

Technical Information Dynasylan® SIVO 140

Innovative Water-Borne Silane Based Binder for
Modern Corrosion Protection

May 2020



Agenda

- 1 Technical profile Dynasylan® SIVO 140 3**
- 2 Dynasylan® SIVO 140 for Zinc Dust Paints 8**
- 3 Dynasylan® SIVO 140 Formulation with Zinc Dust Pastes 14**
- 4 Dynasylan® SIVO 140 and Silikopon EF – a perfect team for corrosion protection 18**
- 5 Disclaimer 23**

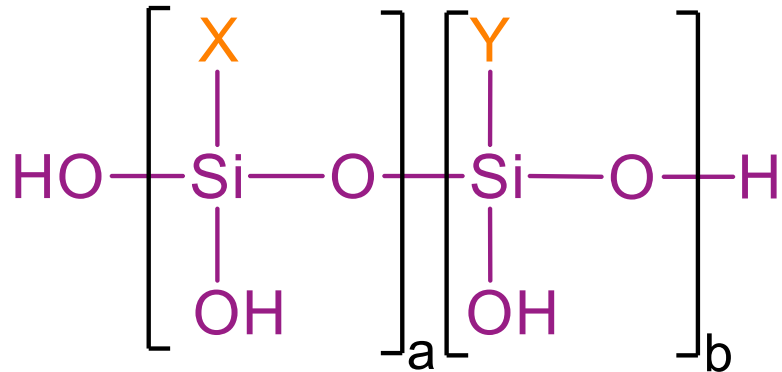
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Dynasylan® SIVO 140

