

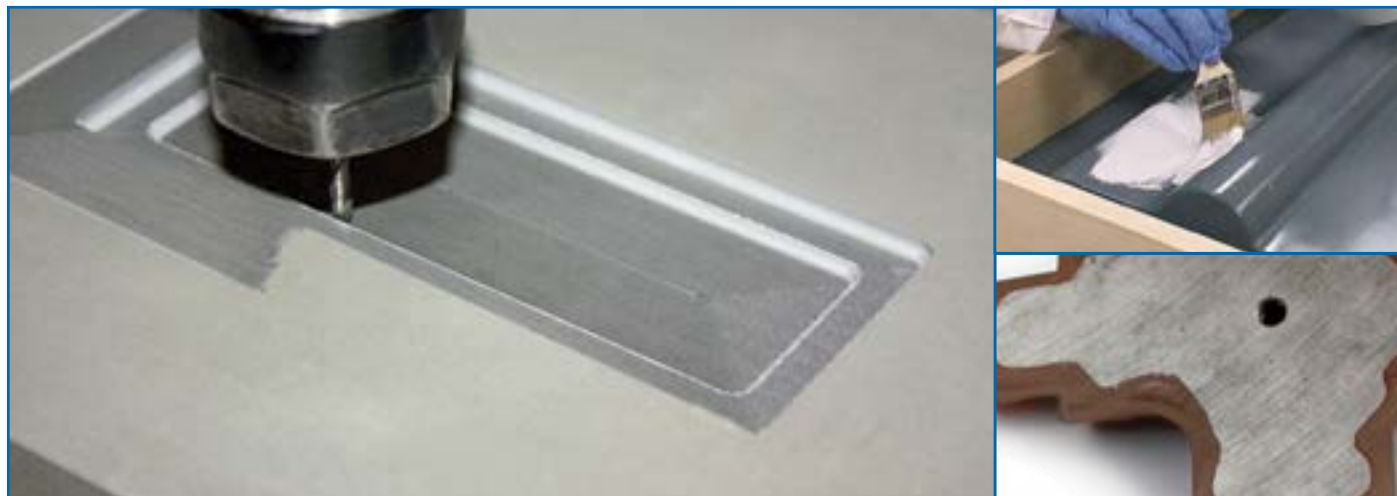
HUNTSMAN

Enriching lives through innovation



EPOXY TOOLING PLASTICS

Freeman's line of epoxies features a wide range of materials to meet the needs of room temperature and high-temperature tooling applications. Our epoxy casting resins are formulated for mass casting applications. Our epoxy surface coats and laminating resins are economical materials ideal for many demanding foundry tooling and high temperature applications. And our paste laminating compounds are used as an alternative to fiberglass cloth reinforcement behind surface coats, saving time in constructing medium-sized tools. These systems are a popular choice for a wide range of applications, including RIM and RTM molds, vacuum-form tools, composite parts, and tooling intermediates.



DID YOU KNOW?

We offer how-to and product demonstration videos!

Our Video Library is available on our website, 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!



EPOXY CASTING RESINS

Freeman and Huntsman Advanced Materials offer a broad, diverse line of pourable epoxy casting resins for the production of foundry patterns, core boxes, molds, fixtures, and tooling.

Aluminum-filled

- Gray
- Readily machinable
- Available with higher temperature resistances

Iron-filled

- Black
- Highly wear-resistant
- Suitable for foundry patterns or thin-gauge metal-forming tools



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)	Mixed Viscosity (cps)	Density (g/cc)	Volumetric Yield (in. ³ /lb.)	Shrink (in./in.)	Compressive Strength (psi)	Flexural Strength (psi)	Tensile Strength (psi)	Coefficient Thermal Expansion (in./in./°F)	Deflection Temp. (°F) (264 psi)	Tg per DMA (°F)
Aluminum-Filled Room-Temperature Epoxy Casting Resins															
Freeman 801	100:12	100:23	150	24	86	4,650	1.70	16.3	0.002	12,500	11,590	7,280	3.82 x 10 ⁻⁵	142	–
Freeman 805	100:18	100:29	150	24	88	9,750	1.47	18.8	0.001	17,200	9,600	8,100	–	200	–
RenCast 3269	100:9	100:18	140	24	88	4,300	1.78	15.6	0.001	14,400	13,000	8,700	3.76 x 10 ⁻⁵	–	171
Devcon Plastic Aluminum	9:1	5:1	75	16	85	15,000 - 25,000	1.58	17.5	0.001	9,820	7,180	2,700	5.00 x 10 ⁻⁶	–	–
Aluminum-Filled High-Temperature Epoxy Casting Resins															
Freeman 925	100:8	100:13	37	24	90	11,000	1.68	16.5	0.001	40,000	18,000	10,200	–	225	–
RenCast 4037 / Ren 4037	100:13	100:22	140	24*	91	15,000	1.58	17.6	0.005	25,800	9,300	6,300	2.25 x 10 ⁻⁵	–	350
RenCast 4036 / Ren 1500	100:6	100:10	60	24*	90	20,000	1.69	16.5	0.004	30,000	7,500	6,500	1.90 x 10 ⁻⁵	–	350
RenCast 4036 / Ren 1511	100:13	100:22	140	24*	91	15,000	1.58	17.6	0.005	25,800	9,300	6,300	2.25 x 10 ⁻⁶	–	350
Iron-Filled Epoxy Casting Resins															
Freeman 855	100:10	100:25	150	24	87	13,950	2.23	12.4	0.001	13,400	9,100	6,800	2.80 x 10 ⁻⁵	230	–
RenCast 3209 / Ren 3209-1	100:10	100:25	90	24	75	15,000	2.04	13.5	0.005	16,500	8,400	5,500	2.60 x 10 ⁻⁵	165	–
RenCast 3209 / Ren 3209-2	100:11	100:28	240	24	85	15,000	2.15	12.9	0.003	11,500	8,000	5,000	3.20 x 10 ⁻⁵	120	–
RenCast 3215-1 / Ren 3215-3	100:50	100:95	60	24	45	4,600	1.48	18.7	0.002	–	–	300	–	77	–
RenCast 3215-1 / Ren 3215-3	100:40	100:76	65	24	70	5,400	1.51	18.3	0.001	–	300	1,200	–	77	–
RenCast 3215-1 / Ren 3215-3	100:30	100:57	70	24	85	6,200	1.54	18.0	0.002	12,600	6,900	4,300	–	77	–
RenCast 3253	100:5	100:16	100	24	90	7,500	2.99	9.3	0.002	15,200	8,500	7,100	3.23 x 10 ⁻⁵	120	–
RenCast 3261	100:6	100:16	25	24	88	35-50,000	2.94	9.4	0.003	16,500	8,500	6,000	3.00 x 10 ⁻⁵	138	–
Other Epoxy Casting Resins															
RenCast 140	100:25	100:30	40	24	80	1,300	1.09	25.4	–	–	–	9,500	–	–	–
Devcon Plastic Steel Liquid	9:1	3:1	45	16	85	15-25,000	2.10	13.1	0.001	10,200	7,480	2,800	3.80 x 10 ⁻⁶	–	–
ASTM	–	–	D-2471	–	D-2240	D-2393	D-792	D-792	D-2566	D-695	D-790	D-638	D-696	D-648	D-648

