



# Adhesives & Repair Materials

## Freeman TUF Repair and Build-Up Materials

Formulated and manufactured by Freeman, our TUF products are a complete line of quality polyester repair & build-up materials that features:

- Low Shrinkage
- Fast setting, sandable in 15 minutes
- Good wear resistance
- Bonds to most any surface
- “No-sag” properties
- Good chemical resistance



### TUF Specifications

	Mix Ratio Resin to Hardener by wt.	Gel Time (minutes)	Hardness (Shore D @ 24 hrs)	Viscosity (cps@77°F)	Density (g/cc)	Available Colors
<b>TUF-Fil</b>	100:1.5	11	81	912,000	1.74	Mahogany, Pine, Gray
<b>TUF-Fil White</b>	100:1.5	9	95	400,000	2.50	White
<b>TUF-Carv</b>	100:1.5	10	71	581,000	1.14	Mahogany, Pine, White
<b>TUF-Fil Hi-Temp</b>	100:2.0	9	82	830,000	1.68	Dark Gray, Black
<b>TUF-Blend</b>	100:1.5	7	75	776,000	1.54	Mahogany, Pine
<b>Quik-Fil</b>	100:1.5	11	70	208,000	0.89	Brown
<b>Econo-Fil</b>	100:1.5	5	70	350,000	1.17	Tan

### TUF-Fil®

Freeman TUF-Fil closely matches mahogany and other hardwoods in hardness. It is suitable for high wear applications, and when fully cured, TUF-Fil may be scraped, filed, tapped and sanded. While it is still rubbery, it can be carved using woodworking tools.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053405	TUF-Fil Mahogany	Quart	2.8
053410	TUF-Fil Pine	Quart	2.8
053415	TUF-Fil Gray (Aluminum)	Quart	2.8
053425	TUF-Fil Mahogany	Gallon	11.5
053430	TUF-Fil Pine	Gallon	11.5
053435	TUF-Fil Gray (Aluminum)	Gallon	11.5
053428	TUF-Fil Mahogany	3 Gallon Cartridge	32.5
053433	TUF-Fil Pine	3 Gallon Cartridge	32.5
053437	TUF-Fil Gray (Aluminum)	3 Gallon Cartridge	32.5



### TUF-Fil® White

TUF-Fil White is the hardest and most dense of the TUF line, closely matching epoxy laminate tooling. It is an ideal repair material for laminate tooling.

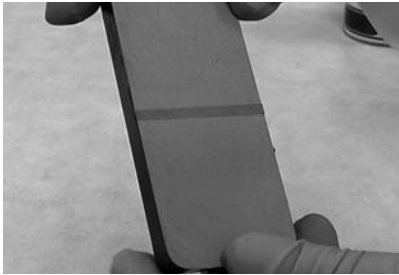
Catalog Number	Description	Availability	Net Wt. (Lb.)
053420	TUF-Fil White	Quart	3.8
053440	TUF-Fil White	Gallon	12.5
053438	TUF-Fil White	3 Gallon Cartridge	37.5

### TUF-Carv®

Freeman TUF-Carv Repair & Build-Up Material is a less dense material than TUF-Fil, closely matching the hardness of pine and jelutong. It is ideal for any job that requires a durable, yet carvable finish. TUF-Carv, when cured, can be carved, sawed, sanded, filed, tapped and machined easily with woodworking tools.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053205	TUF-Carv Mahogany	Quart	1.75
053210	TUF-Carv Pine	Quart	1.75
053213	TUF-Carv White	Quart	1.75
053215	TUF-Carv Mahogany	Gallon	7
053220	TUF-Carv Pine	Gallon	7
053223	TUF-Carv White	Gallon	7
053225	TUF-Carv Mahogany	3 Gallon Cartridge	21
053230	TUF-Carv Pine	3 Gallon Cartridge	21
053228	TUF-Carv White	3 Gallon Cartridge	21

## Freeman TUF Repair and Build-Up Materials [CONT'D.]



### Hi-Temp TUF-Fil®

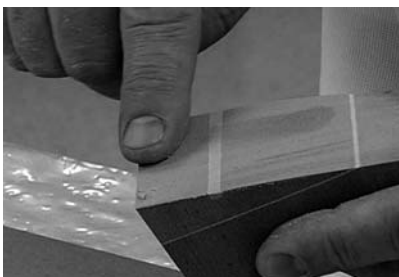
Hi-Temp TUF-fil is ideal for the repair, build-up or alteration of tooling that will be subjected to operating temperatures ranging from 150°F to 350°F. Hi-Temp TUF-fil features high viscosity, and very good adhesive properties when used on high temperature tooling.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053451	Hi-Temp TUF-Fil Dark Gray	Quart	2.5
053454	Hi-Temp TUF-Fil Black	Quart	2.5
053452	Hi-Temp TUF-Fil Dark Gray	Gallon	10
053456	Hi-Temp TUF-Fil Black	3 Gallon Cartridge	30

