Personalized resins
Since 1947

Direct To Metal Coatings

Influence of resins and additives on adhesion of DTM Coatings

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

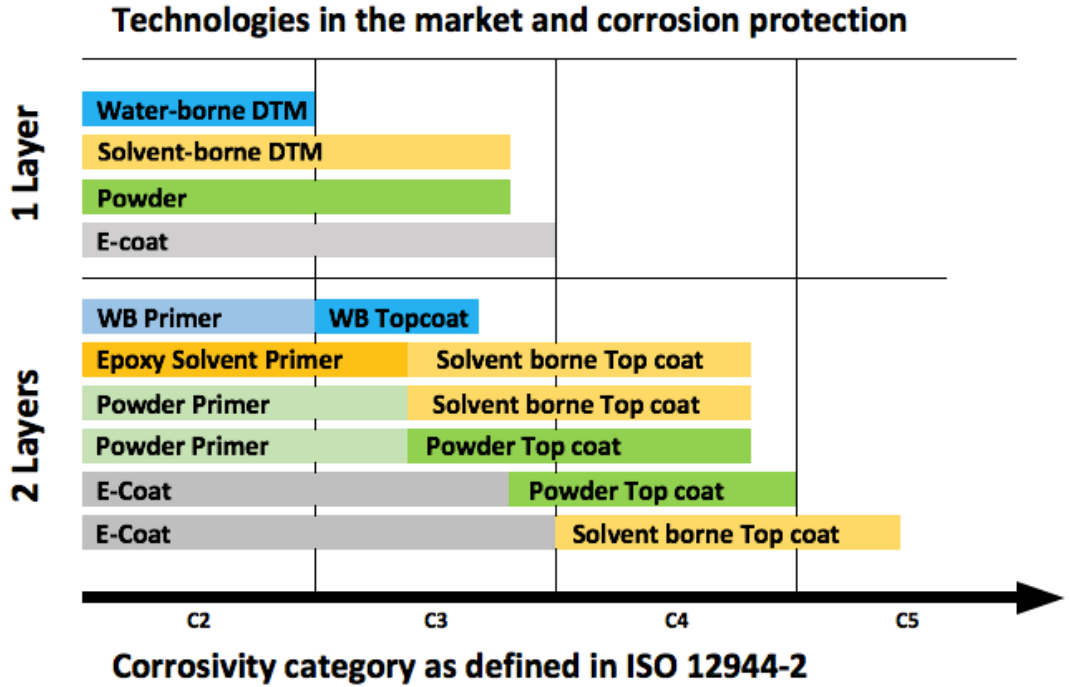
Influence of resins and additives on adhesion of colored DTM Coatings

How to increase performance of DTM Coatings?

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

DTM should offer colors like a regular topcoat, introducing pigments in "primers" generally not used in primers: organic blue, green, red, black and related pigments

ACE Technical market analysis | Technologies in the market



Development white DTM based on Uracron FH28 70 BAC

Code: CY36005
Product: DTM white top coat
Based on: Uracron FH28 70 BAC

Weight ratio Component A / Component B = 100 / 25,00

Raw materials Component A	Weight	Volume% (overall)	Function	Supplier
Uracron FH 28 70 BAC	40,06	40,56	Binder	Synres B.V.
Uralac SY944 XP	3,37	3,20	Binder	DSM Coating Resins
Solvesso 100	2,72	3,07	Solvent	Exxon Chemical
Methoxy propyl acetate	1,41	1,46	Solvent	
Anti terra U	1,52	1,59	Dispersing agent	BYK Chemie
Kronos 2310	27,14	6,53	Colour pigment	Kronos Titan
Pigmentan 465 M	5,43	2,44	Anti corrosive pigment	Pigmentan
Finntalc M05 N	2,95	1,08	Extender	Mondo Minerals Oy
Microtalc IT extra	1,01	0,36	Extender	Mondo Minerals Oy
Aerosil R 972	0,51	0,25	Extender	Evonik
Butyl acetate	1,97	2,20	Solvent	
Urad AF 21	0,19	0,20	Anti-Foaming agent	Synres B.V.
Grind in pearlmill				
Xylene	3,52	4,04	Solvent	
Methoxy propyl acetate	4,52	4,70	Solvent	
Tinuvin 1130	0,42	0,36	UV-absorber	BASF
Tinuvin 292	0,21	0,21	UV-absorber	BASF
Coatosil MP 200	1,27	1,07	Adhesion promoter	Momentive
Urad DD 27 50% in Xylene	1,29	1,44	Leveling agent	Synres B.V.
Urad SA 20 10% in Xylene	0,34	0,38	slip agent	Synres B.V.
TIB kat 216 10% in Xylene	0,17	0,19	Catalyst	TIB Chemicals
	100,00	**75,32**		

