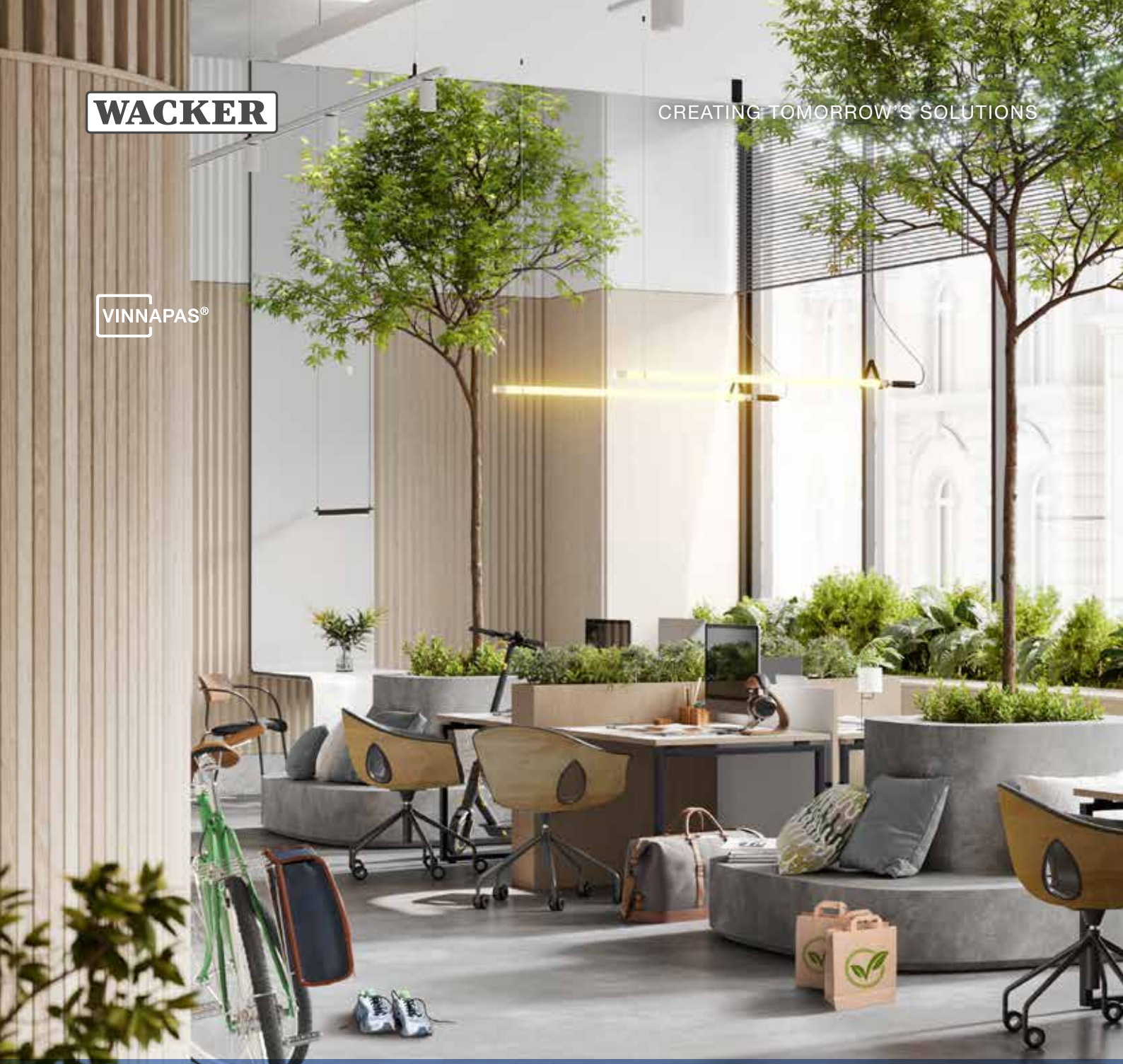
WACKER

CREATING TOMORROW'S SOLUTIONS

VINNAPAS®



ADHESIVES I POLYMER BINDERS I CIS

PRODUCT OVERVIEW VINNAPAS® DISPERSIONS

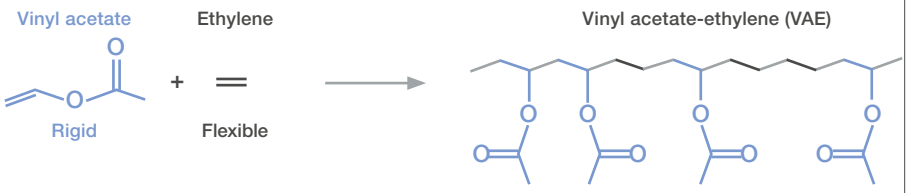
VINNAPAS® VAE –
THE HIGH-PERFORMANCE SOLUTION

Success in the adhesives market often depends on choosing the right binder. VINNAPAS® vinyl acetate-ethylene (VAE) technology offers outstanding benefits in terms of performance, safety and versatility.

VINNAPAS® VAE dispersions are water-based co- and terpolymers mainly based on vinyl acetate and ethylene as comonomers.

Ethylene contributes permanent flexibility to the VAE polymer. No external plasticizer is thus necessary in VAEs.

Two Monomers Creating Best-in-Class Performance



Polymer Properties Provided by Ethylene:

- Softness (T_g approx. -125 °C)
- Non-polar, hydrophobic
- Permanent flexibility
- High saponification resistance
- Form ideal copolymers with vinyl acetate

Vinyl Acetate:

- Hardness (T_g approx. 32 °C)
- Polar, hydrophilic
- Rigid

VAE Copolymer and Terpolymer Dispersion Properties:

VINNAPAS® VAE dispersions can be formulated into adhesives that provide outstanding benefits:

- Excellent adhesion to a wide variety of substrates
- High heat resistance
- Very fast setting
- Excellent machinability and re-emulsification properties
- Very good cost / performance ratio
- T_g range from approx. -35 °C to approx. 30 °C, depending on ethylene content

Diverse Applications

VINNAPAS® VAE dispersions can be formulated into adhesives for various applications:

- Paper packaging (e.g. food packaging, envelope manufacturing, film lamination onto paper)
- Wood (e.g. film lamination onto wood, 3D membrane pressing, EPI systems)
- Flooring installation (e.g. textile flooring, flexible coverings)
- Car interiors (e.g. door paneling)
- Tapes & labels

