WACKER

CREATING TOMORROW'S SOLUTIONS

VINNAPAS®

VINNOL®

NEXIVA®

ADHESIVES I POLYMER BINDERS I GREATER CHINA

PRODUCT OVERVIEW VINNAPAS®/VINNOL® DISPERSIONS, NEXIVA® POWDER

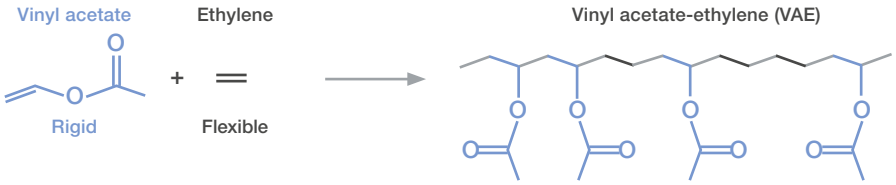
VINNAPAS® VAE –
THE HIGH-PERFORMANCE SOLUTION

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 for a wide range of adhesive applications:

- Paper packaging adhesives, for paper bags, folding cartons, envelopes, and books;
- Wood processing adhesives, for flat lamination, 3D lamination, and wood-to-wood bonding;
- Textile lamination adhesives, for fabric-to-fabric, fabric-to-sponge, and fabric-to-(synthetic) leather bonding;
- Specialized applications requiring low formaldehyde, low benzene series, and low residual monomers
- Adhesives for car interiors and flooring installation.