*Indicates heated post cure

ALUMINUM-FILLED ROOM-TEMPERATURE EPOXY CASTING RESINS



Freeman 801

- ▶ Castable up to 3" thick
- ▶ 150 min. gel time
- ▶ 86 Shore D

This product is an economical aluminum-filled epoxy casting resin that is excellent for making wear resistant core boxes, patterns, and tooling fixtures. Low shrinkage, long gel time, and lower

exotherm enables this material to be poured to a larger thickness.

SKU	Size	Net weight (lb.)
055626Q	Freeman 801 Resin Only (Quart)	2.7
055627Q	Freeman 801 Hardener Only (Pint)	0.32
055626	Freeman 801 Resin Only (Quarts – 6)	15.9
055627	Freeman 801 Hardener Only (Pints – 6)	1.9
055630	Freeman 801 Resin Only (5 Gallon)	60
055631	Freeman 801 Hardener Only (Gallon)	7.2

Freeman 805

- ▶ Castable up to 1/2" thick
- ▶ 150 min. gel time
- ▶ 88 Shore D

Freeman 805 is also an aluminum-filled epoxy casting resin that is similar in wear characteristics to the 801, but is designed for smaller jobs where the maximum casting thickness is only 1/2". This product also works

very well for foundry tooling construction.

SKU	Size	Net weight (lb.)
055812	Freeman 805 Resin Only (Quart)	2
055813	Freeman 805 Hardener Only (1/2 Pint)	0.36
055809	Freeman 805 Resin Only (Quarts – 6)	12
055810	Freeman 805 Hardener Only (1/2 Pints – 6)	2.2
055807	Freeman 805 Resin Only (5 Gallon)	45
055808	Freeman 805 Hardener Only (Gallon)	8.1

RenCast 3269 / Ren 3269

- ▶ Castable up to 3/4" thick
- ▶ 140 min. gel time
- ▶ 87 Shore D

This aluminum-filled epoxy features a slightly lower viscosity than the Freeman 801 and 805 for ease of pouring. Castable to 3/4", RenCast 3269 is also designed for smaller tooling

projects that require good durability and wear resistance.

SKU	Size	Net weight (lb.)
056116	RenCast 3269 Resin Only (5 Gallon)	60
056117	Ren 3269 Hardener Only (Gallon)	5.5

Devcon Plastic Aluminum

- ▶ Castable up to 3/4" thick
- ▶ 75 min. gel time
- ▶ 85 Shore D



This aluminum-filled epoxy is ideal for producing rigid molds, patterns, and holding fixtures that can be machined to a metallic finish as well as drilled or tapped. It is also available in putty form (page 76).

SKU	Size	Net weight (lb.)
054600	Small Kit	1
054605	Large Kit	3



ALUMINUM-FILLED HIGH-TEMPERATURE EPOXY CASTING RESINS

Freeman 925

- ▶ Castable up to 1" thick
- ▶ 37 min. gel time
- ▶ 90 Shore D

Freeman 925 offers high impact and abrasion resistance, high accuracy, and low shrinkage. It

is commonly used in prototype injection molding, vacuum forming, and high-temperature fixtures, handling elevated temperatures up to 225°F.



SKU	Size	Net weight (lb.)
055951	Freeman 925 Resin Only (Quart)	2
055953	Freeman 925 Hardener Only (½ Pint)	0.2
055950	Freeman 925 Resin Only (Quarts – 6)	12
055952	Freeman 925 Hardener Only (½ Pints – 6)	1
055954	Freeman 925 Resin Only (5 Gallon)	45
055955	Freeman 925 Hardener Only (Gallon)	3.6

RenCast 4036 / Ren 1500

- ▶ Castable up to 1" thick
- ▶ 60 min. gel time
- ▶ 90 Shore D

This aluminum-filled casting resin is formulated for constructing hard and durable molds that will be subjected to elevated temperatures up to 300°F. With a maximum casting thickness of 1", 4036 is excellent

for making smaller vacuum form tools, prototype injection molds, and other tooling requiring a high temperature resin.

SKU	Size	Net weight (lb.)
056166Q	RenCast 4036 Resin Only (Quart)	3.1
056167Q	Ren 1500 Hardener Only (Quart)	0.2
056166	RenCast 4036 Resin Only (Quarts – 6)	18.7
056167	Ren 1500 Hardener Only (Quarts – 6)	1.4
056161	RenCast 4036 Resin Only (5 Gallon)	65
056020	Ren 1500 Hardener Only (Gallon)	4

RenCast 4036 / Ren 1511

- ▶ Castable up to 4" thick
- ▶ 140 min. gel time
- ▶ 91 Shore D

RenCast 4036 / Ren 1511 has a lower exotherm formulation than RenCast 4036 / Ren 1500, enabling it to be poured to a maximum thickness of 4" for larger high temperature tooling, up to 300°F.

SKU	Size	Net weight (lb.)
056161	RenCast 4036 Resin Only (5 Gallon)	65
056160	Ren 1511 Hardener Only (2 Gallon)	8.4

RenCast 4037 / Ren 4037

- ▶ Castable up to 4" thick
- ▶ 140-165 min. gel time
- ▶ 91 Shore D

This economical, high-temperature, aluminum-filled epoxy is excellent for constructing larger vacuum form tools, prototype injection molds, compression molds, and other high temperature tooling.

This very versatile resin system is machinable, castable to 4" in thickness, and able to withstand maximum continuous temperatures of 300°F.

Important Note: The resin and hardener in this package is approximately 2.5 gallons total. The manufacturer uses a 5 gallon pail to allow adequate space for the addition of aluminum fillers if desired.

