

VINNOL® SURFACE COATING RESINS PRODUCT OVERVIEW

WACKER markets vinyl chloride copolymers and terpolymers under the trade name VINNOL® surface coating resins.

The product range currently contains

- VINNOL® surface coating resins without functional groups
- VINNOL® surface coating resins with carboxyl groups
- VINNOL® surface coating resins with hydroxyl groups.

VINNOL® surface coating resins are further classified as E and H grades in accordance with the polymerization process employed in their production, namely emulsion or suspension polymerization.

VINNOL® E resins are made by an emulsion polymerization process, and VINNOL® H resins by a suspension process. The E resins contain a residual amount of emulsifier from the above-mentioned process that function as wetting or dispersing agents. The E resins are therefore particularly suitable for formulating pigmented systems.

VINNOL® resins without functional groups are copolymers of vinyl chloride and vinyl acetate of different molar composition and degree of polymerization.

VINNOL® resins containing carboxyl groups, the VINNOL® M grades, are terpolymers of vinyl chloride, vinyl acetate and dicarboxylic acids. The VINNOL® M grades also differ in their molar composition and degree of polymerization.

VINNOL® resins containing hydroxyl groups, the VINNOL® E/A grades, are copolymers and terpolymers of vinyl chloride, hydroxy acrylate and, in one case, dicarboxylic acid ester. They, too, differ in their composition and degree of polymerization.

The physical and chemical properties of the VINNOL® surface coating resins vary with the degree of polymerization and the molar distribution of the individual polymeric constituents in the polymer backbone.

VINNOL® SURFACE COATING RESINS PRODUCT OVERVIEW

Grades	Vinyl chloride % by wt ²	Vinyl acetate % by wt ²	Other monomers % by wt ²	Acid value mg KOH/g polymer ²	Hydroxyl content % by wt ²	Glass transition temperature T _g (DSC) °C ⁴
without functional groups						
E 15/45	85.0 ± 1.0	15.0 ± 1.0	-	-	-	ca. 75
E 20/45	80.0 ± 1.0	20.0 ± 1.0	-	-	-	ca. 68
H 14/36	85.6 ± 1.0	14.4 ± 1.0	-	-	-	ca. 69
H 15/42	86.0 ± 1.0	14.0 ± 1.0	-	-	-	ca. 70
H 15/50	85.0 ± 1.0	15.0 ± 1.0	-	-	-	ca. 74
H 11/59	89.0 ± 1.0	11.0 ± 1.0	-	-	-	ca. 75
H 40/43	65.7 ± 1.0	34.3 ± 1.0	-	-	-	ca. 58
H 40/50	63.0 ± 1.0	37.0 ± 1.0	-	-	-	ca. 60
H 40/55	62.0 ± 1.0	38.0 ± 1.0	-	-	-	ca. 60
H 40/60	61.0 ± 1.0	39.0 ± 1.0	-	-	-	ca. 62
with carboxyl groups						
E 15/45 M	84.0 ± 1.0	15.0 ± 1.0	ca. 1.0	7.5 ± 1.5	-	ca. 73
H 15/45 M	84.0 ± 1.0	15.0 ± 1.0	ca. 1.0	7.0 ± 1.5	-	ca. 74
H 15/45 M special	84.0 ± 1.0	15.0 ± 1.0	ca. 0.5	4.5 ± 1.5	-	ca. 73
H 30/48 M	70.0 ± 1.0	29.0 ± 1.0	ca. 1.0	7.0 ± 1.5	-	ca. 65
with hydroxyl groups						
E 15/40 A	84.0 ± 1.0	-	ca. 16.0	-	1.8 ± 0.2	ca. 69
E 15/48 A	83.5 ± 1.0	-	ca. 16.5	-	1.8 ± 0.2	ca. 69
E 22/48 A	75.0 ± 1.0	-	ca. 25.0	-	1.8 ± 0.2	ca. 61

1) 20 % solution in methyl ethyl ketone, dissolved at 50 °C

2) WACKER method

3) Method: SEC (Size Exclusion Chromatography)

Solvent: THF

Standard: Polystyrene

4) The information contained is for guideline only.

We make no warranty as to the accuracy of these data
and they should not be interpreted as a specification.