### TUF-Blend

Freeman TUF-Blend is a ready-made formulation that fills the hardness gap between TUF-Fil and TUF-Carv. TUF-Blend, when cured, can be carved, sawed, scraped, filed, drilled, tapped, machined and sanded using either wood or metalworking tools. While it is still rubbery, TUF-Blend can be carved or shaped.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053305	TUF-Blend Mahogany	Quart	2.8
053310	TUF-Blend Pine	Quart	2.8
053315	TUF-Blend Mahogany	Gallon	11.5
053320	TUF-Blend Pine	Gallon	11.5



### Quick-Fil

Quick-Fil is a modeling board repair paste designed specifically for the repair, build-up and forming of fillets on medium-density modeling boards. It is similar in hardness to most 30-40 lb density boards and colored brown to match the most popular class of modeling boards. Quick-Fil also features excellent bonding properties with very little sag.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053441	Quick-Fil Brown	Quart	1.1
053442	Quick-Fil Brown	Gallon	4.4

### Econo-Fil

A lower-cost repair material which will enable you to repair and fill voids in your patterns and tools more economically. Econo-Fil sets up fast and is easy to apply.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053500	Econo-Fil Tan	Gallon	7.5
053505	Econo-Fil Tan	3 Gallon Cartridge	21
053501	Cream Hardener – Red	2.7 oz. Tube	

### Cream Hardener

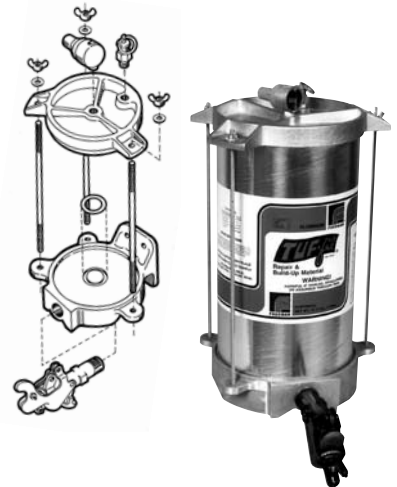
A premium quality white catalyst designed for use with all of the TUF Products. This product may also be used to catalyze other manufacturers' polyester filler products. The bright white color does not significantly change the color of the basic resin.

Catalog Number	Description	Availability
053445	Cream Hardener	1 oz. Tube
053450	Cream Hardener	4 oz. Tube

### TUF Pneumatic Dispenser

A heavy duty, cast aluminum dispenser designed specifically for use with 3-gallon cartridges of TUF-Fil, TUF-Carv, Econo-Fil, and Dynalite Products.

When these products are used in conjunction with the Pneumatic Dispenser shown at the right, you have the convenience and economical means of dispensing only the amount of product needed for any job with little to no waste or mess. Its design permits it to be mounted anywhere in your shop for easy accessibility.



Catalog Number	Description
053470	3 Gallon Dispenser For TUF Line
053471	Replacement Spout For TUF-Fil Dispenser
053462	Replacement Gasket For 3 Gallon Dispenser

#### SEE ALSO:

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## Ren® Repair & Build-Up Materials

### Ren-Patch® 5008

Designed as a companion product for RenShape 5008 Epoxy Board, this epoxy repair material is carefully matched to the properties of the board.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056107	Ren-Patch 5008	Quart	1.45

### Ren-Patch® 5169

A red polyurethane repair material that closely matches RenShape 5169 for color, hardness, machinability, and thermal stability. Repaired areas blend very well with the surrounding tool surface as this paste bonds securely to the board.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056622	Ren-Patch 5169	50 ml Cartridge	0.20

## Other Repair & Build-Up Materials

### Rapid-Patch Urethane Repair Material

Rapid Patch Urethane Repair Material offers a quick (15 minutes) and economical means of repairing urethane molds and pattern equipment. Rapid Patch is also a strong adhesive and provides for a secure bond on various plastics and tooling boards. This black material is easily mixed with a one to one mix ratio and is packaged with two 5 oz. tubes, mixing sticks and instructions.

Catalog Number	Description	Availability
054279	Rigid Rapid Patch	10 Oz. Kit

### Lab Metal & Lab Solvent

Lab-Metal is a durable and resilient air-hardening metal filler ideal for filling sand holes, smoothing rough spots on machine castings or sealing riveted seams. It can be applied directly from the can or thinned for brush or spray applications. Lab-Metal will bond to metal, wood, plastic, glass, or plaster without pre-heating or the use of special tools and may be milled, drilled, tapped, and sanded smooth.

The standard Lab-Metal formulation withstands temperatures up to 350°F. The High-Temp formulation which can withstand temperatures up to 1000°F.

Lab Solvent is a blend of solvents used to thin lab metal for spray or brush applications.