SKU	Size	Net weight (lb.)
056162	RenCast 4037 Resin Only (5 Gallon)	33
056163	Ren 4037 Hardener Only (Gallon)	4.4



RenCast 4037 can be machined for an incredibly smooth surface finish.

IRON-FILLED EPOXY CASTING RESINS



Freeman 855

- ▶ Castable up to ½" thick
- ▶ 150 min. gel time
- ▶ 87 Shore D

This iron-filled epoxy tooling resin features higher abrasion resistance than our aluminum-filled epoxies. Freeman 855 is used in foundry patterns, core box construction, and some metal forming applications.

SKU	Size	Net weight (lb.)
055857	Freeman 855 Resin Only (5 Gallon)	45
055858	Freeman 855 Hardener Only (Gallon)	4.5

RenCast 3209

- ▶ Castable up to 2" or 6" thick
- ▶ 90 or 240 min. gel time
- ▶ 75 or 85 Shore D

This Epoxy Casting system offers high impact strength, low shrink and excellent wear resistance for light gage metal forming and foundry patterns, stretch press forms, and molds. The Ren 3209-2 Hardener offers

a slower cure and higher castable thickness compared to the 3209-1.

SKU	Size	Net weight (lb.)
056059Q	RenCast 3209-1 Resin Only (Quart)	3.7
056061Q	Ren 3209-1 Hardener Only (Quart)	0.4
056059	RenCast 3209-1 Resin Only (Quarts – 6)	22.2
056061	Ren 3209-1 Hardener Only (Quarts – 6)	2.4
056062	RenCast 3209-1 Resin Only (5 Gallon)	39
056063	Ren 3209-1 Hardener Only (Gallon)	3.9
056068	Ren 3209-2 Hardener Only (Gallon)	4.3

OTHER EPOXY CASTING RESINS

RenCast 140

- ▶ Castable up to ¾" thick
- ▶ 40 min. gel time
- ▶ 80 Shore D

RenCast 140 is a clear, two-component epoxy casting system specifically designed for making clear parts or molds. Parts 1/8" or thinner require a heat cure at 100-150°F.

SKU	Size	Net weight (lb.)
056001	RenCast 140 Gallon Kit	9.3

RenCast 3215

- ▶ Castable from ¼" to 2" thick
- ▶ 60-70 min. gel time
- ▶ 45-85 Shore D

RenCast 3215 can be mixed in three different ratios, each offering various properties. A 100:50 ratio results in high flexibility, a 100:40 ratio is resilient, and a 100:30 ratio results in high impact resistance.

SKU	Size	Net weight (lb.)
056072	RenCast 3215-1 Resin Only (5 Gallon)	60
056083	Ren 3215-3 Hardener Only (5 Gallon)	30

RenCast 3253

- ▶ Castable up to ¾" thick
- ▶ 30 min. gel time
- ▶ 90 Shore D

This very tough epoxy with excellent abrasion resistance and good impact strength is ideal for dies, core boxes, foundry patterns, hammer forms, and fixtures.

SKU	Size	Net weight (lb.)
056087	RenCast 3253 Resin Only (5 Gallon)	60
056088	Ren 3253 Hardener Only (Gallon)	3

RenCast 3261

- ▶ Castable up to ½" thick
- ▶ 25 min. gel time
- ▶ 88 Shore D

This dual purpose resin may be used as a casting resin or a surface coat and offers fine surface detail and impact resistance. RenCast 3261 is well-suited for patterns, hammer form dies, core boxes and fixtures.

SKU	Size	Net weight (lb.)
056092Q	RenCast 3261 Resin Only (Quart)	5
056098Q	Ren 3261 Hardener Only (Quart)	0.3
056092	RenCast 3261 Resin Only (Quarts – 6)	29.9
056098	Ren 3261 Hardener Only (Quarts – 6)	1.7

Devcon Plastic Steel

- ▶ Castable up to ¾" thick
- ▶ 45 min. gel time
- ▶ 85 Shore D

Containing 80% steel and 20% epoxy resins and modifiers, this dark gray resin is very machinable with a high impact strength and an excellent resistance to chemicals and solvents. Also available in putty form (page 76).

SKU	Mfg. No.	Net weight (lb.)
054570	10210	1
054575	10220	4
054580	10230	25

EPOXY SURFACE COATS



Freeman 701

These epoxy surface coats by Freeman and Huntsman Advanced Materials are ideal for creating accurate and durable tool surfaces on general purpose laminated tools as well as more demanding abrasion resistant or heat resistant laminated tools.



Freeman 706

Freeman 705

RenGel 4026

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)	Mixed Viscosity (cps)	Density (g/cc)	Volumetric Yield (in. ³ /lb.)	Shrink (in./in.)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Coefficient Thermal Expansion (in./in./°F)	Deflection Temp. (°F) @ 264 psi	Tg per DMA (°F)
Room-Temperature Surface Coats																
Freeman 701	100:8	100:13	15	24	87	Thixotropic	1.48	18.7	–	13,200	10,800	–	6,100	–	127	–
Freeman 705-15	100:14	100:20	15	24	90	18,300	1.4	19.6	–	16,800	7,000	0.76 x 10 ⁶	5,100	–	250	–
Freeman 705-45	100:14	100:20	45	24	90	18,300	1.4	19.6	–	16,800	7,000	0.76 x 10 ⁶	5,100	–	250	–
Freeman 706-45	100:14	100:20	45	24	90	15,000	1.3	21.0	–	16,800	7,000	0.76 x 10 ⁶	5,100	–	250	–
RenGel 1118	100:9	100:13	30	24	90	Paste	1.5	19.0	0.002	13,400	6,500	–	3,500	2.56 x 10 ⁻⁵	235	–
RenGel 1124	100:18	100:27	25	24	90	Paste	1.4	19.0	0.002	14,500	10,000	–	6,200	2.89 x 10 ⁻⁵	127	149
RenGel 1126	100:18	100:25	24	24	90	Paste	1.4	19.7	0.002	12,000	6,800	0.72 x 10 ⁶	4,700	2.60 x 10 ⁻⁵	127	165
RenGel 1129	100:20	100:26	20	24	85	Paste	1.4	19.9	0.002	13,900	15,500	0.49 x 10 ⁶	4,880	3.16 x 10 ⁻⁵	117	156
RenGel 3260	100:9	100:16	33	24	88	30,000	1.9	14.6	0.002	17,000	9,600	1.43 x 10 ⁶	6,500	2.10 x 10 ⁻⁵	138	–
High-Temperature Surface Coats																
Freeman 935-30	100:11	100:18	43	24	90	29,500	1.6	17.3	–	26,500	7,950	1.3 x 10 ⁶	4,000	2.30 x 10 ⁻⁵	370	–
Freeman 945	100:10	100:14	45-55	24	90	Thixotropic	1.4	19.9	–	25,000	8,000	–	5,000	3.70 x 10 ⁻⁵	310	–
RenGel 4026 / Ren 1500	100:10	100:14	50-60	24	90	Paste	1.43	19.4	0.005	27,000	8,500	–	5,500	3.70 x 10 ⁻⁵	–	310
RenGel 4026 / Ren 1501	100:10	100:14	30-40	24	90	Paste	1.4	19.4	0.0015	27,000	8,000	–	4,000	3.20 x 10 ⁻⁵	–	310
RenGel 4026 / Ren 1510	100:10	100:14	120	24	90	Paste	1.4	19.4	–	26,000	8,700	–	6,000	3.80 x 10 ⁻⁵	–	335
RenGel 177-144	100:10	100:15	60	24	92	Paste	1.6	17.8	0.002	28,000	12,500	0.7 x 10 ⁵	7,000	2.40 x 10 ⁻⁵	–	140
ASTM	–	–	D-2471	–	D-2240	D-2393	D-792	D-792	D-2566	D-695	D-790	D-790	D-638	D-696	D-648	D-648

