TECHNOMELT®

LOCTITE®

RESPECT THE PLANET

RETHINK DESIGN AND PROCESSES

LOW PRESSURE MOLDING

ENCAPSULATE AND PROTECT YOUR ELECTRONICS WITH SIMPLIFIED, SUSTAINABLE SOLUTIONS

Henkel

Henkel Adhesive Technologies

CONTENTS

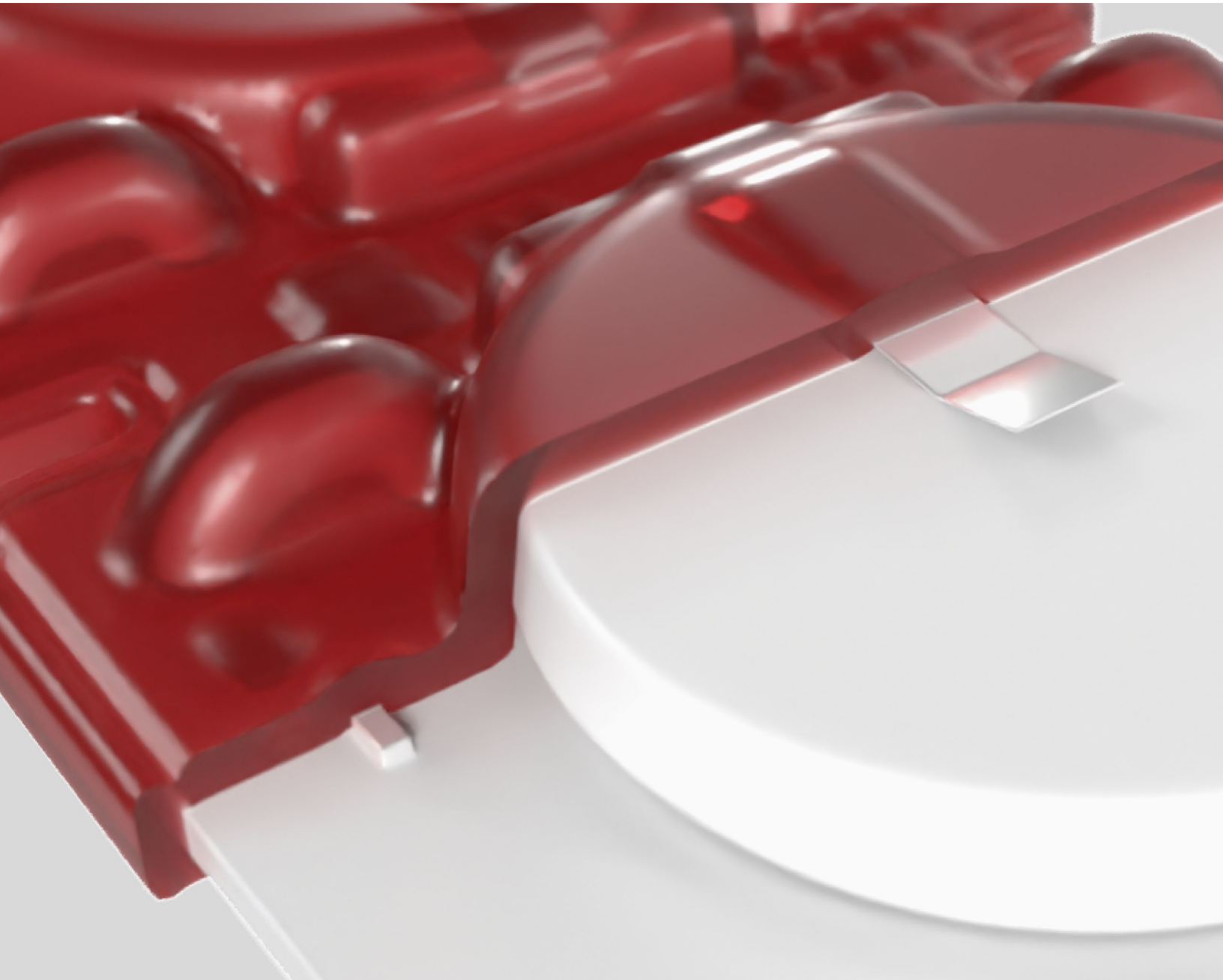
3 INTRODUCTION

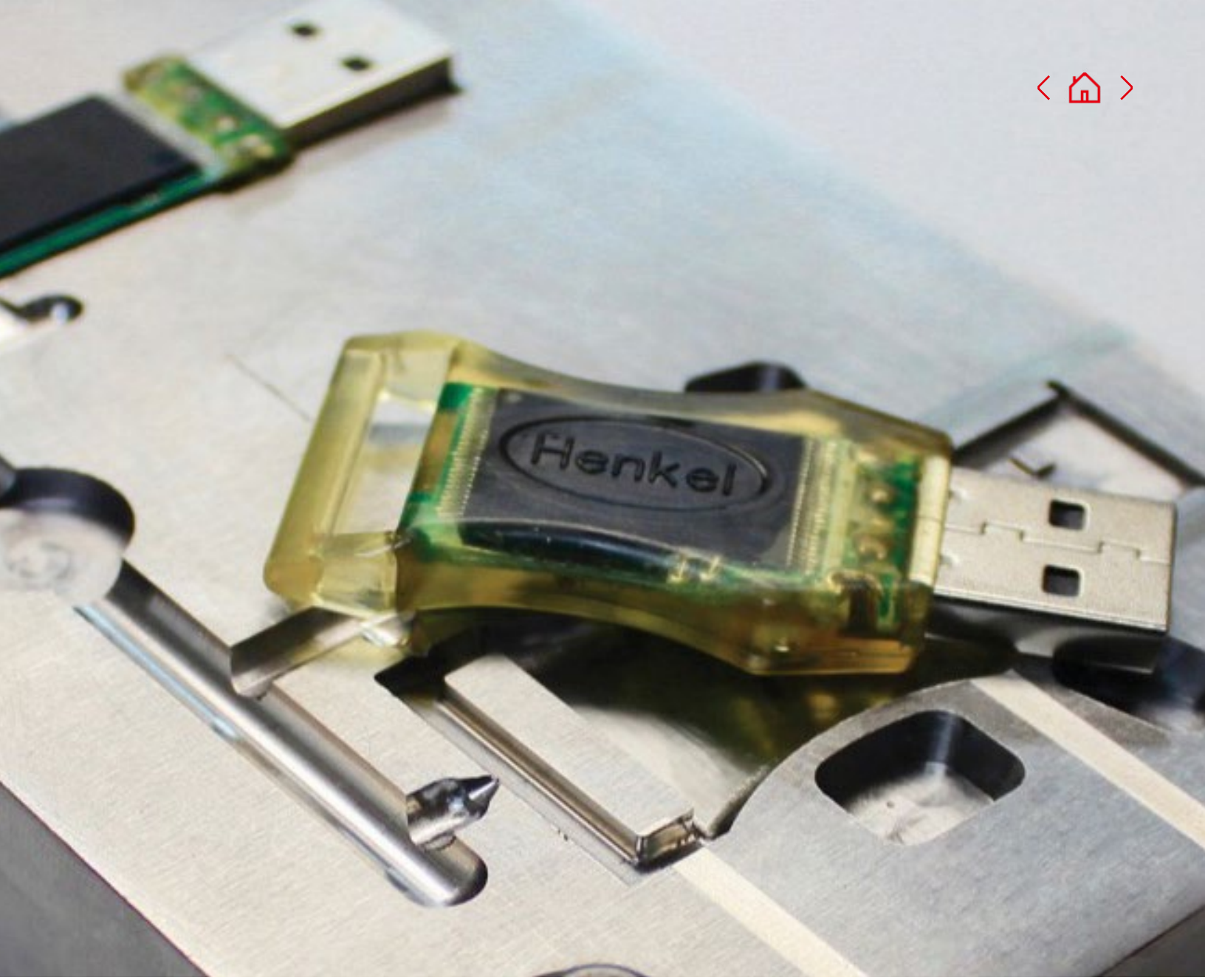
4 A SUSTAINABLE SOLUTION

5 LOW PRESSURE MOLDING PROCESS

7 PRODUCT SELECTION GUIDE

8 HENKEL LOW PRESSURE MOLDING PRODUCTS





INTRODUCTION

LOW PRESSURE MOLDING

Henkel TECHNOMELT® and LOCTITE® low pressure molding solutions offer an efficient, low-cost alternative to conventional multi-step, multi-material PCB protection methods. With Henkel's simple three-step process, parts are inserted into the moldset, overmolded and then tested. Low pressure molding also eliminates messy two-part material mixing routines, device preparation (masking), long cure times and material waste.

What's more, these reworkable thermoplastic materials provide impressive device protection against temperature, vibration, impact, moisture, chemicals and mechanical stress. Sustainable and cost-effective, low pressure molding can reduce PCB protection costs compared to potting, conformal coating and sealing methods. Low pressure molding also reduces weight vs. potting by having both unfilled resins and being able to skyline up and around components.