Catalog Number	Description	Availability	Net Wt. (Lb.)
027335	Lab-Metal	Quart	3
027337	Hi-Temp Lab-Metal	Pint	1.5
027330	Lab Solvent	Pint	1

## Ren and Other Repair & Build-Up Materials Specifications

	Mix Ratio Resin to Hardener by wt.	Gel Time (min)	Hardness (Shore D)	Mixed Viscosity Brookfield (cps.)	Density (g/cc)	Coefficient of Thermal Expansion (in./in./°F)	Color
Ren-Patch 5008	100:21	15	68	Paste	0.65	$1.8 \times 10^{-5}$	Light Blue
Ren-Patch 5169	100:86	45-75 sec	85	Paste	1.12	$4.26 \times 10^{-5}$	Red
Ren TDT 177-113	100:82	20	63	Paste	0.68	$3.46 \times 10^{-5}$	Brown
Ren TDT 177-119	100:12	35	85	Paste	0.94	$1.91 \times 10^{-5}$	Beige
Rapid Patch	1:1	5	80	Paste	1.10	–	Black
Lab Metal	–	–	81	Paste	1.95	$1.5 \times 10^{-5}$	Gray
Dynalite	100:1.5	6	69	360,000	1.21	–	Light Peach
Dyna-Plus	100:1.5	4	60	245,000	1.36	–	Gold
ASTM		D2471	D2240	D2393	D792	D3386	

### Ren TDT-177-113

A smooth epoxy-based paste used to repair RenShape 450.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056313RQ	TDT 177-113 Resin Only	Quart	1.32
056313HQ	TDT 177-113 Hardener Only	Quart	1.08
056313R	TDT 177-113 Resin Only	6 Quart	7.92
056313H	TDT 177-113 Hardener Only	6 Quart	6.48

### Ren TDT-177-119

A low-density heat resistant epoxy repair paste for use on RenShape 550.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056337RQ	TDT 177-119 Resin Only	Quart	1.71
056337HQ	TDT 177-119 Hardener Only	Pint	0.22
056337R	TDT 177-119 Resin Only	6 Quart	10.26
056337H	TDT 177-119 Hardener Only	6 Pint	1.32

### Dynalite Polyester Repair Material

Lightweight, carvable, sandable, and economically-priced, this polyester repair material is a useful material for a wide range of tooling alterations and repair.

The 3 gallon cartridge is packaged 2 cartridges per case and sold in full cases only. Gallon units are sold individually.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053502	Dynalite Lightweight Filler	Gallon	7.5
053503	Dynalite Lightweight Filler	3 Gallon Cartridge	26
053507	Dynalite Cream Hardener	4 oz. Tube	

### Dyna-Plus Polyester Repair Material

Dyna-Plus is a gold colored polyester filler ideal for repairing metal, plastic, and wood. This material is lightweight for easy application to vertical surfaces.

Catalog Number	Description	Availability	Net Wt. (Lb.)
053504	Dyna-Plus Filler	Gallon	10

### Superior Aluminum Solder

Superior Aluminum Solder is used when a softer solder with a lower melting point is preferred. Superior Solder is excellent for tinning. It can be used with a clean hot iron, no flux necessary. This is one of the easiest and quickest of all aluminum solders to use.

Catalog Number	Description	Diameter	Length	Net Wt. (Lb.)
027775	Superior Aluminum Solder	1/4"	12"	1

## Freeman F-Bond Adhesives

### Freeman F-Bond Instant CA Adhesives

A complete line of cyanoacrylate adhesives for various bonding applications. These fast setting materials are designed for metal, wood, plastic, and tooling board adhesive requirements.

**F-Bond Thin** – General purpose and extremely fast setting.

**F-Bond Medium** – Rapid setting medium viscosity adhesive with good flexibility.

**F-Bond Thick** – Rapid setting high viscosity, ideal for gap filling applications.

**F-Bond Gel** – Thixotropic formulation which allows for use on vertical applications.

**F-Bond Flex Black** – Formulated with a rubber filler which allows for high vibration and shock applications. Very high heat resistance and good machinability.



### F-Bond Specifications

	Viscosity	Set Time*			Gap Fill Max.	Tensile Shear PSI	Temperature Range
		M	R	P			
F-Bond Thin	3 cps	5	3	3	.002"	3200	-65 to 200 F
F-Bond Medium	250 cps	12	7	8	.006"	3200	-65 to 200 F
F-Bond Thick	1500 cps	20	10	15	.008"	3400	-65 to 200 F
F-Bond Gel	Thixotropic	60	15	25	.010"	3500	-65 to 200 F
F-Bond Flex Black Thick	1500 cps	70	45	40	.008"	3700	-65 to 280 F

\* = Set Times in Seconds, M = Metal, R = Rubber, P = Plastic

### General Usage Tips:

- Clean all surfaces to be bonded.
- Cut top of nozzle with scissors or knife. Be sure to keep nozzles away from eyes and face when opening.
- Apply a thin layer of adhesive to one surface. Avoid applying excessive amounts as this will increase the set time and weaken the bond strength.
- Place parts together and apply pressure for a few seconds. Handling strength is achieved in minutes. Full cure is reached in 24 hours.

Please read all product labels and Material Safety Data Sheet before using these products.

