



### Characteristics

VUKOL N22 is a two component polyurethane system (resin + hardener) for potting, with low initial viscosity. The system hardens at room temperature. It is suitable for a wide range of applications. It contains only small amounts of inorganic fillers and is free of solvents (VOC < 1 %). The hardened resin resembles hard rubber and belongs to medium hardness class of polyurethanes.

It has the following basic 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 (yellowish), black and pigmented versions (blue – approx. RAL 5005)
- on request, versions with accelerated hardening are available

### Field of application

VUKOL N22 is a system for potting and casting of small and medium-sized transformers, capacitors, coils, electric parts, batteries (automotive) etc. Suitable for potting of materials with different thermal expansion coefficient. Contains no abrasive fillers, it can be worked up with continual mixing devices. One of main advantages of VUKOL N22 is the low starting viscosity of the resin–hardener mixture, which allows the potting of quite narrow gaps.

The temperature resistance of this type of potting compound is from – 40 °C to + 150 °C.

### Processing

- VUKIT M is used as the default hardener. Optionally, VUKIT LV can be used instead, with the same mixing ratio, producing lower viscosity of the initial 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.
- Polyol component VUKOL N22 should always be stirred up thoroughly before mixing with the hardener.
- During mixing the temperature of the components should be between 15 – 25 °C.
- The mixing ratio of polyol component VUKOL N22 and hardener is 100 : 47 (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 working with PUR materials are mentioned in the document: "VUKOL N – Processing Instructions for PUR compounds". It is available on the VUKI website in the "download" section.

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



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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.

### Hardening

Hardening conditions:

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

### Properties of components

Parameter	Standard	Condition	VUKOL N22	VUKIT M or VUKIT LV	Unit	Description
Appearance	HZS 003		pale yellow liquid black liquid	clear brown liquid		VUKOL N22 natural VUKOL N22 black
Density	STN EN ISO 2811-1	25 °C	0,95 – 1,05	1,20 – 1,24	g/cm <sup>3</sup>	= kg/l
Viscosity	STN 67 3014	25 °C	800 – 1 000	VUKIT M: 70 – 250 VUKIT LV: 20 – 40	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 N22 : VUKIT M (or VUKIT LV)	100 : 47

### Properties of mixture

Parameter	Standard	Condition	VUKOL N22 + hardener	Unit	Description
Final color		VUKOL N22 natural VUKOL N22 black	yellowish white black		other colors possible on request
Initial viscosity of mixture	STN 67 3014	25 °C	550 – 800 (VUKIT M) 300 – 400 (VUKIT LV)	mPa.s	
Processing time: Time till reaching double viscosity Time till reaching triple viscosity	STN 67 3014	23 °C	14 – 20 25 – 30	min	100 g
Hardening time		23 °C	16	hours	humidity: less than 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		59	%	4 mm
Tensile strength	STN EN ISO 527		7,6	MPa	4 mm
Hardness	STN EN ISO 868		25 – 30	Shore D	after 7 days at 23 °C
Dielectric strength	STN EN 60243-1	23 °C	20 – 25	kV/mm	2 mm thickness sample
Volume resistivity	STN EN 62631-3-1	23 °C after 24 hours in water	6,5.10 <sup>11</sup> 4,4.10 <sup>11</sup>	Ω.cm	
Surface resistivity	STN EN 62631-3-2	23 °C after 24 hours in water	6,4.10 <sup>13</sup> 3,3.10 <sup>13</sup>	Ω	
Thermal class	STN IEC 60216		B (130 °C)		
Thermal conductivity	STN EN ISO 10456		0,22	W/(m.K)	
Water absorption	ISO 62	25 °C, 24 hours	max. 0,15	%	
Flame retardancy	UL 94		V2		2 mm
tg δ	STN EN 60455-2		0,089		
Permittivity	STN EN 60455-2		4,2		
CTI	STN EN 60112		600		
Tg	STN EN ISO 11357-2		15,6	°C	

### Packing, storing and manipulation

VUKOL N22 and VUKIT M (VUKIT LV) 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



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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 not provide guarantees and has no responsibility with respect to any use of this information. Nothing in this publication is considered to be a use or recommendation to violate any patent rights.

### Contact

VUKI a.s., Rybníčná 38, 831 07 Bratislava 06

Customer service: tel.: +421 906 063 231, +421 906 063 107

e-mail: [info@vuki.sk](mailto:info@vuki.sk)

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

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