PRODUCT OVERVIEW

VINNAPAS® products	Technical data[1]							Product benefit	Recommended applications									VINNAPAS® products
									Paper packaging adhesives			Wood processing adhesives			Textile lamination adhesives	Car interiors adhesives	Flooring installation adhesives	
	Product source	Base polymer[2]	Solids content (DIN EN ISO 3251) [%]	Viscosity BF 20 (at 25 °C at 20 rpm) [mPa s] ISO 2555	pH (ISO 976)	Glass transition temperature onset point [°C] (approx.)	Minimum film-forming temperature (MFFT) (DIN ISO 2115) [°C] (approx)	Stabilizing system[3,4]	Paper (kraft paper/ cardboard)	Coating (ink/UV coating/ barrier coating)	Film (PVC/PET/OPP)	Flat lamination	3D lamination	Wood-to-wood bonding D3 (EN204)	Wood-to-wood bonding D4 (EN204)				
VINNAPAS® products VAE technology (copolymers and terpolymers)																		**VINNAPAS® products VAE technology (copolymers and terpolymers)**
VINNAPAS® EP 706K	China or Korea	VAc-E	54.5 – 56.5	4,400 – 5,400	4 – 6	0	0	PVOH	VINNAPAS® EP 706K offers excellent workability. Universal binder for paper packaging, wood processing and textile lamination adhesives.	●●	●	●	●		●		●	**VINNAPAS® EP 706K**
VINNAPAS® EP 707K	China or Korea	VAc-E	54.5 – 56.5	1,300 – 2,000	4 – 6	0	0	PVOH	Low viscosity with rapid setting speed and flexibility. Excellent elongation and water resistance. With its outstanding water resistance, it is widely used in paper packaging, wood processing and textile lamination adhesives.	●●	●	●	●		●	●●	●●	**VINNAPAS® EP 707K**
VINNAPAS® EP 708	China or Korea	VAc-E	54.5 – 56.5	6,000 – 7,500	4 – 6	0	0	PVOH	High viscosity grade of VINNAPAS® EP 708 provides excellent thickening response to plasticizers and solvents, and performs exceptionally well in textile lamination and flat lamination applications in wood processing.	●●	●	●	●●	●	●		●	**VINNAPAS® EP 708**
VINNAPAS® EP 712	China	VAc-E	53 – 55	5,000 – 7,000	4 – 6	0	0	PVOH	VINNAPAS® EP 712 offers good water resistance and is widely used in textile lamination.	●●	●	●	●		●		●●	**VINNAPAS® EP 712**
VINNAPAS® EP 729	China	VAc-E	54.5 – 56.5	8,500 – 12,000	4 – 5.5	0	0	PVOH	VINNAPAS® EP 729 with high viscosity offers excellent water resistance and is widely used in textile lamination. It features more newtonian behavior, making it suitable for high speed roller application processes.	●●●	●	●	●		●		●●●	**VINNAPAS® EP 729**
VINNAPAS® EP 760	China	VAc-E	59.5 – 61.5	2,000 – 3,000	4 – 6	0	0	PVOH	High solids content VAE with an excellent balance of cohesion and adhesion. Stronger bond and faster setting compared to standard grades.	●●●	●	●	●		●●		●●	**VINNAPAS® EP 760**
VINNAPAS® EP 749	China	VAc-E	54 – 56	1,700 – 4,400	3 – 6	- 11**	0	PVOH	Good adhesion to difficult-to-bond substrates. Suitable for bonding printed or coated paper and PET film.	●●●	●●	●●	●	●●	●●		●●	**VINNAPAS® EP 749**
VINNAPAS® EP 3588	China	VAc-E	62.5 – 64	200 – 800	6 – 7.5	4	0	PVOH/ST	The low viscosity and high solids content VAE offers higher loading filler. Good compatible with natural latex, acrylics, and other dispersions. Fast drying and excellent water resistance. Especially suitable for wood-to-wood bonding.	●●●	●●	●		●●	●●		●●	**VINNAPAS® EP 3588**
VINNAPAS® EP 710	China	VAc-E	54.5 – 56.5	4,400 – 5,400	4 – 6	0	0	PVOH	Lower levels of formaldehyde, benzene series, and residual monomers than standard VAE. Designed for specialized applications. Suitable for medium-speed roller and nozzle applications.	●●	●	●	●		●			**VINNAPAS® EP 710**
VINNAPAS® EP 756	China	VAc-E	54.5 – 56.5	600 – 2,000	4.5 – 5.5	0	0	PVOH	Low viscosity VAE with lower levels of formaldehyde, benzene series, and residual monomers than standard VAE. Designed for specialized applications and suitable for high-speed nozzle applications.	●●	●	●	●		●		●●	**VINNAPAS® EP 756**
VINNAPAS® EP 758	China	VAc-E	59.5 – 61.5	3,500 – 5,500	3.5 – 5.5	17**	4	PVOH	High solids content and good newtonian behavior. Lower levels of formaldehyde, benzene series, and residual monomers than standard VAE. Designed for specialized applications and suitable for high-speed roller applications.	●●●	●	●		●●				**VINNAPAS® EP 758**
VINNAPAS® EP 701K	China	VAc-E	54 – 56	2,000 – 4,000	4 – 6	- 10**	0	PVOH	Good adhesion to difficult-to-bond substrates. Suitable for bonding printed or coated paper and PET film. Lower levels of formaldehyde, benzene series, and residual monomers than standard VAE. Designed for specialized applications.	●●●	●●	●●	●	●●				**VINNAPAS® EP 701K**
VINNAPAS® EP 921	China	VAc-E	55 – 57	800 – 2,500	4 – 6	- 22	0	PVOH/ST	Provides excellent leveling, wetting, and adhesion on various difficult-to-bond substrates. Balance heat resistance and adhesion, APEO-free.	●●	●●●	●●●					●●	**VINNAPAS® EP 921**
VINNAPAS® EP 705A	Korea	VAc-E	54 – 56	1,900 – 2,800	4 – 6	0	0	PVOH	Universal binder for paper packaging and wood processing adhesives, featuring fast setting in paper packaging application.	●●●	●	●		●				**VINNAPAS® EP 705A**
VINNAPAS® EP 724	Korea	VAc-E	54 – 56	1,500 – 2,500	4 – 6	19	4	PVOH	Excellent tensile and cohesion strength and heat resistance. Blending with PVAc homopolymers yields better initial bonding strength, setting speed and water resistance.					●				**VINNAPAS® EP 724**
VINNAPAS® EP 736	Korea	VAc-E	59 – 61	3,000 – 6,000	5 – 8	10	2	PVOH	Modified self-crosslinking technology with no formaldehyde emission and high solids content. Suitable for water-resistant textile lamination and 2C D4 wood processing adhesives.					●	●●			**VINNAPAS® EP 736**
VINNAPAS® EP 645	Korea	VAc-E	54 – 56	5,000 – 10,000	4 – 6	5	0	PVOH	Good compatibility with PUD and acrylic. Modified VAE for difficult-to-bond substrates, with good wet tack, heat resistance, setting speed and machinability.	●●●	●●	●		●●●		●●●		**VINNAPAS® EP 645**
VINNAPAS® EP 6420	Korea	VAc-E	54 – 56	3,500 – 5,500	4 – 6	2**	0	PVOH	Universal binder for paper packaging and wood processing adhesives. Especially suitable for nozzle application.	●●●	●	●						**VINNAPAS® EP 6420**
VINNAPAS® EP 9200	U.S.	VAc-E	54 – 56	800 – 2,000	4.2 – 5.2	- 20	0	PVOH	A carboxylated VAE. Excellent levelling, wetting ability and adhesion to various difficult-to-bond substrates. APEO-free.	●●	●●●	●●●					●●	**VINNAPAS® EP 9200**
VINNAPAS® EP 6300	U.S.	VAc-E	62 – 64	600 – 1,500	4.3 – 5.3	0	0	PVOH	High solids content and carboxyl functional groups give it unique physical properties, such as strong adhesion to metals and films, broad formulation flexibility, and easy solubility in alkaline aqueous solutions. The high solids content enables a high curing rate.	●●●	●	●●●						**VINNAPAS® EP 6300**
VINNAPAS® EP 7000	U.S.	VAc-E	69.5 – 71.5	1,200 – 2,700	4.5 – 5.5	- 3	0	PVOH	Highest solids content VAE with fastest setting speed. High filler loading and good adhesion.	●●●	●	●						**VINNAPAS® EP 7000**
VINNAPAS® EAF 68	Germany	VAc-E-A	58 – 61	4,500 – 9,500*	4 – 5	- 35**	0	ST	A pressure-sensitive VAE with high cohesion designed specifically for high-shear-resistant applications. It provides strong adhesion to difficult-to-bond substrates such as OPP, PET, and UV-coated surfaces.	●●	●●●	●●●					●●●	**VINNAPAS® EAF 68**
VINNAPAS® products PVAc technology																		**VINNAPAS® products PVAc technology**
VINNAPAS® DPN 15	Germany	VAc	51 – 53	12,000 – 18,000*	2.5 – 3.5	28**	5	PVOH	D3 1C wood processing adhesives.					●●●				**VINNAPAS® DPN 15**
VINNAPAS® DPX 271	Germany	VAc	44 – 48	6,000 – 14,000*	5 – 7	30**	5	PVOH	D3 1C wood processing adhesives, low formaldehyde, anti-yellowing.					●●●				**VINNAPAS® DPX 271**
VINNAPAS®/VINNOL® vinyl chloride-ethylene copolymers VC technology																		**VINNAPAS®/VINNOL® vinyl chloride-ethylene copolymers VC technology**
VINNAPAS® CEP 678	Korea	VAc-E-VC	48 – 51	10 – 1,000	5 – 7	15	15	PVOH/ST	Excellent water resistance. Suitable for D4 2C wood-to-wood bonding adhesives. Outstanding flame-retardant performance and good compatibility with various flame-retardant raw materials.					●	●●●			**VINNAPAS® CEP 678**
VINNOL® vinyl chloride CEN 2752	Germany	VC-E	49 – 51	50 – 350*	5 – 7.5	10**	5	ST	D4 2C wood processing adhesives.					●	●●●			**VINNOL® vinyl chloride CEN 2752**

