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TR TECHNICAL REPORT

Wepuran casting resin VT 3407

brownish transparent

Index VT= casting resin, transparent

- **cold and thermal curing**
- **solvent-free**
- **of low viscosity**
- **low heat development and shrinkage pressure during the curing phase**
- **good protection from shock, impact and vibration**

Base: polyurethane (PUR)

Contents

Please read this technical report and the material safety data sheet (MSDS) carefully before using the product.

1. General information

The Wepuran casting resin **VT 3407** is a solvent-free 2-pack casting resin based on polyurethane resin (PUR) that already cures at room temperature and displays a good flowability. In case of (extremely) thin laminates, the coating is brownish transparent, thus conductors and components remain visible. When applied thickly the casting compound is brownish and non transparent.

2. Application

The Wepuran casting resin **VT 3407** was especially developed for the electronics/ electrical engineering industries where it has been proven as an embedding material for the encapsulation of electronic components and assemblies as well as for insulation and protection from corrosion and mechanical attack.

The Wepuran casting resin **VT 3407** is used as a

2.1 Casting and embedding material for high-quality and shock-sensitive electronic components that must not be subjected to heat development in the curing phase or shrinkage/pressure load during operation, owing to thermal shocks (for instance glass diodes, transistors, etc.)

2.2 Casting resin for sensor technology

2.3 Sealing and embedding compound for heat sensors, heating elements, metal-cased capacitors, mini transformers, print transformers, cables and cable terminals

2.4 Temperature-resistant sealing compound

2.5 Protection for electric equipment and components against weather and moisture

2.6 Casting compound for solenoids, ignition, induction and transformer coils

2.7 Implosion protection for TV picture tubes

2.8 Bonding, coating and sealing material for batteries and accumulator cases

2.9 Casting resin for magnetic coils

2.10 Casting compounds for high-voltage cascades and conductors for TV technology

2.11 Casting resin for HF parts, e.g. frequency coils

3. Special notes

Under the product description Wepuran casting compounds of the series **VU 4457,** the Wepuran casting resin **VT 3407** is also available in other colour and viscosity adjustments.

Apart from the Wepuran casting compounds of the series **VU 4457** a large number of casting compounds based on polyurethane, epoxy and silicone rubber resin in different colour, viscosity and elasticity adjustments as well as with self-extinguishing properties (UL approval) are addition-ally available.

Special technical reports on these products are available upon request. In our technical report manual these reports are filed under group 3 and 4.

4. Characteristics

4.1	**Colour/appearance**		:	brownish transparent
4.2	**Viscosity at 25 °C**		:	
	(measured with Haake VT 02*[1])			
	component A (DK*[2]1)	[dPas]	:	6.0 ± 2.0
	component B (DK*[2]3)	[dPas]	:	1.2 ± 0.2
	mixed (DK*[2]1)	[dPas]	:	4.0 ± 1.0
4.3	**Specific gravity at 20 °C**			
	DIN 53 217, part 2			
	component A	[g/cm³]	:	1.02 ± 0.05
	component B	[g/cm³]	:	1.22 ± 0.05
	mixed	[g/cm³]	:	1.07 ± 0.05
4.4	**Pot life of mixture**	[min]	:	approx. 85
	(at room temperature 18 - 23 °C; set-up quantity 500 g)			

*[1] Viscosity measuring unit supplied by: Haake Mess-Technik GmbH + Co
Dieselstr. 4, D-76227 Karlsruhe
phone: +49 721 4094-0
fax: +49 721 4094-360, telex: 7 826 739

*[2] DK = rotary element

5. Dangerous goods regulation

Detailed specifications of safety precautions, environmental protection, waste disposal, storage, handling, exhaust air regulations as well as other characteristics can be found in the material safety data sheet according to EEC 91/155.

When using chemicals, the common precautions should be carefully observed.

