WACKER

CREATING TOMORROW'S SOLUTIONS

CONSTRUCTION I POLYMER POWDERS & **DISPERSIONS** I MEA

PRODUCT OVERVIEW
VINNAPAS® POLYMER BINDERS

VINNAPAS®

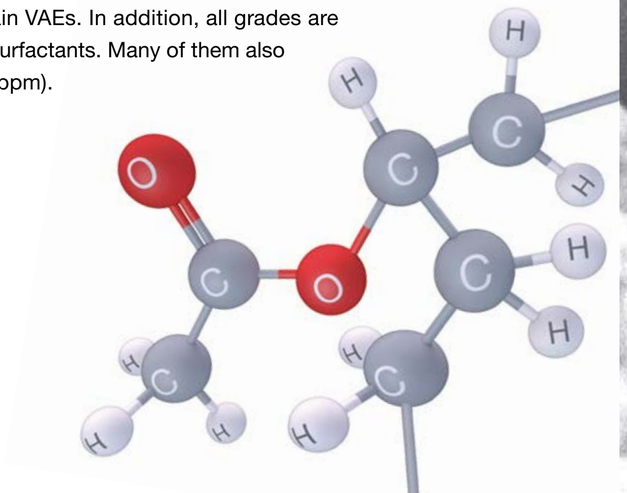
POLYMER CHEMISTRY – A KEY TO QUALITY

Polymer binders have revolutionized the construction and paint industry more than once. WACKER has been a key player in this development. Show Milestones

Vinyl Acetate-Ethylene (VAE) – Serving the Megatrends of Today and Tomorrow

VINNAPAS® polymer binders are co- and terpolymers based on vinyl acetate, ethylene and other monomers. Vinyl acetate-ethylene (VAE), in particular, combines technical performance with environmental benefits at an attractive cost-in-use ratio.

VAE dispersions are produced by the emulsion polymerization of the hard, polar monomer vinyl acetate and the soft, hydrophobic monomer ethylene. Ethylene functions as an optimal flexibilizer for vinyl acetate, incorporating permanent flexibility into VAE polymers. Consequently, the use of plasticizers can be minimized when formulations contain VAEs. In addition, all grades are stabilized without the use of APEO-based surfactants. Many of them also show low residual monomer content (<500 ppm).
Compliance with Strict Labels



Polymer binders enhance two critical characteristics of all mortars and coatings: adhesion and flexibility. They ensure the quality of buildings and prolong their life expectancy, while reducing material consumption. At the same time, they increase creative freedom by making it possible to combine a wide variety of construction materials.

The Fast Track:

PRODUCT FINDER DISPERSIBLE POLYMER POWDERS

Typical General Properties			Grade	Recommended Applications							
Polymer Base	Flexibility	MFFT (ISO 2115) [°C]	Product Name	Tile Adhesives	Tile Grouts	Self-Leveling Compounds	Wall and Joint Fillers	Concrete Repair	ETICS	Waterproofing Membranes	Renders and Plasters
Neutral											
VAc-E	Semi-flexible	1	VINNAPAS® 4023 N	●●			●		●●		
VAc-E	Semi-flexible	0	VINNAPAS® 4240 N	●●					●●		
VAc-E	Hard	4	VINNAPAS® 5010 N	●●	●●		●●				●●
VAc-E	Very flexible	0	VINNAPAS® 5043 N						●●		
VAc-E	Very flexible	0	VINNAPAS® 5044 N				●●	●●	●●	●●	
Enhanced											
VAc-E	Very flexible	0	VINNAPAS® 4040 E		●				●	●●	●
VAc-E	Semi-flexible	4	VINNAPAS® 5028 E	●●							
VAc-E-others	Flexible	0	VINNAPAS® 7034 E	●	●		●	●●	●		●●
VAc-E-others	Highly flexible	0	VINNAPAS® 7055 E					●	●	●●	
VAc-E-others	Hard	7	VINNAPAS® 7210 E	●●	●				●		●
VAc-E-others	Semi-flexible	5	VINNAPAS® 7220 E	●●	●						●
VAc/E/MMA	Semi-flexible	1	VINNAPAS® 7410 E	●●							
Hydrophobic											
VC-E	Flexible	0	VINNAPAS® 3030 H		●●						●
VAc-E	Very flexible	0	VINNAPAS® 4042 H						●●	●●	●
VAc-E	Very flexible	0	VINNAPAS® 5048 H						●●	●●	●●
VAc-E	Hard	4	VINNAPAS® 5518 H		●●					●●	●●
VAc-E-others	Flexible	0	VINNAPAS® 7031 H		●●		●●	●	●	●	●●
VC-E-others	Flexible	0	VINNAPAS® 8031 H		●●					●	●
VC-E-others	Flexible	0	VINNAPAS® 8034 H		●●				●	●	●●