Water-Borne Binder for Zinc Dust Paints

Dynasylan® SIVO 140



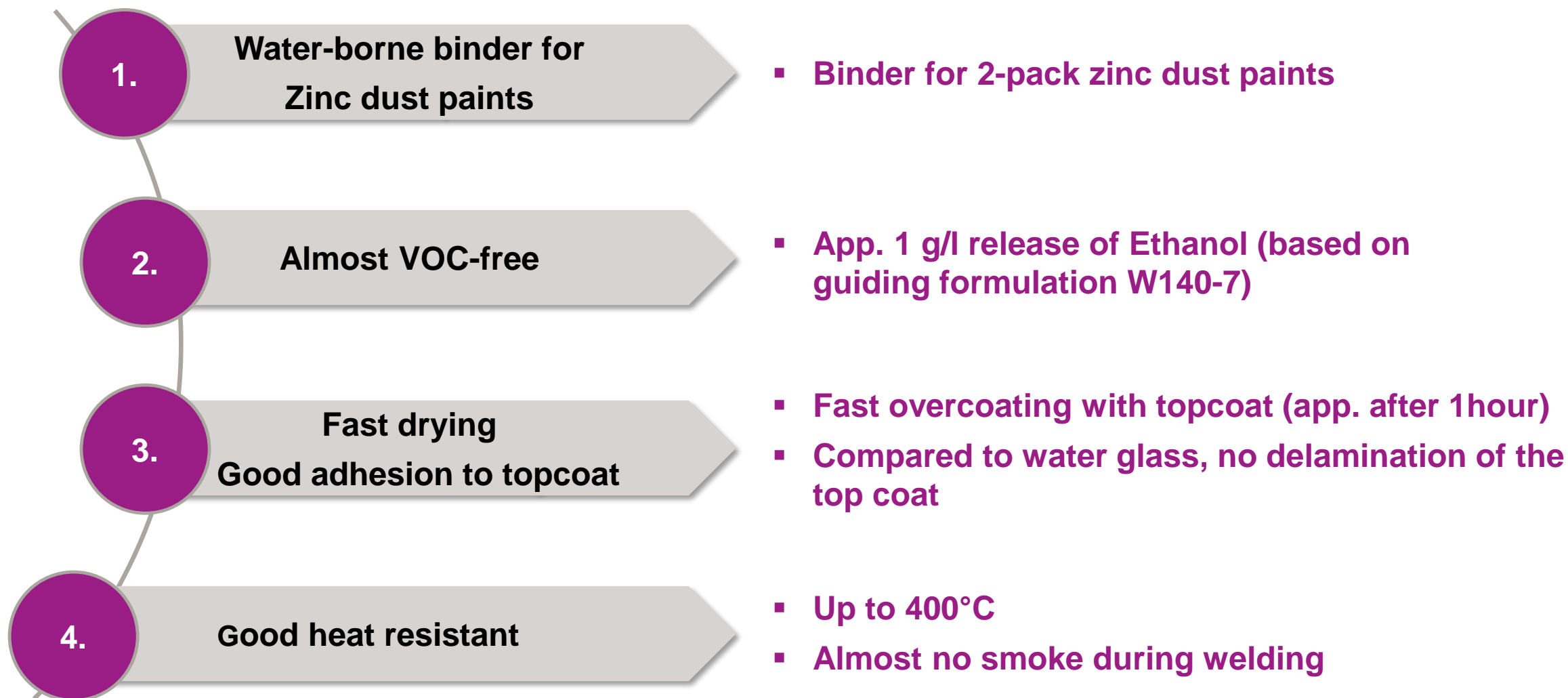
fully hydrolysed

X, Y: organofunctional group

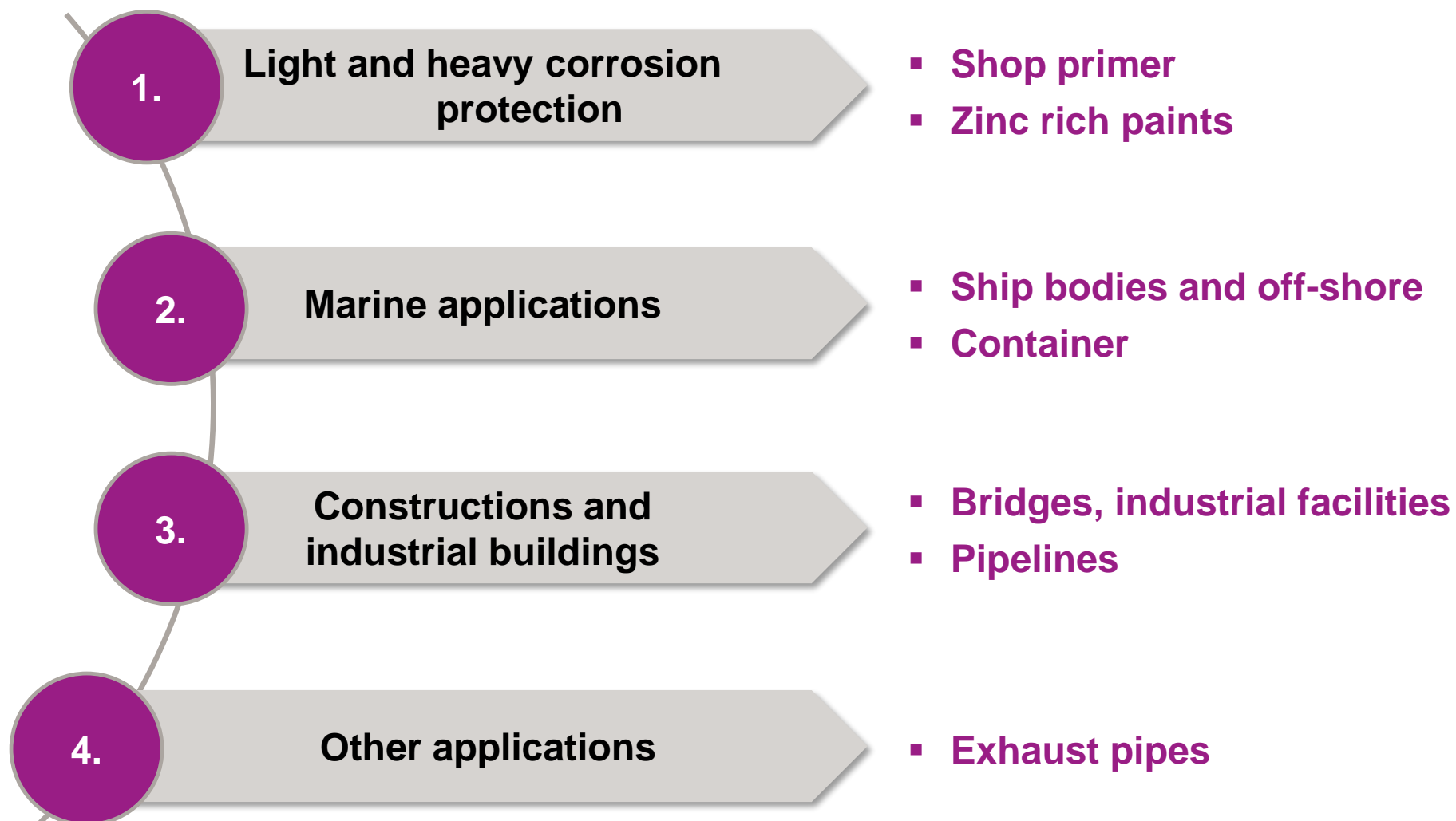
Key advantages:

1. Excellent corrosion protection performance
2. Environmentally friendly - water-borne (almost no VOC)
3. Fast room temperature curing (touch dry time 10 min)
4. Better heat resistant compared to organic binders (>400°C)
5. Easy processing and application
6. Very good adhesion to top coats

Dynasytan® SIVO 140 – Technical Profile



Dynasytan® SIVO 140 – Applications



Zinc Dust Paints – Market Requirements and Market Situation

	+ Corrosion protection	+ No VOC	+ 1-pack system possible	+ Heat resistance	+ Adhesion to topcoat
Water glass	✓	✓	✗	✓	✗
Silicic acid esters	✓	✗	✓	✓	✓
Epoxy resin esters	✓	✗	✓	✓	✓
Water-borne epoxy coating	✓	✓	✗	✗	✓
Dynasylan® SIVO 140	✓	✓	✗	✓	✓

No system fulfill all requirements from the market

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Guiding Formulation W140-7

Zinc-Rich Primer Based on Dynasytan® SIVO 140

W140-7 Eco-friendly water-borne zinc rich primer

Comp. A	p.b.w.
Dynasytan® SIVO 140	41.7
Deionised water	11.1
AEROSIL® 200	1.7
Add under stirring	
Zinc oxide (Red Seal, EverZinc)	23.6
Mica MKT (Imerys)	21.9
Total	100

Comp. B	p.b.w.
Zinc dust powder (4P16, EverZinc)	100.0
Total	100

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Mixing ratio by weight

Comp. A : Comp. B	56 : 100
Mix comp. A and comp. B before application and stir at least 10 minutes @ 10 – 15 m / min	

Coating properties

Theoretical solids content	~ 84%
Density coating	~ 2.8 g/cm ³
Cup efflux time (DIN 4)	20 – 30 sec
VOC (calculated)	~ 1 g/l
PVC	~ 81%

Application

Application method	airless spraying, HVLP
Nozzle size	1.2 – 2 mm
Thinner	DI-water (if necessary)
Recommended film thickness	60 – 150 µm

Drying conditions

Recommended drying temperature	15-35°C
Recommended rel. humidity	40-80%
Drying time – touch dry – 60 µm	10 min
Drying time – overcoatable – 60 µm	1 hour

Guiding Formulation W140-8 Shop Primer Based on Dynasylan® SIVO 140

W140-8 Eco-friendly water-borne shop primer

Comp. A	p.b.w.
Dynasylan® SIVO 140	32.9
AEROSIL® 200	0.9
Add under stirring	
Zinc oxide (Red Seal, EverZinc)	17.1
MIOX micro 30 (Kärntner Montanindustrie)	49.1
Total	100