6. Properties

The Wepuran casting resin **VT 3407** is distinguished by the following properties:

6.1 General properties

- solvent-free; therefore no attack of solvent-sensitive plastics, i.e. polystyrene and practically no perceivable odour
- easy processing
- of very low viscosity; therefore particularly suitable for component geometries to which access is difficult
- already cures at room temperature with a very low heat reaction (approx. 40 - 45 °C), independent of the quantity of casting resin used

- no dissolution of ink wires
- low shrinkage pressure on moulded components
- low volume shrinkage
- good adhesion on almost all materials
- excellent protection against shock, impact and vibration
- low water absorbance and low steam permeability
- good resistance to water, moisture, condensation and tropical climate
- good resistance to numerous chemicals, acids and oils
- high tracking resistance
- excellent dielectric properties in a wide temperature range (-40 up to +90 °C).

6.2 Physical and mechanical properties

Property	Test method	Result
Shore-A hardness after 14 days at room temperature	DIN 53 505	93 ± 5
Shore-D hardness after 14 days at room temperature	DIN 53 505	42 ± 5
Water absorption	24 h/23 °C	approx. 0.1 %
Insulation class	VDE 0530, part 1	Y = 90 °C Limit temperautre

6.3 Electrical properties

Property	Test method	Result
Dielectric strength	VDE 0303, part 2	38 kV/mm
Volume resistivity	VDE 0303, part 3	1.1 x 10^{14} Ohm x cm
Surface resistance	VDE 0303, part 3	2.0 x 10^{14} Ohm
Tracking resistance	IEC 112	CTI > 600
Dielectric constant ε_r	VDE 0303, part 4 at 23 °C 1MHz	3.18
Dielectric loss factor tan δ	VDE 0303, part 4 at 23 °C 1MHz	0.03038

7. Mixing ratio

Component A : Component B = 2 : 1 (parts by weight)

The two components (resin component A and hardener component B) are already packed in the correct mixing ratio.
The volume of the container of component A is sufficient to accommodate the total quantity of component B.
For mixing we recommend using mechanical stirring equipment. Processing can start immediately after thorough mixing.

Our **technical information sheet TI 15/10:** "Processing of 2-pack systems" gives detailed advice on correct mixing. We recommend your quality assurance department adopts major items add-ressed in **TI 15/10** in appropriate operating instructions. We would gladly send you **TI 15/10** on request. In our report manual, this technical information sheet is filed under group 15.

ATTENTION: Components A and B should be stored in tightly sealed containers away from moisture. Opened containers must be sealed carefully after use and turned through 180° to protect the contents from humidity.

8. Processing

8.1 Manual processing

When processing manually, casting is effected after complete and thorough mixing of the A and B components. As air pockets affect the final properties of the casting, make sure that no air is stirred into the compound during the mixing process. In order to remove any

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air pockets as effectively as possible, we suggest evacuating the casting compound before or after casting. The processing time (pot life) is approx. 85 minutes (see also Item 4.4 “pot life“). During this period of time, the viscosity will increase. Therefore a set-up quantity should be chosen that allows perfect processing during the pot life of the mixture.

8.2 Processing in mixing and dispensing units

When using mixing and dispensing equipment the pot life is irrelevant. Since the mixing ratio (see Item 7 “Mixing ratio“) is indicated in parts by weight, the corresponding quantities to be dispensed when using volumetric mixing and dispensing equipment must be converted with the help of the specific gravities of component A and component B (see Item 4.3).

Reliable manufacturers of such equipment can be named upon request.

NOTE: See our **technical information sheet TI 15/2**: “Selection criteria and processing instructions for casting compounds/casting resins“ for more detailed information on processing, properties and application.

We would gladly send you **TI 15/2** upon request. In our report manual, this technical information sheet is filed under group 15.

9. Adjustment of viscosity

The Wepuran casting resin **VT 3407** is processed in the condition supplied.

ATTENTION: Do not add solvents or thinners to reduce the viscosity.