Raw materials Component B	Weight	Volume% (overall)	Function	Supplier
Tolonate HDT-LV2	12,46	10,87	Crosslinker	Vencorex
Butyl acetate	4,18	4,67	Solvent	
Methoxy propyl acetate	4,18	4,34	Solvent	
Xylene	4,18	4,80	Solvent	
	25,00	**24,68**		

Composition data:

Density	**1234**	kg/m3
PVC	**20,4**	%

Ratio's	Weight%	Volume%
Colour pigments	21,7	6,5
Extenders & Fillers	7,9	4,1
Binders	35,4	41,6
Other solid materials	1,5	1,6
Subtotal: solid materials	**66,6**	**53,9**
Volatile organic solvents	32,2	44,5
Other liquid materials	1,2	1,6
Subtotal: liquid materials	**33,4**	**46,1**

Application data:

Applied layer thickness:	**100**	µm wet
Wet layer thickness	**100**	µm
Dry layer thickness	**54**	µm
Resulting yields:		
Weight	**123**	gram/ m2
Volume	**100**	ml/ m2
Area	**8,1**	m2/ kg
	10,0	m2/ liter
Colour pigments:		
Contents	**268**	g/ liter
Yield, indicated layer th.	**26,8**	g/ m2
Yield, 100 µm dry layer	**49,7**	g/ m2
Volatile organic solvents:		
Contents	**397**	g/ liter
Emission, indicated layer th.	**39,7**	g/ m2
Emission, 100 µm dry layer	**73,8**	g/ m2

Date of print (dd-mm-yyyy): 07-02-2017

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Testing of different pigments/ colors in DTM

- Irgazin Red 3670 HD & Heliogen Blue 7087
- 60% solids resin solutions
- Efka PX 4330 polymeric dispersant, 34% m/m on Red, 38% m/m on blue pigment
- Bead milling
- Added 20% Colorants to white base paint version of our DTM. Base paint Contains 10% Titaniumwhite. (7.4 DPP Red on 10 Titaniumwhite)

DTM with different grinding resins / colorants &

Uracron FH28 70BAC (Q panels 240 Hrs Salt spray)

