PANADUR
coating your ideas

Technical Data Sheet

PANADUR Aroqual HH

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PANADUR Aroqual HH

PANADUR Aroqual HH is an aromatic, solvent-free polyurea coating system. It is ideal as a rapid curing and long-lasting coating for substrates such as concrete, steel, GRP, etc. The product is additionally distinguished by its high degree of hardness, thermal resistance and high chemical resistance. PANADUR Aroqual HH is a standard product from the polyurea range of products from PANADUR.

Product Benefits

- High temperature resistance (short-term up to 200 °C, long-term 130 °C possible)
- Very high chemical resistance
- Solvent free
- High mechanical strength
- High impact resistance
- Very high abrasion resistance
- Very good corrosion resistance
- Extremely short curing time
- Rapid subsequent workability
- Mixing ratio 100 : 100 by volume
- Free of organostannic, chromate or other compounds containing heavy metals

Range of Applications

- Wall coating (on concrete, steel)
- Anti-corrosion coating (on concrete, steel)
- Floor coating (concrete)
- Internal pipe coating
- Coating containers, tank pits in the chemical industry

Please contact us for project-based consultation.

Technical Data

Processing method	2K hotspray machinery with fixed (100 : 100 vol.) or variable mixing ratio necessary
Mixing ratio by volume	100 : 100 (with PANADUR Hardener Aroqual H)
Gravimetric mixing ratio	Available upon request
Processing temperature range	10 to 30 °C ambient temperature (non-condensing, rel. humidity < 90 %, at least 3 °C higher than the dew point, please note the dew point chart)
Permissible surface temperature for application	10 to 30 °C (to avoid condensation, keep as close to the ambient temperature as possible)
Permissible material temperature of PANADUR Aroqual HH component and PANADUR Hardener Aroqual H (container + hose assembly) during processing	65 to 75 °C, system-dependent regulation needed (preheating of the supplied containers and plant containers at least 50 °C is required - see part “Processing”)

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Recommended component pressure during processing	> 120 bar
Consumption component mixture	Approx. 1.0 kg/m² (for 1 mm film thickness; depends on specific use, machinery and substrate)
Minimum film thickness	2.0 – 3.0 mm (depends on specific use, machinery and substrate)
Shelf life	Stable for at least 6 months (applies to unopened original containers stored at 20 °C)
Density of PANADUR Aroqual HH component (DIN EN ISO 1183-3, values for white, depends on color)	Approx. 1.050 g/cm³ (23 °C) Approx. 1.019 g/cm³ (65 °C)
Density of PANADUR Hardener Aroqual H (DIN EN ISO 1183-3)	Approx. 1.150 g/cm³ (23 °C) Approx. 1.124 g/cm³ (65 °C)
Dynamic viscosity of PANADUR Aroqual HH component (DIN 53019, measuring system 13, values for white, depends on color)	Approx. 560 (20 °C) Approx. 60 (65 °C)
Dynamic viscosity of PANADUR Hardener Aroqual H (DIN 53019, measuring system 13)	Approx. 830 (20 °C) Approx. 90 (65 °C)
Hardness Shore A (DIN 53505, after 72 h)	Not measurable
Hardness Shore D (ISO 868 / DIN 53505, measured after 1 month)	Approx. 64

Curing Times

Dust dry after approx. (depends on temperature):	60	seconds
Dry to recoat (does not apply for overspray) approx.:	0 – 6	hours
Overspray application possible for approx.:	0 – 3	hours
Ready for light foot traffic after approx.:	5	minutes
Completely cured after:	72	hours

These data are applicable at 23 °C / 50 % relative humidity; curing times may vary at different atmospheric conditions.

Physico-Chemical Properties

Raw material base	Polyamine mixture, cross-linked with isocyanate
Color	White, other colors available upon request
Non-volatile constituents (based on DIN EN 3251)	> 99 %
60° Gloss level (DIN EN ISO 2813)	Glossy
Tensile strength at break (DIN 53504) σ_{break}*	16.6 MPa
Tensile strength at yield (DIN 53504) σ_{max}*	16.7 MPa
Tensile strain at break (DIN 53504) ε_{break}*	147 %
Tensile elongation at break (DIN 53504) ε_{Fmax}*	96 %
Stress at 100 % strain (DIN 53504) $\sigma_{100\%}$*	15.7 MPa

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Elastic modulus (DIN 53504) *	282.0 MPa
Trouser tear strength T_S (DIN ISO 34-1) *	26.4 N/mm

* Values acc. to Test Report.

Processing Guidelines

Before processing start, all provided documents must be entirely read and understood.

Preliminary tests must be performed with original materials of PANADUR according to the coating technology under the respective conditions in order to examine material compatibility with the substrate and the environment (for example liquid media, sludges, etc.) as well as the coating adhesive strength.

It is absolutely necessary to keep detailed process records for every process step and the entire duration of the construction site, especially equipment maintenance logs (material temperatures and pressures, mass output during processing and measuring equipment tracing) and listed data for processing conditions (temperature deviations and air moisture).

Uses which have not been specifically mentioned in this technical data sheet may only be performed after consultation and written confirmation by PANADUR GmbH.

Surface preparation:

The careful surface preparation is essential for a durable coating. It is required to use a PANADUR Primer, which is suitable to the surface to be coated. Its suitability should be verified by preliminary tests.

The following applies in general: See German VOB, Part C, DIN 18363, Section 3.

