

# POLYURETHANE ELASTOMERS

*A complete line of easy to use, economical tooling and prototyping resins, these materials are widely used in many applications that demand the ideal balance between price and performance. Our flexible urethanes are generally more abrasion resistant than silicone rubber, making them preferred materials for concrete and architectural castings. Our semi-rigid urethanes are known for their excellent impact strength and abrasion resistance, making them ideal for foundry tooling as well as semi-rigid part production. Our rigid urethanes are designed to simulate injection molded plastic parts.*



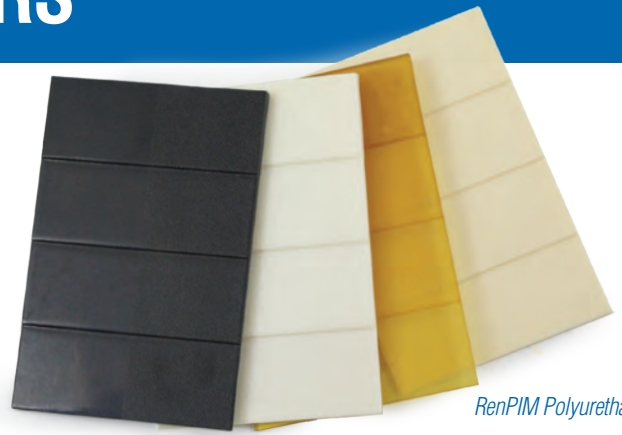
## DID YOU KNOW?

***We offer how-to and product demonstration videos!***

Our Video Library is available on our website, [www.FreemanSupply.com](http://www.FreemanSupply.com), or on our YouTube channel [@freemanmfg](https://www.youtube.com/@freemanmfg). We feature over three hours of instructional and product videos, offering the most comprehensive free resource for the making of parts, patterns, tools and molds. We also have all our videos available for purchase on **eBay**! Start watching today!



# RAPID CURE ELASTOMERS



RenPIM Polyurethanes

Rapid cure polyurethanes produce parts that simulate the appearance and performance of injection-molded thermoplastic parts. The short gel times permit fast demolding of durable parts. These low-viscosity systems are designed to be used with automated dispensing equipment (page 116) and low-cost tooling.

## Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Hardness (Shore D)	Viscosity R/H (cps)	Density (g/cc)	Volumetric Yield (in. <sup>3</sup> /lb.)	Shrink (in./in.)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Izod Impact (ft. lb./in.)	Deflection Temp. (°F)	Tg per DMA (°F)	C.T.E. (in./in./°F)	Color
<b>RenPIM 6450</b>	80:100	67:100	45-65	15-30	77	170/1,600	1.13	23.9	0.0009	23,100	7,000	184,000	4,900	0.90	208	306	67 x 10 <sup>-6</sup>	Buff or Black
<b>RenPIM 6452</b>	80:100	67:100	50-70	15-30	79	30/1,600	1.15	24.1	—	18,000	8,500	198,000	4,300	0.84	179	261	71 x 10 <sup>-6</sup>	Off-White
<b>RenPIM 6458</b>	100:85	1:1	50	15	86	75/400	1.21	22.9	—	14,100	16,500	432,000	10,200	0.87	129	190	43 x 10 <sup>-6</sup>	Clear Amber
<b>RenPIM 6460</b>	80:100	67:100	50	10-15	80	170/1,500	1.18	23.5	—	24,500	7,900	174,000	5,300	1.00	—	320	69 x 10 <sup>-6</sup>	Buff
<b>ASTM</b>	—	—	D-2471	—	D-2240	D-2393	D-792	D-792	D-2566	D-695	D-790	D-790	D-638	D-256	D-648	D-4065	—	—

### RenPIM 6450

RenPIM 6450 is a very fast-setting polyurethane casting system that offers outstanding heat and impact resistance. The quick demold time of 15 to 30 minutes allows for the production of multiple parts per hour depending on part geometry and dispensing equipment capabilities. It is an excellent choice for replicating high-density polyethylene, polypropylene, and ABS parts and prototypes.

- ▶ 45-65 sec. gel time
- ▶ 15-30 min. demold
- ▶ 77 Shore D

SKU	Size	Net weight (lb.)
056553	5 Gallon (Resin)	32
056554	5 Gallon (Hardener)	40

### RenPIM 6458

This very high flexural modulus urethane system is for creating rigid, stable, and extremely tough castings. This is the fastest curing RenPIM material with a demold time of 15 minutes or less and a user friendly 1:1 mix ratio. This is a good selection for duplicating the properties of high flex modulus ABS.

- ▶ 50 sec. gel time
- ▶ 15 min. demold
- ▶ 86 Shore D

SKU	Size	Net weight (lb.)
056607	5 Gallon (Resin)	45
056608	5 Gallon (Hardener)	38.3

### RenPIM 6452

This rapid-curing system offers a high flex modulus that produces a tough prototype or short-run production part. RenPIM 6452 cures to an off-white color that may be easily pigmented and simulates many of the properties of polypropylene and ABS.

- ▶ 50-70 sec. gel time
- ▶ 15-30 min. demold
- ▶ 79 Shore D

SKU	Size	Net weight (lb.)
056571	5 Gallon (Resin)	32
056572	5 Gallon (Hardener)	40

### RenPIM 6460

RenPIM 6460 is the best choice for parts and prototypes requiring elevated heat resistance. This quick-curing formulation (15 to 30 minute demold) is engineered with a glass transition temperature of 320°F.

- ▶ 50 sec. gel time
- ▶ 10-15 min. demold
- ▶ 80 Shore D

SKU	Size	Net weight (lb.)
056574	5 Gallon (Resin)	32
056671	5 Gallon (Hardener)	40

RenPIM polyurethanes offer incredible strength even when cast as thin as 1/16".