A SUSTAINABLE SOLUTION

Respecting the planet is crucial. As pioneers at heart, we believe it's our responsibility, together with our customers, to shape a viable future for the good of generations. We are committed to supporting industry defossilization, embracing a circular economy, prioritizing safety and well-being, and conserving natural resources.

We collaborate with our customers to rethink design and processes, identifying opportunities for sustainable innovation.

Low pressure molding contributes to sustainability in the following ways:

RESPECT THE PLANET

RETHINK DESIGN AND PROCESSES

CLIMATE

- Simplifies assembly with three process steps
- Reduces number of components for less material used and fewer items on inventory
- Enables faster throughput and less energy-intensive processing
- Eliminates processing equipment compared to potting
- Uses less plastic in product packaging
- Can replace plastic housings to reduce carbon footprint

CIRCULARITY

- Up to 80% bio-based, renewable raw material content
- Potential to reuse runners*

SAFETY

- No VOCs, solvent-free, RoHS- and REACH-compliant
- UL-listed material options including flammability rated to UL94 V0 or V2
- ISO 10993 biocompatibility including skin sensitization (LOCTITE®)

*May not be suitable for applications that must meet test standards or require retesting of reusable material.

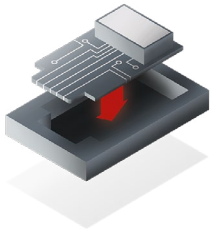
LOW PRESSURE MOLDING PROCESS

Cost reduction and streamlined processing are among the most significant benefits of this solution. Compared to conventional potting techniques that require multiple steps, low pressure molding simplifies encapsulation into only three: insert, overmold and test. Simplicity and processing speed equate to lower costs.

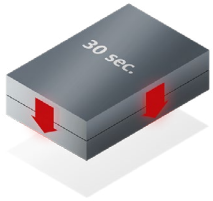
SIMPLIFY THE TRADITIONAL POTTING PROCESS

LOW PRESSURE MOLDING

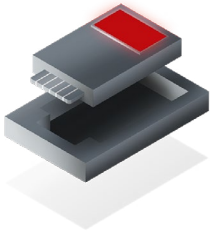
INSERT



OVERMOLD



TEST



TRADITIONAL POTTING PROCESS

MOLD HOUSING	ASSEMBLE PARTS	PREHEAT PARTS	DISPENSE	VACUUM OR SETTLE	CURE	TEST
No housing required	Insert parts directly into moldset	Process step eliminated	30 sec. – 2 min. encapsulation process	Process step eliminated	Thermoplastic material does not require cure	Parts handled immediately after molding

