

Technical Information

EVP 000704 e, Rev. 1, July 2004

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® = registered trademark of
BASF Aktiengesellschaft,
unless otherwise indicated

Laropal® grades

aldehyde and ketone resins for the manufacture of pigment pastes and pigment preparations

Range

| | |
|------------------|---|
| Laropal® A 81 | condensation product from urea and aliphatic aldehydes, bright and resistant to yellowing |
| Laropal® A 101 | condensation product from urea and aliphatic aldehydes, bright and resistant to yellowing |
| Laropal® K 80 | condensation product from cyclohexanone, bright and resistant to hydrolysis |
| Laropal® LR 8991 | modified aldehyde resin, water-soluble, trial product |
| Laropal® LR 9008 | modified aldehyde resin, water-soluble, trial product |

Properties

| | | A 81 | A 101 | Laropal® K 80 | LR 8991 | LR 9008 |
|--|-------------------|-------------------|-------------------|--------------------------|-----------------|-----------------|
| Physical form | | pastilles | pastilles | pastilles | liquid | liquid |
| Product specification | | | | | preliminary | preliminary |
| softening temperature (DIN 53180) | C/F | 80–95/ 176–203 | 95–110 203–230 | 75–85 167–185 | – | – |
| iodine color number (DIN 6162) | | ≤ 3 | ≤ 5 | ≤ 2 | – | – |
| acid value (DIN EN 2114) | mg KOH/g | ≤ 3 | ≤ 3 | ≤ 1 | – | – |
| solid content (DIN EN ISO 3251, 1 g, 125C/257F, 1 hour) | % | – | – | – | 34–36 | 34–36 |
| pH, 10 % solution (ISO 976, DIN 53785) | | – | – | – | 7.5–8.5 | 7.5–8.5 |
| viscosity at 23C/73F (DIN EN ISO 3219), shear rate D = 25 s ⁻¹ | Pa·s | – | – | – | 2–15 | 2–15 |
| Other properties | | | | | | |
| density at 20C/68F (ISO 2811, DIN 53217) | g/cm ³ | ~ 1.11 | ~ 1.12 | ~ 1.10 | ~ 1.03 | ~ 1.03 |
| hydroxyl value (ISO 4629, DIN ISO 4629) | mg KOH/g | ~ 40 | ~ 35 | ~ 150 | – | – |
| saponification value (ISO 3681, DIN 53401) | mg KOH/g | ~ 65 | ~ 62 | ≤ 1 | – | – |
| flash point (DIN EN 22719) | C/F | – | – | – | > 100/ > 212 | > 100/ > 212 |
| sensitivity to frost | C/F | – | – | – | 0/32 | 0/32 |
| glass transition temperature T _g (DSC) | C/F | ~ 57 ~ 135 | ~ 73 ~ 163 | ~ 50 ~ 122 | – | – |
| butyl glycol content | % | – | – | – | 5 | – |

Storage

Laropal® A 81, Laropal® A 101 and Laropal® K 80 can be stored for up to 2 years at temperatures below 40C/104F. Individual pallets must not be stacked since the pastilles are likely to agglutinate. However, the products' properties are not adversely affected.

Laropal® LR 8991 and Laropal® LR 9008 must be stored in tightly sealed containers away from frost and heat. With adequate tank and storage hygiene measures adopted or if stored in original containers, Laropal® LR 8991 and Laropal® LR 9008 can be stored for up to 6 months at 0–25C/32–77F. Extended storage may cause a reduction of viscosity. Adding a suitable neutralizer, e. g., dimethyl ethanolamine, will overturn this effect.

Solubility

| | A 81 | Laropal® | |
|------------------------|------|----------|------|
| | | A 101 | K 80 |
| alcohols | ● | ● | ◎ |
| esters | ● | ● | ● |
| ketones | ● | ● | ● |
| aromatic hydrocarbons | ● | ● | ● |
| aliphatic hydrocarbons | ◎* | ○** | ● |

- soluble
- ◎ limited solubility
- insoluble

* solutions tend to separate at temperatures below 15C/59F – adding 2–5 % of an aromatic solvent, e.g., Solvesso^{®1} 100, produces stable solutions

** insoluble in aliphatic hydrocarbons but very good diluent tolerance

Compatibility

| | A 81 | Laropal® | |
|------------------------------|------|----------|------|
| | | A 101 | K 80 |
| cellulose nitrate | ● | ● | ● |
| ethyl cellulose | ◎ | ◎ | ● |
| cellulose acetobutyrate | ● | ● | ● |
| chlorinated rubber | ● | ● | ● |
| VC copolymers | ● | ● | ● |
| acrylic resins | ● | ● | ● |
| urea-formaldehyde resins | ● | ● | ● |
| melamine-formaldehyde resins | ● | ● | ● |
| alkyd resins | ● | ● | ● |
| epoxy resins | ● | ● | ● |
| hydrocarbon resins | ● | ● | ● |

