



# REPRO

## Fast-Cast Polyurethanes



### Freeman Repro Fast-Cast Polyurethanes

World-renowned as the leading class of quick-curing casting resin systems available today, these products are designed for ease of mixing, quick demolding, and unsurpassed accuracy. Repro is manufactured by Freeman and has become the standard against which all others are measured.

These systems are ideal for many applications including foundry patterns and tooling, core boxes, prototype vacuum-forming tools, holding and assembly fixtures, figurine and decorative castings, duplicator models and tracing aids, back-filling material for other tooling resins, prototype wax injection molds, and prototype parts.



# Freeman Repro® Fast-Cast Polyurethanes

## Choosing a Repro Formulation

Criteria	Product
Balance of Features	Repro 83
Higher Temperatures	Repro One, Repro NS
Speed	Repro Fast, Repro 10
Accuracy	Repro Slow
Light Weight	Repro Light, Repro Ultra Light
Machinability	Repro 95, Repro Ultra Light
Large Size	Repro Surface Coat and Laminating Resin

### Repro 83

- 6-7 Min. Gel Time
- 60-90 Min. Demold

Repro 83 is our most popular tooling urethane with a great balance of speed and accuracy. This castable polyurethane is used extensively in foundry and thermoforming applications, mold making, and in most general plastic casting applications. Offered in a choice of blue, gray, or white.

Catalog Number	Description	Availability	Net Wt (Lbs.) (Kg)
053150	Repro 83 – White	Quart Unit	5 (2.3)
053156	Repro 83 – White	Gallon Unit	20 (9.1)
053152	Repro 83 – Blue	Quart Unit	5 (2.3)
053158	Repro 83 – Blue	Gallon Unit	20 (9.1)
053164	Repro 83 – Blue	5 Gallon Unit	100 (45.4)
053154	Repro 83 – Gray	Quart Unit	5 (2.3)
053160	Repro 83 – Gray	Gallon Unit	20 (9.1)
053166	Repro 83 – Gray	5 Gallon Unit	100 (45.4)

### Repro NS (Non-Settling)

- 6-7 Min. Gel Time
- 60-90 Min. Demold

Repro NS features a non-settling additive that eliminates filler “hard-packing” and dramatically reduces the time required to pre-mix the material for use. Shakers and mixers are no longer required – simply stir with a paint paddle!

It is formulated to match the color, mix ratio, work time, low shrinkage, and surface hardness of our most popular fast cast product, Repro 83. However, Repro NS offers a higher temperature resistance. Therefore, like Repro 83, it is used in foundry and thermoforming applications, mold making, and in most general plastic casting applications.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053153	Repro NS – Blue	Quart Unit	5 (2.3)
053159	Repro NS – Blue	Gallon Unit	20 (9.1)
053165	Repro NS – Blue	5 Gallon Unit	100 (45.4)

### Repro Fast

- 4-5 Min. Gel Time
- 15-30 Min. Demold

Formulated to have the shortest demold time of all of the Repro products for maximum part production. Repro Fast is the best choice when time is most important.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053181	Repro Fast – Tan	Quart Unit	5 (2.3)
053183	Repro Fast – Tan	Gallon Unit	20 (9.1)
053184	Repro Fast – Tan	5 Gallon Unit	100 (45.4)

### Repro One

- Our most advanced fast-cast urethane
- 6-7 Min. Gel Time
- 60-90 Min. Demold

Repro One is the latest formulation in our extensive line of fast-cast urethanes. This castable polyurethane can be used in durable foundry tooling, thermoforming applications, mold making, as well as most general plastic casting applications.

#### Additional Advantages:

- Higher heat resistance for elevated temperature applications
- Higher Shore D hardness for improved abrasion resistance
- Lower moisture sensitivity for ease of use
- Improved release characteristics for easier demold
- Lower density for greater volume yield
- Non-settling formulation for fast and easy mixing
- Compatible with expanded polystyrene (Styrofoam)

Catalog Number	Description	Availability	Net Wt (Lbs.)
053090	Repro One – Gray	Quart Unit	5 (2.3)
053093	Repro One – Gray	Gallon Unit	20 (9.1)
053095	Repro One – Gray	5 Gallon Unit	100 (45.4)

### Repro 10

- 5-6 Min. Gel Time
- 30-60 Min. Demold

The original Repro formulation, this product has a slightly longer work time, longer demold time, and less shrinkage than Repro Fast.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053060	Repro 10 – Tan	Quart Unit	5 (2.3)
053064	Repro 10 – Tan	Gallon Unit	20 (9.1)
053062	Repro 10 – Black	Quart Unit	5 (2.3)
053066	Repro 10 – Black	Gallon Unit	20 (9.1)