N VINNAPAS® N Class – Neutral Effect on Rheology

These products provide a high degree of freedom in developing formulations and are ideal for various applications.

E VINNAPAS® E Class – Enhanced Properties

These products have enhanced properties in a number of applications and improve essential characteristics. They ensure improved workability, increased adhesion or water resistance, to name just a few.

H VINNAPAS® H Class – Hydrophobic Excellence

These products have remarkable hydrophobic properties, making them ideal for all types of plasters and tile grouts as well as for ETICS (external thermal insulation composite systems).

Recommended Applications: ●● Highly recommended ● Recommended

The Fast Track:

PRODUCT FINDER DISPERSIBLE POLYMER POWDERS

Typical General Properties			Grade	Recommended Applications							
Polymer Base	Flexibility	MFFT (ISO 2115) [°C]	Product Name	Tile Adhesives	Tile Grouts	Self-Leveling Compounds	Wall and Joint Fillers	Concrete Repair	ETICS	Waterproofing Membranes	Renders and Plasters
Thixotropic											
VAc-E	Hard	4	VINNAPAS® 5012 T	●●			●●				
VAc-E	Semi-flexible	4	VINNAPAS® 5021 T	●●			●●				
VAc-E	Very flexible	0	VINNAPAS® 5046 T				●●		●		
Leveling											
VAc-E	Semi-flexible	1	VINNAPAS® 4220 L			●●					
VAc-E	Hard	4	VINNAPAS® 4410 L			●●					
VAc-E	Semi-flexible	4	VINNAPAS® 5023 L			●●					
VAc-E	Semi-flexible	4	VINNAPAS® 5025 L			●●					
VAc-E	Hard	4	VINNAPAS® 5111 L			●●					
VAc-E	Semi-flexible	4	VINNAPAS® 5222 L			●●					
Flow											
VAc-E	Hard	4	VINNAPAS® 5014 F			●●					
VAc-E-MMA	Hard	7	VINNAPAS® 7016 F			●●					

T **VINNAPAS® T Class – Thixotropic Expertise**
These products are used in thixotropic tile adhesives and in troweling compounds.

L **VINNAPAS® L Class – Leveling Optimization**
These products create smooth surfaces by displaying excellent leveling properties. They are therefore ideal for self-leveling compounds.

F **VINNAPAS® F Class – Flow Superiority**
These products provide excellent flow properties without the need for any additional synthetic superplasticizers or casein. They are therefore ideal for self-leveling compounds that require an instant liquefying effect and a special rheology.

Recommended Applications: ●● Highly recommended ● Recommended

The Fast Track:

PRODUCT FINDER POLYMER DISPERSIONS

Typical General Properties 1								Grade	Recommended Applications							
Polymer Base 2	Solids Content ±1 % 3 [%]	Viscosity, Brookfield [mPa·s]	pH Value	Glass Transition Temperature T_g (DSC) [°C] 4	Minimum Film-Forming Temperature (ISO 2115) [°C] 4	Predominant Particle Size [µm] 4	Stabilization System 5		Renders, Plasters, Top Coat for ETICS	Adhesive Mortar and Base Coat for ETICS	Waterproofing Membranes	Tile Adhesives (1K RTU)	Cement Admixtures (2K)	Self-Leveling Compounds	Bonding Agents, Primers (1K RTU)	Joint Compounds
VAc-E	63	200–1,000	6.0–8.0	8 ± 2	0	1.0	ST/PVOH	VINNAPAS® 536 ED			●●					
VAc-E	55	1.300–2.000	4.0–6.0	0 ± 2	0	1.0	PVOH	VINNAPAS® 547 ED					●●		●●	
VAc-E	55	100–400	4.0–6.0	-5	0	1.0	PVOH	VINNAPAS® 550 ED			●●		●●		●	●●
VAE	55	2.000–4.000	4.0–6.0	-10	0	1.0	PVOH	VINNAPAS® 561 ED			●●				●●	
VAc-E-VE	59	1,800–2,000	4.0–6.0	-12	0	1.0	ST	VINNAPAS® 760 ED			●●		●●			
S-A	50	6,000–12,000	7.5–8.5	20	12	0.1	ST	VINNAPAS® 224 HD	●●	●●	●	●●			●●	
S-A	50	700–3,000	7.0–8.0	0	0	0.1	ST	VINNAPAS® 240 HD		●	●●	●●			●●	

●● Highly recommended ● Recommended

The Perfect Fit:

RECOMMENDATION BY APPLICATION

Tile Adhesives

Grade Product Name	Product Benefit	Performance Attributes Tensile Adhesion Strength after: Open Time DIN EN 12004-2:2017	Heat Aging DIN EN 12004-2:2017	Water Immersion DIN EN 12004-2:2017
Neutral				
VINNAPAS® 4023 N	Semi-flexible dispersible polymer powder with good tensile adhesion strength on inorganic surfaces even after water immersion.	●●	●●	●●
VINNAPAS® 4240 N	Semi-flexible dispersible polymer powder with good tensile adhesion strength on inorganic surfaces and expecially after heat aging.	●●	●●●	●
VINNAPAS® 5010 N	Hard dispersible polymer powder with very good tensile adhesion strength on inorganic surfaces especially after heat aging.	●●	●●●	●
Enhanced				
VINNAPAS® 5028 E	Semi-flexible dispersible polymer powder with long open time and good tensile adhesion strength after water immersion.	●●●	●●	●●
VINNAPAS® 7210 E	Long open time and very good tensile adhesion strength after water immersion and heat aging.	●●●	●●●	●●
VINNAPAS® 7220 E	Semi-flexible dispersible polymer powder with very good workability and excellent tensile adhesion strength after water immersion.	●●	●●●	●●●
VINNAPAS® 7410 E	Semi-flexible dispersible polymer powder with long open time, a good water and freeze/thaw resistance and excellent tensile adhesion strength after water immersion.	●●●	●●●	●●
Thixotropic				
VINNAPAS® 5012 T	Thixotropic, hard dispersible polymer powder with very good tensile adhesion strength after standard conditions.	●●	●●●	●
VINNAPAS® 5021 T	Thixotropic, semi-flexible dispersible polymer powder with long open time and good tensile adhesion strength especially after water immersion.	●●●	●●	●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Tile Adhesives (1K Ready-To-Use)

Grade	Product Benefit	Performance Attributes			
		Class D1 (EN 12004)	Class D2 (EN 12004)	Filler Load	Slip Resistance
VINNAPAS® 224 HD	The proven benchmark for D2 tile adhesives.		●●	●●	●●
VINNAPAS® 240 HD	Flexible dispersible polymer dispersion recommended to formulate pasty D2 tile adhesives.		●●	●●	●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Tile Grouts

