,44	8,06	Solvent	Exxon Chemical
Xylene	8,05	10,21	Solvent	
EZ Blox	0,25	0,34	Anti skinning agent	Honeywell
Adjust the viscosity				
Solvesso 100 S	2,01	2,52	Solvent	Exxon Chemical
Xylene	6,04	7,66	Solvent	
	100,00	**100,00**		

Density	**1091**	kg/m3
PVC	**16,2**	%

Ratio´s :	Weight%	Volume%
Colour pigments	10,1	2,2
Extenders & Fillers	9,1	4,1
Binders	32,4	32,7
Other solid materials	0,5	0,4
Subtotal: solid materials	**52,0**	**39,4**
Volatile organic solvents	47,0	59,4
Other liquid materials	1,0	1,2
Subtotal: liquid materials	**48,0**	**60,6**

Applied layer thickness:	**100**	µm wet
Wet layer thickness	**100**	µm
Dry layer thickness	**39**	µm
Resulting yields:		
Weight	**109**	gram/ m2
Volume	**100**	ml/ m2
Area	**9,2**	m2/ kg
	10,0	m2/ liter
Colour pigments:		
Contents	**110**	g/ liter
Yield, indicated layer th.	**11,0**	g/ m2
Yield, 100 µm dry layer	**27,9**	g/ m2
Volatile organic solvents:		
Contents	**513**	g/ liter
Emission, indicated layer th.	**51,3**	g/ m2
Emission, 100 µm dry layer	**130,1**	g/ m2

Date of issue (dd-mm-yyyy): 18-04-2018