### Repro Slow

- Highest level of accuracy available
- 12-14 Min. Gel Time
- 3-4 Hr. Demold

Our most accurate fast-cast polyurethane system, Repro Slow features extremely low shrinkage and an extended work time that allows for the creation of larger tools.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053201	Repro Slow – Tan	Gallon Unit	20 (9.1)
053202	Repro Slow – Tan	5 Gallon Unit	100 (45.4)

## Repro Light

- ½ the weight of Repro 83
- 6-8 Min. Gel Time
- 90-120 Min. Demold

Repro Light is a versatile castable urethane that is approximately one half the weight of our other Repro products. This material, which is colored brown, can be used for lightweight tools, backfill applications, and as an adhesive for many urethane modeling boards. Its hardness and color is an almost exact match to the popular tooling board RenShape 450. This material also offers lower internal porosity compared to competitive products. Repro Light offers easy machinability and can be readily worked and carved with hand tools.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053197	Repro Light – Brown	Quart Unit	2.5 (1.1)
053198	Repro Light – Brown	Gallon Unit	10 (4.5)
053199	Repro Light – Brown	5 Gallon Unit	50 (22.7)

## Repro Ultra Light

- ⅓ the weight of Repro 83
- 10-11 Min. Gel Time
- 2-3 Hr. Demold

A unique castable urethane, Repro Ultra Light is a very low-density, syntactic polyurethane casting resin designed for weight critical applications and easy machinability. This light tan formulation may be worked with hand tools or CNC machining equipment when cured.

A long work time allows for large, accurate castings.

Like Repro Light, this material offers a low internal porosity that produces an excellent machined surface finish. Repro Ultra Light is also an excellent choice to use as a hardness-matched adhesive for RenShape urethane foam boards.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053196	Repro Ultra Light – Lt. Tan	Gallon Unit	7 (3.2)
053200	Repro Ultra Light – Lt. Tan	5 Gallon Unit	35 (15.9)

## Repro 95

- Aluminum-Filled
- 6-7 Min. Gel Time
- 60-90 Min. Demold

Repro 95 is a unique castable polyurethane featuring a high aluminum content which provides excellent machining and polishing characteristics. This casting resin has a gray metal-like appearance and is ideal for prototype thermoforming and wax injection mold applications for investment casting.

### Unique Advantages:

- Dense, non-porous surface even after machining
- Reduced tool wear compared to standard fast-cast materials when machining
- The ultra-smooth finish of the material, even after machining, allows for easy sand release in pattern and core box applications

Catalog Number	Description	Availability	Net Wt (Lbs.)
053051	Repro 95 – Gray	Quart Unit	5 (2.3)
053052	Repro 95 – Gray	Gallon Unit	20 (9.1)

## Repro Surface Coat & Laminating Resin System

- 13 Min. Gel Time (surface coat)
- 15 Min. Gel Time (laminating resin)
- 3-4 Hr. Demold (complete tool)

A Freeman exclusive! The Repro Surface Coat and Laminating System is a low-cost, fast, and very accurate alternative to traditional epoxy fiberglass tooling. Although this tooling urethane is not designed to be used in high-temperature or high-wear applications, Repro Surface Coat and Laminating Resin is the ideal material choice for many larger moldmaking applications. Both materials are white in color.



### Additional Advantages:

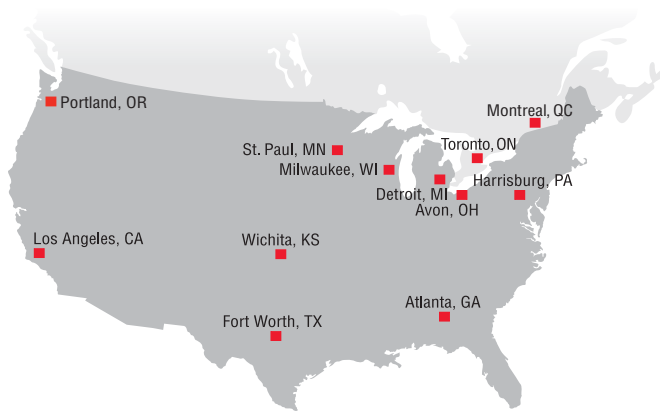
- Low exotherm system provides for very low-shrinkage tools. System will not get hot even in thick applications.
- Quick three hour demold time versus 24 hour cure time for epoxy systems.
- Very easy system to use for first time toolmakers.
- Both the surface coat and laminating resin are rebondable. This means that they will adhere very well to cured material.