PRODUCT OVERVIEW

VINNAPAS® Product	Technical Data[1]								Product Benefit	Performance Attributes																								VINNAPAS® Product
										Paper Packaging										Wood to Wood					Film to Wood				Flooring Installation				Tapes & Labels			Car Interiors	
	Base Polymer [2]	Solids Content (DIN EN ISO 3252) (± 1%)	Viscosity BF 20 at 23 °C at 20 rpm [mPa s] (ISO 2555)	pH (ISO 976)	Glass Transition Temperature Midpoint [°C] (approx.)	Minimum Film-Forming Temperature (MFFT) (DIN ISO 2115) [°C] (approx.)	Film Surface	Stabilizing System[3,4]		Adhesion (for e.g. film to paper)	Cohesion / Heat Resistance	Setting Behavior	Roller / Wheel Application	Nozzle Application	Cleanability	Water Resistance	D3 (EN 204) ≥ 2 N/mm²	D4 (EN 204) ≥ 4 N/mm²	Watt 91 (EN 14257) [N/mm²] (approx.)	Low Wood Discoloration	Setting Behavior	Adhesion	Water Resistance	Heat Resistance	Setting Behavior	Workability	Overall Adhesion	Heat Resistance	Setting Behavior	Tack	Shear Resistance	Adhesion	Suitability	
VINNAPAS® Products Acrylate Technology																																		**VINNAPAS® Products VAE Technology (Copolymer and Terpolymers)**
VINNAPAS® AF 875	A	59 – 61	3,500 – 6,500	3.8 – 5.5	-60	0	Slightly tacky	ST	Ready-to-use polymer binder for pressure sensitive adhesive.																						●●●	●●	●●●	●●	**VINNAPAS® AF 875**
VINNAPAS® Products VAE Technology (Copolymer and Terpolymer)																																		**VINNAPAS® Products VAE Technology (Copolymer and Terpolymers)**
VINNAPAS® EAF 67	VAc-E-A	58 – 62	7,000 ± 2,500	4 – 5	-35	0	Tacky	ST	Low T_g grade for flooring adhesives or tapes & labels.	●●●	●	●	●	●	●	●					●●	●	●	●●	●●●	●●●	●●	●●●	●●●	●●	●●●	●●	●●●	**VINNAPAS® EAF 67**
VINNAPAS® EAF 68	VAc-E-A	58 – 61	7,000 ± 2,500	4 – 5	-35	0	Tacky	ST	Low T_g grade for flooring adhesives with excellent dimensional stability.	●●●	●	●	●	●	●	●					●●	●	●	●●	●●●	●●●	●●	●●●	●●	●●●	●●	●●	●●●	**VINNAPAS® EAF 68**
VINNAPAS® EF 8860	VAc-E	56 – 58	1,500 ± 1,000	4 – 5	-10	0	Slightly tacky	ST	Medium-soft binder for flooring adhesives with good plasticizer resistance and high cohesion. Water resistant glue line.	●●	●	●	●	●	●	●					●●●	●	●	●●	●●●	●●	●●●	●●						**VINNAPAS® EF 8860**
VINNAPAS® EP 1	VAc-E	49 – 51	9,000 ± 3,000	4 – 5	1	0	Slightly tacky	PVOH/ST	Good compatibility with PUD.	●●	●●	●●	●●●	●	●●●	●●●					●●	●●	●●	●●	●	●●	●●	●						**VINNAPAS® EP 1**
VINNAPAS® EP 11	VAc-E	49 – 51	5,000 ± 1,000	4 – 5	3	0	Slightly tacky	PVOH	Universal binder for paper packaging and high cohesion.	●●	●●	●●	●●●	●	●●●	●●					●●	●●	●●	●●	●	●●	●●●	●					●●	**VINNAPAS® EP 11**
VINNAPAS® EP 14	VAc-E	54 – 56	5,500 ± 1,500	4 – 5	3	0	Slightly tacky	PVOH	Universal binder for paper packaging applications / film-to-wood lamination.	●●	●●	●●	●●●	●	●●●	●●					●●	●●	●●	●●	●	●●	●●●	●						**VINNAPAS® EP 14**