CIRCUIT BOARD PROTECTION TECHNOLOGY COMPARISON

Traditional CBP Materials	Material Challenges	TECHNOMELT® and LOCTITE® Low Pressure Molding Solutions
POTTING	▪ Two-part systems; mixing required ▪ Non-reworkable ▪ Large equipment investment and footprint ▪ 24 – 72 hours cure schedule ▪ Up to 8 process steps ▪ 5 – 7 BOM part numbers in inventory	▪ One part; no mixing ▪ Reworkable ▪ Weight reduction ▪ Low waste ▪ 30 sec. – 2 min. cycle times ▪ Strain relief ▪ Green technology; no VOCs
SEALING	▪ Limited by housing dimensions; space constraints ▪ 48 – 72 hours cure schedule ▪ Up to 6 process steps ▪ 5 – 7 BOM part numbers in inventory	▪ No housing; fewer part numbers ▪ Only 3 process steps ▪ Improved aesthetic appearance; skylining ▪ Only 1 BOM part number required ▪ In-line and high-volume processing
CONFORMAL COATING	▪ Very limited mechanical strength ▪ 4 – 12 hours cure schedule ▪ Up to 8 process steps ▪ 3 – 4 BOM part numbers in inventory	▪ No cure ▪ Temperature, vibration, impact and chemical resistance ▪ Watertight encapsulation ▪ Good mechanical strength ▪ Translucent materials available for optical inspection ▪ Eliminates time-consuming, labor-intensive masking ▪ Mold top and bottom of PCB simultaneously

INDUSTRIAL SENSORS AND COMPONENTS MARKET

EXCELLENT ADHESION

APPLICATIONS

- Door sensors
- Security tokens
- Monitoring systems
- Connectors
- Microinverters

INCREASED HARDNESS

APPLICATIONS

- Switches
- Electronic controllers
- Power regulators
- Optical encoders
- Moisture sensors
- Electric motors

LED/LIGHTING MARKET

UV RESISTANT

APPLICATIONS

- LED nodes
- Industrial sensors
- Automotive lighting
- Smart meter systems
- Solar units

CLEAR

APPLICATIONS

- Sensors with LEDs
- Lighting display boards
- Consumer LED units
- LCD screens

MEDICAL MARKET

TESTED TO ISO 10993

APPLICATIONS

- Continous glucose monitors
- Insulin patch pumps
- Other medical wearables

TESTED TO ISO 10993

APPLICATIONS

- Pulse oximeters
- Catheters
- Tube sets and connectors
- Hearing aids
- Surgical tools