Grade Product Name	Product Benefit	Performance Attributes Hydrophobic Effect	 Workability	 Cleaning Properties after Initial Setting
Neutral				
VINNAPAS® 5010 N	Hard dispersible polymer powder with good workability.	○	●●●	●●●
Hydrophobic				
VINNAPAS® 3030 H	Flexible dispersible polymer powder with excellent hydrophobic effect, very high mechanical strength and low stickiness.	●●	●●	●●
VINNAPAS® 5518 H	Hard dispersible polymer powder with strong hydrophobic effect, very good workability, high mechanical strength and good cleaning properties after first setting.	●●	●●●	●●●
VINNAPAS® 7031 H	Flexible dispersible polymer powder with hydrophobic effect and very good workability.	●	●●●	●●
VINNAPAS® 8031 H	Flexible dispersible polymer powder with slight hydrophobic effect, good workability and low stickiness.	●	●	●●
VINNAPAS® 8034 H	Flexible dispersible polymer powder with strong hydrophobic effect, good workability and low stickiness.	●●	●	●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Self-Leveling Compounds

Grade	Product Benefit	Performance Attributes		
Product Name		**Flow Support**	**Defoaming**	**Stabilization**
Leveling				
VINNAPAS® 4220 L	Good defoaming properties for smooth surfaces and specifically recommended for end products with adequate mechanical properties.	●●	●●	●
VINNAPAS® 4410 L	Excellent defoaming properties for very smooth, flat surfaces and good stabilization against water over-dosage.	●●	●●●	●●●
VINNAPAS® 5023 L	Good defoaming properties for smooth surfaces and specifically recommended for end products with melamine sulfates.	●●	●	●●
VINNAPAS® 5025 L	Good defoaming properties for smooth surfaces and very good tolerance against water over-dosage.	●●	●	●●●
VINNAPAS® 5111 L	Good defoaming properties at low viscosity for very smooth, flat surfaces for end products with very low emissions.	●●●	●●	●
VINNAPAS® 5222 L	Very good defoaming properties at low viscosity for smooth, flat surfaces.	●●●	●●	●
Flow				
VINNAPAS® 5014 F	Instant plasticizing effect especially for pumpable systems with shear-thinning rheology.	●●●	●	●
VINNAPAS® 7016 F	Instant plasticizing effect with casein-like rheology and very good self-healing effect especially for manually applied systems.	●●●	●	●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Wall and Joint Fillers

Grade	Product Benefit	Performance Attributes		
Product Name		**Hydrophobicity**	**Thixotropy**	**Workability**
Neutral				
VINNAPAS® 4023 N	Semi-flexible polymer powder with good tensile adhesion strength on all surfaces and good workability.	○	○	●
VINNAPAS® 5010 N	Hard dispersible polymer powder with very good tensile adhesion strength on all surfaces and good workability.	○	○	●●
VINNAPAS® 5044 N	Highly flexible polymer powder with good flexibility and high deformability.	○	○	●●
Hydrophobic				
VINNAPAS® 7031 H	Flexible dispersible polymer powder with hydrophobic effect, very good workability and very good tensile adhesion strength.	●●	○	●●●
Thixotropic				
VINNAPAS® 5012 T	Thixotropic, hard dispersible polymer powder with good workability and very good tensile adhesion strength.	○	●●	●●●
VINNAPAS® 5021 T	Thixotropic, semi-flexible dispersible polymer powder with good workability, long open time and good tensile adhesion strength.	○	●●	●●●
VINNAPAS® 5046 T	Strongly thixotropic, very flexible dispersible polymer powder with very good workability.	○	●●●	●●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Concrete Repair

Grade Product Name	Product Benefit
Neutral	
VINNAPAS® 5044 N	Very flexible dispersible polymer powder with very good tensile adhesion strength on all surfaces.
Enhanced	
VINNAPAS® 7034 E	Flexible dispersible polymer powder with excellent workability and good tensile adhesion strength on all surfaces.

