

VR 2003

Technical Data Sheet

Description

VR 2003 is a two-component ceramic epoxy repair compound specifically developed for rebuilding metal components in a fluid flow environment damaged by erosion and corrosion.

Composition

VR 2003 uses a complex blend of epoxy resins and a polyamino-amide curing system reinforced with carbide and ceramic particles.

Recommended Applications

- Cavitation damages
- Condenser tube sheets
- Pump casing
- Fans
- Pitting corrosion
- Welding seams
- Guide vanes
- Impellers
- Heat exchangers

Features

- VR 2003 is a high performance multi purpose repair compound.
- VR 2003 can be applied to any damaged component in one easy application and is ideal for rebuilding different items.
- Suitable as compensation- or sinkhole filling.
- **Approval acc. AVS D 6.1/50 Rev. A for using in nuclear areas.**

Resistance

Tested at +20 °C.

Acids:

10 % Acetic acid	2
10 % Hydrochloric acid	1
21 % Hydrochloric acid	3
36 % Hydrochloric acid	3
10 % Sulphuric acid	1
21 % Sulphuric acid	4
50 % Sulphuric acid	4
70 % Sulphuric acid	4

Other Compounds:

Kerosene	1
Naphtha	1
Salt water	1
Sewage	1
Xylene	2
Isopropanol	3

Leach and Bleeding:

10 % Ammonium hydroxide	1
25 % Ammonium hydroxide	2

Legend:
 1 = suitable for continuous immersion at 20 °C
 2 = short-term immersion (< 3 days)
 3 = splashes and spills
 4 = not recommended

Due to the reason that the resistance of the coating can be affected by various factors (medium, temperature, concentration, layer thickness etc.) we recommend to consult us prior to the application.

Technical data			
Rockwell R Hardness	ASTM D 785	100	
Compressive Strength	ASTM D 695	106,79	N/mm ²
Tensile Shear Adhesion	ASTM D 1002	188	kg/cm ²
Flexural Strength	ASTM D 790	703	kg/cm ²
Corrosion Resistance	ASTM B 117	5000	hours
Solids content		100	%
Density	ASTM D 792	2.46	g/cm ³
Volume capacity		406	cc/kg
Adhesive strength	DIN EN ISO 4624	5-15 (reference value*)	MPa
Temperature resistance	dry continuous	+120	°C
Wet heat/warm water	continuous	+70	°C
Heat distortion	ASTM D 648	20 °C cure 57 °C 100 °C cure 98 °C	

*depending on test plate

Surface Preparation

Appropriate surface preparation is essential in order to obtain good results with this product. The exact requirements change according to kind of application, expected serviceable life and the original status of the surface.

Steel

Surface preparation by blasting according the DIN standard

DIN EN ISO 12944-3 and -4 as well as DIN EN 14879-1

Surface preparation methods

DIN EN ISO 8504-2 Abrasive blast cleaning

Preparation of steel substrates before application of paints and related products

DIN EN ISO 8501-1 Preparation grade Sa 2½

DIN EN ISO 8501-2 Visual assessment of surface

cleanliness

DIN EN ISO 8501-3 Preparation of grade welds, edges, etc.,

table 1 P3

Test for the assessment of surface cleanliness

DIN EN ISO 8502-4 Dew Point

Optional:

DIN EN ISO 8502-3 Assessment of dust, quantity <2, size <2

DIN EN ISO 8502-6 Bresle method

Surface roughness characteristics of blast-cleaned steel substrates

DIN EN ISO 8503-1 Ry5 (Rz) 40 - 100 µm

For the preparation of other surfaces, kindly contact us.

Preparation of Material

The material is delivered in proper mixing ratio. Put the curing agent completely into the basic material and agitate carefully, preferably with a mechanical agitator. Be sure to contact also bottom and sides of the container. Only prepare as much material as you can handle within pot life. The mixed material should be used within 25 minutes of mixing at +20 °C (68 °F). This time will be reduced at higher temperatures and extended at lower temperatures.

Mixing ratio 5 : 1 part by weight
(Part A : B)

Application Instructions

Conditions of object:

Temperature of substrate and air no less than +5 °C, relative air humidity max. 85 %; temperature of the surface to be coated has to be at least +3 °C over the respective dew-point. Low temperatures delay curing and aggravate treatment. Higher air humidity as well as falling below dew-point may result in formation of condense humidity on subsoil respectively coating surface, this possibly causing severe impairment in adhesion. The conditions of object have to be observed during treatment and curing time. When close to these limits, the use of heaters or drying apparatus is recommended.

The mixed material should be pressed firmly onto the prepared area with a plastic application tool. Care should be taken to avoid air entrapment on deeply pitted surfaces. Application should be carried out as soon as possible after surface preparation is complete, and certainly the same day, otherwise flash blasting will be necessary before application.

Once the material placed, it may be smoothed utilizing a variety of methods. If required, VR 2003 can be ground using a fast wearing open type wheel. VR 2003 can only be machined by diamond-tools.

Pot life in minutes:

	+10 °C	+20 °C	+30 °C
0.5 kg	50-60	25-30	15-20

This schedule states the practical curing time from beginning of mixing.

Composition of Coating/ Material Consumption

VR 2003 can be applied with a minimum stratum thickness of 1 mm.

Re-coating Intervals/Sequence Coatings

VR 2003 is re-coatable with itself or with other polymer compounds. In areas where a second layer of VR 2003 is required, this application must be carried out within the initial set time for the first layer, if this is not possible surfaces will require thorough abrasion or abrasive blasting prior to any subsequent material being applied. The re-coating interval shortens strongly through sun influence. Appropriate safety measures must be taken.

Curing Time

	+20 °C
Movement without load or immersion	1.5 hours
Machining and light loading	2 hours
Full loading	2 days
Immersion	3 days

The above mentioned values are standard values. Variations caused by practical requirements or conditions are possible.

Packing Units

The material is supplied in the following packing size:
0.5 kg (0.416 kg Part A and 0.084 kg Part B)
Delivery in colour grey.

Cleaning

All tools should be cleaned using industrial solvents (acetone, xylene, alcohol, methylethylketone) before the material hardens. If the material is allowed to set, it can only be removed by mechanical means.

Storage

The material should ideally be stored in unopened original bins under cool and dry conditions, at temperatures between +15 and +30 °C, divergence during transport is acceptable. Please observe the expiry date stated on the material.

Safety Instructions

For the handling of our products, the significant physical, safety-related, toxicological and ecological data according the substance-specific safety data sheet are to be extracted. The applicable rules and regulations, such as for example the Hazardous Substances Regulation, have to be observed. A detailed safety data sheet will be delivered with the material or is available upon request.