

DAOTAN™ TW 7000/40WA Waterborne Polyurethane Dispersion with Improved Chemical and Abrasion Resistance

DAOTAN™ TW 7000/40WA is a novel patented solvent free, polycarbonate and aliphatic isocyanate based waterborne polyurethane dispersion. It was especially designed for high end two-component plastic coatings, and demonstrates excellent adhesion to most standard types of plastic, as well as highest chemical and abrasion resistance when used as a topcoat.

Depending on the final application, it can be used when combined with waterbased acrylics or polyesters, to enhance gloss and DOI (Distinction of Image). Its amazing flexibility enables coating of plastic foils, allowing for thermoforming.

Automotive Interior-Crème Resistance Test

DAOTAN TW 7000/40WA passed successfully following tests according to automotive OEM standard requirements⁽¹⁾

- PV 3964 Volkswagen AG
- GMN 10033 GMN Group
- AA-P 257 BMW Group
- DBL 7384 Mercedes Benz⁽²⁾

(1) Test substrate ABS, direct coating, no primer or pre-treatment

(2) Selection of test substances

* See test conditions

Adhesion Overview

Adhesives used with most plastic substrates

Substrate	ABS	PC	PP _{treat.}	PVC-h	PPSU
Results	Full Adhesion				
Substrate	PA6	PMMA	PS	PET	
Results	No Adhesion				

* See test conditions

Fast Development of Hardness and Chemical Resistance

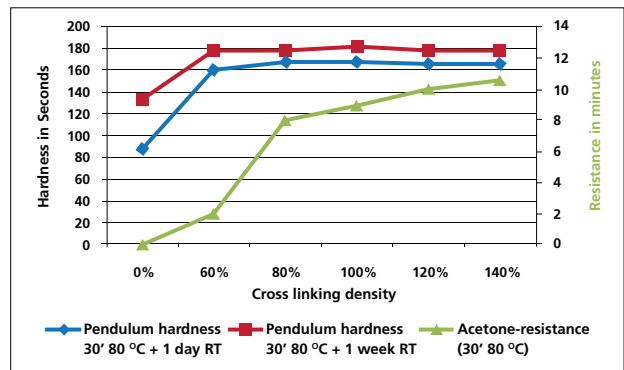
- At 80% cross linking already full hardness development and 8 minutes acetone resistance are achieved
- Reducing NCO allows more flexible films (thermoforming possible) while saving cross linker cost
- For full crème resistance, 140% cross linking might be required

Test conditions:

Hardener: Bayhydur™ 3100

Application: 200 µm wet film on glass

Influence of cross linking density



* Test conditions: 150% crosslinking with Bayhydur 3100, drying 30 minutes @ 80°C plus 12 hours @ 70 °C post-cure, cross hatch with tape peel-off – Standard Industry Conditions for accelerating aging before testing of coating.

DAOTAN TW 7000/40WA offers a unique combination of:

- Outstanding chemical and water resistance
- Very high film hardness
- High flexibility
- Excellent metallic pigment orientation in a 2K metallic monocoat

Guiding formulation 2K High Gloss Monocoat Black ⁽¹⁾	
Part A: DAOTAN TW 7000/40WA	36.14
RESYDROL® AN 6617w/50WA	12.05
Dimethylethanolamin 10WA	2.41
Water deionized	24.10
ADDITOL® VXW 6503 (surfacewetting)	0.24
ADDITOL VXL 4930 (leveling)	0.24
Surfynol™ 104 E Surfactant	0.72
Methoxypropoxypropanol	4.82
ColonylSchwarz PR 130 (Clariant)	2.40
Part B: Bayhydur 3100 (Bayer)	19.28

(1) Drying time: 30' @ 80°C

- Pendulum hardness (König): 120s
- Gloss (20°): 87
- Hydrolysis⁽¹⁾ ABS: Adhesion before and after
- Hydrolysis⁽¹⁾ PC: Only adhesion before
- Acetone resistance: 2.5 min
- Very high gloss and DOI
- Polyester modification for improved appearance and gloss

(1) According VW-Std. TL 226: 72 h, 90°C, 95 % humidity

Film Hardness

Hardener	Solvent (for hardener)	Appearance	Pendulum hardness (sec)
Bayhydur 3100	MPP 1:1	Clear	143
Bayhydur 304	MPP 1:1	Clear - Slight haze	145
Tolonate™ HDTLV2	MPP 1:1	Haze	108
Desmodur™ N3900	MPP 1:1	Slight Haze	136
Easaqua™ 501	MPP 1:1	Haze	168
Bayhydur 3100	/	Clear	172
Easaqua XL 600	/	Clear	

Test conditions:

Sole binder, cured with 150% of the hardener, 30' @ 80°C followed by 12h @ 70°C post-cure – Industry standard for accelerating aging before testing of coating



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SCR-012-B-EN-WW-01D