



Characteristics

VUKOL N33 is the resin part of a two component polyurethane system (resin + hardener) for potting or casting. The resin contains inorganic fillers and fire retardants, it is free of solvents (VOC < 1 %). The system hardens at room temperature. It is suitable for a quite general and universal use. The hardened resin belongs to rather soft and flexible types of polyurethanes.

This potting material is characterized by following properties:

- thermal-class B
- good dielectric properties
- favorable mechanical properties, no internal tension
- very good thermal-shock resistance
- highly resistant to water
- bubble free castings
- good processibility, suitable for both manual casting and casting with automatic mixer and feeder
- solvent and halogen free system
- fire retardancy class V2/2 mm (according to UL94)
- available in natural (off-white) and black versions
- on request, versions with accelerated hardening are available

Field of application

VUKOL N33 is a system for potting and casting of small and medium-sized transformers, capacitors, coils, electric parts etc. No abrasive fillers are included, allowing the use in continual mixing devices. It has improved thermal conductivity, compared to non-filled materials. VUKOL N33 is suitable for a wide range of applications, not restricted to the area of electroinsulating materials.

Processing

- VUKIT M is used as the default hardener.
- During mixing, the temperature of the components should be between 15 – 25 °C. At higher temperature, the hardening takes place more rapidly, thus shortening the pot life of the mixture.
- Moisture must be strictly avoided during all steps of work-up, until the resin is hardened. All workpieces and processing tools must be dry before use, possibly stored at ambient temperature, to avoid condensation of air moisture on cold surfaces.
- During storage, slight sedimentation of the fillers in the resin can occur, so VUKOL N33 should always be stirred up thoroughly before mixing with the hardener.
- The mixing ratio of polyol component VUKOL N33 and hardener is 100 : 23 (weight mixing ratio).

For manual work-up:

- The amount of resin-hardener mixture prepared at once should be adjusted to the number of the workpieces, as they should be casted/potted within the pot life. As soon as the viscosity of the mixture reaches double to triple of the initial value, it should not be used any more.
- For cleaning of the tools, it is recommended to use VUKI thinner T5.

In case of automatic application:

- According to the device manufacturer/supplier specific instructions.

Detailed instructions for manual processing are available in the document: "VUKOL N - Processing Instructions for PUR compounds.pdf". They are available on the VUKI website within the "Downloads" section.

CAUTION: In case of humidity higher than 55 %, bubbles may arise in castings, therefore application in such conditions is not recommended.

Labor safety and environmental information is detailed in the „Safety data sheets” of the product. Follow the safety instructions in the Safety Data Sheet during all the works



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Hardening

Hardening conditions:

- 16 hours at 23 °C , humidity: < 55 %
- 2 hours at 80°C
- full hardening: min. 7 days at 23 °C

Properties of components

Parameter	Standard	Condition	VUKOL N33	VUKIT M	Unit	Description
Appearance	HZS 003		moderately viscous liquid	brown liquid		
Density	STN EN ISO 2811-1	25 °C	1,30 – 1,35	1,20 – 1,24	g/cm ³	
Viscosity	STN 67 3014	25 °C	2 400 – 3 000	70 – 250	mPa.s	
Non-volatile content			> 99	> 99	%	
Flash point	STN EN ISO 2592		> 220	> 200	°C	
Shelf life		15 – 25 °C	12	12	months	

Mixing ratio	Weight mixing ratio
VUKOL N33 : VUKIT M	100 : 23

Properties of mixture

Parameter	Standard	Condition	VUKOL N33 + hardener	Unit	Description
Final color		VUKOL N33 natural VUKOL N33 black	yellowish white black		other colors possible on request
Initial viscosity of mixture	STN 67 3014	25 °C	1 500 – 2 500	mPa.s	
Processing time Time till reaching visc. 3 000 mPa.s	STN 67 3014	23 °C	15 – 30	min	100 g
Hardening time		23 °C	16 – 24	hours	humidity: max. 45 – 55 %
Full hardening time		23 °C	7	days	



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Parameters of the hardened material (after 7 days at 23 °C)

Parameter	Standard	Condition	Value	Unit	Description
Elongation at break	STN EN ISO 527-2		30	%	4 mm
Tensile strength	STN EN ISO 527-2		5,0	MPa	4 mm
Hardness	STN EN ISO 868	Shore D	30 – 35		after 7 days at 23 °C
Dielectric strength	STN EN 60243-1	23 °C	25	kV/mm	2 mm thickness sample
Volume resistivity	STN EN 62631-3-1	23 °C after 7 days in water 23 °C	4,9.10 ¹² 8.10 ¹⁰	Ω.cm	
Surface resistivity	STN EN 62631-3-2	23 °C after 7 days in water 23 °C	1.10 ¹⁵ 1.10 ¹⁵	Ω	
Thermal index	STN IEC 60 216		B (130°C)		
Thermal conductivity	STN EN ISO 10456		0,45	W/(m.K)	2 cm thickness sample
Water absorption	ISO 62	25 °C, 24 hours	max. 0,25	%	
Combustibility class	UL 94		V2		2 mm
tg δ	STN EN 60455-2		0,126		
Permittivity	STN EN 60455-2		5,8		
Tg	STN EN ISO 11357-2		0,2	°C	

Packing, storing and manipulation

VUKOL N33 and VUKIT M are supplied in non-returnable, clean, metal containers. Should be stored in tightly closed containers in a dry, ventilated place at + 5 °C to + 25 °C. When the storage conditions are met, the quality of the unhardened resin is guaranteed 12 months from the date of manufacture.

CAUTION: Prevent the infiltration of moisture or air humidity into the material, it causes degradation!

NOTE

The information in this document is consistent with our best knowledge of the date of publication. This information can be a subject of revision without prior notice if new knowledge and experience are available. The data provided falls within the normal range of product properties and relates only to the specified material. These data may not apply to materials used in combination with other materials or ingredients or other processes, unless expressly stated otherwise. The data provided should not be used to set limits or used separately as a basis for the sample: they are not intended to compensate for any testing that may be necessary to make a decision as to whether the specific material is suitable for your particular purpose. Because VUKI cannot predict all variants of end-use product conditions, VUKI does



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<http://www.vuki.sk/en/impregnating-substances-and-potting-materials>

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