5) DIN EN ISO 1628-2

K value ⁵	Molecular weight average M_w (SEC) ^{3,4}	Viscosity ¹ DIN 53015 [mPa·s]	Efflux time ISO 2431 4 mm cup ^{1,4}	Particle size mm ²	Monomers in section A/B of EU Directive 2002/72/EG	FDA regulation § 175.300
45 ± 1	45–55 x 10 ³	37 ± 5	ca. 36	< 2.5	yes/no	yes
45 ± 1	45–55 x 10 ³	35 ± 5	ca. 32	< 2.5	yes/no	yes
35 ± 1	30–40 x 10 ³	13 ± 3	ca. 20	< 1	yes/no	yes
42 ± 1	35–50 x 10 ³	28 ± 5	ca. 26	< 1	yes/no	yes
50 ± 1	60–80 x 10 ³	70 ± 10	ca. 66	< 1	yes/no	yes
59 ± 1	80–120 x 10 ³	450 ± 100	-	< 1	yes/no	yes
42 ± 1	40–50 x 10 ³	25 ± 5	ca. 26	< 1	yes/no	yes
50 ± 1	60–80 x 10 ³	55 ± 10	ca. 45	< 1	yes/no	yes
55 ± 1	80–120 x 10 ³	100 ± 20	ca. 80	< 1	yes/no	yes
60 ± 1	100–140 x 10 ³	180 ± 30	ca. 145	< 1	yes/no	yes
45 ± 1	50–60 x 10 ³	40 ± 5	ca. 34	< 2.5	yes/no	yes
48 ± 1	60–80 x 10 ³	60 ± 10	ca. 50	< 1	yes/no	yes
48 ± 1	60–80 x 10 ³	60 ± 10	ca. 50	< 1	yes/no	yes
48 ± 1	60–80 x 10 ³	45 ± 10	ca. 45	< 1	yes/no	yes
39 ± 1	40–50 x 10 ³	20 ± 5	ca. 22	< 2.5	yes/no	no
48 ± 1	60–80 x 10 ³	60 ± 10	ca. 69	< 2.5	yes/no	no
48 ± 1	60–80 x 10 ³	45 ± 7	ca. 46	< 2.5	yes/yes	no

APPLICATIONS

VINNOL® WITHOUT FUNCTIONAL GROUPS

Application	VINNOL® E 15/45	VINNOL® E 20/45	VINNOL® H 14/36	VINNOL® H 15/42	VINNOL® H 15/50
Adhesives					
Adhesive for PVC-P	○	○	○	○	●
Adhesive for PVC-U					○
Industrial coatings					
Artificial leather coatings	●	●	○	○	●
Coil coatings					
Corrosion-protection coatings					
Marine paints	○	○		○	
Metal coatings	○	○	○	○	○
Plastic coatings	○	○	○	○	○
Strippable coatings	●	●	●	●	●
Vinyl wallpaper top coats	●	●	●	●	●
Wood varnishes	○	○	○	○	○
Magnetic storage media					
Audio and video tape coatings					
Magnetic stripes					
Masonry paints					
Concrete paints	●	●	●	●	●
Floor paints	●	●	●	●	●
Road-marking paints			●	●	
Roof paints					
Packaging coatings					
Barrier coatings	●	●	●	●	●
Can coatings					
Heat-sealable coatings					●
Primers for metallization			○	○	
Protective coatings for metallized film					
Pigment preparations					
Chips/Liquid/Paste	●	●		●	●
Printing Inks					
Gravure printing	●	●	●	●	○
Ink-jet printing	●	●	●	●	
Screen printing	●	●			●
Transfer printing	●	●	○	○	○

● = Recommended ○ = Suitable

VINNOL® H 11/59	VINNOL® H 40/43	VINNOL® H 40/50	VINNOL® H 40/55	VINNOL® H 40/60
●	○	●	●	●
●				
○	○	●	●	●
	○	○	○	○
	○	○	○	○
	○	○	○	○
	○	○	○	○
○	○	○	○	○
●	●	●	●	●
●	●	●	●	●
	●	●	●	○
	○	○	○	
	○	○	○	
○	●	●	●	○
○	●	●	●	○
	●	●	●	○
	●	●	●	○
●	●	●	●	●
	○	○	○	○
	●	●	●	●
	○	○	○	○
	○	○	○	○
	○	○		
	○	○		
●		○	●	●
○	●	●	●	●

APPLICATIONS

VINNOL® WITH FUNCTIONAL GROUPS

Application	VINNOL® E 15/45 M	VINNOL® H 15/45 M	VINNOL® H 15/45 M special
Adhesives			
Adhesive for metal	○	●	●
Two-Pack adhesive			
Industrial coatings			
Artificial leather coatings			
Coil coatings	●	●	●
Corrosion-protection coatings	●	●	●
Marine paints		●	●
Metal coatings	●	●	●
Plastic coatings	●	●	●
Baking enamels	●	●	●
Vinyl wallpaper top coats	○	○	○
Wood varnishes			
Magnetic storage media			
Audio and video tape coatings			
Magnetic stripes			
Masonry paints			
Concrete paints	●	●	●
Floor paints	●	●	●
Road-marking paints	●	●	●
Roof paints	●	●	●
Packaging coatings			
Barrier coatings	○	○	○
Can coatings	○	●	●
Heat-sealable coatings	●	●	●
Heat-seal-resistant coatings			
Primers for metallization	●	●	●
Protective coatings for metallized film	●	●	●
Pigment preparations			
Chips/Liquid/Paste			
Printing Inks			
Gravure printing	●	○	○
Ink-jet printing	○		
Screen printing	●	●	●
Transfer printing	●	●	●

● = Recommended ○ = Suitable

VINNOL® H 30/48 M	VINNOL® E 15/40 A	VINNOL® E 15/48 A	VINNOL® E 22/48 A
●		○	
	●	○	●
	●		●
●	●		●
●	●	●	●
●	●	●	●
●	●	○	●
●	●	●	●
○	●	●	●
	●	●	●
	●	●	●
	●	●	●
●	○	●	○
●	○		○
●		●	
●			
○	○	●	○
●	○		○
●	●	●	●
●	○		○
●	○	●	○
	●	○	●
		○	
○	●		●
		●	○
●	●	○	○
●	○	○	○

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