VINNAPAS® EP 17	VAc-E	59 – 61	3,800 ± 1,000	4 – 5	3	0	Slightly tacky	PVOH/ST	Good compatibility with PUD.	●●	●●	●●	●●	●	●	●					●●	●	●●	●●	●	●●	●●●	●					●●●	**VINNAPAS® EP 17**
VINNAPAS® EP 400	VAc-E	54 – 56	2,400 ± 400	4 – 5	5	0	Slightly tacky	PVOH	Universal binder for paper packaging applications / film-to-wood lamination.	●●	●●	●●	●●●	●●	●●●	●					●●	●	●●	●●	●	●●	●●●	●						**VINNAPAS® EP 400**
VINNAPAS® EP 401	VAc-E	54 – 56	2,500 ± 800	4 – 5	-7	0	Slightly tacky	PVOH	Universal binder for paper packaging applications / film-to-wood lamination. Higher adhesion level compared to VINNAPAS® EP 400.	●●●	●●	●●●	●●●	●●	●●●	●					●●	●	●●	●●	●	●●	●●●	●						**VINNAPAS® EP 401**
VINNAPAS® EP 441	VAc-E	53 – 57	4,000 ± 1,000	4 – 5	5	0	Slightly tacky	PVOH	Universal binder for paper packaging applications / film-to-wood lamination. Especially suitable for nozzle (HHS) applications.	●●	●●	●●	●●●	●●●	●●●	●					●●	●	●●	●●	●	●●	●●●	●						**VINNAPAS® EP 441**
VINNAPAS® EP 8010	VAc-E	58 – 61	6,000 ± 2,000	4 – 5	-10	0	Slightly tacky	PVOH/ST	Excellent adhesion to various difficult-to-bond surfaces.	●●●	●●	●●●	●●	●	●●●	●●					●●●	●●	●●	●●	●	●●●	●●	●					●●●	**VINNAPAS® EP 8010**
VINNAPAS® EP 8041	VAc-E	51 – 55	4,000 – 10,000	4 – 6	-8	0	Slightly tacky	PVOH	Universal binder with low formaldehyde for paper packaging applications / film-to-wood lamination. Especially suitable for nozzle (HHS) applications with high adhesion level.	●●●	●●	●●	●●●	●●●	●●●	●					●●	●	●●	●●	●	●●	●●●	●						**VINNAPAS® EP 8041**
VINNAPAS® Products PVAc Technology																																		**VINNAPAS® Products PVAc Technology**
VINNAPAS® DP 500	VAc	48 – 52	35,000 ± 5,000	4.5 – 5.5	33	14	Tack-free	PVOH	Very low sedimentation, excellent plasticizer response.	●	●●●	●●	●●	●	●●●	●	No	No	5	●●●	●●●												**VINNAPAS® DP 500**
VINNAPAS® DP 600	VAc	58 – 62	35,000 ± 6,000	4 – 5.5	33	14	Tack-free	PVOH	Very low sedimentation, excellent plasticizer response.	●	●●●	●●	●●	●	●●●	●	No	No	5	●●●	●●●												**VINNAPAS® DP 600**
VINNAPAS® DPN 15	VAc	51 – 53	15,000 ± 3,000	2.5 – 3.5	28	5	Tack-free	PVOH	D3 1-component wood adhesive.								>3	No	>7	●	●●●												**VINNAPAS® DPN 15**
VINNAPAS® DPN 16	VAc	50 – 54	12,000 ± 2,000	2.5 – 3.5	28	5	Tack-free	PVOH	D3 1-component wood adhesive, reduced discoloration.								>3	No	>7	●●	●●●												**VINNAPAS® DPN 16**
VINNAPAS® DPN 18	VAc	42 – 44	10,000 – 20,000	2.5 – 3.5	28	5	Tack-free	PVOH	D3 1-component wood adhesive, longer open time.								Yes	No	>7	●	●●												**VINNAPAS® DPN 18**
VINNAPAS® DPN 47	VAc	48 – 52	18,000 ± 4,000	4.5 – 5.5	19	3	Tack-free	PVOH	D4 2-component wood adhesive.								Yes	Yes	>7	●	●●●												**VINNAPAS® DPN 47**
VINNAPAS® DPX 271	VAc	44 – 48	10,000 ± 4,000	5 – 7	30	5	Tack-free	PVOH	D3 1-component wood adhesive, low formaldehyde, discoloration-free.	●	●●●	●●	●	●	●●	●●	>3	No	5	●●●	●●●	●	●●	●●●	●●									**VINNAPAS® DPX 271**

