ELPECAST® peters

TR TECHNICAL REPORT

Casting compounds of the series Wepuran VU 4444/31 SB-WB

The casting compounds of the series **Wepuran VU 4444/31 SB-WB** protect and insulate electronic components and assemblies against extreme climatic influences and aggressive media, as well as against mechanical attack.

- Base: polyurethane resin (UR)
- elastic
- particularly suitable for sensitive electronic components since it reduces material tension under temperature changes
- low-cost alternative for silicone casting compounds
- temperature range from **-65 to at least +90 °C [-85 up to at least 194 °F]**
- very good resistance to weathering and UV radiation, no loss of gloss or adhesion after long-term outdoor use
- good adhesion on almost all materials
- for the embedding of LEDs:

  VU 4444/31 SB-WB, black, minimises light reflexion of the substrate and increases the contrast with the LEDs

  VU 4494/31 SB-WB, white, optimises the light emission due to high reflectivity and high yellowing resistance
- excellent protection against impact, shock and vibration
- good resistance to water, moisture, lyes, acids, and numerous chemicals
- correspond to the best flame class V-0 acc. to UL 94

LP 201303 E-2 / 300671e_000

Characteristics

	VU 4444/31 SB-WB	VU 4494/31 SB-WB
Colour/aspect	black	white
Solids content	> 99 %	> 99 %
Viscosity* at 20 °C [68 °F], DIN EN ISO 3219 Component A Hardener (comp. B) Mixture	 13 000 ± 1 500 mPas* 400 ± 100 mPas** 3 000 ± 500 mPas**	 9 000 ± 1 000 mPas* 400 ± 100 mPas** 2 300 ± 500 mPas**
Density at 20 °C, DIN EN ISO 2811-1 Component A Hardener (comp. B) Mixture	 1.60 ± 0.05 g/cm³ 1.09 ± 0.05 g/cm³ 1.44 ± 0.05 g/cm³	 1.62 ± 0.05 g/cm³ 1.09 ± 0.05 g/cm³ 1.44 ±0.05 g/cm³
Pot life of mixture at 19–21 °C [66.2–69,8 °F] in acc. with DIN EN 14022, approx. 200 mL Double viscosity Tenfold viscosity	 ≈ 70 min ≈ 100 min	 ≈ 70 min ≈ 130 min

* measured with Haake RS 600, C 20/1°, D = 50 s^{-1}

** measured with Haake RS 600, C 35/1°, D = 100 s^{-1}
viscosity measuring unit supplied by Thermo Fisher Scientific, www.thermofisher.com

Indices: VU = casting compound opaque, /31 = mixing ratio 3:1, SB = hardly flammable, WB = weatherproof

Physical and mechanical properties

These properties are reached after 14 days storage at room temperature (18-23°C [64.4-73.4°F]).

Property	Test method	VU 4444/31 SB-WB		VU 4494/31 SB-WB
Shore-A hardness	DIN 53 505	80–90		75–85
	DIN ISO 7619-1	75–85		75–85
Water absorption	DIN EN ISO 62, 24 h/23 °C 30 min/100 °C + 15 min/23 °C	≈ 1.1 % ≈ 0.4 %		≈ 1.1 % ≈ 0.4 %
Glass transition temperature Tg	TMA	≈ -10 °C		≈ -10 °C
Coefficient of thermal expansion CTE	TMA	≈ 50 ppm/°C < Tg ≈ 155 ppm/°C > Tg		≈ 70 ppm/°C < Tg ≈ 170 ppm/°C > Tg
Temperature shock*	in acc. with IPC-TM-650, 2.6.7.1, -65 to +125 °C [-85 to 257 °F]	passed		passed
Thermal class	in acc. with DIN IEC 60 085	Y = 90 °C		Y = 90 °C
Temperature index (TI)	in acc. with DIN EN 60216 (IEC 60216), version 2001 mass loss: 5 % 10% 20 % 50 %	after 5 000 h ≥ 105 °C ≥ 115 °C ≥ 130 °C ≥ 145 °C	after 20 000 h ≥ 80 °C ≥ 90 °C ≥ 105 °C ≥ 120 °C	n/a

* can be used in a temperature range of **-65 up to at least + 90 °C** [-85 up to at least 194 °F]. Both at the lower and upper ends of this range the performance and reliability of the material can be negatively affected in some applications. In these cases, additional pre-trials and tests are required.

Electrical properties

These properties are reached after 14 days storage at room temperature (18-23°C [64.4-73.4 °F]).

Property	Test method	VU 4444/31 SB-WB	VU 4494/31 SB-WB
Dielectric strength	VDE 0303, part 21 DIN EN 60243-1	≥ 25 kV/mm	≥ 35 kV/mm
Surface resistance	VDE 0303, part 30 DIN IEC 60093	≥ 6 x 10^{13} Ohm	≥ 10^{14} Ohm
Specific volume resistivity	VDE 0303, part 30 DIN IEC 60093	≥ 7 x 10^{12} Ohm x cm	≥ 10^{13} Ohm x cm
Comparative tracking index (CTI, tracking resistance	DIN EN 60112	CTI > 600	CTI > 600

Dielectric properties

The values were determined based on a contact pressure of 20 g/cm³ and a test voltage of 100 V (50 Hz and 1 kHz) resp. 1 V (1 MHz); they strongly depend on the measuring method applied (voltage, contact pressure etc.), the temperature and the frequency.