AUTOMOTIVE MARKET

HIGH-TEMPERATURE RESISTANT

APPLICATIONS

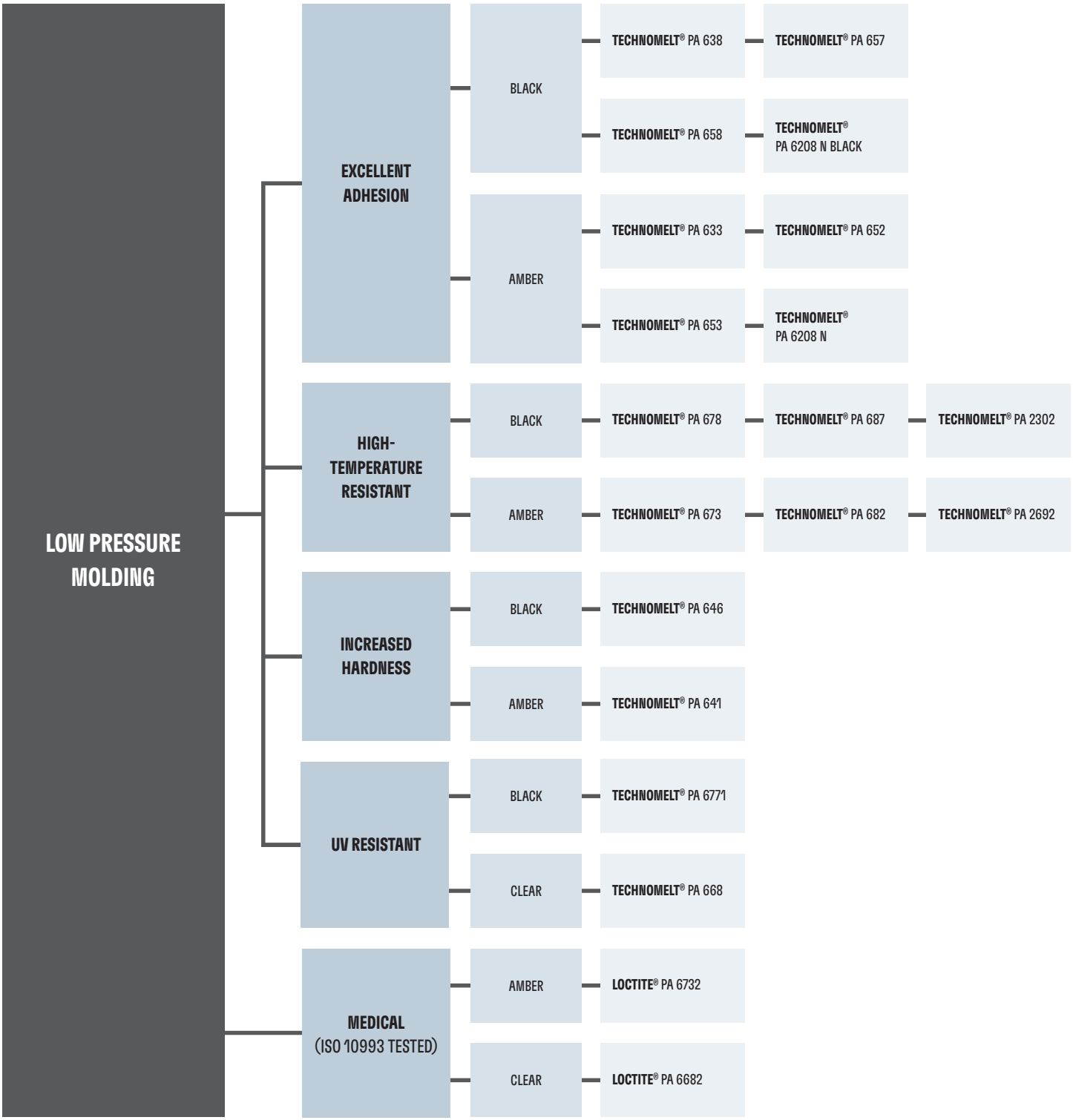
- Automotive sensors
- Engine control units
- Temperature sensors