Comp. B	p.b.w.
Zinc dust powder (4P16, EverZinc)	100.0
Total	100

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Mixing ratio by weight

Comp. A : Comp. B 100 : 43

Mix comp. A and comp. B before application and stir at least 10 minutes @ 10 – 15 m / min

Coating properties

Theoretical solids content	~ 82%
Density coating	~ 2.8 g/cm ³
Cup efflux time (DIN 4)	20 – 30 sec
VOC (calculated)	~ 1 g/l
PVC	~ 88%

Application

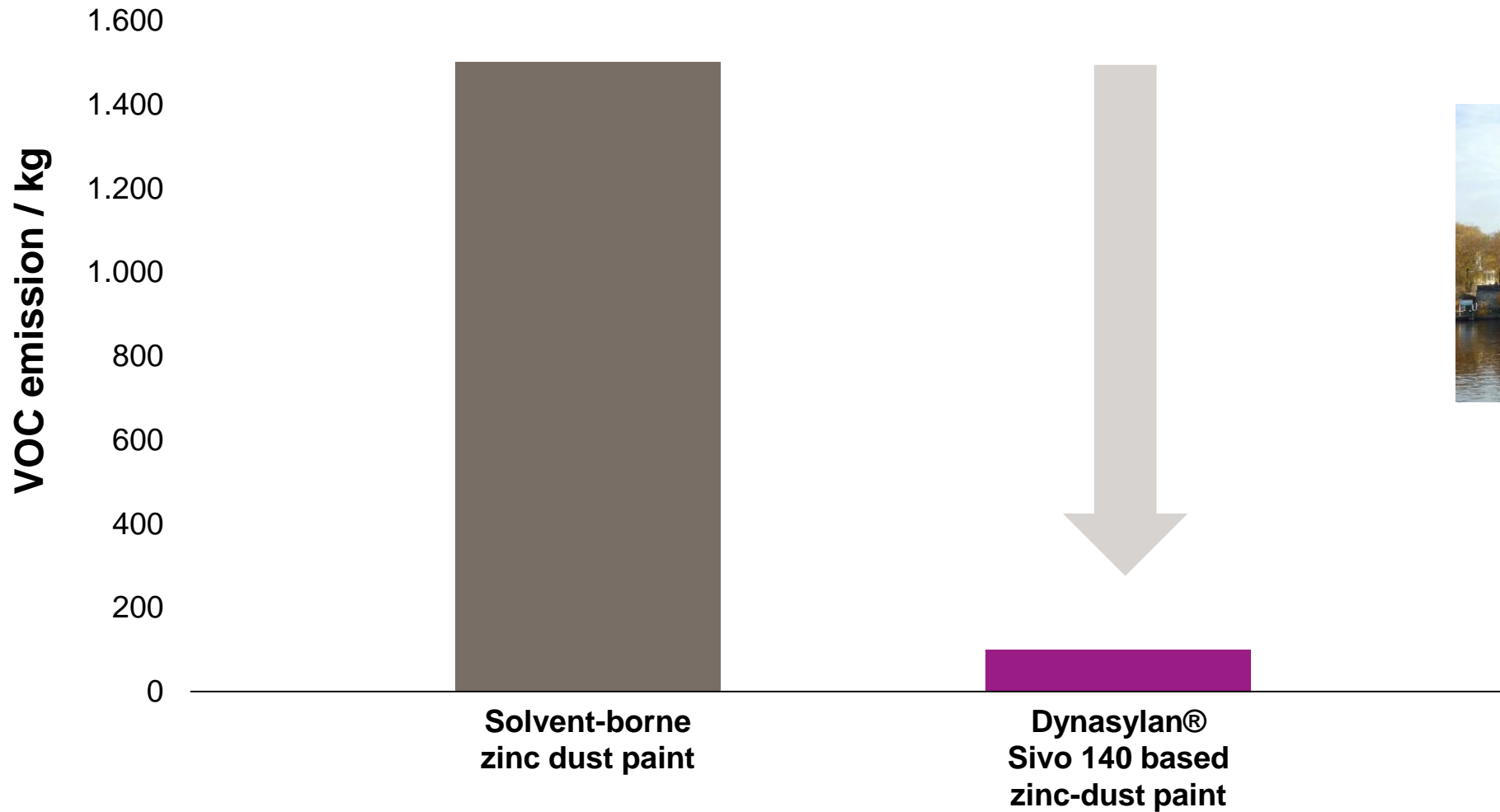
Application method	airless spraying, HVLP
Nozzle size	1.2 – 2 mm
Thinner	DI-water (if necessary)
Recommended film thickness	60 – 150 µm

