

RAMPF | Polyurethanes



Advanced Liquid Polyurethanes for Models, Prototypes, and Production Parts

RAMPF Group, Inc., based in Wixom, Michigan, is the North American subsidiary of the international RAMPF Group.

The product portfolio of RAMPF Group, Inc. is comprised of:

- > Mixing and dispensing systems for the reliable processing of polymers (Production Systems)
- > Two-component polymer (or synthetic) systems based on polyurethane, epoxy, and silicone (Polymer Solutions)
- > Modeling and mold engineering materials, in particular for the automotive, marine, and aviation industries (Tooling Solutions)

The international RAMPF Group based in Grafenberg, Germany, stands for Engineering and Chemical Solutions and caters to the economic and ecological needs of industry. The Group secures its presence on the international markets with six core competencies and more than 700 employees.

RAMPF thinks globally and acts locally. The Group has production facilities strategically located in Germany, the United States, Canada, China, and Japan.

RAMPF Tooling Solutions manufactures advanced **mercury-free, RoHS-compliant** polyurethanes for casting models, prototypes, and low-volume production parts. Our comprehensive line of products is known for its outstanding consistency and quality. Polyurethanes supplied by RAMPF exhibit a wide range of handling, curing, and performance properties for use in many applications:

- > Medical and electronic devices and housings
- > Automotive interior parts, under-hood components, and fascia
- > Amusement ride seats and restraints
- > Abrasion-resistant parts and linings
- > Medical and veterinary demonstration models
- > High-clarity lenses and pillow optics
- > Taxidermy reproductions
- > Equipment seals, gaskets, and O-rings
- > Material handling nests and fixtures

Based on our extensive experience, we formulate polyurethanes for molding via hand casting, mass casting, automated meter/mix dispensing, rotomolding, and vacuum casting. Our chemists also have the expertise to develop custom systems and color-match products quickly and economically. In addition, our dedicated technical support team is on-call to help customers solve their toughest casting challenges.

Fast response to customer needs is a priority: We maintain a flexible production schedule that accommodates shipping of most orders on a same-day or next-day basis.



Machine Systems



Production Systems



Composite Solutions



Eco Solutions



Polymer Solutions



Tooling Solutions

RAKU[®] TOOL | Products by Material Properties

InnoTuf[®] HP Series | Abrasion Resistant Polyurethane Resins

Our polyurethanes offer Shore A and D durometer hardness materials with excellent abrasion resistance.

The products were developed to meet customer needs for durable parts that can withstand exposure to gouging, cutting, and abrasion as well as chemical and solvent exposure.

They are ideal for use in a variety of markets and industries including amusement / theme park ride components / oil and gas / mining equipment, as well as parts for the paper, printing and metal finishing industries.



HP-1500 Series is based on polyester polyols

- > Outstanding elongation characteristics as well as high tear strength and resistance to oils and chemicals
- > Readily processed at temperatures between 120° F and cured at 150° F

HP-2100 Series is based on polyether / polyurea polyol hybrids

- > High tear strength and good abrasion resistance
- > Can be processed at room temperature

InnoTuf[®] TP Series | Impact Resistant Polyurethane Resins

Next-generation InnoTuf[®] TP Series high-impact polyurethanes are based on advanced crosslinked chemistries.

Prototypes molded using InnoTuf[®] TP Series polyurethanes simulate parts built from thermoplastics including ABS, TPO, and polycarbonate

The high-impact polyurethanes are ideal for producing durable military training aids, recreation equipment, functional automotive components, and theme park models.

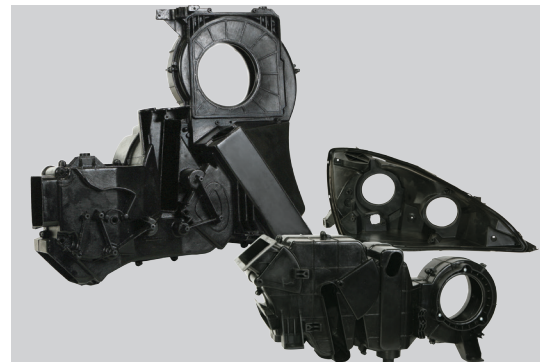


The Shore D materials feature a unique combination of:

- > High impact strength with excellent heat resistance and good flexural characteristics

The low-viscosity products are easy to handle and process:

- > Via cartridge and machine dispensing
- > Via hand casting and vacuum casting



RAKU[®] TOOL | Products by Material Properties

InnoTooling™ Series | Polyurethane Resins for Mold Making

Tooling materials from RAMPF include both Shore A and D durometer hardness polyurethanes:

- > Shore A elastomer with good abrasion resistance and tear strength.
- > Advanced Shore D polyurethanes with low shrinkage values and high tensile strength.



