Preliminary

Parts-In-Minutes®
Polyurethanes

RP 6463 RESIN
RP 6463 SLOW HARDENER
RP 6463 FAST HARDENER
CRYSTAL CLEAR POLYURETHANE FOR PROTOTYPES AND PARTS

DESCRIPTION

Ren® RP 6463 Slow and Fast polyurethane systems are formulated to produce tough, crystal clear parts. Two speeds are available to meet a variety of molding conditions and part production requirements. RP 6463 systems can be processed and cured at room temperature. The convenient one to one weight and volume mixing ratio combined with low mixed viscosity help produce high quality crystal clear parts. RP 6463 R/H offer the best combination of Heat Distortion Temperature and notched Izod Impact Strength available on the market today. Parts made from RP 6463 R/H exhibit outstanding clarity, durability and toughness.

APPLICATIONS

Designed for production of crystal clear, durable, short run, and rapid prototype parts using low cost tooling and hand mix and meter-mix dispensing equipment.

ADVANTAGES

- ?? Simple to use one-to-one weight or volume reacting ratio
- ?? Excellent combination of Izod Impact resistance and heat resistance
- ?? Very low mixed viscosity for easy pouring
- ?? Hardness and flexural modulus to simulate clear plastics
- ?? Good color stability

ACCESSORIES

Use Ren® PIM Color Pastes for the best coloring results. Other coloring materials may not be compatible with this product and yield undesirable results.
Moldmaking Silicone: RP 6473 Si clear silicone rubber

MIX RATIO

By Weight:	100	to	100	Resin to Hardener
By Volume:	100	to	100	Resin to Hardener

Mixing Instructions: Mix thoroughly and vacuum de-air where possible for best results. Pressure casting in a suitable pressure chamber at 90 psi produces excellent results.

Simple silicone, polyurethane, or epoxy molds can be used for molding the RP 6463 systems. Mold design and construction for small parts can be for pressure-free casting. Large parts will require reinforced tooling.

Part clarity is governed by a number of important factors. The master model for making molds for clear parts is extremely important. Any imperfections on this model will transfer to the final RP 6463 parts. A highly polished master combined with a high-quality silicon rubber mold such as RP 6473SI is a good starting point. Use of release agents anywhere in the process will generally degrade surface optics

TYPICAL HANDLING PROPERTIES

Tested @ 77ºF (25ºC) unless otherwise noted.

Property	Criteria	ASTM Test Method	Test Value
Color	Resin	Visual	Clear
	Hardeners		Clear
	Cured		Crystal Clear
Specific Gravity	Resin	D-1963	1.20
	Slow Hardener		1.04
	Fast Hardener		1.04
Viscosity, cP	Resin	D-2393	280
	Slow Hardener		700
	Fast Hardener		700
Gel Time, 150 g, minutes	Slow Hardener	D-2471	18–25
	Fast Hardener		4–6

NOTE

These physical properties are reported as typical test values obtained by our test laboratory. If assistance is needed in establishing product specifications, please consult with our Product Management Department.

PROCESSING

Static mixer recommendations for general purpose, all around use:

Overall Length	Outside Diameter	Inside Element Diameter	Number of Elements
9.5”	0.370	0.250	32

Unacceptable results may be obtained with other static mixers. Evaluate different mixers carefully for suitability.

Specialty Static Mixers are available from the following companies among others:

Michael Engineering Limited (517) 772-4073
Plas-Pac Industries, Inc. (860) 889-3383

DEMOLD TIME		Temperature	Time	Thickness
	Slow System	77ºF (25ºC)	16 hours	1/8"
	Fast System	77ºF (25ºC)	4 hours	1/8"

RECOMMENDED CURE SCHEDULE	*Options*	Temperature	Time
	1.	77ºF (25ºC)	7 days
	2.	77ºF (25ºC)	24 hours
	plus	176ºF (80ºC)	16 hours

TYPICAL CURED PROPERTIES

Cured 7 days @ 77ºF (25ºC)
Tested @ 77ºF (25ºC) unless otherwise noted

Property	ASTM Test Method	Slow System	Fast System
Density, lb./ft^3 (g/cm^3)	D-792	68 (1.09)	68 (1.09)
Cubic Inch per Pound		25.4	25.4
Hardness, Shore D	D-2240	79	79
Flexural Strength, at yield, psi	D-790	10,500	10,800
Flexural Modulus, psi	D-790	250,000	230,000
Ultimate Tensile Strength, psi	D-638	4,800	5,700
Tg by DMA, E", ºF(ºC)	D-4065	153 (67)	174 (79)
Deflection Temperature, ºF(ºC) 66 psi	D-648	136 (58)	152 (67)
264 psi	D-648	133 (56)	140 (60)
Compressive Strength, 0.2%, psi	D-695	7,700	6,800
Izod Impact, notched, ft-lb./in	D-256	1.0	1.1
Coefficient of Thermal Expansion	D-3386		
-22º to 86ºF, in/in/ºF		53 x 10^{-6}	51.4 x 10^{-6}
-30 to 30ºC, in/in/ºC		95.4 x 10^{-6}	92.5 x 10^{-6}