- compatible
- ◎ limited compatibility

Properties

| | A 81 | Laropal® | |
|---|------|----------|------|
| | | A 101 | K 80 |
| brightness | 1 | 2 | 1 |
| fastness to light | 1 | 1 | 2 |
| heat resistance | 1 | 1 | 3 |
| compatibility | 1 | 1 | 1 |
| soluble in alcohols | 1 | 1 | 2 |
| soluble in aliphatic hydrocarbons | 3 | 5 | 1 |
| suitable for coatings resistant to water | 3 | 3 | 2 |
| suitable for coatings resistant to mineral oils | 2 | 1 | 3 |
| suitable for coatings resistant to saponification | 3 | 3 | 1 |
| solvent release | 3 | 2 | 4 |
| pigment binding capacity | 1 | 2 | 1 |

- 1 very good
- 5 insufficient

¹ registered trademark of Exxon Mobil Corporation

Application

Laropal® A 81 Laropal® A 101 Laropal® K 80

Because of their excellent solubility and compatibility, Laropal® A 81, Laropal® A 101 and Laropal® K 80 can be used in many types of coating formulations.

Depending on the application, Laropal® A 81 and Laropal® A 101 improve gloss, hardness, body, adhesion and resistance to yellowing while Laropal® K 80 improves body, gloss and hardness.

Because of their good pigment wetting and very low solution viscosity, Laropal® A 81, Laropal® A 101 and Laropal® K 80 can be used for the manufacture of pigment pastes with a high pigment content.

Laropal® A 81 is very stable to heat and can be used in baking finishes, neither causing odor nor discoloration.

Laropal® A 101 is not soluble in aliphatic hydrocarbons and therefore is suitable for coatings resistant to mineral oil. Because of its relatively low solvent retention, it only leads to a slight increase of the drying time of physically drying finishes (e.g., cellulose nitrate).

Exposure of Laropal® K 80 to temperatures above 80C (176F) can cause – even at short baking times and dependent on the other components of the formulation – degradation of the product going along with odor nuisance.

Laropal® LR 8991 Laropal® LR 9008

Laropal® LR 8991 and Laropal® LR 9008 are used for the manufacture of aqueous pigment pastes which, among others, are combined with air- or oven-drying water-thinnable alkyd, acrylic and pure acrylic resins as well as polyurethane dispersions.

They have outstanding wetting properties for inorganic and organic pigments. Pigment pastes are compatible with practically all water-reducible film-forming coatings raw materials.

The pigments pastes must be bead-milled to achieve an optimum degree of pigment dispersion. Three points must be observed in selecting pigments:

Pigments must be suitable for water-reducible, amine-neutralized binders.

Pigments must have sufficient light and weathering fastnesses if the pigment paste is to be used for shading, in which case the pigment content in the finished paint will be very low.

For best results in paste production, a pH value of approx. 8 is recommended.

Using additional wetting agents (depending on the type of pigment) and an anti-settling agent to stabilize the viscosity may have to be considered. Adding 0.2–0.5 %, related to the paste formulation, of a commercial defoamer is recommended. Its suitability, particularly regarding long-time effectiveness, should be determined in trials.

The pH value influences the viscosity of Laropal® LR 8991 and Laropal® LR 9008: the higher the pH, the higher the viscosity. Pigments contained in pastes (acidic or alkaline) influence the pH value. The viscosity can be adjusted with a neutralizing agent such as diethanol amine.

Fields of application

Alkyd resins, air- and oven-drying

(preferably Laropal® A 81)

- partial replacement of up to 20 % solids on solids
- improvement of resistance to yellowing through excellent heat stability and fastness to light
- improvement of hardness, gloss, body and flow
- cost reduction
- use as modifying component in alkyd resin production

Cellulose nitrate

(preferably Laropal® A 101)

- improvement of light fastness, body and gloss
- replacement of genuine NC solvents by budget-priced diluent solvents due to very good gelling capacity

Universal pigment pastes

- very well suitable as grinding resin because of broad compatibility and universal solubility, low solution viscosity, high pigment binding capacity and transparency

Powder coatings

(preferably Laropal® A 81 und Laropal® A 101)

- partial replacement of up to 15 % of epoxy/polyester or PUR powder
- improvement of flow due to low melt viscosity

VC copolymer / chlorinated rubber

(preferably Laropal® K 80)

- partial replacement of up to 20 % solids on solids, depending on the application
- reduces viscosity

Hot melts for road marking and spray plastics

(preferably Laropal® A 81)

- suitable as basic resin in combination with suitable plasticizers due to low melt viscosity, good light fastness and heat stability
 - improved adhesion to substrates
-

Safety

When handling these products, advice and information given in the safety data sheet must be complied with. Further, protective and workplace hygiene measures adequate for handling chemicals must be observed.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.