# INTERMEDIATE CURE ELASTOMERS

These hand-pourable urethanes offer a wide range of hardnesses and working times, and can be demolded in as little as 15 minutes to 2 hours. This enables the production of multiple thermoplastic-like prototypes and short-run end-use parts per day.

PRC-1700



## Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Hardness (Shore D)	Viscosity R/H or Mixed (cps)	Density (g/cc)	Volumetric Yield (in. <sup>3</sup> /lb.)	Shrink (in./in.)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Izod Impact (ft. lb/in.)	Deflection Temp. (°F)	Tg per DMA (°F)
<b>Freeman 1070</b>	100:92	1:1	3	15 - 30 min.	70	80	1.05	26.6	0.004	3,650	4,500	132,000	3,000	-	140	-
<b>Freeman 1080</b>	115:100	1:1	20	2 - 4	80	150	1.12	24.7	0.003	8,300	9,500	288,000	6,650	0.31	134	-
<b>Freeman 1085</b>	1:1	1:1	6	30 - 120 min.	69	80	1.12	24.7	0.002	4,880	5,600	170,000	3,300	0.35	137	172
<b>RenCast 6432-1</b>	100:50	100:50	5 - 6	1 - 2	72	50/1,100	1.13	24.5	0.005	7,200	8,600	234,000	5,900	0.6	145	153
<b>RenCast 6486</b>	100:50	1:1	7 - 8	8	67	7,800/75	1.16	23.9	-	-	4,750	110,000	3,600	6.6	156	156
<b>RenCast 6491</b>	1:1	89:100	4 - 5	30 - 40 min.	85	200/640	1.22	23	-	33,500	16,000	400,000	8,600	1.2	205	224
<b>RenCast 6492-1</b>	1:1	97:100	6 - 8	4	84	40/1,800	1.30	21.3	-	23,000	16,764	453,000	8,647	0.5	156	181
<b>RenCast 6497</b>	1:1	-	4 - 5	2	70A	1,875	1.10	25.2	-	-	-	-	995	-	-	-
<b>PRC 1700*</b>	100:60	-	17 - 19	2*	87	500	1.10	25.2	0.002	-	11,603	-	10,152	29.9	221	-
<b>ASTM</b>	-	-	D-2471	-	D-2240	D-2393	D-792	D-792	D-2566	D-695	D-790	D-790	D-638	D-256	D-648	D-4065

\*The above properties for PRC-1700 are average values measured on specimens after curing 2 hours at 158°F, plus 16 hours at 212°F.



Freeman 1070 is an off-white color while Freeman 1085 is tan. Both are extremely easy to use but offer different casting thicknesses.

## Freeman 1070

An easily mixed and economical urethane that can be used to create parts that simulate injection molded plastic, Freeman 1070 features an off-white color, low viscosity, ease of pouring, and a short demold time for multiple part production. It is castable up to ½" in thickness.

- ▶ 3 min. gel time
- ▶ 15-30 min. demold
- ▶ 70 Shore D

SKU	Size	Net weight (lb.)
055500	Quart Kit	2.1
055406	Gallon Kit	15.4
055405	5 Gallon Kit	77

## Freeman 1080

This brilliant white, tough urethane elastomer features a 1:1 mix ratio by volume, a low viscosity for pouring thin-walled parts, and sufficient time to degas. It is castable up to ½" in thickness.

- ▶ 20 min. gel time
- ▶ 2-4 hour demold
- ▶ 80 Shore D

SKU	Size	Net weight (lb.)
055419	Quart Kit	2
055412	Gallon Kit	16
055411	5 Gallon Kit	80

## Freeman 1085

Freeman 1085 is an excellent general-purpose prototyping urethane elastomer. It offers a tan color, 1:1 mix ratio by weight or volume for quick and easy mixing along with a very low viscosity to ensure void-free castings. It is castable up to 3" in thickness.

- ▶ 6 min. gel time
- ▶ 1/2-2 hour demold
- ▶ 69 Shore D

SKU	Size	Net weight (lb.)
055502	Quart Kit	2
055127	Gallon Kit	15.2
055125	5 Gallon (Resin)	38
055126	5 Gallon (Hardener)	38

# INTERMEDIATE CURE CONTINUED

## RenCast 6432-1

RenCast 6432-1 is a low viscosity polyurethane casting system for simulating injection molded plastic parts. The 5 to 6 minute gel time permits hand mixing and pouring, yet the parts are demoldable in 1 to 2 hours. This enables production of multiple parts in 1 day without the expense of a meter-mix machine.

- ▶ 5-6 min. gel time
- ▶ 1-2 hour demold
- ▶ 72 Shore D

SKU	Size	Net weight (lb.)
056678	Gallon Kit	13.8

## RenCast 6486

This extremely tough material features a notched IZOD impact strength over 6 ft. lb./in. This system is designed to closely simulate the performance characteristics of polyethylene and polypropylene.

- ▶ 7-8 min. gel time
- ▶ 8 hour demold
- ▶ 67 Shore D

SKU	Size	Net weight (lb.)
056636	5 Gallon (Resin)	40
056637	5 Gallon (Hardener)	20

## RenCast 6491

RenCast 6491 is specifically designed for simulating ABS parts. A flexural modulus of 400,000 psi and impact resistance of 1.2 ft. lb./in. gives this product an excellent combination of rigidity & durability. Its heat resistance is 224°F Tg per DMA.