Catalog Number	Description	Availability	Net Wt. (Lb.)
055300	F-Bond Thin (3 CPS)	2 oz.	0.16
055307	F-Bond Thin (3 CPS)	8 oz.	0.64
055301	F-Bond Medium (250 CPS)	2 oz.	0.16
055308	F-Bond Medium (250 CPS)	8 oz.	0.63
055302	F-Bond Thick (1500 CPS)	2 oz.	0.16
055309	F-Bond Thick (1500 CPS)	8 oz.	0.64
055303	F-Bond Gel (Thixotropic)	20 gm	0.06
055311	F-Bond Flex Black Thick (1500 cps)	2 oz.	0.14

### Freeman F-Bond Instant CA Accessories

A complete line of accessories for our F-Bond Instant CA Adhesives:

**F-Bond Primer** – Pre-apply primer to surfaces to be bonded to increase bond strength.

**F-Bond Accelerator** – Used to accelerate cure time and increase gap-filling capabilities.

**F-Bond Remover** – Use to easily remove F-Bond from unwanted areas.

**F-Bond Dosing Tips** – High-quality precision application replacement tips for our 2 oz. bottles.

**F-Bond Piercing Cap** – A needle point cap to prevent dispenser clogging.

Catalog Number	Description	Availability
055310	F-Bond Primer w/Pump	2 oz.
055304	F-Bond Accelerator w/Pump	2 oz.
055305	F-Bond Accelerator	8 oz.
055306	F-Bond Remover	2 oz.
055315	F-Bond 8 oz. Cap	
055314	F-Bond Dosing Tips for 2 oz. Bottles	
055316	F-Bond Piercing Cap	

### Freeman F-Bond Infiltrants

F-Bond Infiltrants are single component, ethoxyethyl-based cyanoacrylate adhesives that are ideally suited for providing strength, durability, and enhanced surface quality to models from 3-D printers.

Some 3-D printers generate models from starch based or plaster-based materials that are solidified with a binder. These porous and somewhat fragile parts can be strengthened and the surface can be made harder by flowing F-Bond Infiltrants over the model surface and allowing it to cure.

**F-Bond 5005** is specifically designed for use with starch based parts and offers a low viscosity of 5 cps and a set time of 5 to 20 seconds.

**F-Bond 5008** is designed for use with the plaster based material and offers an 80 cps viscosity and has a set time of 15 to 40 seconds. The improved part may then be sanded and painted for use as an engineering model or as a master model for the creation of durable urethane reproductions.

Both materials are low in odor (when compared to generic cyanoacrylates) and offer low exotherm to minimize risk of part deformation due to heat.

Catalog Number	Description	Availability
055319	F-Bond Infiltrant 5005	100 grams
055320	F-Bond Infiltrant 5005	1 Lb.
055321	F-Bond Infiltrant 5008	100 grams
055322	F-Bond Infiltrant 5008	1 Lb.





## Devcon® Repair Materials

Devcon's repair materials are widely used throughout the industry because they are custom tailored for specific types of metal repair applications. These high-performance, metal-filled epoxies quickly and

permanently repair or rebuild critical equipment and offer excellent resistance to a broad range of chemicals, high temperature resistances, and a room temperature cure.

### Devcon Repair Materials Specifications

	Mix Ratio (by wt.) Resin:Hardener	Mix Ratio (by vol.) Resin:Hardener	Gel Time (min.)	Cure Time (Hrs.)	Volumetric Yield (in. <sup>3</sup> /lb.)	Hardness (Shore D)	Compressive Strength (psi)	Flexural Strength (psi)	Tensile Strength (psi)	Coefficient of Thermal Expansion (in/in/°F)	Max. Service Temp. (°F)
DE087 Putty	9:1	4:1	50	16	15.4	88	9,840	7,260	2,580	-	250
WR-2 Putty	9:1	4:1	60	16	13.9	85	9,800	6,500	2,200	32 x 10 <sup>-6</sup>	250
Fasmetal Putty	1.07:1	1:1	4	1	17.2	90	12,700	7,700	2,000	32 X10 <sup>-6</sup>	250
Aluminum Putty	9:1	4:1	60	16	17.5	85	8,420	6,760	2,600	29 x 10 <sup>-6</sup>	250
Plastic Steel 5-Min Putty	1.7:1	1:1	5	1	12.2	85	10,400	7,680	3,100	34 x 10 <sup>-6</sup>	200
Plastic Steel Putty	9:1	2.5:1	45	16	11.9	85	8,260	5,600	2,800	48 x 10 <sup>-6</sup>	250
Titanium Putty	4.3:1	3.1:1	21	16	11.7	87	18,800	7,700	2,000	22 x 10 <sup>-6</sup>	350
Bronze Putty	9:1	3:1	35	16	12.4	85	8,540	6,180	2,640	33 x 10 <sup>-6</sup>	250
ASTM						D2240	D695	D790	D1002	D696	

### DE087 Wear Resistant Putty

This blended aluminum-filled epoxy putty is used to repair fatigued metal surfaces where exceptional durability and ruggedness is required. Repairs molds at the parting line where metal has been lost or worn. Commonly used to fill voids in castings. It protects metal from bi-metallic corrosion and doesn't shrink cure.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054638	Aluminum Wear-Resistant Putty	20	DE087

### WR-2 Wear Resistant Putty

This smooth, non-rusting, all-purpose epoxy putty is used for repairs requiring low-friction finishes, such as machine lathe beds. It bonds to steel, iron, aluminum, ceramic, concrete, brass, and some plastics and contains wear-resistant fillers for low friction applications.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054637	Wear-Resistant Putty	1	11410

### Fasmetal™ Putty

This high-performance, alumina-filled epoxy is used for making fast, dependable emergency repairs to leaks in pipes carrying ores, coal, cement, sand, and gravel. It hardens in 5 minutes and is economical and convenient. It can be applied in temperatures as low as 40°F

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054643	Fasmetal Putty	0.75	107080