ROOM-TEMPERATURE SURFACE COATS

Freeman 701

- ▶ General Purpose
- ▶ White
- ▶ 15 min. gel time

This epoxy surface coat is used for constructing larger laminated tools, fixtures, and molds. Its thick viscosity means it will not sag on vertical walls.

SKU	Size	Net weight (lb.)
055721	Freeman 701 Resin Only (5 Gallon)	45
055722	Freeman 701 Hardener Only (Gallon)	3.6

Freeman 705

- ▶ Plastic-Face Plaster
- ▶ White
- ▶ 15 or 45 min. gel time

Freeman 705 offers good durability for a variety of composite tooling. Since it cures in the presence of moisture, it is ideal for plastic-face plaster tools. The choice of hardeners offer different working times.

SKU	Size	Net weight (lb.)
055712	Freeman 705 Resin Only (Quart)	2
055706	Freeman 705-15 Hardener Only (½ Pint)	0.3
055713	Freeman 705-45 Hardener Only (½ Pint)	0.3
055709	Freeman 705 Resin Only (Quarts – 6)	12
055705	Freeman 705-15 Hardener Only (½ Pints – 6)	1.7
055710	Freeman 705-45 Hardener Only (½ Pints – 6)	1.7
055707	Freeman 705 Resin Only (5 Gallon)	45
055704	Freeman 705-15 Hardener Only (Gallon)	6.3
055708	Freeman 705-45 Hardener Only (Gallon)	6.3

Freeman 706

- ▶ Plastic-Face Plaster
- ▶ Blue
- ▶ 45 min. gel time

Freeman 706 is very similar to Freeman 705 except for its powder-blue color. This epoxy surface coat also cures in the presence of moisture for making plastic-faced plasters.

SKU	Size	Net weight (lb.)
055714	Freeman 706 Resin Only (Quart)	2
055715	Freeman 706-45 Hardener Only (½ Pint)	0.3
055703	Freeman 706 Resin Only (Quarts – 6)	12
055716	Freeman 706-45 Hardener Only (½ Pints – 6)	1.7
055717	Freeman 706 Resin Only (5 Gallon)	45
055718	Freeman 706-45 Hardener Only (Gallon)	6.3

RenGel 1118

- ▶ Hydrophobic
- ▶ Blue
- ▶ 30 min. gel time



RenGel 1118 will cure in the presence of moisture and is specifically designed for plastic-faced plaster tooling. It has a thick viscosity and will not sag on vertical walls.

SKU	Size	Net weight (lb.)
056016	RenGel 1118 Resin Only (5 Gallon)	40
056017	Ren 1118 Hardener Only (Gallon)	3.6

RenGel 1124

- ▶ General Purpose
- ▶ White
- ▶ 25 min. gel time

This durable epoxy surface coat system has a green color indicator in the resin that changes to amber when the product is completely mixed. Successive layers will aggressively bond to themselves, even to a cured underlying layer.

SKU	Size	Net weight (lb.)
056340Q	RenGel 1124 Resin Only (Quart)	2.8
056342Q	Ren 1124 Hardener Only (Quart)	0.5
056340	RenGel 1124 Resin Only (Quarts – 6)	16.9
056342	Ren 1124 Hardener Only (Quarts – 6)	3.1
056343	RenGel 1124 Resin Only (5 Gallon)	56
056344	Ren 1124 Hardener Only (Gallons – 2)	10

RenGel 1126

- ▶ General Purpose
- ▶ White
- ▶ 24 min. gel time

This general-purpose epoxy surface coat is lower in viscosity than RenGel 1124 but provides uniform coverage on vertical surfaces without sagging. It offers lower mechanical properties for less demanding applications.

SKU	Size	Net weight (lb.)
056023Q	RenGel 1126 Resin Only (Quart)	2.3
056024Q	Ren 1126 Hardener Only (Quart)	0.4
056023	RenGel 1126 Resin Only (Quarts – 6)	13.6
056024	Ren 1126 Hardener Only (Quarts – 6)	2.6
056026	RenGel 1126 Resin Only (5 Gallon)	45
056027	Ren 1126 Hardener Only (Gallon)	8.3

RenGel 1129

- ▶ Impact Resistant
- ▶ White
- ▶ 20 min. gel time

RenGel 1129 has a medium viscosity for easy application while resisting sagging on vertical walls. It produces a durable, high-impact resistant and durable surface for laminated tooling.

SKU	Size	Net weight (lb.)
056031	RenGel 1129 Resin Only (5 Gallon)	45
056032	Ren 1129 Hardener Only (Gallon)	9

RenGel 3260

- ▶ Silicone Carbide Filled
- ▶ Blue
- ▶ 33 min. gel time

Perfect for demanding applications, this silicon carbide-filled surface coat offers very high wear resistance. It is castable up to ½" thick and is ideal for foundry tooling, check fixtures, and metal forming dies. Alterations

to the cured resin are very difficult due to the silicon carbide filler.