Cement Admixtures (2K)

Grade	Product Benefit	Performance Attributes				
		Flexibility	Adhesion	Hydro-phobicity	Elastic Modulus Reduction	Flexural Strength
VINNAPAS® 547 ED	Standard grade for bonding aid applications with excellent balance of adhesion and cohesion.	●●	●●	●	●●	●●
VINNAPAS® 550 ED	Product with improved flexibility and good mechanical strength.	●●	●●	●	●●	●
VINNAPAS® 760 ED	Highly flexible product with excellent cement compatibility and outstanding adhesion properties.	●●	●●	●●	●●	●●

Based on WACKER guide formulation:
K = component

●● Excellent ● Good

ETICS

Grade	Product Benefit	Performance Attributes		
Product Name		**Tensile Adhesion Strength**	**Impact Resistance**	**Hydrophobicity**
Neutral				
VINNAPAS® 4023 N	Semi-flexible dispersible polymer powder with high tensile adhesion on mineral substrates after water immersion.	●●	●	○
VINNAPAS® 4240 N	Very good tensile adhesion strength particularly on organic surfaces and high impact strength.	●●●	●	○
VINNAPAS® 5043 N	Very flexible dispersible polymer powder with very good tensile adhesion strength particularly on organic surfaces, very high impact strength and good workability.	●●●	●●●	○
VINNAPAS® 5044 N	Very flexible dispersible polymer powder with very good tensile adhesion strength particularly on organic surfaces, very high impact strength and good workability.	●●●	●●●	○
Hydrophobic				
VINNAPAS® 4042 H	Very flexible dispersible polymer powder with slight hydrophobic effect, very good tensile adhesion strength particularly on organic surfaces and very high impact strength.	●●●	●●●	●●
VINNAPAS® 5048 H	Very flexible dispersible polymer powder with strong hydrophobic effect, very good tensile adhesion strength particularly on organic surfaces and very high impact strength.	●●●	●●●	●●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Renders, Plasters, Top Coat for ETICS (1K Ready-To-Use)

Grade	Product Benefit	Performance Attributes					
		Synthetic Resin-Bound Renders	Silicone-Bound Renders	Silicate-Bound Renders	Resistance to Dirt Pick-Up	Color Stability	Durability
VINNAPAS® 224 HD	Proven benchmark for a wide range of applications.	●●	●●		●●	●●	●●

Adhesive Mortar and Base Coat for ETICS

Grade	Product Benefit	Formulation		Performance Attributes			
		1K Ready-To-Use	2K	Flame Resistance	Flexibility	Hydrophobicity	Compatibility with Cement
VINNAPAS® 224 HD	Product for ready-to-use tile adhesives and embedding mortars.	●●			●	●●	

Based on WACKER guide formulation:
K = component

●● Excellent ● Good N/A = not applicable

Renders and Plasters

Grade Product Name	Product Benefit	Tensile Adhesion Strength	Hydrophobicity
Neutral			
VINNAPAS® 5010 N	Hard dispersible polymer powder with very good tensile adhesion strength on inorganic surfaces and good workability.	●●●	○
Enhanced			
VINNAPAS® 7034 E	Excellent workability and very good tensile adhesion strength.	●●●	●
Hydrophobic			
VINNAPAS® 5048 H	Very flexible dispersible polymer powder with strong hydrophobic effect and very good tensile adhesion strength.	●●●	●●●
VINNAPAS® 5518 H	Hard dispersible polymer powder with strong hydrophobic effect, very good workability and very good tensile adhesion strength.	●●●	●●●
VINNAPAS® 7031 H	Flexible dispersible polymer powder with hydrophobic effect, very good workability and very good tensile adhesion strength.	●●●	●●
VINNAPAS® 8034 H	Flexible dispersible polymer powder with strong hydrophobic effect, good workability and very good tensile adhesion strength.	●●●	●●●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Bonding Agents, Primers (1K Ready-To-Use)

Grade	Product Benefit	Performance Attributes				
		Penetration	Surface Consolida-tion	Adhesion on Critical Substrates	Flexibility	Water Resistance
VINNAPAS® 224 HD	Proven benchmark for primers.	●	●●	●●	●	●●
VINNAPAS® 240 HD	Recommended for pasty tile adhesives as D2 adhesive.	●●	●●	●●	●●	●●
VINNAPAS® 547 ED	Standard grade for bonding aid applications with excellent balance of adhesion and cohesion.		●●	●●	●	●
VINNAPAS® 561 ED	Good tensile adhesion strength on all surfaces, reasonable elongation and good crack-bridging properties and elasticity with good performance under positive water pressure.		●	●●	●●	●