Drying conditions

Recommended drying temperature	15-35°C
Recommended rel. humidity	40-80%
Drying time – touch dry – 60 µm	10 min
Drying time – overcoatable – 60 µm	1 hour

Dynasylan® SIVO 140

Comparison of VOC Emission of Zinc Dust Primers



Example: corrosion protection of bridge construction, Film thickness: ~ 70 µm, Area: ~ 20.000 m²

Dynasylan® SIVO 140 – Comparison of Corrosion Protection

Water-borne silane binder Dynasylan® SIVO 140

There is no significant difference in corrosion protection between a standard solvent-borne and the water-based Dynasylan® SIVO 140 zinc rich primer.

Solvent-borne versus water-borne binder for zinc dust paints

Solvent-borne
Silic acid ester



Dynasylan®
SIVO 140



~ 35 µm dry film thickness

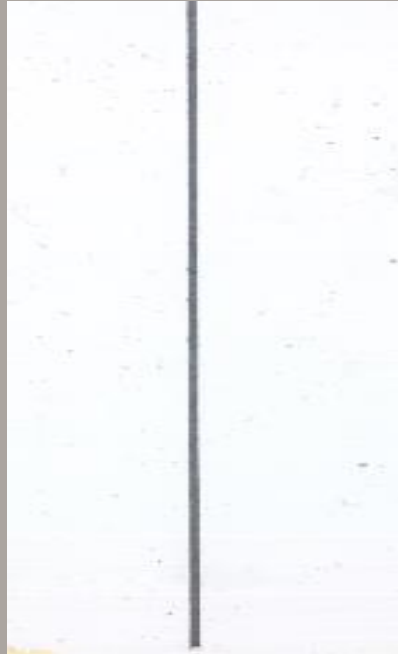
644 h salt spray test

Dynasylan® SIVO 140

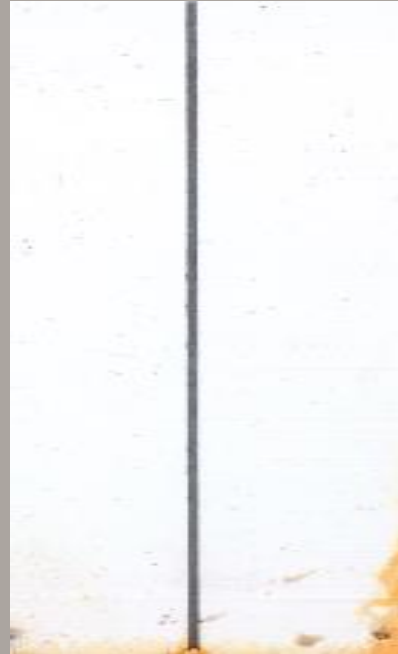
Performance of a Zinc-Rich Paint with w/b - Epoxy Coating as Topcoat

Zinc dust coating (W140-7) on shot blasted steel (surface roughness ELK 0.12 - 0.25 mm) overcoated with an water-borne epoxy coating tested in NSS