### Aluminum Putty

This aluminum-filled epoxy putty bonds to aluminum and many other metals for dependable non-rusting repairs to aluminum castings, machinery and equipment. Commonly used to fill porosity in aluminum castings. Can be machined drilled or tapped using conventional metal-working tools.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054585	Aluminum Putty	1	106010
054590	Aluminum Putty	3	106020

### Plastic Steel® 5-Minute Putty

This is a fast-curing, steel-filled epoxy for dependable emergency repairs in less than one hour. Mixes, applies, and cures at temperatures as low as 40°F. Can be machined, drilled, tapped, or sanded.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054582	5-Minute Putty	1	10240

### Plastic Steel® Putty

The original metal-filled epoxy putty used for hundreds of routine maintenance, production, and tooling applications, especially in areas where welding or brazing would be undesirable or impossible. Bonds to most metals, concrete, and some plastics. It cures at room temperature and forms a tough, durable, metallic mass that can be drilled, tapped, machined, or painted.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054555	Plastic Steel Putty	1	10110
054560	Plastic Steel Putty	4	10120
054565	Plastic Steel Putty	25	10130

### Titanium Putty

This high-technology, titanium-reinforced epoxy, is used for making repairs to machinery and equipment that can be precision machined. It features excellent temperature resistance (350°F), high compressive strength, and resistance to many chemicals and most acids, bases, solvents, and alkalis.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054631	Titanium Putty	1	10760

### Bronze Putty

Bronze-filled epoxy putty for repairing bronze and brass bushings, shafts, castings and equipment parts. It repairs and rebuilds areas where brazing would be undesirable or impossible and bonds securely to bronze alloys, brass, copper, and ferrous metals. Can be machined, drilled, tapped, or grinded using conventional metalworking tools.

Catalog Number	Description	Net Wt. (Lb.)	Mfg No
054632	Plastic Bronze Putty	1	10260

## Devcon® Adhesives

These high strength adhesives are toughened, fast-curing polymers with excellent environmental and chemical resistance. They are designed for a wide range of rigid plastic and metal substrates.

### Devcon Adhesives

Adhesive	Color	Viscosity (cps)	Working Time	Functional Cure (min.)	Full Cure (hours)	Adhesives Tensile Shear (psi)	Service Temperature (F)
5-Minute Epoxy	Light Amber	10,000	3-6 min.	45-60	12	1,900	-40 ~ 200
Zip Grip 4404	Clear	3	2-10 sec.	60	24	3,200	-65 ~ 200
Zip Grip HV2200	Clear	2,400	25-70 sec.	8-10	24	3,700	-65 ~ 250
Plastic Welder	Pale Yellow	50,000	4-6 min.	45-60	24	3,500	-67 ~ 250

### 5-Minute® Epoxy

A widely popular, rapid-curing, low viscosity, general-purpose adhesive/encapsulant which easily dispenses, mixes in seconds, and dries in 15 minutes with full strength in 1 hour. It bonds rigid durable substrates such as metals, glass, ceramics, concrete, and wood in all combinations, forming a clear hard rigid bond that self-levels in minutes.



Catalog Number	Description	Size	Mfg No
054618	5-Minute Epoxy	2.5 oz. Tube	14210
054620	5-Minute Epoxy	15 oz. Unit	14200
054634	5-Minute Epoxy	9 Lb	14630
054647	5-Minute Epoxy	50 ml	14270

### Zip Grip® 4404

A low viscosity (20cps), single-component cyanoacrylate adhesive for close-fitting parts. Zip Grip 4404 bonds in seconds to rubber, fixturing rubber gaskets, splicing o-rings, repairing plastics and metals. It is also highly resistant to aging and weathering. However, it is not recommended for use on glass due to substrate weakness.



Catalog Number	Description	Size	Mfg No
054629	Zip Grip Super Glue 4404	14 Gm	44044
054633	Zip Grip Super Glue 4404	1 lb	44046

### Zip Grip® HV2200

A high viscosity, rubber-toughened instant adhesive with exceptional flexibility and extended temperature resistance. Zip Grip HV2200 bonds dissimilar substrates, features exceptional thermal shock performance and enhanced toughness to peel and shock loads. It is temperature-resistant to 280°F and is humidity and water-resistant.

Catalog Number	Description	Size	Mfg No
054591	Zip Grip HV2200	1 lb.	44220

### Plastic Welder™ Methacrylate Adhesive

Toughened structural adhesive formulated for bonding difficult-to-bond substrates such as nylon containing alloys, modified polyesters, epoxy composites and standard plastics. This one to one mix ratio methacrylate features superior bond strength, durability, and impact resistance. Plastic Welder has a creamy consistency with excellent gap filling capabilities and good peel strength in all environments.

Catalog Number	Description	Size	Mfg No
054646	Plastic Welder	47 ml	14320

### Devcon Dispenser Gun

Dispensing gun designed to be used with the Devcon 47 ml and 50 ml adhesive cartridges. The mixing nozzles are for general use with the Devcon 50 ml adhesive cartridges. They are conveniently packaged 12 per bag.