Inno-FR™ Series | Flame Retardant Polyurethane Resins

Shore A and D durometer hardness polyurethanes that meet UL94 V-0 requirements or are UL listed:

FX Series

Shore A products, designed for use in producing electronic parts, medical devices, and video game console components.

RC Series

For molding medical and electronic devices via automated meter mix dispensing.

TP Series

For casting equipment housings and automotive parts.



FX Series*

- > Products meet UL94 V-0 requirements and feature excellent tear strength and elongation
- > Easy to handle

RC Series*

- > Products comply with UL94 V-0 standards, exhibit good flexural properties and high heat resistance

TP Series*

- > Products comply with UL94 V-0 standards
- > High-impact products with good flexural modulus
- > High tensile strength and excellent heat resistance



* In each series products with yellow card available

InnoClear™ Series | Optically Clear Polyurethane Resins

InnoClear™ optically clear series polyurethanes produce water-clear prototypes and initial parts via automated meter mix dispensing, hand casting, and vacuum casting.

The product line includes systems in the Shore A and D durometer hardness range and is based on UV-stable chemistries.

InnoClear™ Shore A Polyurethanes

- > For molding water-clear products such as figurines, LED-containing devices, and theme park parts

InnoClear™ Shore D Polyurethanes

- > For theme park props, artistic jewelry, and medical teaching aids including dental models

IE Series™ | Easy-To-Process, Low Viscosity Polyurethane Resins

The IE Series™ polyurethanes includes products ranging from flexible to rigid. The materials are industry favorites for hand casting of prototypes and parts. Several of the products are also suited for mass casting.

Shore A IE Series™ Polyurethanes

The products are used for building patterns and fixtures as well as military training aids, automotive components, sporting goods, medical training models, seals and gaskets.

Shore D IE Series™ Polyurethanes

The systems are ideal for molding architectural models, medical training models, taxidermy cores, and scale models / sculptures.



InnoClear™ Shore A Polyurethanes

- > Offer high tear strength and good elongation

InnoClear™ Shore D Polyurethanes

- > Have good flexural modulus
- > Excellent buffing and polishing characteristics
- > Ideal for molding automotive lenses and light pipes, housings for fluid testing equipment



Shore A & D IE Series™ Polyurethanes

- > Low-viscosity, easy-to-process and cure systems
- > Excellent tear strength and elongation
- > Typically used for hand casting
- > Several of the products can be mass cast, roto-molded or vacuum cast
- > Materials exhibit low viscosity and attain rapid green strength
- > Cured Shore D polyurethanes simulate polypropylene and ABS thermoplastics with good tensile strength and flexural modulus values
- > Many of the products are suitable for color matching

RAKU[®] TOOL | Products by Process

Rotomolding Series | Polyurethane Resins for Rotational Molding

Specially formulated for rotational casting, RAMPF Tooling Solutions rotomolding polyurethanes are formulated with low viscosities and gel times long enough to provide an even, complete coating of mold surfaces.

Typical applications include amusement park ride seats, bottles, and automotive tubing.



Rotomolding Rotational-Casting Polyurethanes

- > The rotomolding process utilizes low-cost tooling that can be built quickly for fast production of durable parts that withstand exposure to challenging conditions.



RapidCast™ RC Series | Polyurethane Resins for Quick Demolding

The fast-gelling polyurethanes are used for automated meter mix dispensing into molds built from a variety of tooling materials. Several of the systems are also suitable for cartridge dispensing.

The products are typically used for producing functional ABS and polypropylene-like prototype parts.

Included are UL94 V-0 flame retardant materials (two systems have yellow cards), a buffable, water-clear lens making product, a FDA-compliant (CFR 21.177.1680) product for dry food contact, and a room-temperature cure, high-heat material for under-hood automotive prototypes.

RapidVac™ VA Series | Polyurethanes for Vacuum Assisted Casting

Polyurethanes for vacuum-assisted casting are formulated with hardnesses from Shore 50A to Shore 85D.

The product line includes two water-clear materials as well as a variety of colorable products.