SKU	Size	Net weight (lb.)
056085Q	RenGel 3260 Resin Only (Quart)	2.9
056086Q	Ren 3260 Hardener Only (Quart)	0.3
056085	RenGel 3260 Resin Only (Quarts – 6)	17.6
056086	Ren 3260 Hardener Only (Quarts – 6)	1.7
056090	RenGel 3260 Resin Only (5 Gallon)	60
056091	Ren 3260 Hardener Only (Gallon)	5.5

HIGH-TEMPERATURE SURFACE COATS

RenGel 4026

- ▶ Aluminum filled
- ▶ Gray
- ▶ 30-150 min. gel time

RenGel 4026 is formulated to be high-temperature resistant as well as for creating



vacuum form tools and prototype injection molds. This medium-viscosity material will not sag on vertical walls.

SKU	Size	Net weight (lb.)
056153Q	RenGel 4026 Resin Only (Quart)	2.2
056167Q	Ren 1500 Hardener Only (Pint)	0.2
056154Q	Ren 1501 Hardener Only (Pint)	0.2
056153	RenGel 4026 Resin Only (Quarts – 6)	13.1
056167	Ren 1500 Hardener Only (Pints – 6)	1.4
056154	Ren 1501 Hardener Only (Pints – 6)	1.4
056156	RenGel 4026 Resin Only (5 Gallon)	60
056039	Ren 1500 Hardener Only (Gallon)	6
056157	Ren 1501 Hardener Only (Gallon)	7.5
056040	Ren 1510 Hardener Only (Gallon)	6.8

RenGel 177-144

- ▶ Silicon Carbide filled
- ▶ Gray
- ▶ 60 min. gel time

This product's silicon carbide filler resists abrasive wear and effects of styrene monomer on the tool surface. It is ideal for close-tolerance, long-lasting molds for polyester parts and can withstand

the high exotherm during the curing process.

SKU	Size	Net weight (lb.)
056025	RenGel 177-144 Resin Only (5 Gallon)	60
056039	Ren 1500 Hardener Only (Gallon)	6

Freeman 935-30

- ▶ Aluminum filled
- ▶ Gray
- ▶ 43 min. gel time

This high-temperature resistant epoxy surface coat is ideal for constructing laminated tooling subjected to elevated temperatures such as vacuum forming and prototype injection molds.

SKU	Size	Net weight (lb.)
055942	Freeman 935 Resin Only (Quart)	2
055943	Freeman 935-30 Hardener Only (½ Pint)	0.2
055939	Freeman 935 Resin Only (Quarts – 6)	12
055940	Freeman 935-30 Hardener Only (½ Pints – 6)	1.3



Freeman 945 Surface Coat

Freeman 945

- ▶ Aluminum filled
- ▶ Gray
- ▶ 45-55 min. gel time

Freeman 945 is for large laminated tools subjected to high temperatures, serviceable up to 300°F. Uses include applications such as vacuum form tools and molds to produce composite parts that require an elevated cure to solidify. This medium-viscosity material will not sag on vertical walls.

SKU	Size	Net weight (lb.)
055966	Freeman 945 Resin Only (5 Gallon)	45
055967	Freeman 945 Hardener Only (Gallon)	4.5

DID YOU KNOW?

Freeman's Tech Team is ready to guide you on any project, large or small. To ask technical questions about a product or process, just call (800) 321-8511, option 5 or email tech@freemansupply.com. You will be connected to a technical representative specially trained on our products! They will be able to provide specifications, troubleshoot a problem, walk you through an application process, and provide various other technical information.



EPOXY LAMINATING RESINS



These resins are ideal for general-purpose fiberglass laminated tooling and demanding abrasion-resistant or heat-resistant laminated tools.

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)	Mixed Viscosity (cps)	Density (g/cc)	Volumetric Yield (in. ³ /lb.)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Coefficient Thermal Expansion (in./in./°F)	Deflection Temp. (°F) @ 264 psi	Tg per DMA (°F)
Room-Temperature Laminating Resins															
Freeman 601	100:10	100:14	28	24	88	3,000	1.39	19.9	39,900	9,100	1.0 x 10 ⁶	25,000	-	128	-
Freeman 605-15	100:16	100:20	20	24	82	2,850	1.30	21.3	40,000	33,500	1.8 x 10 ⁶	25,300	-	188	-
Freeman 605-45	100:20	100:26	37	24	86	2,800	1.28	21.6	40,000	33,500	1.8 x 10 ⁶	25,300	-	188	-
Freeman 690	100:33	100:37	90	24	86	1,445	1.10	25.0	26,500	39,900	1.3 x 10 ⁶	35,500	-	180	-
Miapoxy 100 / 95	100:24	100:25	38	24	90	800	1.13	24.5	26,000	39,000	-	36,000	0.93 x 10 ⁻⁵	128	-
Miapoxy 100 / 97	100:26	100:25	20	24	90	1,120	1.13	24.5	28,000	37,000	-	26,000	1.00 x 10 ⁻⁵	128	-
RenLam 1700-1/ Ren 1700-1	100:26	100:28	20	24	90	2,000	1.13	18.5	28,000	37,000	1.5 x 10 ⁶	26,000	1.00 x 10 ⁻⁵	128	-
RenLam 1700-1/ Ren 956	100:23	100:25	36	24	89	1,350	1.13	18.5	24,700	40,700	1.73 x 10 ⁶	34,900	0.97 x 10 ⁻⁵	128	-
RenLam 1710/ Ren 1710	100:16	100:23	22	24	90	3,500	1.35	18.8	23,000	30,000	1.84 x 10 ⁶	25,000	1.20 x 10 ⁻⁵	129	164
RenLam 1710/ Ren 956	100:16	100:23	35	24	90	2,000	1.35	18.8	26,900	32,900	1.5 x 10 ⁶	25,000	0.81 x 10 ⁻⁵	129	-
RenLam 1720/ Ren 956	100:15	100:21	40	24	90	3,200	1.34	20.5	21,000	36,000	1.6 x 10 ⁶	20,000	1.02 x 10 ⁻⁵	-	164
RenLam 177-114/ Ren 956	100:24	-	38	24	90	800	1.15	24.1	26,000	39,000	-	36,000	0.93 x 10 ⁻⁵	-	273
RenLam 8100	100:25	100:29	35	24	92	2,500	1.13	18.5	23,450	42,180	1.91 x 10 ⁶	32,224	1.2 x 10 ⁻⁶	128	167
High-Temperature Laminating Resins															
Freeman 917	100:10	100:13	52	24	92	4,000	1.46	19.0	24,500	30,574	1.6 x 10 ⁶	23,000	2.56 x 10 ⁻⁵	-	301
RenLam 4005/ Ren 1500	100:14	100:15	50	24	90	1,900	1.19	23.3	28,000	35,000	1.6 x 10 ⁶	26,000	0.85 x 10 ⁻⁵	289	338
RenLam 4014/ Ren 1500	100:11	100:14	55	24	90	4,000	1.34	20.8	28,000	34,000	1.7 x 10 ⁶	24,000	1.41 x 10 ⁻⁵	-	333
RenLam 4017/ Ren 1510	100:15	100:18	90	24	93	8,000	1.42	19.6	44,000	77,000	4.4 x 10 ⁶	80,000	3.40 x 10 ⁻⁵	-	350
RenLam 5052	100:38	100:47	7 hr.	24	-	700	1.17	20.2	-	20,305	4.5 x 10 ⁶	12,473	-	-	273
ASTM	-	-	D-2471	-	D-2240	D-2393	D-792	D-792	D-695	D-790	D-790	D-638	D-696	D-648	D-648

