



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



## 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**

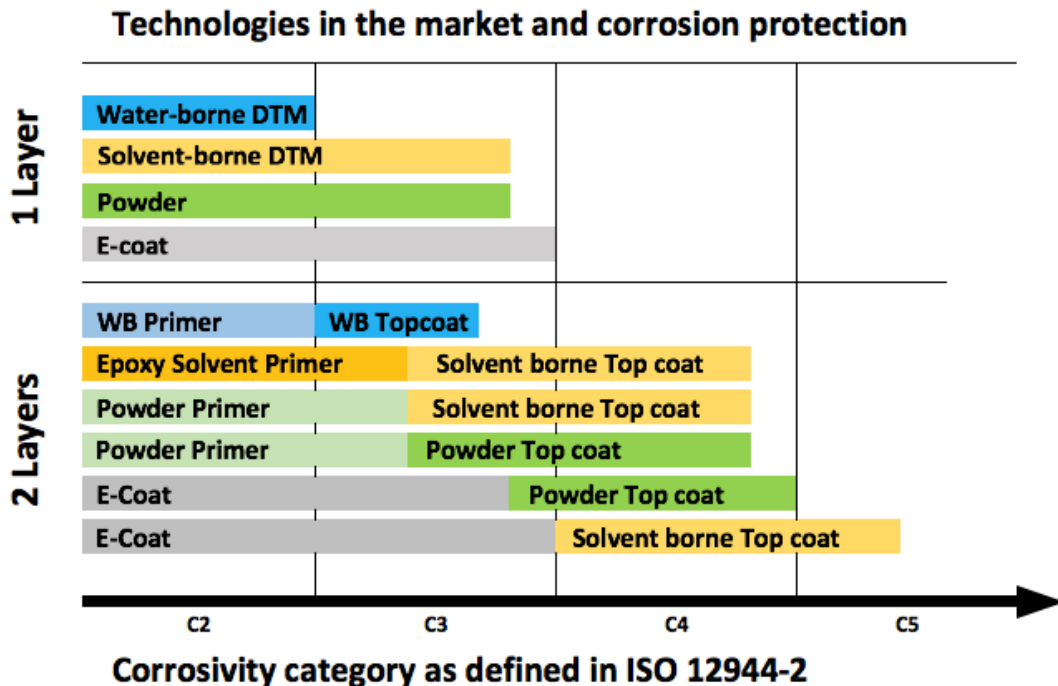
How to increase performance of DTM Coatings?

*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*

## Synres | Solventborne resins for ACE(T) | 2K Acrylics | DTM

### 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 FH28 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
Microtac 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
Tolionate 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



## 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)







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



- 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  $\approx$  5-7 mm delamination
- Higher hardness poly-esters

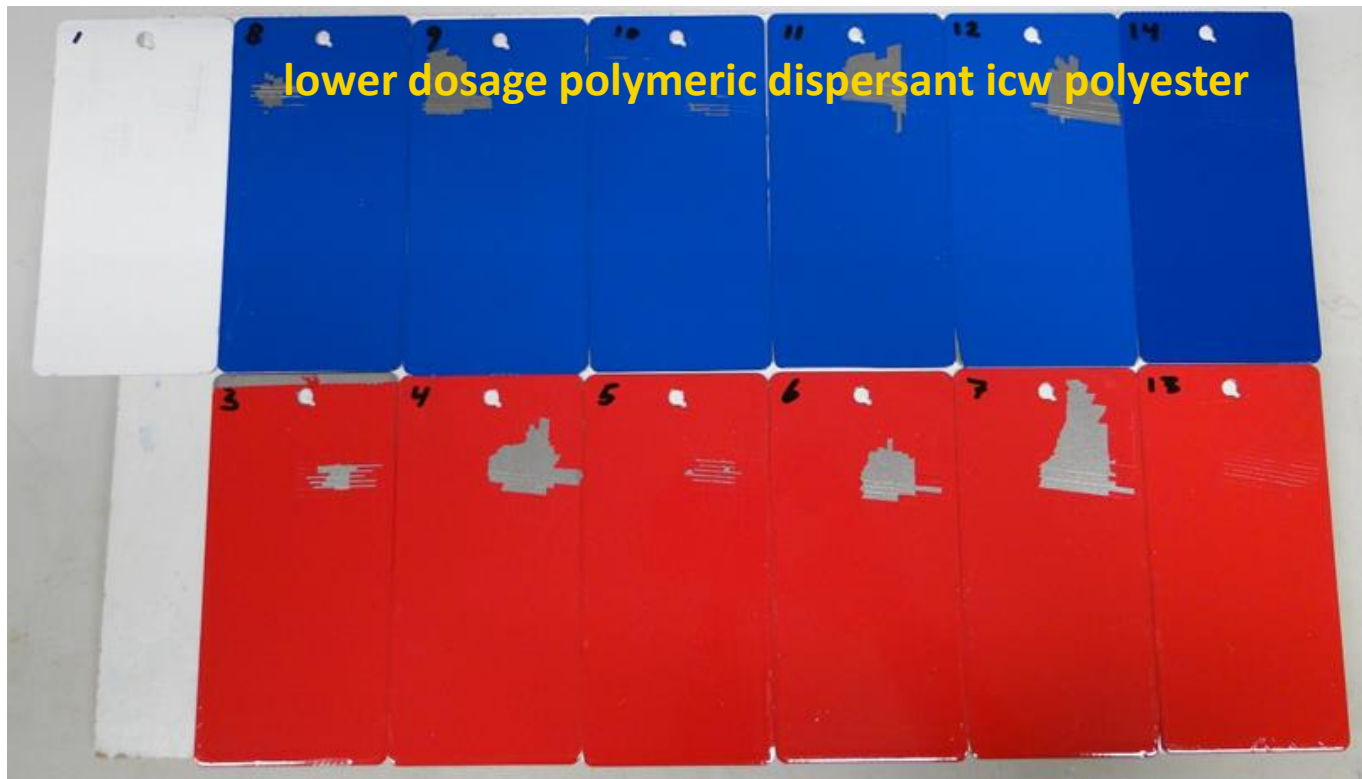




# White reference, reference, poly-esters and reference initial adhesion CRS

Personalized resins  
Since 1947

Pannel nr 5 versus 4 & 10 versus 9:





## Conclusion & Discussion

- Color of DTM can influence performance, indirectly by the polymeric dispersant needed to stabilize the pigment
- Poly-ester with good wetting properties opens possibility to lower polymeric dispersions dosages, positively influencing early adhesion 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