The substrate (concrete) must be stable and must have a minimum tensile adhesive strength of 1.5 N/mm². The substrate surface must be dry, clean, flat and without ridges, defects, loose material or cement slurry. It must also be free of formwork oils and other materials or substances that may separate or impede adhesion (oil, grease, silicone, release agent residue or other impurities). The residual moisture of concrete must be < 4 % (CM-Methods). Moisture penetration thereafter is not permitted and should be avoided. Verified compliance with this requirement (e.g. in construction records) must be documented.

We would be glad to advise you about film layering on a project-based level.

Processing:

PANADUR Aroqual HH may only be processed in 2K hotspray machinery with separate material feeds to the spray head and to the mixing chamber of the heated hose assembly. The appropriate spray parameters must be determined through preliminary tests based on the used system.

It is prohibited to dilute the material with any type of additive, e.g. solvents. It is only permitted to use PANADUR Hardener Aroqual H with a correct mixing ratio.

The material containers should be opened right before use. PANADUR Aroqual HH should be intensely stirred in original container using appropriate equipment until it appears to be homogeneous and unicolored. After material withdrawal a protection against surrounding moisture (nitrogen or argon fumigation) is highly required for the opened containers. After fumigation, close tightly and use the material promptly.

A preheating of the components to temperature of 50 °C is recommended for viscosity reduction and therefore facilitation of the coating process. The preheating should be performed in original containers by means of an electric heating system.

For achieving best results, the processing temperatures of both components (temperatures in the containers and hose packs) should be system-dependently regulated. Processing in temperature range of 60 to 75 °C is possible. The prescribed mixing ratio of PANADUR Aroqual HH specified on the container should be strictly followed.

Use cross-coat application until the desired thickness is attained.

Note: A spray mist may occur during application. Appropriate precautionary measures must be taken. During longer processing periods all spraying parameters as well as environmental conditions are to be supervised and documented in the process records.

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After application, the coating must not be exposed to moisture for three days in order to achieve the end properties as listed above.

Do not move or load coated parts during the first day after coating to avoid stress cracking.

Recoating / Overspray:

Overspraying is possible within 3 hours after applying the first coat (see chart with curing times).

At a room temperature of 23 °C with 50 % relative humidity, it is possible to recoat without sanding for up to 6 hours (not applicable for overspray application; see chart with curing times).

We would be glad to offer consultation on this matter.

Coating repair:

Damages detected during facility inspection must be immediately repaired.

The area that shall not to be repainted (beyond the overlapping area) must be protected against possible spray mist formation.

To repair a damage, cut away the damaged area down to the substrate process as following: Taper the edges. Sand the bordering areas (at least 10 cm overlap), clean with PANADUR Silicone Remover and dry completely (approx. 10 minutes - the silicone remover solvent should be completely evaporated). Apply a thin layer of PANADUR 1K Primer-P to the overlapping area using a medium-nap roller or brush or reps. spraying equipment and allow to dry. Please pay attention to the maximum application amount and curing times of 1K Primer-P as specified in the technical data sheet.

After 1K Primer-P is completely dried, the area may be overcoated as described above with PANADUR Aroqual HH – the proper layer structure of the coating has to be applied again.

In order to remove small superficial damages (cracks, etc.) sand down the damaged part, until the damage is completely removed. Clean the sanded area with PANADUR Silicone Remover and let dry completely (approx. 10 min, solvents have to be completely evaporated). Then coat with PANADUR 1K Primer-P using a medium-nap roller, brush or reps. spraying equipment in a thin layer and let dry. For max. consumption and curing times see Technical Data Sheet of PANADUR 1K Primer-P. Afterwards apply PANADUR FAST and PANADUR Hardener NN 38 to the area (see Technical Data Sheet).

Tool cleaning:

The used 2K hotspray machinery must be thoroughly cleaned immediately after use, and, if necessary, also in between depending on the system type with e.g. Mesamoll. A proper cleaning agent must be chosen based and tested according to the used system. Please also observe the instructions of the equipment manufacturer.

Note: If the curing process has started, it is no longer possible to clean any used tools.

Cleaning the Coating

Abrasive or aggressive cleaning agents/equipment (e.g. dichloromethane, cellulose thinner, butyl acetate, ozone) must not be used.

Cleaning the paint with pressure washers is only permitted with moderate water pressure. The use of any type of grinding brushes is not permitted.

Color Information

The components processed in this product have a tendency to yellow which makes it technically impossible to guarantee that two different batches of the same product will have exact same color.

In particular for white and paler colors, a yellowing is not regarded as a defect.

Supplemental Products

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- PANADUR Primer (substrate dependent)
- For repair of the coating: PANADUR Silicone Remover, PANADUR 1K Primer-P, PANADUR FAST, PANADUR Hardener NN38
- PANADUR Citrasol (for metallic substrates)

Storage

Protect from heat (T > 30 °C), frost (T < 7 °C) and humidity. Already opened containers must be protected against surrounding moisture (nitrogen or argon fumigation). After fumigation, immediately close tightly and use the material promptly. Do not expose uncured components to direct sunlight. Store containers upright and tightly closed. Further information may be found in the corresponding safety data sheets.

Protective Measures

The relevant protective measures are to be observed during processing and application. Suitable protective clothing including respiratory must be worn during processing.

The instructions and safety advice on the containers should be observed during application. Further details may be found in our corresponding safety data sheets for each component.

Environmental Information

Uncured components are harmful to aquatic organisms and may cause longer-term adverse effects in water.

Do not allow individual components to enter water, sewers or groundwater.

The instructions and safety advice on the containers should be observed during processing. Further details may be found in our corresponding safety data sheets for each component.

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