

# VINNOL® H 5/50 A

VINYL CHLORIDE COPOLYMER, CAS NO. 2586-48-0

## Product description

VINNOL® H 5/50 A is a terpolymer of vinyl chloride (VC), vinyl acetate (VAc) and vinyl alcohol (VOH). Its main use is as a binder for surface coating compounds and printing inks.

## Properties

VINNOL® H 5/50 A is a thermoplastic, physically drying, binder that forms a film when the solvent contained in the formulation has evaporated.

Like all VC copolymers, VINNOL® H 5/50 A is characterized by excellent toughness, permanent flexibility, abrasion resistance, low swelling in the presence of water, and low gas permeability. Films of VINNOL® H 5/50 A are highly resistant to water. They also show excellent resistance to oil, grease, diluted aqueous acids, alkaline and saline solutions. VINNOL® H 5/50 A is resistant to aliphatic hydrocarbons, such as white spirit, and to alcohols.

## Special features

VINNOL® H 5/50 A contains approx. 2% free hydroxyl groups and can therefore also be used in reactive coating and ink systems. For example it may be crosslinked with isocyanates, epoxy or melamine resins.

## Application

Typical applications for VINNOL® H 5/50 A:

- Primers
- Printing inks
- Intermediate coatings
- Two-pack coating systems
- Baking finishes
- Adhesives

## Processing

VINNOL® H 5/50 A is generally used in dissolved form.

Ketones, esters and chlorinated hydrocarbons are the solvents most commonly used for VINNOL® H 5/50 A. Ketones are particularly good solvents for vinyl chloride copolymers; VINNOL® H 5/50 A dissolves

rapidly, for instance, in acetone, methyl ethyl ketone, methyl isobutyl ketone and cyclohexanone. Esters, such as ethyl and butyl acetate 98/100, are somewhat less efficient solvents than ketones and lead to slightly hazy solutions. This can be avoided by combining them with ketones as cosolvent.

Aromatic hydrocarbons and chlorinated hydrocarbons cause them to swell to varying extents.

Alcohols, aliphatic hydrocarbons and aromatic solvents do not dissolve VINNOL® surface coating resins.

By virtue of their chemical composition, VINNOL® surface coating resins containing hydroxyl groups produce highly flexible films. The flexibility of VINNOL® H 5/50 A can be increased further by adding monomeric and polymeric plasticizers such as phthalates, adipates, sebacates, citrates, phosphates, epoxides and chlorinated paraffins.

VINNOL® H 5/50 A is fully compatible with all other VINNOL® surface coating resins. It also combines well with many acrylic polymers and ketone resins, as well as with some polyurethane and alkyd resins. Nitrocellulose, polyvinyl acetates and polyvinyl butyrals are in general incompatible with VINNOL® H 5/50 A. We recommend always checking the compatibility of VINNOL® H 5/50 A with the polymer in question.

VINNOL® H 5/50 A shows good compatibility with the pigments and fillers normally used in the paint and printing ink industry. In stoving finishes, care must be taken when using pigments containing zinc or cadmium because these catalyze the decomposition of VC copolymers at elevated temperatures. The same applies to iron-oxide pigments. Preliminary tests are essential, since there is a danger of discoloration.

Despite good inherent stability, it is necessary for some applications to stabilize coatings based on VINNOL® H 5/50 A against heat and / or UV light. Epoxy compounds often suffice to stabilize these coatings against low thermal impact. Where higher temperatures are involved, it is advisable to use organo-tin stabilizers.

A combination of epoxy stabilizers and organo-tin compounds produces synergistic effects.

Outdoor applications require the additional use of UV stabilizers along with thermal stabilizers optimized for these conditions, such as sulfur free tin stabilizers.

When metal containing stabilizers are used, there must

be taken care in two-pack systems regarding reduction of the pot life.

VINNOL® H 5/50 A can be processed according to all methods commonly used in the paints and printing ink industry.

To avoid risk of discoloration, contact with iron should be avoided both during preparation of the solution and during subsequent storage of the product. VINNOL® - based surface coating compounds should be stored in coated containers.

### **Storage**

Store VINNOL® H 5/50 A under dry conditions and at room temperature (below 25 °C). Under these conditions, the product has a shelf life of at least 12 months, from the delivery date. If the material is kept beyond the recommended shelf life, it is not necessarily unusable, but the user should perform a quality control on the properties relevant to the application. The properties determined in our pre-release quality control may change during storage, depending on storage conditions, and deviate from the specification.

### **Packaging**

VINNOL® H 5/50 A is packed in 25-kg, coated three-ply paper bags containing a polyethylene liner.

### **Additional information**

The composition of VINNOL® H 5/50 A is in compliance with FDA 21 CFR §175.105 and § 175.300.

For further information please contact our technical service.

If VINNOL® H 5/50 A is used in applications other than those recommended, the choice, processing and use of VINNOL® H 5/50 A is the sole responsibility of the purchaser. In connection with this, all legal or other regulations should be considered.

### **Safety notes**

Detailed safety information is contained in each Material Safety Data Sheet, which can be obtained from our sales offices.

**Product data**

Specification data	Inspection Method	Value
Chlorine content	specific method	50,0 - 53,0 wt. %
K-value	DIN EN ISO 1628-2	50 - 52
Volatiles	specific method	< 1 wt. %
Viscosity <sup>1)</sup> (20% solids in MEK)	DIN 53015 (20°C)	80 - 120 mPa*s

Typical general characteristics	Inspection Method	Value
Efflux time (20% in MEK)	DIN EN ISO 2431 (4 mm)	approx. 85 s
Supply form	Visual	white powder
Particle size	specific method	< 1,0 mm
Bulk density	DIN EN ISO 60	approx. 750 kg/m <sup>3</sup>
Density	DIN 66137-2	1,39 g/cm <sup>3</sup>
Glass transition temperature	DSC (DIN 53765 / ISO 11357-5)	approx. 74 °C
Molecular weight (M <sub>n</sub> )	SEC, PS-Standard	60000 - 80000

<sup>1)</sup> after dissolving at 50°C

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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