



**PANADUR**

coating your ideas



# Technical Data Sheet

## PANADUR Aroqual S DE

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## PANADUR Aroqual S DE

PANADUR Aroqual S DE is an aromatic, solvent-free polyurea coating system. It is excellent as a rapid curing, durable finishing coat for the PANADUR System for electrostatic dissipation in hazardous area zones 0 and 1. The product is additionally distinguished by its discharge capacity that is not dependent upon the film thickness, its good damping properties and both high mechanical and chemical resistance. PANADUR Aroqual S DE is a standard product from the polyurea range of products from PANADUR.

### Product Benefits

- As a finishing coat for dissipating electrostatic charges
- Crack bridging
- Solvent free
- Very high abrasion resistance
- Excellent flexibility
- Impermeable to liquids
- Extremely short curing time
- Rapid subsequent workability
- High chemical resistance
- Mixing ratio 100 : 100 by volume
- Free of organostannic, chromate or other compounds containing heavy metals

### Range of Applications

As a finishing coat for the PANADUR electrostatic dissipative coating system for

- Reinforced concrete substrates as flooring, e.g. in factory buildings
- Storage of flammable liquids
- Gas industry operations
- Collecting rooms and collecting basins

Please contact us for project-based consultation.

### Technical Data

Processing method	2K hot spray machinery with fixed (100 : 100 vol.) or variable mixing ratio necessary
Mixing ratio by volume	100 : 100 (with PANADUR Hardener Aroqual S)
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 S DE and PANADUR Hardener Aroqual S (temperature of 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")



Recommended component pressure during processing	> 120 bar
Consumption component mixture	Approx. 1.7 kg/m <sup>2</sup> (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 S DE component (DIN EN ISO 1183-3, values for grey, depends on color)	Approx. 1.040 g/cm <sup>3</sup> (23 °C) Approx. 1.009 g/cm <sup>3</sup> (65 °C)
Density of PANADUR Hardener Aroqual S (DIN EN ISO 1183-3)	Approx. 1.110 g/cm <sup>3</sup> (23 °C) Approx. 1.083 g/cm <sup>3</sup> (65 °C)
Dynamic viscosity of PANADUR Aroqual S DE component (DIN 53019, measuring system 13, values for grey, depends on color)	Approx. 500 mPas (20 °C) Approx. 120 mPas (65 °C)
Dynamic viscosity of PANADUR Hardener Aroqual S (DIN 53019, measuring system 13)	Approx. 1200 mPas (20 °C) Approx. 200 mPas (65 °C)
Hardness shore A (DIN 53505, after 72 h)	Approx. 75
Hardness shore D (ISO 868 / DIN 53505, after 72 h)	Approx. 25

## Curing Times

Dust dry after approx. (depends on temperature):	50 – 70 seconds
Dry to recoat approx. (does not apply for overspray):	0 – 6 hours
Overspray application possible for approx.:	0 – 45 minutes
Ready for light foot traffic after approx.:	30 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	Grey, other colors available upon request
Non-volatile constituents (based on DIN EN 3251)	> 99 %
60° Gloss level (DIN EN ISO 2813)	Glossy
Electrical resistance	Between $1 \times 10^5 \Omega$ and $1 \times 10^8 \Omega$ , rel. conductivity: > 20 % / < 75 %
Tensile strength at yield (DIN EN ISO 527-1, 2) $\sigma_{\max}$	approx. 15 N/mm <sup>2</sup>
Tensile strain at break (DIN EN ISO 527-1, 2) $\epsilon_{\text{break}}$	approx. 250 %



Stress at 100 % strain (DIN 53504) $\sigma_{100\%}$	approx. 9 MPa
Trouser tear strength $T_S$ (DIN ISO 34-1)	approx. 26.4 N/mm <sup>2</sup>
Taber abrasion test (ASTM D 4060, 1 kg, 1000 cycles)	215 mg (Wheel H-18) 10 mg (Wheel CS-17)
Changes in film thickness due to drying/curing	Applied film thickness is equivalent to dry film thickness
Rain resistance (adapted from DIN 52461)	Raintight

## 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/mm<sup>2</sup>. 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.

Concrete substrates should be prepared with PANADUR 2K Primer-WDS and PANADUR 2K Primer-DE should be subsequently applied as conductive layer.

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

### Processing:

Before the coating process with Aroqual S DE is allowed to start the conductive resistance to the ground has to be measured according to DIN EN 1081 between the strips PANADUR Conductive copper tape and the layer of PANADUR 2K Primer-DE (<10<sup>4</sup> Ω, using Metrigo 2000 measuring system acc. to DIN EN 61340-4-1 and DIN EN 61340-2-3 or similar).

PANADUR Aroqual S DE may only be processed in 2K hot spray 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 S with a correct mixing ratio.

The material containers should be opened right before use. PANADUR Aroqual S DE 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 S DE 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.

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

Following full completion of the coating process, employ a registered specialist electrician to professionally and properly connect the strips of PANADUR Conductive copper tape to allow for equalization of electrostatic potential (grounding point).

#### **Recoating / Overspray:**

Overspraying is possible within 45 minutes 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 S DE – the proper layer structure of the coating has to be applied again.

#### **Tool cleaning:**

The used 2K hot spray 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

- PANADUR Primer (substrate dependent): for concrete: PANADUR 2K Primer-WDS, PANADUR 2K Primer-DE
- For repair of the coating: PANADUR Silicone Remover, PANADUR 1K Primer-P
- PANADUR Citrasol (for metallic substrates)

## Storage

Protect from heat ( $T > 30\text{ °C}$ ), frost ( $T < 7\text{ °C}$ ) 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 and transport 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 and uncured material mixtures 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.

### Important:

When handling our products, the essential physical, safety-related, toxicological and ecological data are to be taken from the appropriate material safety data sheets. Relevant provisions, such as the Hazardous Substances Ordinance, are to be observed.

### Disclaimer:

The information above, in particular the suggestions for processing and use of our products, is based on our knowledge and experience under normal circumstances, provided that the products have been properly stored and used. Due to differences in materials and surfaces as well as diverging operating conditions, it is not possible to guarantee a particular result or to be held liable, regardless of the legal relationship, based on these references or on a verbal consultation unless we are found guilty of intention or gross negligence. In such a case, the user must prove that he/she transmitted all information in writing in a timely and accurate manner to PANADUR GmbH which was necessary for PANADUR GmbH to make an appropriate and promising assessment. The user must evaluate the suitability of a product for its intended purpose. Product specifications are subject to change. Proprietary rights of third parties must be observed. Furthermore, our respective current terms and conditions of sale and delivery apply. Only the latest version of each technical data sheet and the corresponding safety data sheets apply which are to be requested from us.