- ▶ 4-5 min. gel time
- ▶ 30-40 min. demold
- ▶ 85 Shore D

SKU	Size	Net weight (lb.)
056675	Gallon Kit	16

## RenCast 6492-1

RenCast 6492-1 offers high flexural strength and was developed to simulate flame retardant ABS plastics, meeting UL-VO standards. A 6-8 minute gel time permits hand mixing and pouring, yet the rapid cure rate enables demolding in 4 hours. This enables multiple parts production without the investment in a meter mixing machine.

- ▶ 6-8 min. gel time
- ▶ 4 hour demold
- ▶ 84 Shore D

SKU	Size	Net weight (lb.)
056686	5 Gallon (Resin)	45
056685	5 Gallon (Hardener)	45



*RenCast 6497 is recommended for thin-wall flexible parts.*

## RenCast 6497

RenCast 6497 is a flexible polyurethane casting system used to produce rubber-like parts quickly and easily. A 4-5 minute gel time permits hand mixing and pouring, yet the rapid cure enables multiple parts to be made in one day without the use of a meter-mix machine.

- ▶ 4-5 min. gel time
- ▶ 2 hour demold
- ▶ 70 Shore A

SKU	Size	Net weight (lb.)
056723	Gallon Kit	16

# OVERNIGHT CURE ELASTOMERS

## OVERNIGHT CURE - FLEXIBLE

Urethane rubber is generally less expensive than silicone rubber and more abrasion resistant, making it a preferred material for concrete and architectural castings. However, flexible urethanes are not self-releasing and therefore require a release procedure to facilitate clean and easy part release.



### Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Mixed Viscosity (cps)	Casting Limit Thickness (in.)	Hardness (Shore A)	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Density (g/cc)	Volumetric Yield (in. <sup>3</sup> /lb.)	Tensile Strength (psi)	Elongation (%)	Tear Strength (psi)	Tear, Die C (pli)	Tear, Split (pli)	Shrink (in./in.)	Color
<b>Freeman 1035</b>	1:1	1:1	1,500	2	35	30	16	1.02	27.2	420	1,000	—	85	—	0.001	Lt. Brown
<b>Freeman 1040</b>	10:100	9:100	1,350	2	45-55	38	24	1.04	26.6	1,257	225	146	—	—	0.001	Off-White
<b>RenCast 6400-3</b>	10:100	9:100	1,700	2	52	40	24	1.04	26.6	1,143	251	132	—	—	0.001	Off-White
<b>RenCast 6401-3</b>	25:100	22:100	1,200	1.5	65	40	16-24	1.07	25.9	1,720	270	214	—	—	0.0005	Off-White
<b>RenCast 6410-2</b>	1:1	93:100	1,200	4	37	26	16	1.04	26.6	504	340	85	—	—	0.003	Off-White
<b>ISOMold URP-4102</b>	1:1	1:1	1,025	2	29	25-30	16	1.02	27.2	907	1,000	—	108	24	0.001	Gray
<b>ISOMold URP-4106</b>	100:89	1:1	1,375	—	35	20	16	1.11	24.9	400	450	—	78	9	0.001	Blue
<b>ISOMold UMC 5001</b>	1:1	1:1	2,000	—	48-52	7-8	12-24	1.04	26.6	910	530	130	25	20	0.001	Gray
<b>ASTM</b>	—	—	D-2393	—	D-2240	D-2471	—	D-792	D-792	D-638	D-638	D-624	—	—	D-2566	—

### Freeman 1035

This flexible beige material is excellent for making molds with deep undercuts or where a flexible mold makes demolding easier. This economical urethane features a one to one mix ratio by weight or volume, making mixing easy and convenient. It is castable up to 2" thick.

- ▶ 30 min. gel time
- ▶ 16 hour demold
- ▶ 35 Shore A

SKU	Size	Net weight (lb.)
055129	Pint Kit	2
055401	Gallon Kit	16
055402	5 Gallon Kit	80
055403	Drum Kit	880

### Freeman 1040

This flexible urethane is an excellent low-cost alternative to RTV silicone rubber mold making materials. Like most castable urethane rubber systems, it is ideal for general flexible mold construction, flexible parts and gaskets, plaster casting, and prototypes. Freeman 1040 is off-white, flows easily, features a high tear strength and is castable up to 2" thick.

- ▶ 38 min. gel time
- ▶ 24 hour demold
- ▶ 52 Shore A

SKU	Size	Net weight (lb.)
055130	Gallon Kit	8.8
055131	2 Quarts (Resin)	4
055132	5 Gallons (Hardener)	40



Freeman 1040 offers excellent flexibility and a high tear strength.

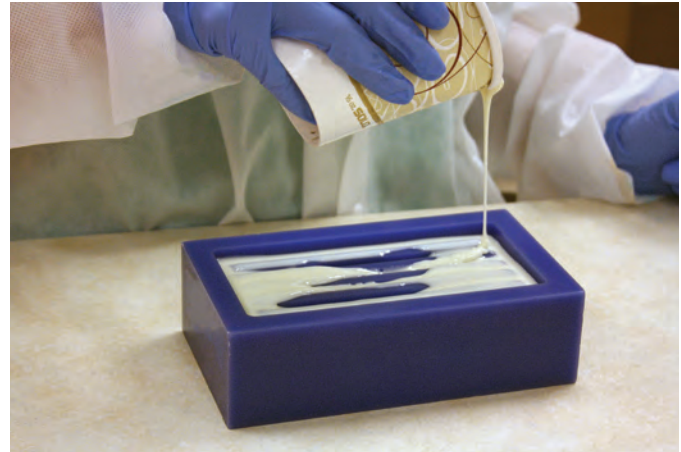
# OVERNIGHT CURE - FLEXIBLE CONTINUED

## RenCast 6400-1 / Ren 6400-3

RenCast 6400 is ideal for making flexible molds which can be stripped from parts having undercuts or backdraft. This off-white material can be cast as resilient parts and pads. It is very flexible and tear-resistant and is castable up to 2" thick.

