

Mowital® B

Technical Data Sheet

Characteristics

Polyvinyl butyral (PVB) grades with different molecular weights and degrees of acetalisation.

Recommended uses

Temporary binder for ceramics. Binder for coatings, adhesion promotion, corrosion protection primers, shop primers, wash primers, stoving enamels, varnishes and lacquers for different substrates. Binder for printing inks.

Co-binder for powder coatings. Binder or raw material for textile printing and non-woven. Wetting agent for grindings, esp. of organic pigments. Adhesives, pressure-sensitive adhesives and hotmelts.

Form supplied

Fine-grained and free-flowing white powder.

Specification data

The data are determined by our quality control for each lot prior to release.

Grade	Non-volatile content ¹	Content of polyvinyl alcohol ²	Content of polyvinyl acetate ³	Dynamic viscosity ^{4,5}
	wt-%	wt-%	wt-%	mPa · s
Mowital® B 14 S	≥ 97,5	14–18	5–8	9–13
Mowital® B 16 H	≥ 97,5	18–21	1–4	14–20
Mowital® B 20 H	≥ 97,5	18–21	1–4	20–30
Mowital® B 30 T	≥ 97,5	24–27	1–4	30–55
Mowital® B 30 H	≥ 97,5	18–21	1–4	35–60
Mowital® B 30 HH	≥ 97,5	11–14	1–4	35–60
Mowital® B 45 H	≥ 97,5	18–21	1–4	60–90
Mowital® B 60 T	≥ 97,5	24–27	1–4	180–260
Mowital® B 60 H	≥ 97,5	18–21	1–4	160–260
Mowital® B 60 HH	≥ 97,5	12–16	1–4	120–280
Mowital® B 75 H	≥ 97,5	18–21	0–4	60–100 ⁶

1) Kuraray method ref. DIN EN ISO 3251:2019-09

2) Kuraray method ref. DIN EN ISO 4629-1:2016-12

3) Kuraray method ref. DIN EN ISO 3681:2019-03

4) Kuraray method ref. DIN 53015:2019-06, at 20 °C

5) as 10 % solution in ethanol containing 5 % H₂O

6) as 5 % solution in ethanol containing 5 % H₂O

Additional data

These data are used solely to describe the product. They are not subject to constant monitoring or part of the specification.

Glass transition temperature

The glass transition temperature is determined according to the following standard: DIN EN ISO 11357-1:2017-02. The **Mowital**® B grades have average values in a range of 60–73 °C.

Moisture absorption

Moisture absorption is determined according to the Kuraray method following standard: DIN EN ISO 3251:2019-09. When applying the standard climate (23 °C / 50 % r. h.), the **Mowital**® B grades show average values in a range of 0,5–1,5 %.

Bulk density

The bulk density is determined according to the Kuraray method, which refers to DIN EN 543:2003-08. The **Mowital**® B grades have average values in a range of 200–350 g/l.

Nomenclature

The tradename **Mowital**® is followed by a capital B stating the butyraldehyde used. The numbers refer to the degree of polymerisation, the higher the number the higher the degree of polymerisation (viscosity). The suffixes T, H, S and HH indicate the degree of acetalisation (T being the lowest and HH being the highest).

PROPERTIES AND USES

The **Mowital**® grades are thermoplastic polyvinyl butyral resins. The properties of the grades are mainly determined by molecular weight and degree of acetalisation. **Mowital**® can be processed thermoplastically or in solution of organic solvents.

Mowital® grades are soluble in a broad variety of organic solvents. They show good compatibility with plasticisers and other resins. The grades are able to cross-link with other resins such as phenolic, epoxy and melamine resins.

The network density may be adjusted depending on the degree of residual OH-groups which is determined by the degree of acetalisation (see stoving enamels).

Mowital® films are resistant to light and heat-sealable at temperatures above 120 °C. Toughness and elasticity are influenced by their molecular weight. Water resistance and solubility in non-polar solvents mainly depend on the degree of acetalisation. **Mowital**® HH grades show the highest water resistance and best solubility in non-polar solvents such as toluene. Guided recipes can be provided on demand for different applications.

Temporary binder for ceramics

Mowital® is an excellent binder for the production of ceramics and ceramic tape cast materials. It shows remarkably good strength and flexibility of the ceramic tapes. **Mowital**® provides good dimensional stability and decomposes cleanly during sintering.

Stoving enamels

Due to their medium to high content of hydroxyl groups **Mowital**® grades are particularly suitable for cross-linking with phenol formaldehyde, epoxy and melamine resins, respectively.

In stoving enamels the **Mowital**® content should be between 10 and 40 % based on total binder content. Generally, stoving conditions are temperatures between 160 and 200 °C for 10 to 20 minutes. In the case of multi-layer coatings the first layer should not be fully stoved before application of the second layer in order to avoid adhesion faults of the succeeding coating.

Mowital® H grades provide better plasticising properties in above mentioned binder combinations. However, they are less cross-linkable than T grades due to the lower number of non-acetalised OH-groups.

Shop and wash primers

In combination with orthophosphoric acid **Mowital**® H and HH grades are generally used to manufacture shop and wash primers (1K and 2K primers). The films adhere extremely well to steel, iron, zinc, aluminum and other metals.

