

Bayhydrol® UV 2689/1

Characterization

Anionic, UV-curable polyurethane dispersion.

Bayhydrol® UV 2689/1 is used in the formulation of industrial waterborne UV clear and pigmented coatings. Main applications are plastic coatings (e.g. mobile phones) and wood coatings.

Before UV curing the surface of dried films is soft and slightly tacky. After UV-cure the coatings are hard with high chemical and mechanical resistance. The product is suitable to achieve high gloss coatings.

Form supplied

Approx. 42 % solids dispersion in water

Specification

Property	Value	Unit of measurement	Method
Non-volatile content (1 g/1 h/125 °C, convection oven)	40.0 - 44.0	% by wt.	DIN EN ISO 3251
Viscosity 23 °C, D=40s-1	< 1000	mPa.s	M014-ISO 3219/A.3
pH	7.0 - 8.5		DIN ISO 976

Other data*

Property	Value	Unit of measurement	Method
Pendulum hardness	190	s	DIN 53157 (König)
Pencil hardness	> 1 H		DIN EN 13523-4
Double rubs acetone (10)	Unchanged		
Double rubs ethanol (50)	Unchanged		
Double rubs petrol (50)	Unchanged		

Formulation [% by weight]

- 97.0 Bayhydrol® UV 2689/1
- 2.0 Irgacure® 127 (30% by weight solids in acetone)
- 1.0 Byk® 348
- Draw-down on glass 120 µm wet film thickness
- Drying 10 min RT, 5 min 60 °C
- UV cure 1500 mJ/cm² mercury lamp

*These values provide general information and are not part of the product specification.

Bayhydrol[®] UV 2689/1

Solubility / thinnability

Bayhydrol[®] UV 2689/1 can be thinned with water.

Compatibility

The dispersion should be formulated and applied at pH between 6.7 and 9.0. The stability of the product outside this pH range is very limited. In general, the product is compatible with many other dispersions, including UV-curing dispersions. However, compatibility must be tested in each case. Additions of solvent, which may be necessary as an additive, are generally unproblematic. Addition of UV monomers (i.e. low molecular weight acrylates) is possible for certain types of monomers but must be tested in each case as a negative influence on viscosity and storage stability is possible.

Properties / Applications

Bayhydrol[®] UV 2689/1 is used for the formulation of waterborne UV coatings, in particular for plastic applications. The addition of 1.0 to 2.5 wt.-% photoinitiator relative to binder has proven effective for initiation.

We achieved good results with Irgacure[®] 500, Irgacure[®] 127, Irgacure[®] 819 DW (Ciba) and Esacure[®] KIP 100F (Lamberti). Viscosity is set by the addition of polyurethane thickeners for clear coats or acrylic thickeners for metallic effect coatings.

As the dispersion has a relatively high surface tension the formulation should always contain a wetting agent, e.g. BYK[®] 348 (BYK) to avoid surface defects. Matting agents and additives can be dispersed directly into the formulation using a dissolver. Bayhydrol[®] UV 2689/1 can be easily matted using common matting agents. The formulation of metallic effect coatings using suitable metallic pigments is also possible. The product can also be combined with Bayhydrol[®] or other hardeners to formulate "dual cure" waterborne UV coatings.

After evaporation of the water and before UV-cure, the coatings are soft and slightly tacky. Water-free coatings can be cured with suitable UV-curing equipment at a line speed of typically 5 to 10 m/min per 80 W/cm lamp. To achieve the best film properties the coating temperature should be higher than 60 °C when entering the UV zone. Care has to be taken if temperature sensitive materials are cured in this way. During UV curing a further temperature increase of 20 to 60 °C is possible depending on conditions.

UV curing yields surfaces with high hardness, very good mechanical strength and excellent chemical resistance especially against cosmetics.



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Storage

- Storage in original sealed Covestro container.
- Recommended storage temperature: 5 - 30 °C.
- Protect from frost, intense radiation (light, UV), heat and foreign material.

General information: The product is sensitive to frost. Freezing will damage the product irreversibly. Prolonged storage at higher temperatures may result in an increase of average particle size, risk of sedimentation, risk of pH-drift and ultimately coagulation. Even though the product is stabilized by a biocide, contamination with certain bacteria, fungi or algae may render the product unusable.

Storage time

Covestro represents that, for a period of six months following the day of shipment as stated in the respective transport documents, the product will meet the specifications or values set forth in section "specifications or characteristic data" above, what ever is applicable, provided that the product is stored in full compliance with the storage conditions set forth in and referenced under section "storage" above and is otherwise handled appropriately.

The lapse of the six months period does not necessarily mean that the product no longer meets specifications or the set values. However, prior to using said product, Covestro recommends to test such a product if it still meets the specifications or the set values. Covestro does not make any representation regarding the product after the lapse of the six months period and Covestro shall not be responsible or liable in any way for the product failing to meet specifications or the set values after the lapse of the six months period.



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Labeling and statutory requirements This product data sheet is only valid in conjunction with the latest edition of the corresponding Safety Data Sheet. Any updating of safety-relevant information – in accordance with statutory requirements – will only be reflected in the Safety Data Sheet, copies of which will be revised and distributed. Information relating to the current classification and labeling, applications and processing methods and further data relevant to safety can be found in the currently **valid Safety Data Sheet**.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance, information and recommendations to determine to your own satisfaction whether our products, technical assistance and information are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Covestro. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale which are available upon request. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with any claim of any patent relative to any material or its use. No license is implied or in fact granted under the claims of any patent.

This product is not designated for the manufacture of a medical device or of intermediate products for medical devices¹⁾. [This product is also not designated for other specifically regulated applications (e.g. including cosmetics, plant protection, fertilisers, plant strengtheners, food processing, food contact and others). If the intended use of the product is for the manufacture of a medical device or of intermediate products for medical devices or for other specifically regulated applications Covestro must be contacted in advance to provide its agreement to sell such product for such purpose.] Nonetheless, any determination as to whether a product is appropriate for use in a medical device or intermediate products for medical devices, for Food Contact products or cosmetic applications must be made solely by the purchaser of the product without relying upon any representations by Covestro.

1) Please see the "Guidance on Use of Covestro Products in a Medical Application" document.

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 **Bayhydrol[®]**

Product Data Sheet

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