Catalog Number	Description	Mfg No
054648	50 ml Dispenser Gun	14280
054649	50 ml Mixing Nozzles	14285



## Araldite® Adhesives

The Araldite line of urethane, epoxy, and methacrylate adhesives is a diverse selection engineered to bond a wide variety of materials, including the most challenging metals, composites, and thermoplastics. With formulations designed to bond dozens of materials and gel times ranging from 90 seconds to two hours, Araldite is the most versatile line of adhesives for the modern toolmaker.



### Araldite Applications & Resistance Properties

Product	Ferrous Metals and Aluminum	Copper	Zinc and Galvanized Metal	GRP/SMC/GRE/Thermoset Composites	ABS/PVC	Acrylics/Polycarbonate	Polyamides/Polystyrene Foams/Polyurethane Foams	Rubbers	Glass/Quartz/Precious Stones	Ceramics	Wood	Chemical Resistance	Heat Resistance	Water Resistance	Impact Resistance
2010-1	●	●	●	●			●	●	●	●	●	●	●	●	●
2011	●	●	●	●	●		●	●	●	●	●	○	○	○	●
2012	●	●	●					●	●	●	●	●	●	○	○
2013	●	●	●	●			●	●			●	●	●	○	○
2014	●	●	●	●					●	●	●	●	●	○	○
2015	●	●	●	●				●		●	●	●	●	○	○
2043	●	●	●	●	●			●	●	●	●	●	○	○	●
2026	●	●	●	●	●	●	●	●	●		●	○	○	○	●
2027	●			●	●	●	●	●			○	○	○	○	●
2040	●			●	●	●	●	●			○	○	○	○	●
2041	●			●	●	●	●	●			○	○	○	○	●
2042	●			●	●	●	●	●			○	○	○	○	●
2021	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2022	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2024	●	●	●	●	●	●	●	●			●	●	●	●	●

● = Excellent   ● = Good   ○ = Moderate

### Araldite Adhesives Specifications

Product	Mix Ratio Resin to Hardener (by wt.)	Mix Ratio Resin to Hardener (by vol.)	Gel Time (minutes)	Cure Time (hrs.)	Mixed Viscosity (cps.)	Lap Shear Strength (psi)	Handling Strength*	Tensile Strength (psi)	Hardness (Shore)	Maximum** Service Temp. (°F)
2010-1	100:100	100:100	10	3	80,000	3,325	30 min	-	-	140
2011	100:80	100:100	120	7	45,000	2,560	7 hours	4,800	80D	140
2012	100:100	100:100	4	1	30,000	2,400	20 min	-	82D	120
2013	100:60	100:100	65	10	Paste	3,000	4 hours	5,000	80D	149
2014	100:50	100:50	40	6	90,000	2,600	4 hours	5,500	84D	284
2015	100:100	100:100	35	10	Paste	3,200	4 hours	3,400	75D	176
2043	100:100	100:100	90 sec	1	20,000	1,800	5 min	-	83D	120
Fastweld 10	100:100	100:100	4	4	250,000	2,840	10 min	3,850	85D	140
AY557/HY557	100:100	100:100	4	4	14,000	2,560	10 min	4,630	83D	120
AW1253/HV1253	100:82	100:100	20	6	Paste	1,990	4 hours	2,130	73D	120
AW1258/HV1258	100:100	100:100	23	6	Paste	2,840	4 hours	5,600	89D	140
2026	100:100	100:100	3-4	8	10,000	3,050	1 hour	2,600	-	120
2027	100:97	100:100	8-10	8.5	Paste	1,950	1.5 hours	2,050	-	120
2040	93:100	100:100	15	48	50,000	300	10 hours	1,100	30D	120
2041	80:100	100:100	15	16	50,000	1,450	4 hours	2,100	85A	140
2042	80:100	100:100	3	6	50,000	1,450	1 hours	2,100	85A	140
AW8680/HV8685	80:100	100:100	8-10	12	34,000	2,900	2 hours	2,100	40D	140
2021	100:90	100:100	3	18 min	45,000	3,190	8 min	-	78D	212
2022	100:94	100:100	10	30 min	60,000	3,625	18 min	-	75D	190
2024	100:11	100:10	4-5	15 min	180,000	2,350	10 min	2,900	-	212
ASTM			D-2471		D-2393	D-1002				

\*Handling Strength=Time required for bond to reach lap shear strength of 150 psi or greater.

\*\*Temperature at which bond maintains 1,000 psi lap shear strength.

## Araldite® Adhesives [CONT'D.]

### Araldite Epoxy Adhesives

Araldite Epoxy Adhesives are formulated for easy handling and are generally excellent for bonding metals and are good for some plastic applications.