1 These figures are intended as a guide only and should not be used in preparing specifications.
2 VAc = Vinyl acetate
A = Acrylic ester
E = Ethylene
3 PVOH = Polyvinyl alcohol
ST = Surfactant
4 All products produced without the use of APEO surfactants

Legend for performance attributes
●●● Excellent ●● High ● Medium

VINNAPAS® eco:
The majority of VINNAPAS® grades that contain vinyl acetate can be certified as VINNAPAS® eco according to the mass balance approach. For more information on the mass balance approach and available VINNAPAS® eco grades, please visit www.wacker.com.

YOUR QUALITY CHOICE – MADE EASY

Our VINNAPAS® dispersions are specially designed to address the continuously changing needs of the modern adhesives industry, offering up-to-date solutions for the latest end-user requirements and market trends.

VINNAPAS® dispersions set the industry benchmark in product quality, performance and reliability. With our product portfolio you benefit from:

- Consistently high quality
- 80 years' experience in vinyl acetate based dispersion technology
- Properties such as adhesion, heat resistance, bonding to a wide range of different substrates, fast setting speed, high wet tack, reliable machinability, and broad formulation possibilities

Technical Support

WACKER is one of the most research-intensive chemical corporations worldwide. Our VINNAPAS® grades for adhesives applications are produced in five manufacturing plants across Europe, the Americas, China and the Asia-Pacific region. To support adhesives manufacturers, we also operate dedicated state-of-the-art adhesives laboratories and technical centers around the globe, where we carry out extensive tests to develop formulations for new products or optimize those of existing products.

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