

PUT3220-2L

Two-component Polyurethane Potting Compound

PUT3220-2L is ideal for potting and sealing various lighting, electronic, and electrical items. It has a low mixing viscosity, excellent fluidity, easy pouring capabilities, and is easy to work with. Its primary uses include waterproofing, protection, sealing, filling, and insulation. Once cured, it forms a strong adhesive colloidal structure with good electrical properties. This product meets RoHS and Reach environmental standards as well as flame retardant requirements.

PRODUCT COMPOSITION

- PUT3220-2L is a two-component, high-performance (high thermal conductivity, high flame retardant) polyurethane potting material.
- PUT3220-2L consists of main agent and curing agent
 - *A glue: curing agent/cured isocyanate.
 - *Glue B: main agent/polyol.

TYPICAL PROPERTIES

Index	Mixing ratio (By weight)	Color	Viscosity value (fluidity) 25 °C, Mpas	Density 25 °C, g/cm ³	Open time 100g, 25 °C	Storage Sealed, 25°C
PUT3220-2LA	1	brown liquid	200 ~ 350	1.12 ± 0.05	-----	3 months
PUT3220-2LB	5	black liquid	3000 ~ 5000	1.60 ± 0.05	-----	3 months
Mix A+B	-----	black	900 ~ 1350	1.47 ± 0.05	30 ± 5 min	-----

- Potting glue's key component, known as ingredient B, comprises a blend of oil and powder. Prior to application, it is essential to stir them separately so that the oil and white powder mix evenly - the oil floating and the powder sinking. Subsequently, solidification should take place with the correct ratio. Failure to evenly disperse the main ingredient B before combining with ingredients AB will lead to various issues.
 - The cured product is softer and lighter in color;
 - The curing time is too long or does not cure;
 - The mechanical properties, thermal properties, and electrical properties of the cured product are different from the standards;
- Once the potting glue curing agent A is opened, it should be securely sealed with plastic wrap and the lid to avoid exposure to moisture in the air, which could lead to self-curing. It is important not to exceed a 7-day period before using it.

TYPICAL CURED PROPERTIES

Index	Fixed time 25 °C	Curing time 25 °C	Heat curing 60 °C	Cured hardness	Color	Temperature resistant C	Tg point C	Linear expansion coefficient N/mm ²	Flame retardancy UL94
PUT3220-2L	4~6H	10~12H	2.5H	50±5A	Black	- 40°C~120°C	5°C	163*10 ⁻⁶ K ⁻¹	VO

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The surface drying time indicates how long it takes for the A&B mixture to initially cure. During this period, it is safe to touch the surface of the cured product. Subsequent steps in the potting process can be taken based on the current conditions, although the hardness of the cured product may not have reached its maximum level.