#### Araldite 2010-1 Epoxy Adhesive – Pale Yellow

This fast setting epoxy adhesive is ideal for bonding metal, ceramics, rubber, plastics, and glass. Araldite 2010 features a 10 minute gel time, a handling strength of 30 minutes, and a thick viscosity for vertical applications.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056400	Araldite 2010-1 Cartridge	50 ml	0.13

#### Araldite 2011 Epoxy Adhesive – Pale Yellow

This epoxy adhesive features high shear strength and good resistance to dynamic loading. Room temperature cure and long 120 minute work life. Strong bonding to metals, ceramics, rubbers and rigid plastics.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056451	Araldite 2011 Cartridge	50 ml	0.12

#### Araldite 2012 Epoxy Adhesive – Pale Yellow

Tough epoxy adhesive features high shear strength and four minute work life. Room temperature cure. Strong bonding to metals, ceramics and rubbers.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056452	Araldite 2012 Cartridge	50 ml	0.13
056469	Araldite 2104 (2012) Resin Only	5 Gallon	40
056470	Araldite 2934 (2012 ) Hardener Only	5 Gallon	40

#### Araldite 2013 Epoxy Adhesive – Gray

Gap-filling epoxy adhesive features good environmental stability and chemical resistance. For use on metals, ceramics and rubbers.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056453	Araldite 2013 Cartridge	50 ml	0.13
056467	Araldite AV 144-2 (2013) Resin Only	5 Gallon	50
056468	Araldite HV 997 (2013) Hardener Only	5 Gallon	30

#### Araldite 2014 Epoxy Adhesive – Gray

Gap-filling, no-sag epoxy adhesive features excellent resistance to water and chemicals. Offers a heat resistance up to 250°F. Room temperature cure. For use on metals and electronic components.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056454	Araldite 2014 Cartridge	50 ml	0.18

#### Araldite 2015 Epoxy Adhesive – Beige

Sag-resistant, tough epoxy adhesive with good shear strength. Room temperature cure. Ideal for metals, sheet molding compounds and fiberglass reinforced parts.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056455	Araldite 2015 Cartridge	50 ml	0.16

#### Araldite 2043 Epoxy Adhesive – Transparent

This adhesive features a 90 second gel time and can be handled after five minutes at room temperature. Strong bonding to metals, ceramics, rubbers and rigid plastics. This material requires the Mini Static Mixing Nozzles for dispensing with the DS-50 Dispensing Gun.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056459	Araldite 2043 Cartridge	50 ml	0.13

#### Fastweld 10 Epoxy Adhesive – Gray

This fast-setting epoxy adhesive is ideal for the bonding of small parts for repair work. Fastweld 10 will cure at temperatures as low as 41°F.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056505	Fastweld 10 Cartridge	50 ml	0.12
056512	Fastweld 10 Tube	9 oz.	0.56
056511	Fastweld 10 Tubes	24 Tube Pack	13.50
056508	Fastweld 10 Resin Only	6 Quarts	16.49
056509	Fastweld 10 Hardener Only	6 Quarts	16.49

#### Araldite AY 557/HY 557 Epoxy Adhesive – Clear

This epoxy adhesive is fast setting for quick repairs to small parts. Suggested for metal bonding, this material is also great for gluing most tooling boards and some plastics. One to one mix ratio and ten minute handling strength makes this adhesive easy to use for fast gluing.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056483	Araldite AY 557 Resin Only	5 Gallon	45
056484	Araldite HY 557 Hardener Only	5 Gallon	45

#### Araldite AW 1253/HV 1253 Epoxy Adhesive – Brown

A mahogany-colored, carvable paste. You can easily sand and carve it using typical woodworking tools. It is recommended for the repair and bonding of wood products.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056515R	Araldite AV 1253 Resin Only	6 Quart	8.99
056515H	Araldite HV 1253 Hardener Only	6 Quart	7.38

#### Araldite AW 1258/HV 1258 Epoxy Adhesive – Gray

An aluminum-filled, general-purpose paste that is recommended for general bonding repair and gap filling. It machines easily.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056641	Araldite AV 1258/HV 1258	Tube Kit	0.69
056507	Araldite AV 1258/HV 1258	24 Tube Kits	16.5
056501R	Araldite AV 1258 Resin Only	6 Quart	18.02
056501H	Araldite HV 1258 Hardener Only	6 Quart	18.02



## Araldite® Adhesives [CONTD.]

### Araldite Urethane Adhesives

Araldite Polyurethane Adhesives are formulated for easy handling and are generally excellent for bonding a wide variety of plastic materials and are good for some metal applications.

#### Araldite 2026 Polyurethane Adhesive – Clear

This transparent, flexible polyurethane adhesive features a three to four minute gel time and a one hour handling strength for fast bonding of ABS, PVC, acrylics, thermoset composites and plastics to metal or glass.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056404	Araldite 2026 Cartridge	50 ml	0.12

#### Araldite 2027 Polyurethane Adhesive – Beige

This thixotropic polyurethane adhesive features an eight minute gel time and a 90 minute handling strength for superior bonding of sheet molding compounds (SMC) and some metals.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056405	Araldite 2027 Cartridge	50 ml	0.16

#### Araldite 2040 Flexible Polyurethane Adhesive – Gray

General-purpose gray adhesive with a 15 minute work life. For bonding plastic, polycarbonate and nylon.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056456	Araldite 2040 Cartridge	50 ml	0.13

#### Araldite 2041 Polyurethane Adhesive – Pink

Excellent environmental stability and impact resistance. 15 minute work life. Bonds polycarbonate, ABS, FRP, SMC, nylon and can be used on primed metals.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056457	Araldite 2041 Cartridge	50 ml	0.13
056485	Araldite 2041 Cartridge	200 ml	0.53

#### Araldite 2042 Polyurethane Adhesive – Pink

Environmentally stable and impact-resistant. It offers a three minute work life and is suitable for bonding polycarbonate, ABS, FRP, SMC, nylon, and other materials with different coefficients of thermal expansion.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056458	Araldite 2042 Cartridge	50 ml	0.13

#### Araldite AW 8680/HW 8685 High Strength Polyurethane Adhesive – Black

This is a two-part, black polyurethane adhesive specifically formulated for bonding plastics. It bonds well to polycarbonate, ABS, nylon and other plastics.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056514	Araldite AW 8680 / HW 8685 Cartridge	200 ml	0.53

### Araldite Methacrylate Adhesives

Araldite Methacrylate Adhesives are formulated for easy handling and are generally excellent for bonding thermoplastics, composites, and some metals.