131 hours



347 hours



751 hours



1140 hours



Dry film zinc dust paint: ~ 70 µm

Dry film epoxy coating: 70 – 80 µm

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Dynasylan® SIVO 140: Standard Procedure for Producing Zinc Dust Paints



Powdery pigments
and fillers



Liquid binder
Dynasylan® SIVO 140

Mixing together and
dispersing with dissolver
just before use



- Not applicable on 2-pack painting lines
- Powders are often not desired at the end-user cause of forming dust and more difficult handling

Dynasylan® SIVO 140: Solution for using Dynasylan® SIVO 140 with Zinc Dust Pastes



Liquid zinc dust paste
with
stabilized zinc dust



Liquid binder
Dynasylan® SIVO 140

Easy handling and mixing with mixing tube
or premix with paddle mixer without any
dust exposure

HVLP or airless



Sandblasted cold rolled
steel

Dynasylan® SIVO 140 - Guiding formulation W140-9: Zinc rich paint for 2 component painting system

W140-9 Eco-friendly water-borne zinc rich primer

Comp. A	p.b.w.
Deionised water	37.7
Add under stirring and disperse 10 min @10-15 m/s	
Zinc oxide (Red Seal, EverZinc)	6.5
Byk® 420 (Byk Chemie)	0.4
Add under stirring and mix carefully for 10 min	
Stabilized Zinc dust powder (0G4P64, EverZinc)	55.4
Total	100
Comp. B	p.b.w.
Dynasylan® SIVO 140	56,0
Dynasylan® AMEO	27,1
Deionised water	12,4
AEROSIL® 200	4,5
Total	100

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Mixing ratio

	Mixing ratio by weight	Mixing ratio by volume
Comp. A : Comp. B	100 : 13.0	100 : 22.5

Coating properties

	Density	Viscosity DIN 4 cup
Component A	2.0 g/cm ³	pseudoplastic
Component B	1.1 g/cm ³	55 +/- 5 sec
Component A and B	1.79 g/cm ³	18 +/- 2 sec

Application

Application method	airless spraying, HVLP
Nozzle size	1.2 – 2 mm
Thinner	DI-water (if necessary)
Recommended film thickness	60 – 150 µm

Drying conditions

Recommended drying temperature	15-35°C
Recommended rel. humidity	40-80%
Drying time – touch dry – 60 µm	10 min
Drying time – overcoatable – 60 µm	2 hour

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Dynasylan® SIVO 140 and SILIKOPON® EF

Water-borne **Dynasylan® SIVO 140** for zinc-rich paints is exceptionally safe for the environment yet easy to process. Typical heavy-duty anticorrosion applications include utility poles, industrial equipment, bridges, and ship exteriors.

The high crosslinking density of coatings based on **SILIKOPON® EF** allows this binder to be used for extraordinary gloss and color retention and excellent weather resistance during outdoor use.

Ultralow VOC

Allow the formulation of low VOC coatings systems without compromising properties.