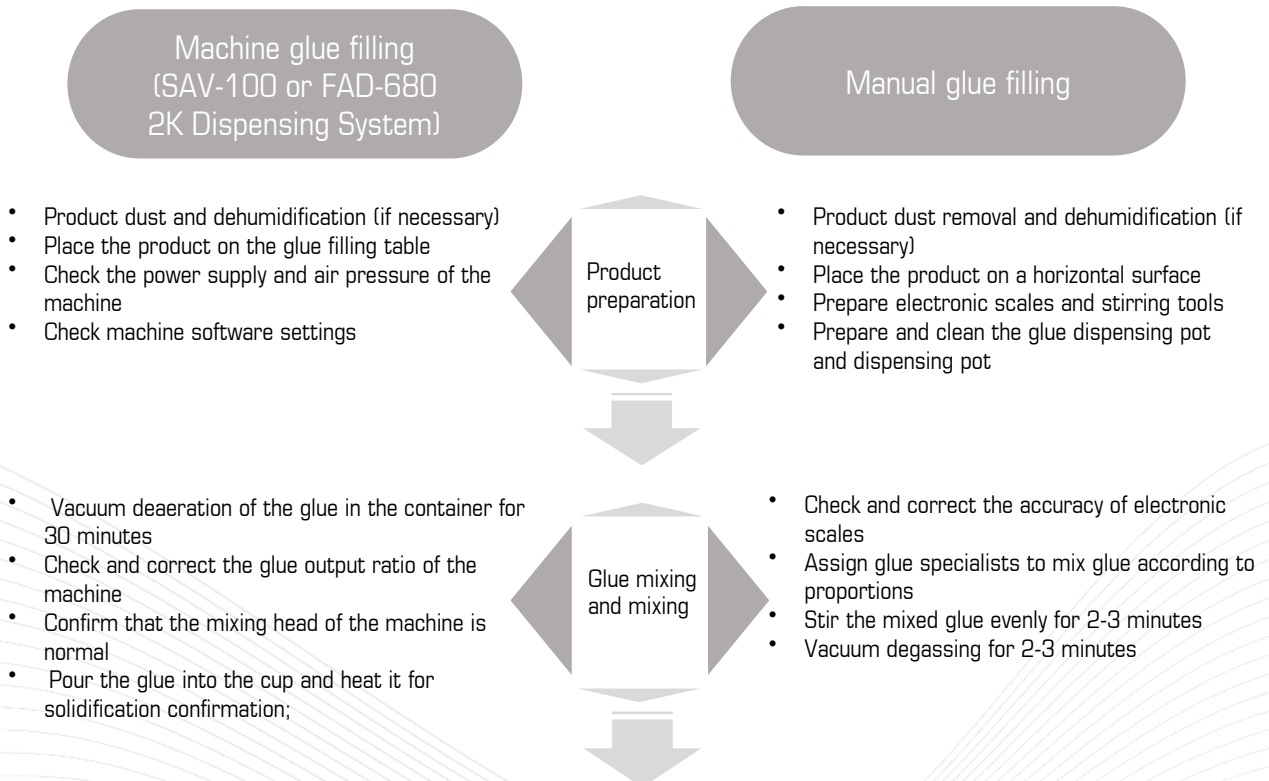
The curing process is defined as the period during which the surface of the combined cured substance dries completely and achieves a hardness level exceeding 95% of its fully cured state. The duration of curing is predominantly influenced by the quantity of adhesive mixed (greater amounts lead to quicker curing) and the ambient temperature (higher temperatures accelerate the process). Once this curing phase is completed, the potted product can be gathered or packaged.

The level of hardness known as cure hardness is achieved when a mixture of cured material reaches a thickness of 20mm and is fully cured. This typically occurs within a period of 5 to 7 days, with the exact timing influenced by the surrounding temperature conditions.

CURED ELECTRICAL PERFORMANCE

Index	Thermal Conductivity W/m.k	Dielectric strength 23 C, kV	Volume resistivity 23°C/50% r.h	Surface resistance 23 °C/50%	Dielectric constant at 1MHz, 23 °C
PUT3220-2L cured product	0.8	≥ 36	4.19E+12Ω.cm	4.36E+14Ω/sq	6.74

GENERAL PROCESS FLOW



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Machine glue filling
(SAV-100 or FAD-680
2K Dispensing System)

Manual glue filling

- Adjust the machine's gluing schedule
- Fill glue according to product requirements
- Carry out secondary glue filling (if necessary)
- Turnover and placement of glue-filled products

- The vacuumed glue water is given to the glue filling employees
- Multiple glue filling employees fill the product
- The glue distribution specialist continues to prepare and distribute glue
- Turnover and placement of glue-filled products



- Specialist inspects the glued products
- Deal with glue leakage, less glue, and more glue parts
- Bubble treatment caused by process
- Curing at room temperature or heating (if necessary)

- Specialist inspects glue-filled products
- Treat parts with glue leakage, less glue, and more glue
- Bubble treatment due to process
- Curing at room temperature or heating (if necessary)



- Appearance inspection of glue-filled finished products
- Clean up residual glue (if necessary)
- Check for glue filling defects (rework if necessary)
- Qualified finished products enter the packaging process

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- Qualified finished products enter the packaging process



STORAGE AND PROCESSING ENVIRONMENT PRECAUTIONS

- Basic overview of process environment and vehicle suggestions: Polyurethane (PU) is susceptible to moisture, water vapor, and organic tin, therefore proper ventilation must be upheld.
- Maintain a temperature of 25 ± 3 degrees Celsius and humidity at 85%.
- Particularly during the rainy season, it is crucial to regulate humidity levels.
- Utilize ventilation methods such as natural airflow or mechanical systems. Ensure control over dust accumulation and oil residues, as well as monitor the condition of stripping components.

OTHER PROCESS REGARDING PRECAUTIONS

- In the workshop, a first in, first out quality policy is adhered to when using glue.
- It is important to thoroughly stir the main agent of polyurethane potting material before use to ensure even dispersion of oil and filler. This stirring process should be done consistently whether filling manually or with equipment.