	Frequency	23 °C [73.4 °F]	60 °C [140 °F]	90 °C[194 °F]
Loss factor tan δ acc. to IEC 62631-2-1	50 Hz 1 kHz 1 MHz	≈ 0.0465 ≈ 0.0486 ≈ 0.1087	≈ 0.3116 ≈ 0.0486 ≈ 0.1469	≈ 0.4317 ≈ 0.1810 ≈ 0.0803
Permittivity ε_r acc. to IEC 62631-2-1	50 Hz 1 kHz 1 MHz	≈ 6.05 ≈ 5.65 ≈ 3.65	≈ 5.97 ≈ 5.29 ≈ 4.53	≈ 10.38 ≈ 5.24 ≈ 5.33

Processing

	Please read this technical report and the publications listed below carefully before using the product. These sheets are enclosed with the first shipment of product or sample.
MSDS	The corresponding material safety data sheet contains detailed information and characteristics on safety precautions, environmental protection, transport, storage, handling and waste disposal.
TI	Technical information TI 15/2 ”Selection criteria and processing instructions for casting compounds”
TI	Technical information TI 15/3 ”Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents”
TI	Technical information TI 15/10 “Processing of 2-pack systems“

Since the many different permutations make it impossible to evaluate the whole spectrum (parameters, reactions with materials used, chemical processes and machines) of processes and subsequent processes in all their variations, the parameters we recommend are to be viewed as guidelines only that were determined in laboratory conditions. We advise you to determine the exact process limitations within your production environment, in particular as regards compatibility with your specific follow-up processes, in order to ensure a stable fabrication process and products of the highest possible quality.

The specified product data is based upon standard processing conditions/test conditions of the mentioned norms and must be verified if necessary while observing suitable test conditions on processed products.

Feel free to contact our application technology department (ATD) if you have any questions or for a consultation.

Safety recommendations

➔ When using chemicals, the common precautions should be carefully noted.

Mixing

Stir before use

Component A : hardener (component B) = 3 : 1 (parts by weight)

Auxiliary products recommended

- ELPESPEC® sealing mastic EH 13.271
  solvent-free paste for sealing jobs in electronics and electrical engineering, self-adhesive and permelastic
- ELPESPEC® adhesion promoters EH 13.950/EH 13.951
  for improving the adhesion; **EH 13.950** is applied thinly to the parts that will come into contact with the casting compound while **EH 13.951** is mixed thoroughly with the casting compound prior to potting
- ELPESPEC® mould release agent EH 13.650
  solvent-, silicone- and grease-free, for pre-treating the surfaces of parts to be potted; after curing, the potting can be easily removed from the mould without residue
- ELPESPEC® accelerator B 4402
  reduces the curing time and the processing time, thus to be applied preferably with mixing and dosing units; stirred into component A prior to processing the casting compound
- ELPESPEC® cleaning agent R 13.780
  for the cleaning of work place and tools; cleaning should be effected immediately after processing as cleaning becomes increasingly difficult the further the curing process progresses and is impossible after final curing

Drying/Curing

The following specifications for a quantity of 25 g serve as a guideline:

	Room temperature (18-23 °C [64.4-73.4 °F]	**80 °C [176 °F]**	**125 °C [257 °F]**
Tack-free	24 h	1 h	20 min
Cured	14 days	2 h	1 h

Packaging

The packing units available are indicated in our offer which we will send you upon request.

Shelf life and storage conditions

Shelf life: In sealed original containers at least 9 months

Storage conditions: +5 °C to +25 °C [+41 °F to +77 °F]

Protect against humidity

Protect hardener (component B) against frost

For warehousing reasons, isolated cases may occur where the shelf life upon shipment is less than the shelf life indicated in this technical report. However, it is ensured that our products have **at least** two-thirds of their shelf life remaining when they leave our company. Labels on containers show shelf life and storage conditions.

Disclaimer

All descriptions and images of our goods and products contained in our technical literature, catalogues, flyers, circular letters, advertisements, price lists, websites, data sheets and brochures, and in particular the information given in this literature are non-binding unless expressly stated otherwise in the Agreement. This shall also include the property rights of third parties if applicable.

The products are exclusively intended for the applications indicated in the corresponding technical data sheets. The advisory service does not exempt you from performing your own assessments, in particular as regards their suitability for the applications intended. The application, use and processing of our products and of the products manufactured by you based on the advice given by our Application Technology Department are beyond our control and thus entirely your responsibility. The sale of our products is effected in accordance with our current terms of sale and delivery.

Any questions? We would be pleased to offer you advice and assistance in solving your problems. Samples and technical literature are available upon request.

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