10. Auxiliary products

10.1 Accelerator

Both the curing and processing times are reduced by adding the accelerator **B 4400**. Therefore, the accelerator **B 4400** should only be added when mixing and dispensing units are used.

By adding, for example, only 1 % of the accelerator **B 4400** the casting compound is tack-free after just 45 - 60 minutes.
The quantity added is subject to the quantity of component A and is also stirred into component A. Only then is component B added.

10.2 Sealing mastic

For the sealing of casting moulds and cable outlets, we recommend our sealing mastic **EH 13.271**, which is characterized by the following properties:
solvent-free, self-adhesive, permelastic, easily deformable and highly temperature-resistant.

10.3 Mould release agent

Polyurethane resins (PUR) adhere well to almost all substrates. In order to be able to remove the casting compound from the mould after curing, the surfaces of the components to be casted must be pretreated with the mould release agent **EH 13.650**.
The aqueous release agent **EH 13.650** ensures a safe, clean and easy removal of the casting compound even in case of complicated mould configurations. **EH 13.650** is solvent, silicone and grease-free.

Special technical reports for these products are available upon request. In our report manual, these technical reports are filed under group 4 and 13.

11. Cleaning

To clean tools, we recommend our cleaning agent **R 13.780**. Cleaning should take place immediately after processing, because cleaning becomes increasingly difficult the further the curing process progresses.

ATTENTION: Do not use the cleaning agent as a thinner or to clean hands.

A special technical report for this product is available on request. In our report manual, this technical report is filed under group 13.

12. Drying conditions

The curing time depends on the quantity of the casting compound applied per item. Smaller quantities require a longer period of time, larger quantities cure faster.

A quantity of 25 g will cure within approx. 24 hours at room temperature (18 - 23 °C) to such an extent that processing of the part can be continued. The final hardness (Shore-A hardness approx. 93) is only achieved after 14 days.

Curing can be accelerated considerably by applying heat or post tempering. The following specifications for a quantity of 25 g serve as a guideline:

Temperature	[°C]:	80
Time	[h]:	approx. 2

13. Standard packaging

The Wepuran casting resin **VT 3407** is packed for delivery as follows:

Component A: 4 tins of 2.0 kg each = 8 kg in one carton
Component B: 4 tins of 1.0 kg each = 4 kg in one carton
= 1 selling unit = 12 kg

Partial lots of the selling units may be ordered, but will entail surcharges to cover repackaging costs.

14. Storage

In a cool, dry place, sealed original containers can be stored for at least 9 months.
In accordance with EN ISO 9001, labels on containers show expiry dates.

ATTENTION: Temperatures in excess of +25 °C affect the storage stability. Opened containers should be closed carefully to protect them from humidity and must be used up as soon as possible.

We are prepared to assist you in solving your problems and look forward to receiving your inquiry. On request we will send you publications and samples free of charge.

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Coating Innovations for Electronics

Supplementary sheet to Technical Report

Wepuran casting resin VT 3407
brownish-transparent

Edition LP 961608 E-0

Revised Characteristics

4. Characteristics

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	Component A (DK 1***2**)	[dPas]	:	6.0 ± 2.0
	Component B (DK 3***2**)	[dPas]	:	1.2 ± 0.2
	mixed (DK 1***2**)	[dPas]	:	4.0 ± 1.0
4.3	**Density at 20 °C**			
	DIN 53 217, part 2			
	Component A	[g/cm³]	:	1.02 ± 0.05
	Component B	[g/cm³]	:	1.22 ± 0.05
	mixed	[g/cm³]	:	1.07 ± 0.05
4.4	**Pot life of mixture**	[min]	:	approx. 60
	(at room temp. approx. 18 - 23 °C; set-up quantity 500 g)			

***1** viscosity measuring unit supplied by:

Haake Mess-Technik GmbH + Co
Dieselstraße 4, 76227 Karlsruhe (Germany)
phone: +49 7 21 40 94 - 0
fax: +49 7 21 40 94 - 360

***2** DK = rotary body