- ▶ 40 min. gel time
- ▶ 24 hour demold
- ▶ 52 Shore A

SKU	Size	Net weight (lb.)
056548	0.5 lb. Thickening Agent (Resin)	0.5
056923	1 Gallon Kit	8.8
056531	2 Quart (Resin)	4
056922	5 Gallon (Hardener)	40
056900	5 Gallon (Resin)	40
056921	55 Gallon (Hardener)	400



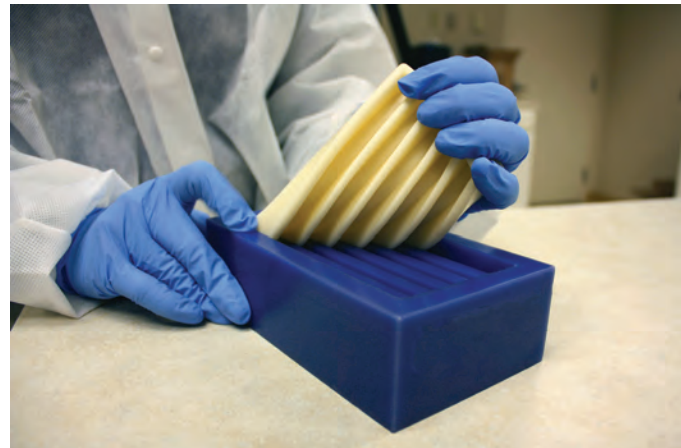
## RenCast 6401-1 / Ren 6401-3

This off-white product features outstanding tear strength and elongation. Molds made of this material can be flexed and stretched, allowing for easy removal of parts. It is castable up to 1½" thick.



- ▶ 40 min. gel time
- ▶ 16-24 hour demold
- ▶ 65 Shore A

SKU	Size	Net weight (lb.)
056926	Gallon Kit	10
056528	1 Gallon (Resin)	9
056924	5 Gallon (Hardener)	36
056551	5 Gallon (Resin)	40
056925	55 Gallon (Hardener)	450



*These overnight cure elastomers offer incredible flexibility. They are not self-releasing, so make sure to use the appropriate release system to ensure a clean and easy demolding process. You can also use Machinable Wax (page 69) shown above, which naturally features self-releasing properties.*

## RenCast 6410-1 / Ren 6410-3

Ideal for producing very flexible molds and resilient parts, this off-white elastomer features a 1:1 mix ratio by weight with low viscosity and is castable up to 4" thick.

- ▶ 26 min. gel time
- ▶ 16 hour demold
- ▶ 37 Shore A

SKU	Size	Net weight (lb.)
056934	Gallon Kit	14
056540	5 Gallon (Resin)	35
056942	5 Gallon (Hardener)	35

## ISOMold URP-4102

This gray, low-viscosity, flexible urethane with a 1:1 mix ratio by weight or volume is most commonly used for molds of masters with undercuts, rapid prototyping, special effects, taxidermy, and sculpture reproduction.

- ▶ 25-30 min. gel time
- ▶ 16 hour demold
- ▶ 29 Shore A

SKU	Size	Net weight (lb.)
057472	10 Gallon Kit	80
057473	55 Gallon Kit	880

## ISOMold URP-4106

This blue flexible urethane is used to make molds of detailed masters that contain shallow undercuts. The most common uses include architectural and sculpture reproductions, taxidermy, prototypes, and general moldmaking applications. This economical material features a 1:1 mix ratio by volume for easy use.

- ▶ 20 min. gel time
- ▶ 16 hour demold
- ▶ 35 Shore A

SKU	Size	Net weight (lb.)
057404	2 Quart Kit	4.6
057405	2 Gallon Kit	18.5
057406	10 Gallon Kit	92.5

## ISOMold UMC 501

Used to make molds of detailed masters that do not contain undercuts, this flexible, beige-colored elastomer is ideal for making concrete molds and form lines.

- ▶ 20 min. gel time
- ▶ 16 hour demold
- ▶ 50 Shore A

SKU	Size	Net weight (lb.)
057475	2 Gallon Kit	16
057476	10 Gallon Kit	80
057477	55 Gallon Kit	880

# OVERNIGHT CURE - SEMI-RIGID

Freeman and Ren semi-rigid urethanes are known for their excellent impact strength and abrasion resistance, making them ideal for foundry tooling as well as semi-rigid part production.