ROOM-TEMPERATURE LAMINATING RESINS

Freeman 601

- ▶ 28 min. gel time
- ▶ 88 Shore D
- ▶ White

This economical, general-purpose epoxy laminating resin is used for large composite tooling, mold construction and check fixtures. Freeman 601 is designed to be used with Freeman 701 Surface Coat.

SKU	Size	Net weight (lb.)
055621	Freeman 601 Resin Only (5 Gallon)	45
055622	Freeman 601 Hardener Only (Gallon)	4.5
055623	Freeman 601 Resin Only (55 Gallon)	400
055624	Freeman 601 Hardener Only (5 Gallon)	40

Freeman 605

- ▶ 20 or 37 min. gel time
- ▶ 82 or 86 Shore D
- ▶ White

This general-purpose epoxy laminating resin features a variable gel time (depending on the hardener used) and is designed to be used with Freeman 705 and Freeman 706 Surface Coats.

SKU	Size	Net weight (lb.)
055612	Freeman 605 Resin Only (Quart)	2
055606	Freeman 605-15 Hardener Only (½ Pint)	0.3
055613	Freeman 605-45 Hardener Only (½ Pint)	0.4
055609	Freeman 605 Resin Only (Quarts - 6)	12
055605	Freeman 605-15 Hardener Only (½ Pints - 6)	1.9
055610	Freeman 605-45 Hardener Only (½ Pints - 6)	2.4
055607	Freeman 605 Resin Only (5 Gallon)	45
055608	Freeman 605-45 Hardener Only (Gallons - 2)	9
055614	Freeman 605 Resin Only (55 Gallon)	450
055615	Freeman 605-45 Hardener Only (5 Gallon) - 2 Req.	45

ROOM-TEMPERATURE LAMINATING RESINS CONTINUED

Freeman 690

- ▶ 90 min. gel time
- ▶ 86 Shore D
- ▶ Translucent

Freeman 690 features a long gel time for construction of large laminated molds and finished parts. This product is clear, making it easy to identify any air entrapment. It is low in viscosity for easy cloth wet out.

SKU	Size	Net weight (lb.)
055015	Freeman 690 Resin Only (5 Gallon)	45
055016	Freeman 690 Hardener Only (Gallons – 2)	14.9

Miapoxy 100

- ▶ 38 or 20 min. gel time
- ▶ 90 Shore D
- ▶ Translucent

Miapoxy 100 is a clear, two-component epoxy laminating system specifically designed for producing strong



and accurate fiberglass laminates or repairs. The Mia 95 hardener offers a longer 38 minute working time for larger parts, and the Mia 97 hardener offers a 20 minute working time for smaller parts or repairs.

SKU	Size	Net weight (lb.)
405665	Miapoxy 100 Resin Only (Quart)	2
405615	Mia 95 Hardener Only (Pint)	0.5
405630	Mia 97 Hardener Only (Pint)	0.5
405660	Miapoxy 100 Resin Only (Gallon)	8
405620	Mia 95 Hardener Only (Quart)	2
405635	Mia 97 Hardener Only (Quart)	2.1
405650	Miapoxy 100 Resin Only (5 Gallon)	32
405610	Mia 95 Hardener Only (Gallon)	8
405625	Mia 97 Hardener Only (Gallon)	8
405655	Miapoxy 100 Resin Only (55 Gallon)	450
405605	Mia 95 Hardener Only (5 Gallon)	40
405624	Mia 97 Hardener Only (5 Gallon)	40

SEE ALSO

Convenient proportioning pumps (page 8) are sold separately for quick, accurate, and trouble-free metering of the correct amount of Miapoxy 100 resin and hardener.



RenLam 1700-1

- ▶ 20 or 36 min. gel time
- ▶ 90 Shore D
- ▶ Translucent

This unfilled, general-purpose laminating system features excellent moisture and chemical resistance. Also used for adhesive



applications and recommended for bonding wood and RenShape. Ren 956 hardener can also be used for an extended working time.

SKU	Size	Net weight (lb.)
056042Q	RenLam 1700-1 Resin Only (Quart)	1.6
056044Q	Ren 1700-1 Hardener Only (Pint)	0.5
056042	RenLam 1700-1 Resin Only (Quarts – 6)	9.8
056044	Ren 1700-1 Hardener Only (6 Pints)	2.8
056045	RenLam 1700-1 Resin Only (5 Gallon)	42
056046	Ren 1700-1 Hardener Only (Gallons – 2)	10.9
056043	RenLam 1700-1 Resin Only (55 Gallon)	480
056048	Ren 1700-1 Hardener Only (5 Gallon)	31.2
056192	Ren 956 Hardener Only (5 Gallon)	40

RenLam 1710

- ▶ 22 or 35 min. gel time
- ▶ 90 Shore D
- ▶ White

This laminating system features low odor, excellent wetting qualities, room-temperature cure, and works very well on vertical surfaces. Ren 956 Hardener can also be used for an extended working time.