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OTHER PROCESS REGARDING PRECAUTIONS

- When starting to apply glue, it is recommended to use no more than 200 grams initially. As proficiency in handling the glue increases, the amount used can be gradually increased.
- Caution should be taken when working with alcohol or other solvents during gluing operations to prevent any reactions that may interfere with curing processes.
- When conducting glueing tasks, individuals with skin allergies to chemicals should wear gloves. Following the glueing process, it is important to wash hands with soap immediately or clean any parts that have come into contact with the glue. In case of eye contact with glue, it is crucial to promptly open the eyelids and rinse the eyes with plenty of water for over 15 minutes.
- When using heat to expedite curing, it is advised not to drastically increase temperatures. There are two primary heating methods: Method 1 involves heating in a closed space or baking room with temperature control.
- Begin at an initial temperature of $45 \pm 5^{\circ}\text{C}$ and after 20 to 30 minutes, gradually increase it to $60 \pm 5^{\circ}\text{C}$ without surpassing this limit. Sudden exposure to high temperatures can cause rapid expansion of cavity structures within the glued product, leading to physical bubbles that affect its appearance. Bubbles on the surface impact product aesthetics while those within may compromise performance. For products with a simple glue filling structure and thickness of 5mm, heating up to around 80°C is acceptable.
- Assembly line tunnel furnace with multi-stage temperature control, referred to as Method 2, consists of different temperature zones for optimal glue filling. The first section serves as the inspection area for glue appearance, addressing any excess or insufficient glue or bubbles encountered along the track.
- Following this is the initial heating zone set at a recommended temperature of $45 \pm 5^{\circ}\text{C}$. Subsequently, the third paragraph suggests a heating temperature of $55 \pm 5^{\circ}\text{C}$, while the fourth and fifth paragraphs recommend temperatures of $65 \pm 5^{\circ}\text{C}$ each. The process concludes with the sixth section dedicated to cooling.

RECOMMENDED POTTING THICKNESS

Glue filling thickness:

$3\text{mm} \leq \text{Glue filling thickness} \leq 30\text{mm}$.

Higher thicknesses require long-term high and low temperature cycles to determine whether they match.

RECOMMENDED VACUUM SYSTEM

When dealing with the product's component layout, it is advisable to utilize vacuum pouring for bubble-free filling if there are numerous components requiring pouring.

Recommended vacuum potting system: GLUDITEC FAC-600 or FAC-950

PERFORMANCE TEST

Additionally, it is recommended to perform an electrical performance aging test on the product before commencing batch usage.

PACKAGING

5kg, 20kg, 200kg metal drums or plastic drums.

STORAGE & DELIVERY

- These products are non-dangerous goods and are stored and transported as general chemicals.
- Stored for 3 months in a dry warehouse without direct sunlight in the temperature range of $20\sim 30^{\circ}\text{C}$
- A glue (curing agent) may undergo physical crystallization when it is below 15°C and left for more than 24 hours. Preheat the crystallized curing agent at $50^{\circ}\text{C}\sim 60^{\circ}\text{C}$ for 2 hours or the temperature rises to 25°C for more than 24 hours. The crystallization phenomenon will disappear naturally.
- When the glue has been opened and used, be sure to seal the lid with plastic wrap and tighten the lid. The best effect is to use it within 3 days. If the glue that has been opened cannot be used within 7 days, please seal it before subsequent use. Use again if there are no abnormalities in the test.

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STORAGE & DELIVERY

- When glue is placed in the barrel of the glue filling machine, it should be evacuated and stored during shutdown, and the air inlet valve of the barrel should be equipped with a moisture filtering device to ensure that the glue does not come into contact with moisture and should not be left for more than 7 days.

DISCLAIMER

- Most of the performance data contained in this article are typical data for testing the product after it is fully cured at a humidity of 70% and a temperature of 25°C. Some data are test data under corresponding conditions (marked) and are for customer use only. For reference, there is no guarantee that all data can be achieved in a specific environment.
- Customers are requested to conduct necessary sample confirmation before using this product. This article is both an instruction manual and a product approval letter. After taking a sample, please sign or stamp the approval page to acknowledge that this product meets your performance requirements. If you use this product directly after taking the test without product approval, your company will be deemed to have acquiesced that the products listed in this manual meet your performance requirements.
- It is recommended that before using this product in batches or every time when changing other types of raw materials or changing construction methods or glue filling equipment, customers must first do a small batch trial production and meet the requirements before using it in large batches, otherwise there will be adverse consequences. We are not responsible.