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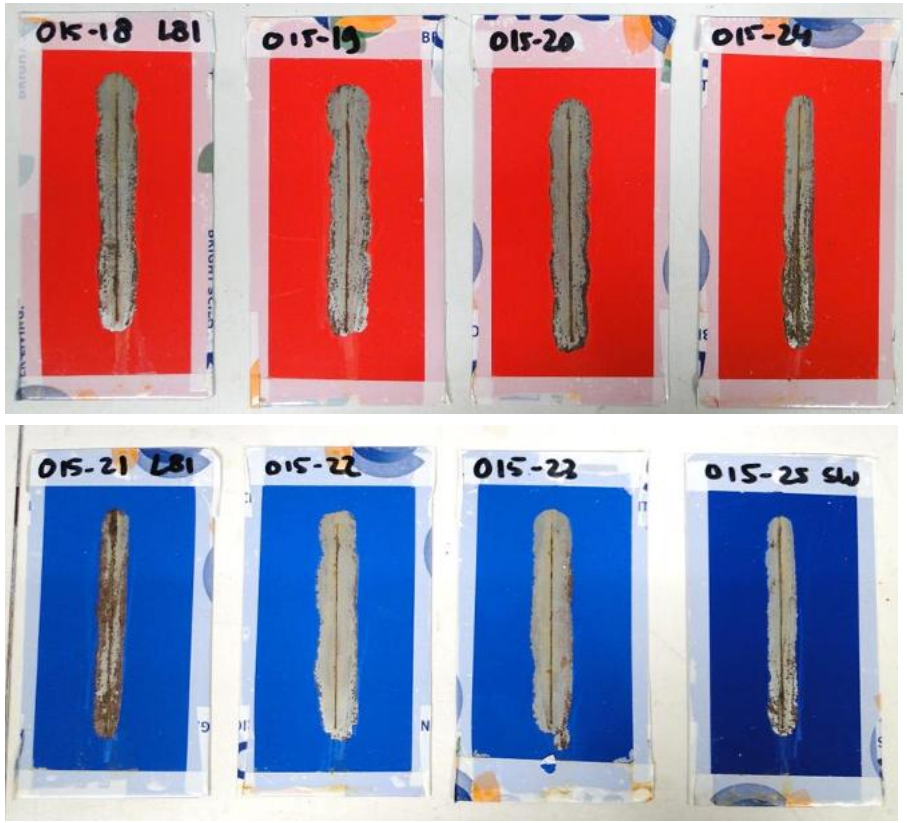
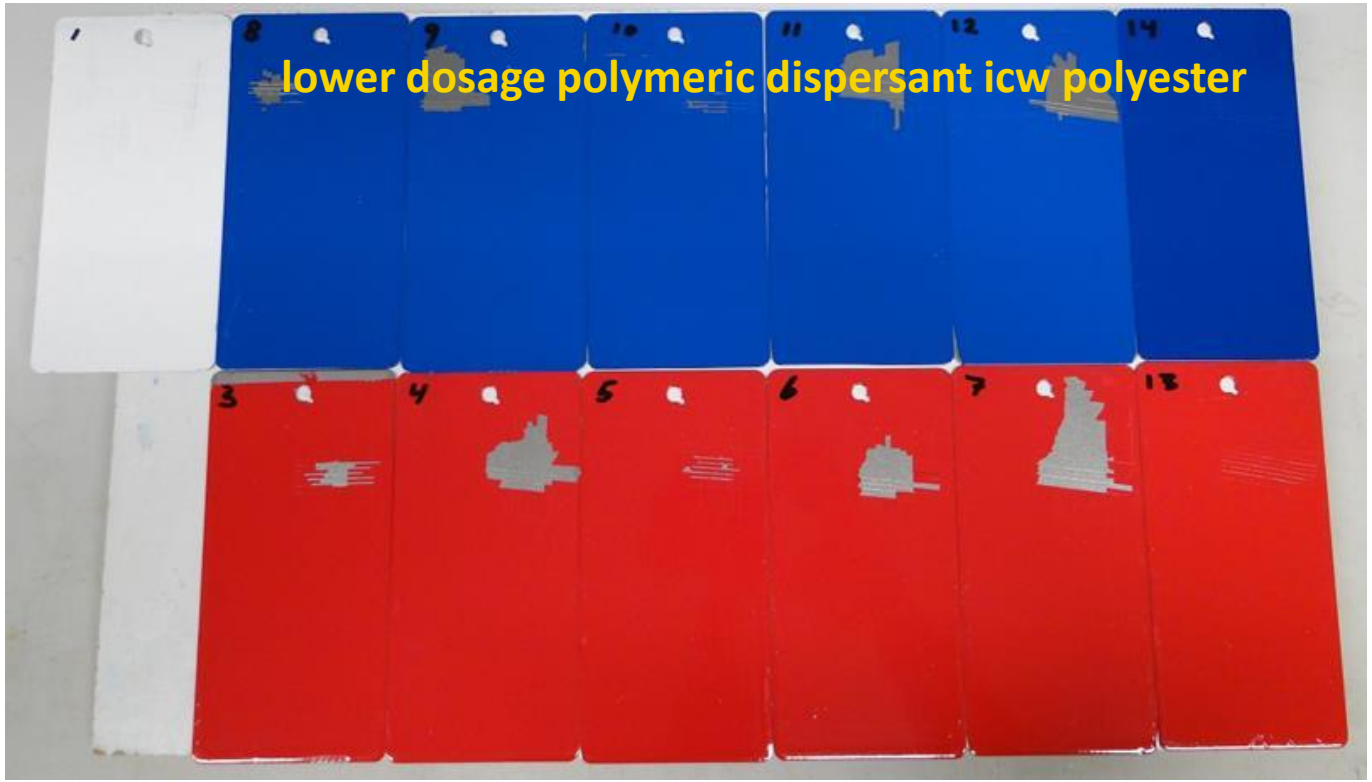


- 015-18 Base FH28+ reference
- 015-19 Base FH28+PE -464
- 015-20 Base FH28+PE -465
- 015-24 Base FH28+comm. Colorant

- **good adhesion all**
- **Slightly better performance FH28+ comm. Colorant**
- **240 Hrs salt spray ≈ 5-7 mm delamination**
- **Higher hardness poly-esters**

White reference, reference, poly-esters and reference initial adhesion CRS

Pannel nr 5versus 4 & 10 versus 9:



Conclusion & Discussion

- Color of DTM can influence performance, indirectly by the polymeric dispersant needed to stabelize the pigment
- Poly-ester with good wetting properties opens possibility to lower polymeric dispersions dosages, possitively influencing early adhseion to CRS.
- Control of corrosion class of different DTM colors can be managed many ways, also pragmatical ones like implementing more colored base paints in the color mixing system, or ship more ready made colors.
- A technical solution to control DTM color and corrosion class, might offer advantages in flexibility of use for the customer of the DTM paint system