SOLVENT RESISTANT

APPLICATIONS

- Medical sensors
- Security sensors
- Outdoor batteries

PRODUCT SELECTION GUIDE



HENKEL LOW PRESSURE MOLDING PRODUCTS

Product	Description	Color	Performance Temperature	Shore Hardness	Application Temperature Range
MEDICAL (ISO 10993 TESTED)					
LOCTITE® PA 6682	Thermoplastic polyamide designed for overmolding sensitive medical electronic devices. The material is clear in color.	Clear	-40°C to 85°C	90A	180°C - 230°C
LOCTITE® PA 6732	Thermoplastic polyamide designed for overmolding sensitive electronics, including wearable medical devices. The material is amber in color.	Amber	-40°C to 140°C	88A	210°C - 240°C
EXCELLENT ADHESION					
TECHNOMELT® PA 633 **TECHNOMELT®** PA 638	High-performance thermoplastic polyamide with moderate strength and good adhesion for in-cabin and underhood applications. Good adhesion to polar plastics like PA, ABS and PVC. Shore hardness Shore A 90.	Amber Black	-40°C to 125°C	90A	200°C - 240°C
TECHNOMELT® PA 652 **TECHNOMELT®** PA 657	Excellent adhesion and cold-temperature flexibility. Applications include automotive exteriors, white goods, PCBs and plugs for indoor applications. Good adhesion to polar plastics like PA, ABS and PVC. Soft touch (Shore hardness Shore A 77). Good processability.	Amber Black	-40°C to 125°C	77A	200°C - 240°C 180°C - 230°C
TECHNOMELT® PA 653 **TECHNOMELT®** PA 658	Excellent adhesion to plastic substrates. Designed for improved performance where prolonged exposure to moisture and harsh environments is expected. Adhesion to polar plastics like PA, ABS and PVC. Maintains stable mechanical values after 85/85 test (85°C, 85% humidity, 1000h).	Amber Black	-40°C to 125°C	77A	210°C - 230°C
TECHNOMELT® PA 6208 N **TECHNOMELT®** PA 6208 N BLACK	Excellent adhesion to tough substrates. Great flexibility at low temperatures and incredible strain relief on cables, wires and other electronics. High dielectric strength. Ideal for encapsulation of heat-producing components in appliances and consumer electronics. Good adhesion to polar plastics like PA, ABS and PVC. Good processability with low viscosity formulation.	Amber Black	-40°C to 125°C	82A	180°C - 230°C
HIGH-TEMPERATURE RESISTANT					
TECHNOMELT® PA 673 **TECHNOMELT®** PA 678	Good adhesion for high-temperature applications, such as automotive underhood and outdoor areas. Adhesion to polar plastics like PA, ABS and PVC. Shore hardness Shore A 92. Good processability.	Amber Black	-40°C to 140°C	88A	210°C - 240°C
TECHNOMELT® PA 682 **TECHNOMELT®** PA 687	Moldable polyamide for the most demanding high-humidity applications, such as automobile tire pressure sensors. Formulated for very low water vapor transmission.	Amber Black	-40°C to 140°C	88A	225°C - 235°C 225°C - 235°C
TECHNOMELT® PA 2692	Designed with excellent heat and oil resistance for stability in harsh environments such as automotive fluids. High hardness and very low moisture sensitivity.	Amber	-40°C to 175°C	57D	240°C - 270°C
TECHNOMELT® PA 2302	Good adhesion for high-temperature applications. Ideal for potting electronics modules, molding strain relief into wiring, and encapsulation of sensors. Passes autoclave and steam sterilization requirements.	Black	—	53(D)	220°C - 240°C
INCREASED HARDNESS					
TECHNOMELT® PA 641 **TECHNOMELT®** PA 646	Moldable polyamide, where strength and hardness are needed, such as in memory sticks and computer connectors. Often for applications with PVC components. Very good adhesion to a variety of substrates, including PVC. Good balance of low- and high-temperature performance. Excellent moisture and environmental resistance. High elongation break (650%); Shore hardness Shore A 90. Higher viscosity (7000 mPa*s).	Amber Black	-40°C to 130°C	92A	210°C - 240°C 200°C - 240°C
UV RESISTANT					
TECHNOMELT® PA 668	Outstanding moldability and clarity. Ideal for indoor and outdoor LED lighting applications as well as PCBs, electronic parts, sensors, control systems and plug-wire connections. Good adhesion to polar plastics. UV stable.	Clear	-40°C to 85°C	90A	180°C - 230°C
TECHNOMELT® PA 6771	High-performance, UV-resistant thermoplastic polyamide that exhibits strong mechanical properties and low-temperature performance. Typical applications are grommets and plugs for solar technology. Weatherproof with very good cold flexibility (-50°C). Due to the similar plastic properties, a plastic housing is not needed.	Black	-40°C to 100°C	29(D)	210°C - 240°C

TECHNOMELT®
LOCTITE®

henkel-adhesives.com

LEARN MORE

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