SKU	Size	Net weight (lb.)
056050	RenLam 1710 Resin Only (5 Gallon)	38
056051	Ren 1710 Hardener Only (Gallon)	6.1
056334	RenLam 1710 Resin Only (55 Gallon)	500
056192	Ren 956 Hardener Only (5 Gallon)	40
056336	Ren 1710 Hardener Only (5 Gallon)	40

RenLam 1720

- ▶ 40 min. gel time
- ▶ 90 Shore D
- ▶ White

RenLam 1720 resin with Ren 956 hardener is a white, room-temperature curing laminating resin system. It is ideal for applications where a stable fiberglass laminate is required. This product features a 40 minute gel time for larger

tooling. It is approved for and commonly used in the automotive and aircraft industry for close tolerance tools.

SKU	Size	Net weight (lb.)
056052	RenLam 1720 Resin Only (5 Gallon)	45
056192	Ren 956 Hardener Only (5 Gallon)	40

RenLam 177-114

- ▶ 38 min. gel time
- ▶ 90 Shore D
- ▶ Amber

RenLam 177-114 is an unfilled, amber-colored laminating resin. Its very low viscosity and a 38 minute gel time makes this an excellent resin for constructing large fiberglass tools and parts.

SKU	Size	Net weight (lb.)
056212	RenLam 177-114 Resin Only (55 Gallon)	450
056202	Ren 956 Hardener Only (55 Gallon)	450

RenLam 8100

- ▶ 35 min. gel time
- ▶ 92 Shore D hardness
- ▶ Light Yellow

RenLam 8100 / Ren 8100 is an unfilled fast-cure general purpose laminating resin system offering good wet-out and excellent strength.

SKU	Size	Net weight (lb.)
056009	RenLam 8100 Resin Only (5 Gallon)	38
056010	Ren 8100 Hardener Only (2 Gallon)	9.5

HIGH-TEMPERATURE LAMINATING RESINS

Freeman 917

- ▶ 52 min. gel time
- ▶ 92 Shore D hardness
- ▶ Gray

Freeman 917 features low viscosity, adequate gel time, excellent wet out characteristics, low shrinkage, good durability, and heat resistance. It is ideal for vacuum-form molds, blow molds, holding, nesting, and bonding

fixtures that are typically subjected to high temperatures.

SKU	Size	Net weight (lb.)
055976	Freeman 917 Resin Only (5 Gallon)	45
055977	Freeman 917 Hardener Only (Gallon)	4.5



RenLam 4005 / Ren 1500

RenLam 4005 / Ren 1500

- ▶ 50 min. gel time
- ▶ 90 Shore D hardness
- ▶ Amber

This laminating system is an unfilled, heat-resistant epoxy suitable for continuous temperature of 300°F. This material is an excellent adhesive for bonding RenShape High-Temperature Tooling Boards (page 16).

SKU	Size	Net weight (lb.)
056132Q	RenLam 4005 Resin Only (Quart)	2
056133Q	Ren 1500 Hardener Only (Pint)	0.3
056132	RenLam 4005 Resin Only (Quarts – 6)	12
056133	Ren 1500 Hardener Only (Pints – 6)	1.8
056136	RenLam 4005 Resin Only (5 Gallon)	43
056039	Ren 1500 Hardener Only (Gallon)	6
056137	RenLam 4005 Resin Only (55 Gallon)	500
056038	Ren 1500 Hardener Only (5 Gallon)	40

RenLam 4014 / Ren 1500

- ▶ 55 min. gel time
- ▶ 90 Shore D hardness
- ▶ Gray

This laminating system is an aluminum-filled, general-purpose product used for tooling up to 300°F. It is ideal for vacuum-forming, foam molds, and RIM molds.

SKU	Size	Net weight (lb.)
056138	RenLam 4014 Resin Only (Quarts – 6)	14
056141	RenLam 4014 Resin Only (5 Gallon)	54.5
056039	Ren 1500 Hardener Only (Gallon)	6
056142	RenLam 4014 Resin Only (55 Gallon)	550
056038	Ren 1500 Hardener Only (5 Gallon)	40

RenLam 4017 / Ren 1510

- ▶ 90 min. gel time
- ▶ 93 Shore D hardness
- ▶ Black

This laminating system features an extended gel time and good cloth wet-out for construction of large, high temperature tools which may operate at temperatures up to 350°F. Allows enough time for vacuum

bagging when required and is ideal for bonding fixtures, prepreg lay-up molds, and vacuum-form molds. RenLam 4017 / Ren 1510 is also the recommended adhesive for bonding RenShape 5065 (page 16).

SKU	Size	Net weight (lb.)
056144	RenLam 4017 / Ren 1510 Gallon Kit	9.2
056146	RenLam 4017 Resin Only (5 Gallon)	45
056040	Ren 1510 Hardener Only (Gallon)	6.8

RenLam 5052

- ▶ 7 hour gel time
- ▶ Translucent

RenLam 5052 has a 7 hour gel time for large tool and part construction. Designed for wet layup, RTM, pressure molding, and filament winding, this system will cure at room

temperature and may also be postcured at elevated temperatures for higher mechanical properties.

SKU	Size	Net weight (lb.)
056283	RenLam 5052 Resin Only (5 Gallon)	37
056284	Ren 5052 Hardener Only (Gallons – 2)	14

DEGASSING, MIXING & DISPENSING EQUIPMENT

Gas Vac II Industrial Vacuum Degassing Unit

Designed for simplified and dependable operation, this vacuum efficiently deaerates urethane elastomers and silicone rubbers resulting in casts that are virtually void-free in quality. The clear acrylic lid permits viewing while maintaining complete seal and the heavy-gauge steel support stand mounted on swivel casters offers portability.



SKU	Description	Net weight (lb.)
054300	Degassing Unit	185
054303	Vacuum Seal	-

Vacuum Seal included with purchase, sold separately as well.

- ▶ Large chamber (14" dia. x 17" deep)
- ▶ 1/2 hp, two stage, direct drive pump displaces up to 6 CFM
- ▶ Thermal protected capacitor start & 20 micron factory rating
- ▶ 28"W x 25"D x 31"H, 115V, 60 hz motor

Red Devil Mixer

Make any project easier with the Red Devil Mixer's 3-way agitation action for smooth and quiet mixing. This heavy-duty, clamp-design, electric mixer is for effective mixing of Freeman's line of Repro Fast-Cast urethanes, paint, or any other low to medium viscosity liquid. Available with bench or pedestal mount.