Freeman 1060

## Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Casting Limit Thickness (in.)	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Shore Hardness	Viscosity R/H or Mixed (cps)	Density (g/cc)	Volumetric Yield (in. <sup>3</sup> /lb.)	Shrink (in./in.)	Tensile Strength (psi)	Elongation (%)	Tear Strength (ppi)	Deflection Temp (°F) (264 psi)	Color
<b>Freeman 1050</b>	1:1	100:94	4	26	16	85A	1,650	1.10	25.2	0.001	2,050	510	280	-	Lt. Amber
<b>Freeman 1060</b>	100:60	100:60	2	28	16	60D	2,600	1.05	26.4	0.001	3,200	300	510	-	Red, Black
<b>Freeman 1066</b>	100:50	100:50	2	15-17	2-4	65D	3,200	1.03	26.9	0.0025	3,100	140	630	181	Red, Black
<b>RenCast 6402-1/Ren 6402-3</b>	35:100	31:100	1	31-33	24	82A	940	1.08	25.6	0.001	2,172	270	285	-	Off-White
<b>RenCast 6403-1/Ren 6403-3</b>	50:100	44:100	0.5	30	24	85-90A	710	1.10	25.2	0.001	3,334	328	419	-	Off-White
<b>RenCast 6442</b>	1:1	100:94	4	28	24	85A	1,610	1.09	25.4	<0.001	2,100	525	290	-	Lt. Amber
<b>RenCast 6443</b>	100:60	100:60	2	19	24	95A	2,450	1.06	26.1	0.001	3,500	475	375	-	Lt. Amber
<b>RenCast 6444</b>	100:60	100:60	2	27	24	60D	2,500	1.08	25.6	0.001	3,400	325	550	154	Lt. Amber
<b>RenCast 178-88/Ren 6444</b>	100:60	100:60	2	27	24	60D	2,500	1.05	26.4	0.001	3,400	325	550	-	Red
<b>Flexane 80</b>	77:23	-	4	30	10	87A	10,000	1.04	26.5	0.0018	2,100	650	350	-	Black
<b>Flexane 94</b>	69:31	-	4	10	5	97A	6,000	1.04	26.5	0.0014	2,800	500	415	-	Black
<b>ISOMold URP-5122</b>	96:100	1:1	2	12	24	70-74A	2,650	1.06	26.1	0.001	1,568	900	264	-	Dk. Amber
<b>ASTM</b>	-	-	-	D-2471	-	D-2240	D-2393	D-792	D-792	D-2566	D-638	D-790	D-624	-	

## Freeman 1050

A tough, semi-flexible urethane that is ideal for creating molds requiring some degree of flexibility, as well as for producing semi-rigid prototypes and finished parts. It features a light amber color, 1:1 mix ratio by weight for easy mixing, and a 26 minute gel time providing ample time for degassing. It is castable up to 4" thick.

- ▶ 26 min. gel time
- ▶ 16 hour demold
- ▶ 85 Shore A

SKU	Size	Net weight (lb.)
055142	Quart Kit	2.5
055141	Gallon Kit	10
055139	5 Gallon (Resin)	25
055140	5 Gallon (Hardener)	25

## Freeman 1060

An industry standard, Freeman 1060 semi-rigid polyurethane casting resin is renown throughout the industry for its excellent impact strength and abrasion resistance, particularly in foundry tooling and other modeling and prototyping applications requiring strength and durability. Freeman 1060 is available in either red or black, with a maximum cast thickness of 2".

- ▶ 28 min. gel time
- ▶ 16 hour demold
- ▶ 60 Shore D

SKU	Size	Net weight (lb.)
055108	Quart Kit (Black)	2.5
055106	Gallon Kit (Black)	10
055110	Gallon Kit (Red)	10
055107A	5 Gallon (Resin)	31.3
055107B	5 Gallon (Hardener - Black)	18.8
055111B	5 Gallon (Hardener - Red)	18.8
055116	55 Gallon (Resin)	460
055117	55 Gallon (Hardener - Black)	280



Both Freeman 1060 and 1066 are available in Red or Black.

## Freeman 1066

With a 65 Shore D hardness, this black or red polyurethane elastomer is specifically designed for highly abrasion resistant foundry tooling. Harder than our Freeman 1060, this product will not deflect as much under high pressure molding processes. It also has increased rigidity in thin wall sections and is able to be machined or sanded without softening. Freeman 1066 features a heat deflection temperature of 181°F, and a maximum cast thickness of 2".

- ▶ 15-17 min. gel time
- ▶ 2-4 hour demold
- ▶ 65 Shore D

SKU	Size	Net weight (lb.)
055120	Gallon Kit (Black)	9.75
055119	Gallon Kit (Red)	9.75
055121	5 Gallon (Resin)	32.5
055122	5 Gallon (Hardener - Black)	16.3
055118	5 Gallon (Hardener - Red)	16.3
055123	55 Gallon (Resin)	420
055124	55 Gallon (Hardener - Black)	210
055112	55 Gallon (Hardener - Red)	210

# OVERNIGHT CURE - SEMI-RIGID CONTINUED

## RenCast 6402-1 / Ren 6402-3

This product is a tough, flexible elastomer that features an off-white color and low viscosity for easy mixing and excellent detail reproduction. This system is ideal for production models, metal-forming pads, and a variety of mechanical parts. It is castable up to 1" thick.

- ▶ 31-33 min. gel time
- ▶ 24 hour demold
- ▶ 82 Shore A

SKU	Size	Net weight (lb.)
056929	Gallon Kit	7.8
056534	Gallon (Resin)	9.1
056927	5 Gallon (Hardener)	26



## RenCast 6403-1 / Ren 6403-3

Ideal for durable parts such as impellers, rollers, gears and wheels, this off-white elastomer features low viscosity, fast cure, high tensile strength and good load recovery. It is castable up to 1/2" in thickness.

- ▶ 30 min. gel time
- ▶ 24 hour demold
- ▶ 85-90 Shore A

SKU	Size	Net weight (lb.)
056931	Gallon Kit	12
056537	5 Gallon (Resin)	40
056930	5 Gallon (Hardener)*	40

\*Two 5 Gallon Hardeners are required for one 5 Gallon of Resin.

## RenCast 6442

Ideal for vibration-dampening applications as well as production and prototype parts, RenCast 6442 features a 1:1 mix ratio by weight, long pot life, light amber color, low viscosity and good wear resistance. It is castable up to 4" in thickness.