TYPICAL CURED PROPERTIES

Cured 24 hours @ 77ºF (25ºC) plus 16hours @ 176ºF (80ºC)
Tested @ 77ºF (25ºC) unless otherwise noted

Property	ASTM Test Method	Slow System	Fast System
Density, lb./ft^3 (g/cm^3)	D-792	68 (1.09)	68 (1.09)
Cubic Inch per Pound		25.4	25.4
Hardness, Shore D	D-2240	78	80
Flexural Strength, at yield, psi	D-790	11,200	11,300
Flexural Modulus, psi	D-790	240,000	270,000
Ultimate Tensile Strength, psi	D-638	6,100	7,900
Tg by DMA, E", ºF(ºC)	D-4065	187 (86)	187 (86)
Deflection Temperature, ºF(ºC) 66 psi	D-648	153 (67)	153 (68)
264 psi	D-648	145 (63)	144 (62)
Compressive Strength, 0.2%, psi	D-695	7,700	7,000
Izod Impact, notched, ft-lb./in	D-256	1.1	1.1
Coefficient of Thermal Expansion	D-3386		
-22º to 86ºF, in/in/ºF		51.0 x 10^{-6}	49.9 x 10^{-6}
-30 to 30ºC, in/in/ºC		91.9 x 10^{-6}	89.8 x 10^{-6}

PACKAGING

Unit		***Weight***
A package	*Slow System*	14 lb.
A package	*Fast System*	14 lb.
5 gallon	*Resin*	38 lb.
5 gallon	*Slow Hardener*	38 lb.
5 gallon	*Fast Hardener*	38 lb.
Drum	*Resin*	428 lb.
Drum	*Slow Hardener*	428 lb.
Drum	*Fast Hardener*	428 lb.

Please call Customer Service (800) 367-8793 for price and availability.

STORAGE

Store at 70 to 90ºF. This product is moisture-sensitive and packaged under a blanket of dry nitrogen. Maintain factory seal, after use re-blanket with dry nitrogen and tightly reseal.

CONDITIONING

RP 6463 Resin

This product may crystallize upon storage. If crystallized, vent container and heat to 125 to 145ºF until crystals dissolve. Stir well after product has liquefied. If heating of products in plastic packaging is necessary, heat in a ventilated oven to 145°F maximum.

Before heating loosen the container lid slightly to relieve any pressure buildup and place container to be heated into a metal bucket of sufficient volume to contain the product should the container tip over or leak

HANDLING

Work in a well-ventilated area and use clean, dry tools for mixing and applying. For a two-component system, combine the resin and hardener according to mix ratio. Mix together thoroughly and use immediately after mixing. Material temperature should not be below 65ºF (18ºC) when mixing.

SHELF LIFE

Provided this material is stored under the recommended storage condition in the original container, it will remain in useable condition for six months from date of shipping.

SAFETY

Do not use or handle this product until the Material Safety Data Sheet has been read and understood.

RP 6463 Resin

Warning! Causes eye, skin, and respiratory irritation. May cause allergic skin and respiratory reactions. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

RP 6463 Slow and Fast Hardener

Caution! In accord with good industrial practice, handle with due care. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

FIRST AID In case of contact:

Skin: Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes.

Eyes: Immediately flush with water for at least 15 minutes. Call a physician.

Ingestion: If conscious, give plenty of water to drink. Do not induce vomiting. Call a physician.

Inhalation: Remove to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician.

Other: Referral to physician is recommended if there is any question about the seriousness of any injury.

PRECAUTIONARY NOTE

Thermosetting systems generate heat when curing. The amount of heat and the period of time in which heat is released vary significantly between systems. Additionally, ambient or compound temperature, amount of material mixed, and construction and shape of the mold or container can also be factors in the temperature profile of a mixed system.

In some cases, the thermosetting reaction can be vigorous, generating heat sufficient to cause decomposition of the system with subsequent liberation of large volumes of acrid smoke.

A good rule of thumb is never mix more material than can be applied during the stated pot life or gel time. Also take care when using materials in applications other than stated on the Product Data Sheet, i.e., a laminating resin for casting.

Please feel welcome to call our Product Information Department or your local technical sales representative for instructions before you start your job.

IMPORTANT

The following supercedes Buyer's documents. **SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential, or indirect damages for alleged negligence, breach of warranty, strict liability, tort, or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

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