No hazardous ingredients

Non isocyanate curing

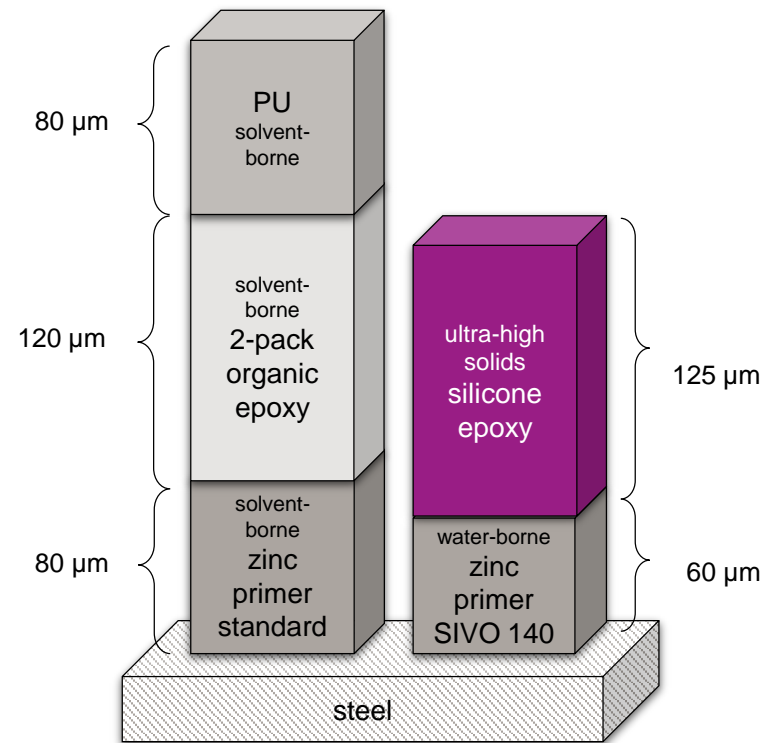
Fast and save processing

Easy-to-use and fast curing systems.



Dynasytan® SIVO 140 and SILIKOPON® EF

Faster Processing by Reducing the Number of Coating Layers



Reduction of coating layers from 3 to 2

- Allow the formulation of low VOC coatings systems without compromising properties associated with traditional higher VOC systems.
- The VOC emission can be reduced from 120 g/m² to 20 g/m² compared to a common solvent-borne coating system.
- This reduction protects the substrate and the environment.

Dynasylan® SIVO 140 for SILIKOPON® EF - Guiding Formulation W140-10: Zinc Rich Primer Based on Dynasylan® SIVO 140

W140-10 Eco-friendly water-borne zinc rich primer

Comp. A	p.b.w.
Dynasylan® SIVO 140	40.7
Deionised water	10.8
TEGO® Wet 270	2.7
TEGO® Twin 4100	1.3
AEROSIL® 200	1.6
Zinc oxide (Red Seal, EverZinc)	21.6
Mica MKT (Imerys)	21.3
Total	100

Comp. B	p.b.w.
Zinc dust powder (4P16, EverZinc)	100.0
Total	100

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Mixing ratio by weight

Comp. A : Comp. B	58 : 100
Mix comp. A and comp. B before application and stir at least 10 minutes @ 10 – 15 m / min	

Coating properties

Theoretical solids content	~ 82%
Density coating	~ 2.8 g/cm ³
Cup efflux time (DIN 4)	20 – 30 sec
VOC (calculated)	~ 1 g/l
PVC	~ 88%

Application

Application method	airless spraying, HVLP
Nozzle size	1.2 – 2 mm
Thinner	DI-water (if necessary)
Recommended film thickness	60 – 150 µm

Drying conditions

Recommended drying temperature	15-35°C
Recommended rel. humidity	40-80%
Drying time – touch dry – 60 µm	10 min
Drying time – overcoatable – 60 µm	1 hour

Guiding Formulation Topcoat Based on SILIKOPON® EF

2- pack top coat with low VOC for industrial coatings

Comp. A	p.b.w.
Silikopon® EF	55.0
TEGO® Foamex 840	0.7
TEGO® Wet 260	0.6
AEROSIL® R 972	1.0
BENTONE® SD-2 (Elementis)	0.5
FINNTALC® M40 (Elementis)	8.0
Blanc Fixe ZB (Ziegler Minerals)	20.0
Black FW 200 (Orion Engineered Carbons)	1.5
Butyl acetate	10.7
Butyl glycol acetate	2.0
Total	100.0

Mixing ratio by weight (95% cross linking)

Hardener	Dynasylan® AMEO
Mixing ratio coating : hardener	100 : 12.8

Coating properties

Theoretical solids content	~ 87%
Density coating	1.27 g/cm ³
Cup efflux time (DIN 6)	15 – 18 sec
VOC (calculated)	~ 170 g/l

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- Further information on functional silanes (Product Information/ Safety Data Sheet) please see our webpage:
- www.dynasylan.com



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