- ▶ 28 min. gel time
- ▶ 24 hour demold
- ▶ 85 Shore A

SKU	Size	Net weight (lb.)
056542	Gallon Kit	13.8
056543	5 Gallon (Resin)	40
056544	5 Gallon (Hardener)	40
056566	55 Gallon (Resin)	460
056567	55 Gallon (Hardener)	460

## RenCast 6443

RenCast 6443 is light amber in color, cures semi-rigid in mass and is flexible in thin cross-sections. This material is used for foundry patterns and core boxes because it features good abrasion resistance and is moisture tolerant during casting. It is castable up to 2" in thickness.

- ▶ 19 min. gel time
- ▶ 24 hour demold
- ▶ 95 Shore A

SKU	Size	Net weight (lb.)
056545	Gallon Kit	11.2
056546	5 Gallon (Resin)	40
056547	5 Gallon (Hardener)	24

## RenCast 6444

RenCast 6444 is highly specified for the most demanding wear applications such as foundry patterns and core boxes. It features low viscosity and good working life allowing for ease of handling and release of entrapped air. It is castable up to 2" in thickness.

- ▶ 27 min. gel time
- ▶ 24 hour demold
- ▶ 60 Shore D

SKU	Size	Net weight (lb.)
056521	Gallon Kit	11.2
056522	5 Gallon (Resin)	40
056523	5 Gallon (Hardener)	24
056669	55 Gallon (Resin)	460
056670	55 Gallon (Hardener)	276

## RenCast 178-88

This is the red-colored version of RenCast 6444 for foundry patterns. It uses the RenCast 6444 hardener.

- ▶ 27 min. gel time
- ▶ 24 hour demold
- ▶ 60 Shore D

SKU	Size	Net weight (lb.)
056519	5 Gallon (Resin)	40
056523	5 Gallon (6444 Hardener)	24
056672	55 Gallon (Resin)	460
056670	55 Gallon (6444 Hardener)	276

## Devcon Flexane 80

Featuring low shrink and high chemical and abrasion resistance, this black-colored material is ideal for creating flexible molds and holding fixtures. The Flex-Add additive may be used with Flexane 80 Liquid to produce a lower durometer castable urethane.

- ▶ 30 min. gel time
- ▶ 10 hour demold
- ▶ 87 Shore A

SKU	Size	Net weight (lb.)
054625	1 lb. Kit	1
054626	10 lb. Kit	10
054642	8 oz. Additive	0.5

## Devcon Flexane 94

Flexane 94 features low shrink and high chemical and abrasion resistance. It is a black, semi-rigid material for creating extremely tough, flexible molds and non-marring holding and assembly fixtures.



- ▶ 10 min. gel time
- ▶ 5 hour demold
- ▶ 97 Shore A

SKU	Size	Net weight (lb.)
054627	1 lb. Kit	1
054628	10 lb. Kit	10

## ISOMold URP-5122

This semi-rigid urethane is used to make molds of detailed masters that do not contain undercuts. The most common uses include foundry patterns and core boxes, gaskets, liners, and fixtures. This dark amber, economical material features a 1:1 mix ratio by volume for ease of use.

- ▶ 15 min. gel time
- ▶ 16 hour demold
- ▶ 70 Shore A

SKU	Size	Net weight (lb.)
057455	2 Gallon Kit	17.5
057456	10 Gallon Kit	94



# OVERNIGHT CURE - RIGID

These harder polyurethanes have a variety of uses including prototyping thermoplastic-like parts, constructing molds for low-volume metal forming applications, and heat-resistant foundry tooling. The long gel time to provide sufficient time to vacuum degas prior to pouring. A 16-24 hour cure time is required before demolding.



## Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Hardness (Shore D)	Viscosity R/H or Mixed (cps)	Density (g/cc)	Volumetric Yield (in.³/lb.)	Shrink /in./in.)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Izod Impact (ft. lb./in.)	Deflection Temp. (°F) (264 psi)	Tg per DMA (°F)
<b>Synthene HRI 120</b>	100:75	—	120	24	87	650/400	1.18	23.4	0.001	—	12,618	319,083	—	—	176	185
<b>RenCast 6405-1</b>	1:1	90:100	45 - 55	24	75	220	1.13	24.5	0.001	6,400	6,600	—	4,900	0.71	124	—
<b>RenCast 178-59-1</b>	36:100	50:100	22	24	88	4,000	1.61	17.2	0.001	14,500	9,000	835,000	5,500	0.35	136	201
<b>ASTM</b>	—	—	D-2471	—	D-2240	D-2393	D-792	D-792	D-2566	D-695	D-790	D-790	D-638	D-256	D-648	D-4065

### Synthene HRI 120

Cristal HRI 120 is a mercury-free clear polyurethane elastomer ideal for prototyping, encapsulating, and optical parts. This material offers 120 minute gel time and is self-degassing. It offers an overnight cure, but the demold time can be accelerated as well as strength if heat cured at 158°F for 2 hours.



- ▶ 120 min. gel time
- ▶ 24 hour demold
- ▶ 87 Shore D

SKU	Size	Net weight (lb.)
055417	Quart Kit	2
055415	Gallon Kit	15.2
055414	5 Gallon Kit	76

### RenCast 6405-1

Ideal for prototyping of injection molded or thermoformed parts, this tough urethane features low viscosity, minimal air entrapment, and easy mixing. RenCast 6405-1 is white and may be easily tinted if desired. It is castable up to ½" in thickness.

- ▶ 20 min. gel time
- ▶ 24 hour demold
- ▶ 75 Shore D

SKU	Size	Net weight (lb.)
056271	Gallon Kit	16
056273	5 Gallon (Resin)	38
056272	5 Gallon (Hardener)	38

### RenCast 178-59-1

Used in foundry applications with hot sand conditions, this red-brown polyurethane forms a very hard, durable, heat-resistant compound. It is castable up to 2" in thickness. \*Use three 5 gallon pails of hardener per each 5 gallon pail of resin for the correct mix ratio.