With a broad range of physical performance properties, the systems are well suited for use in molding high-quality, void-free automotive components, electronics parts, medical equipment components, and sports / recreation equipment.



RapidCast™ RC Series Polyurethanes

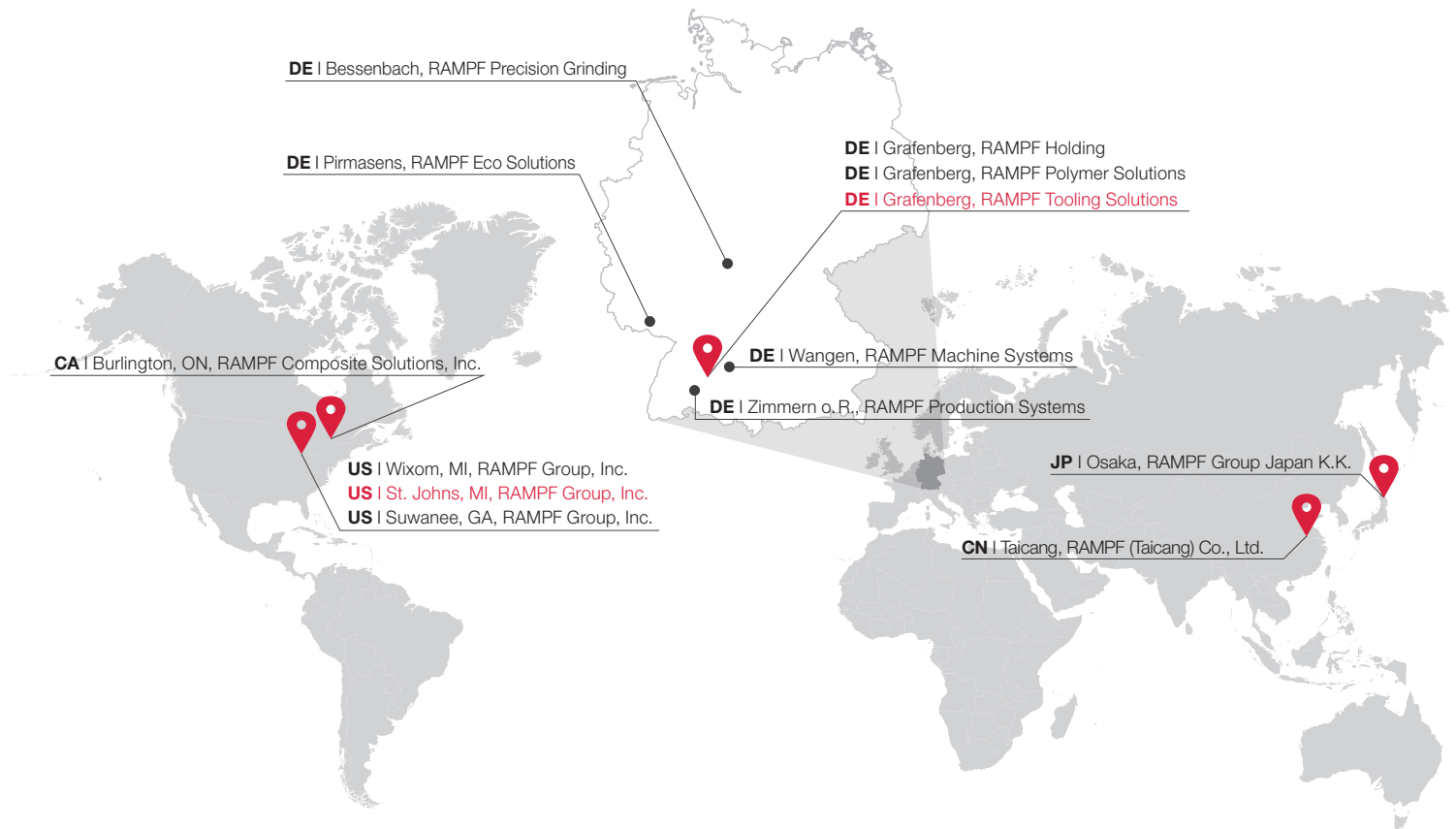
- > Demold time 5 to 30 minutes at room temperature
- > Excellent flexural modulus
- > Good elevated temperature performance



RapidVac™ VA Series Polyurethanes

- > Low viscosities with rapid gel times
- > Shore A systems have high elongation and tear strength
- > Shore D systems include materials with ultra-high flexural modulus, good tensile strength, and high heat resistance

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