

# VINNAPAS® EP1400

## Product description

VINNAPAS® EP1400 is a poly(vinyl alcohol) stabilized vinyl acetate-ethylene copolymer dispersion with a glass transition temperature (T<sub>g</sub>) of 0 °C. It was developed as a high performance, cost competitive base polymer dispersion for formulating a variety of water borne adhesives to replace:

- Plasticized vinyl-acetate homopolymer packaging adhesives
- High wet tack, low solids poly(vinyl alcohol) or dextrin/starch based adhesives
- Conventional non-contact extrusion applied adhesive systems

## Properties

VINNAPAS® EP1400 is a base polymer dispersion for formulating water borne adhesives. It has an excellent balance of wet tack, speed of set, adhesion, and heat resistance. It is compatible with a wide variety of formulating additives. It has a high thickening response to plasticizer. The dried adhesive bonds are resistant to water exposure. The low solids provides a long open time with good wet tack. The low T<sub>g</sub> of the dried film provides excellent cold temperature flexibility. This dispersion offers clean machining, easy clean up and is suitable for a variety of roll, extruder, and spray applications. VINNAPAS® EP1400 can be formulated into adhesive systems designed especially for non-contact extrusion machine applications. The total free residual vinyl acetate monomer content is less than 1,000 ppm. VINNAPAS® EP1400 is produced without formaldehyde containing ingredients.

The dry film is tack-free and heat-sealable. The backbone of the polymer is internally flexibilized to give the dried adhesive film high tensile strength and flexibility. This allows adhesives to be formulated that continue to perform with fluctuations in temperature and humidity. This dispersion has excellent heat resistance which, is much greater than that exhibited by other plasticized vinyl acetate, vinyl acetate-maleate and vinyl acetate-acrylate copolymers with similar glass transition temperatures. The adhesive strength is excellent after aging, and it exhibits excellent resistance to plasticizer migration.

## Application

VINNAPAS® EP1400 can be used to bond a variety of substrates including but not limited to coated and uncoated paper, cellulose acetate, polystyrene, poly(vinyl chloride) (PVC), and poly(vinylidene chloride). It is recommended for use in high-speed packaging and converting applications where rapid setting speeds, good machining and easy-clean up properties are required. The long open time helps to prevent premature drying under conditions of prolonged exposure to air especially on large diameter applicator rolls and non contact extrusion nozzles. The level of ethylene in the polymer acts as an internal plasticizer which provides flexibility and reduces or eliminates the need for plasticizer in many applications. Due to the low T<sub>g</sub>, VINNAPAS® EP1400 continues to form a film at low temperatures and can be used in the laminating of cold substrates while still maintaining adhesion and heat resistance.

## Processing

VINNAPAS® EP1400 can be compounded with typical plasticizers, solvents, fillers, and thickeners that are used for water borne packaging adhesives and other poly(vinyl acetate)-based adhesives. It is compatible with other poly(vinyl alcohol) and surfactant stabilized vinyl acetate-based dispersions and acrylic copolymers. This dispersion can be compounded with poly(vinyl alcohol) to create a more water sensitive adhesive.

## Storage

When VINNAPAS® EP1400 is stored in tanks, proper storage conditions must be maintained. If stored in the original, unopened containers at cool (below 30 °C), but frost-free temperatures VINNAPAS® EP1400 has a shelf life of 6 months. Iron or galvanized-iron equipment and containers are not recommended because the dispersion is slightly acidic. Corrosion may result in discoloration of the dispersion or its blends when further processed. Therefore the use of containers and equipment made of ceramics, rubberized or enameled materials, appropriately finished stainless steel, or plastic (e.g. rigid PVC, polyethylene or polyester resin) is recommended.

**Preservation for Transport, Storage and further Processing**

VINNAPAS® EP1400 is adequately preserved during transportation and storage if kept in the original, unopened containers. However, if it is transferred to storage tanks, the dispersion should be protected against microbial attack by adding a suitable preservative package.

To maintain proper storage conditions appropriate measures should also be taken to ensure cleanliness of the tanks and piping. In a storage tank in which VINNAPAS® EP1400 is not stirred, it is advisable to contact your biocide representative/supplier. Proper procedures must be set up in order to prevent microbial attack between necessary periodic tank cleaning and sanitization. These procedures will vary, since loading and unloading practices in each storage situation will differ slightly.

Finished products manufactured from polymer dispersions usually also require preservation. The type and scope of preservation will depend on the raw materials used and the anticipated sources of contamination. The compatibility with other components and the efficacy of the preservative should always be tested in the respective formulation.

Preservative manufacturers will be able to advise you about the type and dosage of preservative required.

**Additional information**

If VINNAPAS® EP1400 is used in applications other than those mentioned, the choice, processing and use of VINNAPAS® EP1400 is the sole responsibility of the purchaser. All legal and other regulations must be complied with.

For questions concerning food contact status according to chapter 21 CFR (US FDA) and German BfR, please contact:

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**Safety notes**

Comprehensive instructions are given in the corresponding Material Safety Data Sheets. They are available on request from WACKER sales offices or may be printed via WACKER web site [www.wacker.com/vinnapas](http://www.wacker.com/vinnapas).

**Product data**

Specification data	Inspection Method	Value
Solids content	specific method	47.0 - 50.0 %
Viscosity, dynamic at 25 °C	specific method	1700 - 2400 mPa.s
pH-Value	specific method	5.0 - 6.0
Grit 100 Mesh	specific method	max. 50 ppm

Typical general characteristics	Inspection Method	Value
Density	specific method	1.05 g/cm <sup>3</sup>
Wet tack	specific method	high
Mechanical stability	specific method	excellent
Thickening response	specific method	high
Frost resistance	specific method	protect from freezing
Glass transition temperature DSC	specific method	approx. 0 °C
Water resistance	specific method	very good
Film clarity	specific method	slightly hazy
Dry tack	specific method	none
Flexibility	specific method	excellent

These figures are only intended as a guide and should not be used in preparing specifications.

The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose.

The management system has been certified according to DIN EN ISO 9001 and DIN EN ISO 14001

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For technical, quality, or product safety questions, please contact:

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