Based on WACKER guide formulation:
K = component

●● Excellent ● Good

Grade Product Name	Product Benefit	Adhesion on Critical (Especially Organic) Surfaces
Neutral		
VINNAPAS® 5044 N	Very flexible dispersible polymer powder with very good tensile adhesion strength on all surfaces and good crack-bridging properties.	●●●
Enhanced		
VINNAPAS® 4040 E	Very flexible dispersible polymer powder with very good tensile adhesion strength and very good crack-bridging properties combined with improved workability.	●●●
VINNAPAS® 7055 E	Highly flexible dispersible polymer powder with very good tensile adhesion strength particularly on all surfaces and very good crack-bridging properties even at low temperatures.	●●●
Hydrophobic		
VINNAPAS® 4042 H	Very flexible dispersible polymer powder with slight hydrophobic effect and very good tensile adhesion strength.	●●●
VINNAPAS® 5048 H	Very flexible dispersible polymer powder with strong hydrophobic effect and very good tensile adhesion strength.	●●●
VINNAPAS® 5518 H	Hard dispersible polymer powder with strong hydrophobic effect, very good workability and high mechanical strength.	●

Based on WACKER guide formulation: ●●● Excellent ●● Very Good ● Good ○ Neutral

Grade	Product Benefit	Formulation		Performance Attributes			
		1K Ready-To-Use	2K	Dispersion; Liquid-Applied Water-Impermeable Product (EN 14891)	Cement Mortar CM (EN 14891)	Flexibility	Adhesion on Critical (Esp. Organic) Surfaces
VINNAPAS® 240 HD	Optimum binder for flexible ready-touse waterproofing membranes.	●●		●●		●●	●●
VINNAPAS® 536 ED	Highly versatile product with excellent crack-bridging properties adhesion, cohesion and water resistance.		●●		●●		●●
VINNAPAS® 760 ED	Highly flexible product with excellent workability and outstanding adhesion properties.		●●		●●	●●	●●
VINNAPAS® 550 ED	Very good combination of excellent compatibility with cement and good flexibility.		●●		●●	●●	●●
VINNAPAS® 561 ED	Good tensile adhesion post water emersion, excellent negative pressure permeability.		●●		●●	●●	●●

Based on WACKER guide formulation:
K = component

●● Excellent ● Good

CREATING TOMORROW'S SOLUTIONS

A Diverse Array of Products for Growing Markets

Our product portfolio ranges from silicones, binders and polymeric additives all the way up to bioengineered pharmaceutical actives. Rounding these out is hyperpure silicon for semiconductors and solar applications.

Innovations that Improve Quality of Life

Resource scarcity, climate change, urbanization: the challenges of our time demand new responses. In our search for solutions, we invest some 3.5% of our annual sales in research and development. With their emphasis on using energy efficiently and protecting the climate and our environment, our products are already improving quality of life for people all over the world.

Global Knowledge for Local Markets

When you work with WACKER, you have 100 years of chemistry expertise at your disposal, with access to the research findings and best practices of our experts throughout the world. Our knowledge base consists of a network of 22 technical centers, 13 training centers and our basic research center.

And most importantly: we are there wherever you need us – worldwide. Our local specialists know your markets and speak your language. Working with them, you will find innovative solutions that win over your customers and make you more competitive.

Follow us:
Find us on LinkedIn, YouTube and Twitter, and we'll keep you up to date on the latest and discuss current issues with you.

All figures are based on fiscal 2018.

Silicones and Polymers

3,200 specialty products from organic and inorganic chemistry

Global Market Leader

In dispersions and dispersible polymer powders based on vinyl acetate-ethylene (VAE), in building-protection silicones and in the production of cyclodextrin and cystein.

Globally Active

- Sites worldwide
- Headquartered in Munich
- 24 production sites in Europe, Asia and the Americas
- 22 technical centers
- 13 WACKER ACADEMY training centers
- 50 sales offices

Employees: 14,500

Total Sales

€4,98 billion

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