To achieve further improvement in anti-corrosion protection as well as adhesion **Mowital**® can be combined with low-molecular weight phenolic, epoxy or melamine resins as well as corrosion protection pigments. The good anchorage of the primer on metal is caused by a binder/pigment/orthophosphoric acid/metal complex. In 1K primers the orthophosphoric acid is added to the primer during its manufacture. The acid amount used should not exceed 5%. In the case of 2K primers the acid is supplied in a second container separately. 2K primers contain higher acid amounts. However, if the level exceeds 10 % the coating becomes less water resistant. Upon mixing the pot life of the 2K primer is limited to a few hours.

Printing inks

Low-viscosity grades are suitable binders for flexographic and gravure printing inks. They exhibit very good adhesion to substrates like polyolefins, metals, cellulose acetate, polyester, cellophane, polyamide, and polystyrene films. If necessary, the adhesion to problematic substrates like OPP foil can be improved by way of coronal discharge and chemical adhesion promoters. **Mowital**® show an excellent pigment wetting property. These grades are suitable for the manufacture of pigment concentrates and preparations.

Printing inks based on **Mowital**® exhibit low solvent retention, and good flow, as well as good resistance to water. **Mowital**® can be used as a sole binder or in combination with alcohol-soluble nitro-cellulose or other resins, like ketone condensation resins, alkyds, maleic resins, and some natural polymers.

Strippable lacquers

Although **Mowital**® H grades exhibit very good adhesion properties they may also be used successfully as strippable lacquers. Strippability has to be adjusted using common additives and will retain for several months.

Foil lacquers

Mowital® H grades are specially suitable binders for lacquers on aluminum, tin, brass, lead and steel foils. With a dry film thickness of 2 to 10 µm the films have a very good flexibility. Their adhesive strength can be improved by stoving at temperatures of up to 140 °C. If necessary, gloss and flexibility can be improved by addition of plasticisers.

Adhesives and hotmelts

Owing to the excellent adhesion of **Mowital**® to glass and metals, it is used to bond or laminate these materials. It may also be employed for binding other polar substrates. **Mowital**® can be applied in solution or as a part of hotmelt.

For hotmelts **Mowital**® is compounded in heated kneaders or extruders with plasticisers and adequate additives. These compounds are applied by heated rollers, nozzles or spray guns on to one of the substrates and subsequently submitted applying heat and pressure.

Preparation of solutions

Mowital® can be dissolved in single solvents. To obtain low solution viscosities it is recommended to dissolve **Mowital**® in solvent mixtures (e.g. 1:1 mixture of ethanol and toluene). **Mowital**® is not soluble in water. However, a water content of up to 10 % in the solvent mixture is possible and can be used to influence solution viscosity. The viscosity depends on the solvent (e.g. increase in ethanolic solution) and must be tested in advance.

To dissolve **Mowital**®, while low to medium stirring speed of the solvent, **Mowital**® is added in portions at ambient temperature. This ensures good dispersion of **Mowital**® powder in the solvent and avoid dusting. Later the the stirring speed can be increased. Sometimes heat may be necessary for dissolving **Mowital**®. In this case do not apply heat until **Mowital**® is wetted to avoid agglomeration.

For preparation of a solution with mixed solvents first add **Mowital**® to the solvent which does not dissolve **Mowital**® alone (e.g. aromatic solvent) in order to form a slurry. Then add the alcoholic solvent which normally dissolves **Mowital**® best.

The final solution viscosity as well as the speed of dissolution depend on the used solvent, the temperature and the stirring speed.

Overpaintability

Virtually all commonly used paints adhere to hardened coatings of **Mowital**® based primers. Problems may be encountered using some special nitro-cellulose or 2-component epoxy resin paints.

Storage

Mowital® B grades can be stored in its original packaging under dry and cool conditions for at least 12 months after delivery date.

Precautions

Static electricity has to be avoided applying the appropriate safety measures while handling **Mowital**® as well as organic solvents.

Food contact status

The use of **Mowital**® is sanctioned by: The (EU) regulation 1935/2004 and No. 10/2011 – all monomers and starting sub-stances authorised by listing in Annex I.

As well as Council of Europe, Resolution AP 96(5) on surface coatings intended to come into contact with foodstuffs – all monomers and starting substances authorised by listing in appendix 2, list 1. US Food and Drug Administration 21CFR § 175.105 Adhesives, § 175.300 Resinous and polymeric coatings, § 176.170 Components of paper and paperboard in contact with aqueous and fatty foods, § 176.180 Components of paper and paperboard in contact with dry food.

Industrial safety and environmental protection

Not classified as a dangerous substance or preparation according to the current criteria of chemical legislation, or of the CLP regulation EU Directives (1272/2008).

A safety data sheet is available on our homepage www.mowital.com and is updated on a regular base.

Waste disposal

In accordance with current regulations and/or after consultation with site operator and/or with the responsible authorities **Mowital**® may be taken to waste disposal sites or incineration plants.

This information is based on our present state of knowledge and is intended to provide general notes on our products and their uses. It should therefore not be construed as guaranteeing specific properties of the products described or their suitability for a particular application. Any existing industrial property rights must be observed. The quality of our products is subject to our General Conditions of Sale. June 2022

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