- ▶ Heavy-duty twin arm design for mixing – 6 pints, 4 quarts, 2 gallons
- ▶ New safety covers for mixer arms
- ▶ 15-minute dial timer
- ▶ 110 volt, 1/3 HP, 60 Hz, heavy guard

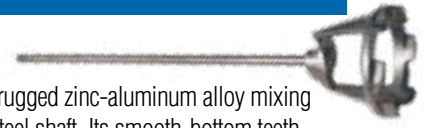
SKU	Description	Height	Width	Depth	Weight (lb.)
054311	1400-00 Red Devil Mixer	31½"	41⅝"	29⅞"	191
054313	No. 5153 Counter Base*	19"	33"	20¾"	20
054314	No. 5151 Pedestal Base*	46"	33"	18"	75

*Dimensions include mixer.

Plunge Industrial Mixers

This heavy-duty Plunge Mixer has a rugged zinc-aluminum alloy mixing head mounted with a set screw to a steel shaft. Its smooth-bottom teeth thoroughly mixes resins containing high-density fillers much faster and more effectively than standard drill-driven paint mixers. The mixing head's tumble finish allows for quick clean up of resins and paints.

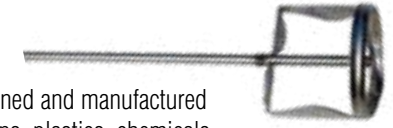
SKU	Size	Length	Shaft Dia.	Head Dia.	Model No.
054190	Quart	13¼"	⅝"	2¼"	002
054195	Gallon	17"	⅝"	3⅜"	003
054200	5 Gallon	23½"	½"	5⅞"	006A



Jiffy Mixer

This all-purpose mixer is designed and manufactured to thoroughly mix epoxies, resins, plastics, chemicals, paints and many other materials at 450 to 750 RPM without sucking air into material or splashing material outside container.

SKU	Shaft Length	Container Size	Top Dia.	Bottom Dia.	Depth of Head	Shaft Dia.	Model No.
054220	10¼"	Pint	1¼"	1¼"	1⅜"	¼"	LM
054215	10¼"	1-2 Gallon	2⅝"	2⅝"	2⅜"	¼"	HS-1
054210	20½"	5-10 Gallon	4⅝"	5½"	5"	½"	PS-1



Miapoxy 100 Hand Pumps

Miapoxy 100 Hand Pumps are specifically designed for fast and accurate dispensing of the Miapoxy 100 Resin and Hardener (page 51). Each pump is clearly marked with a different colored sticker for resin and hardener. Use one stroke of the hardener pump for every stroke of the resin pump to obtain the correct mix ratio. Kit size ½ includes one resin pump for quarts and gallons, one hardener pump for pints and one hardener pump for quarts and gallons. Kit size 3 includes one resin pump for 5-gallons and one hardener pump for quarts and gallons.



SKU	Size
406650	1/2
406655	3

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 mixing 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 mixing 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

GLOVES & PROTECTIVE WEAR



Vinyl Gloves

Vinyl gloves are an economical choice for activities that do not require the highest degree of tactile precision. Vinyl does not offer as much dexterity as nitrile or latex and tends to tear more easily, but offers the best value for low-risk applications. Our vinyl gloves feature rolled cuffs to provide greater tear resistance and easy gripping.

SKU	Description	Pairs/box
054060	5 mil (Large)	50
054061	5 mil (X-Large)	50

Latex Gloves

Latex gloves provide superior dexterity and barrier protection. However, because

latex is a natural substance, the protein in latex gloves can cause an allergic reaction and irritation in some people. Our latex gloves feature rolled cuffs to provide greater tear resistance and easy gripping.

SKU	Description	Pairs/box
054064	With Powder – 8 mil (Large)	100
054063	Latex Gloves – 8 mil (X-Large)	100
054066	Powder-Free – 7.5 mil (Large)	50
054068	Powder-Free – 7.5 mil (X-Large)	50

Nitrile Gloves

Nitrile gloves are made of synthetic latex. They contain no latex proteins and are three times more puncture resistant than latex rubber. More importantly, they offer superior resistance to many types of chemicals.

SKU	Description	Pairs/box
054070	7 mil (Large)	50
054069	7 mil (X-Large)	50

3M Particulate Respirators (Mask)

Because of their low-profile shape, eye glasses, goggles and face shields can be easily worn without interference. They are excellent to wear when operating sanders and other dust creating equipment. These masks do not protect the user from toxic dusts, spray paints, or organic vapor.

SKU	Mfg. #	Qty/box
054526	8210	20



Tyvek® Sleeves

These 18" long sleeves are designed to protect workers' arms from resin contact. Tyvek is a durable yet pliable fabric that resists tears, snags, and punctures, and its slick surface prevents particle entrapment. These sleeves are purchased in pairs. **(SKU #418002)**

Tyvek® Apron

These comfortable, reusable aprons form a virtually impermeable barrier against dirt, grease, grime, sprays, chemicals, and moisture. Like the Tyvek sleeves, these aprons are made of a durable yet pliable fabric that resists tears, snags, and punctures. Its slick surface prevents particle entrapment. Even though these aprons are disposable, they can often be used over and over (depending on work conditions). These 28" x 36" aprons feature serged seams and long ties for a comfortable fit. **(SKU #418001)**



Freeman Heavy-Duty Shop Apron

This very heavyweight cotton apron is tough enough for shop use. Features include two chest pockets, two hip pockets, metal ferrule tie holes and heavy-duty stitching. **(SKU #054065)**



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



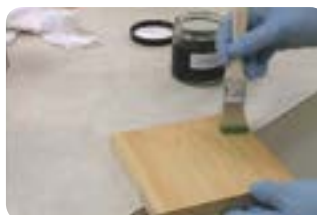
1. Cover the entire surface with Freeman Wax Release (a semi-paste, typically applied with a brush).

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.

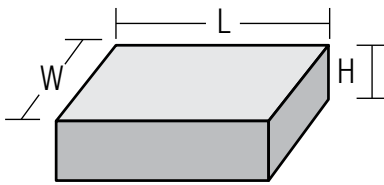
Additional Notes

- Epoxy, urethane, or metal patterns require only the use of wax release agents. Apply three coats and lightly buff after each.
- 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.
- Sheet Wax should be sealed with aerosol version.

CALCULATING MATERIAL REQUIREMENTS

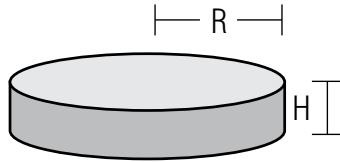
Step 1

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/cm³).
2. Divide 27.68 by the density (grams/cm³) to calculate the Volumetric Yield (in.³/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

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

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.

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)

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FAX 440-934-7200

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

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TEL 800-345-9259
FAX 586-774-1019

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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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