- ▶ 22 min. gel time
- ▶ 24 hour demold
- ▶ 88 Shore D

SKU	Size	Net weight (lb.)
056354	5 Gallon (Resin)	45
056355	5 Gallon (Hardener) - 3 req.*	41

# POLYURETHANE ACCESSORIES

### Devcon Flexane FL-10 Primer

This blue, one-component adhesion promoter increases the bonding strength of liquid polyurethanes to metal surfaces. To use, apply two coats to a clean and roughened metal surface permitting 15 minutes between applications and 30 minutes prior to pouring the urethane. Offered in a 4 oz. can. (SKU #054635)

### Devcon Flexane FL-20 Primer

FL-20 is an orange, one-component adhesion promoter that increases the bonding strength of liquid polyurethanes to concrete, rubber, urethane, wood, fiberglass, and cured epoxy surfaces. To use, apply two coats to the clean and roughened surface permitting 15 minutes between applications and 30 minutes prior to pouring the urethane. Offered in a 4 oz. can. (SKU #054639)

### Freeman 302 Urethane Protectant

Freeman 302 is an inert gas used to preserve and prolong the usable life of moisture sensitive polyurethanes. Before resealing the containers, spray a short burst of Freeman 302 in the open container and seal immediately. Repeat after every use. Offered in a 10 oz. aerosol can. (SKU #054706)

### Ren Accelerators

These liquid catalysts accelerate the curing process and reduce

SKU	Description	Net weight (lb.)
056557	Ren 178-57 (Quart)	1.7
056556	Ren 178-62 (Quart)	1.5

demold times. Mix thoroughly in the hardener before adding the required amount of resin. Ren 178-57 is for use ONLY with RenCast 6442, 6443, 6444, Freeman 1050, or Freeman 1060. Ren 178-62 is for use ONLY with RenCast 6400, 6401, 6402, 6403, 6405, 6410 or Freeman 1040.

# MIXING CUPS & PADDLES

## Paper Cups

These paper cups are ideal for mixing all types of tooling and reproduction plastics. The lined paper cups are specially coated to prevent resin absorption. The larger paper cups are untreated. Cups sold individually.

SKU	Description	Cups/package	Cups/Case
054037	Lined Paper Cups (16 oz.)	50	500
054042	Lined Paper Cups (32 oz.)	25	500
054048	Untreated Paper Cups (83 oz.)	25	100
054050	Untreated Paper Cups (165 oz.)	25	100

## Plain Plastic Cups

These cups are ideal for all types of tooling and reproduction plastics. They are made of high-density polyethylene (HDPE), white in color, and unmarked. Cups sold individually.

SKU	Size	Cups/case
054031	12 oz. Cups	500
054036	16 oz. Cups	500
054041	32 oz. Cups	500
054047	64 oz. Cups	200
054049	85 oz. Cups	200
054055	128 oz. Cups	120
054051	166 oz. Cups	120

## Graduated Plastic Cups

These convenient plastic cups are also made of high density polyethylene (HDPE). However, these cups are translucent and have both milliliter and ounce graduations on the container to aid in mixing. Cups sold individually.

SKU	Size	Cups/case
054025	24 oz.	100
054026	48 oz.	50

## Wood Mixing Paddles

Wood mixing paddles for both gallon and 5 gallon containers. Both paddles are ideal for paint, urethanes, epoxies, or any other liquid. Sold by the box.

SKU	Description	Thickness	Width	Length	Qty/box
054524	Paddles for 1 Gallon	1/8"	1 1/8"	14"	50
054521	Paddles for 1 Gallon	1/8"	1 1/8"	14"	500
054525	Paddles for 5 Gallon	7/32"	1 3/8"	21"	250

## Tongue Depressors

These polished hardwood depressors are excellent for mixing small quantities of tooling plastics and repair materials.

SKU	Width	Length	Qty/box
054520	3/4"	6"	500

# PREPARING PATTERNS AND MOLDS

## Sealing A Wood Pattern/Model

(also applies to plaster and sheet wax)



1. Apply one coat of Freeman Wood and Plaster Sealer (a fairly thin viscosity, lacquer-based paint) to the bare wood surface using a pure bristle brush and allow the material to absorb into the wood.



2. After the first coat has dried (about half an hour), you'll notice that the sealer has swelled the grain and made it rough. Using sand paper or Scotch-Brite®, lightly sand the surface to make it smooth again. Sanding is not necessary when working with plaster or sheet wax.



3. Wipe off the pattern with a cloth and then apply a second coat of sealer.



4. After allowing the second coat to dry overnight, lightly sand the wood again and wipe it off with a cloth.

5. You are now ready to apply the release agents.

## Applying Release Agents



1. Cover the entire surface with Freeman Wax Release (a semi-paste, typically applied with a brush).

2. Allow this coat to dry or immediately wipe the off excess with a cloth.



3. We suggest at least two coats of Wax Release to make sure your entire part is covered evenly.

4. Next, you'll need to apply two layers of Partall PVA mold release (a polyvinyl alcohol) with brush or a spray.



5. Each coat will require a half hour of drying time unless you use a fan or air hose.

6. After the second coat of PVA has dried thoroughly, apply a final coat of Freeman Wax Release.



7. Buff this last coat very gently so as not to break through the layers of the PVA.

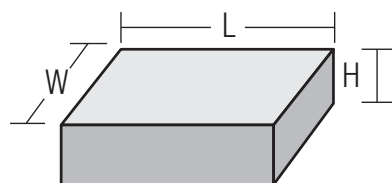
## Additional Notes

- Epoxy, urethane, or metal patterns require only the use of wax release agents. Apply three coats and lightly buff after each.
- Sheet Wax should be seated with aerosol version.
- Plaster patterns should be dried in an air-circulating oven at 120°-125° F for 16 hours, or in dry air for 48 hours before applying sealer.
- Plaster patterns can also be sealed.