[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
VC = Vinyl chloride

[3] PVOH = Polyvinyl alcohol
ST = Surfactant

[4] All products produced without the use of APEO surfactants.

* Viscosity BF 20 at 23 °C at 20 rpm [mPa·s]
** Midpoint

● Suitable
●● Recommended
●●● Highly recommended

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.

NEXIVA® 210 dispersible polymer powders can be used to formulate 2C (EPI) wood processing adhesives. Compared with conventional water-based adhesive emulsions, NEXIVA® 210 eliminates transport and storage issues at low temperatures, reduces the risk of bacterial contamination in humid environments, and simplifies processing – only water needs to be added. It also provides superior bonding strength and water resistance.

NEXIVA®	Product source	Base polymer	Solids content (DIN EN ISO 3251) (±1) %	Ash content (%)	Bulk density (kg/m³)	Particle size	Protective colloid	Minimum film-forming temperature (MFFT) (DIN ISO 2115) [°C] (approx.)	Glass transition temperature onset point [°C] (approx.)	Product benefit
NEXIVA® 210	China	VAc-E	98	15	475 – 625	No more than 4% of the particles are larger than 400 µm.	Polyvinyl alcohol	1	15	High-performance dispersible polymer powders for adhesives, designed for D4 2C wood processing adhesive

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