Catalog Number	Description	Availability	Net Wt (Lbs.)
053189	Repro Surface Coat – White	Gallon Unit	20 (9.1)
053193	Repro Laminating Resin – White	Quart Unit	5 (2.3)
053194	Repro Laminating Resin – White	Gallon Unit	20 (9.1)
053195	Repro Laminating Resin – White	5 Gallon Unit	100 (45.4)
054071	¼" Fiberglass Strand	Box	50 (22.7)
054073	¼" Fiberglass Strand	Box	5 (2.3)

# Freeman Repro Fast-Cast Urethanes Specifications

	Mix Ratio (by wt or vol.)	Gel Time (min.) @ 77°F	Demold Time (min.) @ 77°F	Hardness (Shore D)	Specific Gravity	Mixed Viscosity (CPS) @ 1 min.	Volumetric Yield (cu. in./lb.)	Shrinkage (in./in.) <sup>2</sup>	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Tensile Modulus (psi)	IZOD Impact Strength (ft. lbs./in.)	Heat Deflection Temp. @ 66 psi	Coefficient Thermal Expansion (in/in/°F)
Repro 83	1:1	6-7	60-90	84	1.9	1,100	14.5	0.0010	6,470	5,140	939,000	3,130	941,000	0.31	135°F/57°C	-
Repro NS	1:1	6-7	60-90	84	1.9	1,750	14.5	0.0010	5,970	2,990	-	1,710	-	0.35	142°F/61°C	1.45 x 10 <sup>-5</sup>
Repro One	1:1	6-7	60-90	87	1.75	1,500	15.8	0.0010	7,860	4,290	799,000	2,350	582,000	0.30	156°F/69°C	1.79 x 10 <sup>-5</sup>
Repro Fast	1:1	4-5	15-30	84	1.9	1,100	14.5	0.0015	6,470	5,140	939,000	3,130	941,000	0.31	135°F/57°C	-
Repro 10	1:1	5-6	30-60	84	1.9	1,100	14.5	0.0012	6,470	5,140	939,000	3,130	941,000	0.31	135°F/57°C	-
Repro Slow	1:1	12-14	3-4 hr	84	1.9	1,100	14.5	0.0009	6,470	5,140	939,000	3,130	941,000	0.31	135°F/57°C	-
Repro Light	1:1	6-8	90-120	68	0.9	1,500	30.0	0.0014	3,980	2,620	347,000	1,530	350,000	0.15	132°F/56°C	3.50 x 10 <sup>-5</sup>
Repro Ultra Light	1:1	10-11	2-3 hr	55	0.6	1,400	47.0	0.0014	2,700	1,840	160,000	1,490	72,400	0.12	128°F/53°C	4.18 x 10 <sup>-5</sup>
Repro 95	1:1	6-7	60-90	84	1.9	1,450	14.5	0.0012	7,140	3,070	505,000	1,770	561,000	0.29	131°F/55°C	3.13 x 10 <sup>-5</sup>
Surface Coat	1:1	13	3-4 hr	84	1.9	6,000	14.5	-	-	-	-	-	-	-	-	-
Laminating Resin	1:1	15	3-4 hr	84	1.9	3,500	14.5	-	-	-	-	-	-	-	-	-
ASTM Tests								D-2566	D-695	D-790	D-790	D-638	D-638	D-256	D-648	D-696-88

\*Shrinkage Dependent upon Mass



## Worldwide

Freeman has authorized international distributors throughout the world including Japan, Korea, Australia, and Western Europe

## Freeman Has Twelve Strategic North American Locations and Worldwide Distribution

### Ohio (Headquarters)

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Avon, OH 44011  
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TEL 440-934-1902  
FAX 440-934-7200

### Pennsylvania

909 Strickler Road  
Mt. Joy, PA 17552  
TEL 800-631-4230  
TEL 717-653-5300  
FAX 717-653-7372

### California

I M C Distribution  
15147 Don Julian Road  
City of Industry, CA 91746  
TEL 800-325-2100  
FAX 440-934-7200

### Ontario

Voyageur Distribution  
3600B Laird Road, Unit 4  
Mississauga, ON L5L 5Y7  
TEL 800-345-9259  
FAX 586-774-101

### Georgia

Shippers Warehouse of Georgia  
9250 S. Main St.  
Jonesboro, GA 30236  
TEL 800-445-0811  
FAX 440-934-7200

### Oregon

Bushnell's Warehousing  
2720 N.W. 35th Ave.  
Portland, OR 97210  
TEL 800-558-0866  
FAX 262-789-5407

### Kansas

Garvey Warehouse  
5755 S. Hoover Rd., Bldg. #5  
Wichita, KS 67215  
TEL 800-792-1047  
FAX 817-568-0908

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FAX 514-335-3225

### Michigan

27655 Groesbeck Hwy.  
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TEL 800-345-9259  
TEL 586-774-1210  
FAX 586-774-1019

### Texas

3152 S.E. Loop 820  
Fort Worth, TX 76140  
TEL 800-792-1047  
TEL 817-551-7301  
FAX 817-568-0908

### Minnesota

Professional Warehouse  
2117 Charles Ave.  
Saint Paul, MN 55114  
TEL 800-558-0866  
FAX 262-789-5407

### Wisconsin

16910 W. Cleveland Ave.  
New Berlin, WI 53151  
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TEL 262-789-9800  
FAX 262-789-5407

## Terms and Conditions

### Liability/Warranty Statement

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