# CALCULATING MATERIAL REQUIREMENTS

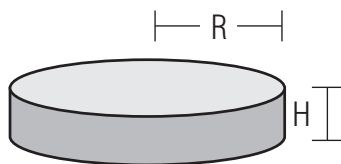
## Step 1

Calculate the volume of the part (or mold) in cubic inches. Follow whichever shape is closest to your model or mold:



**Volume of a Rectangle**

$$L \times W \times H$$



**Volume of a Cylinder**

$$R \times R \times H \times 3.14$$

## Step 2

Find the volumetric yield for your material. This number, which can be found in most specification tables, represents how much coverage your material will achieve. If the Volumetric Yield is not available, you can calculate it based on the specific gravity (density).

1. Find the specific gravity (or density) on the specification table and/or SDS. This is measured in grams per cubic centimeter (grams/cm<sup>3</sup>).
2. Divide 27.68 by the density (grams/cm<sup>3</sup>) to calculate the Volumetric Yield (in.<sup>3</sup>/lb.).

## Step 3

Divide the volume of the part in cubic inches (step 2) by the volumetric yield (step 1) to determine the amount of material required in pounds

$$\frac{\text{Volume of Model or Mold (in.<sup>3</sup>)}}{\text{Volumetric Yield (in.<sup>3</sup>/lb.)}} = \frac{\text{Weight of Product}}{\text{Required (lb.)}}$$

## Step 4

Select package size and quantity based on calculated weight.

# CALCULATING MATERIAL FOR MIX RATIO

Once you know how much material you need and the product's mix ratio (found on the TDS or product packaging), you may need to calculate the mix ratio for a specific weight of A & B combined. Let's use an example.

Say a product's mix ratio is 100:60 by weight and you need 1,438 grams total.

## Calculate the above equation to determine the pounds needed

You will need 3.17 lb. for a pour. This equals 1,438 grams (ounces x 28.35 = grams).

## Determine ratio multiplier

The 1.6 factor is the multiplier to work out the resin based on the total amount of resin required. Calculated from the mix ratio 100:60 meaning if you have 100 parts resin you will need 60 parts hardener. 160 divided by 100 = 1.6.

## Determine how much of each resin and hardener to mix

Take the total weight (in grams) needed of mixed resin and divide by your ratio multiplier: 1,438 / 1.6 = 898.75 g resin, therefore the hardener is 539.25 g (1,438 - 898.75). So you would now pour 898.75 g resin and 539.25 g hardener.

## Poured too much on one side? Calculate for the other side

If you accidentally over-pour by 30 grams on the resin side, multiply 30 x 1.6 (the mix ratio multiplier) and you get 48. You would add 18 grams of hardener (48-30=18).



## Still not sure?

Our Technical staff is available to answer any question, large or small, via phone at (800) 321-8511 opt. 5 or via email at [tech@freemansupply.com](mailto:tech@freemansupply.com).

# LOCATIONS

## Branch Locations and Public Warehouses

Freeman has strategically placed satellite locations across North America with customer service representatives ready to help. Thousands of products are stocked at these locations as well as public warehouses to reduce your shipping costs.

## Strategic & Effective Stocking

Freeman's inventory staff constantly monitors sales and stocking data across the country to properly provide the right amount of products at each location.

## Worldwide Shipping

Freeman ships orders all across the globe and has various international distributors available to supply customers with top-quality products.



### OHIO (HEADQUARTERS)

1101 Moore Road  
Avon, OH 44011  
TEL 800-321-8511  
TEL 440-934-1902  
FAX 440-934-7200

### KANSAS

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Wichita, KS 67215  
TEL 800-792-1047  
FAX 817-568-0908

### ONTARIO

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Mississauga, ON L5L 6A7  
TEL 800-345-9259  
FAX 586-774-1019

### QUEBEC

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Montreal, QC H4S 1H3  
TEL 800-263-7699  
TEL 514-335-3530  
FAX 514-335-3225

### CALIFORNIA

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Vernon, CA 90058  
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FAX 440-934-7200

### MICHIGAN

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TEL 586-774-1210  
FAX 586-774-1019

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TEL 817-551-7301  
FAX 817-568-0908

### GEORGIA

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FAX 440-934-7200

### NORTH CAROLINA

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Mocksville, NC 27028  
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FAX 440-934-7200

### PENNSYLVANIA

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TEL 800-631-4230  
TEL 717-653-5300  
FAX 717-653-7372

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4921 South 2nd St.  
Milwaukee, WI 53207  
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TEL 262-789-9800  
FAX 262-789-5407

# TERMS & CONDITIONS

## Returned Goods

To save transportation charges, and facilitate handling of merchandise upon our receipt, we request that no merchandise be returned without prior written authorization.

## Damaged Goods

Merchandise given to a transportation firm is their responsibility to deliver in satisfactory condition. If merchandise is delivered damaged, the customer should note as such on freight bill and file a claim with the delivering carrier. Regulations require that hidden damage, identified upon unpacking, must be reported within ten (10) days of delivery in order to file a proper claim.

## Liability/Warranty Statement

Our products are intended for sale to industrial and commercial customers. We request that customers inspect and test our products before use and satisfy themselves as to contents and suitability. Nothing herein shall constitute a warranty, expressed or implied, including any warranty or merchantability or fitness, nor is protection from any law of patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is replacement of our materials and in no event shall we be liable for special, incidental, or consequential damages.

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