#### Araldite 2021 Methacrylate Adhesive – Beige

Multi-purpose methacrylate adhesive that features a three minute gel time and an eight minute handling strength for fast, effective bonding of ABS, PVC, acrylic, polycarbonate, as well as most metals.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056401	Araldite 2021 Cartridge	50 ml	0.11

#### Araldite 2022 Methacrylate Adhesive – Pale Yellow

This is a toughened methacrylate adhesive that features a ten minute gel time and an 18 minute handling strength for fast bonding of thermoset composites, ABS, PVC, acrylic, polycarbonate, and metal. This material also offers excellent resistance to gasoline and oils.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056402	Araldite 2022 Cartridge	50 ml	0.11

#### Araldite 2024 Methacrylate Adhesive – Blue

This toughened methacrylate adhesive features a five minute gel time and a ten minute handling strength for very fast bonding of thermoset composites, ABS, PVC, and metal.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056403	Araldite 2024 Cartridge	37.5 ml	0.08

### Araldite Gun & Nozzles

#### Araldite DS 200 Dispensing Guns

A premium piece of equipment for dispensing the Araldite Adhesives and RenPIM® 6456 urethanes that are packaged in 200 ml cartridges.



Catalog Number	Description
056462	DS 200 Dispensing Gun (Pneumatic)
056598	DS 200 Dispensing Gun (Manual)
056599	Mixer for DS200 Gun MC 10-32, 32 Elements
056600	Nut, Retainer DS 200

#### Araldite DS 50 Dispensing Gun & Nozzles

This dispensing gun is designed to be used with the Araldite 50 ml adhesive cartridges. The mini mixing nozzles are designed to be used only with the Araldite 2043 cartridge and are conveniently packaged 12 per bag. The other mixing nozzles are for general use with the Araldite 50 ml adhesive cartridges.

Catalog Number	Description
056460	Araldite DS 50 Dispensing Gun (Manual 1:1 & 2:1)
056488	Araldite DS 50 Nozzles – Individual nozzles
056500	Araldite DS 50 Mini Nozzles (2043 only) – Bag of 12
056502	Araldite DS 50 Nozzles – Bag of 12

## Ren® Tooling Board Adhesives

Specialized adhesives specifically designed for bonding certain RenShape Modeling & Tooling Boards.

### RenShape® Modeling & Tooling Board Adhesive Reference Chart

Adhesive	Matched Board(s)
Ren CG 1305	RS 5003, RS 550
Ren-Weld 100	RS 470, RS 5166
Ren-Weld 103	RS 440, RS 460, RS 472, RS 5003, RS 5025, RS 5030
Ren-Weld 5008	RS 5008
Ren-Weld 5169	RS 5169

### Ren CG 1305 Syntactic Adhesive

This material is a self-extinguishing syntactic adhesive with high strength and low weight characteristics for bonding RenShape 5003 and RenShape 550. It is ideal for potting applications and reinforcing honeycomb structures. CG 1305 is qualified to BMS-5-28, type 7, class 1.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056003	Ren CG 1305	Gallon Unit	7.18
056179	Ren CG 1305 Resin Only	5 Gallon	30
056180	Ren CG 1305 Hardener Only	Gallon	6

### Ren-Weld® 100

Ren-Weld 100 is a general purpose adhesive designed for laminating many of the higher density Ren Shape Modeling and Tooling Boards.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056516Q	Ren-Weld 100	Quart Unit	3
056516	Ren-Weld 100	Gallon Unit	13



### Ren-Weld® 103

A faster setting general purpose adhesive, Ren-Weld 103 is designed for laminating many of the lower density Ren Shape Modeling and Tooling Boards.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056492	Ren-Weld 103	Quart Unit	2.1
056506	Ren-Weld 103	Gallon Unit	10

### Ren-Weld® 5008

A medium-speed adhesive which is hardness and color matched for use with RenShape 5008. Ren-Weld 5008 has a 75 minute gel time and reaches full strength after 24 hours. The cure may be accelerated by heating the material to 200°F for four hours.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056106	Ren-Weld 5008	Quart Unit	1.44
056108	Ren-Weld 5008	Gallon Unit	6

### Ren-Weld® 5169

This red polyurethane adhesive, designed specifically for laminating RenShape 5169 foundry tooling boards, has a gel time of 13 minutes and may be machined in 12 hours.

Catalog Number	Description	Availability	Net Wt. (Lb.)
056620	Ren-Weld 5169	Quart Unit	4

## 3M™ Spray Adhesives

**Super 77 Spray Adhesive** is a fast drying general purpose adhesive designed for permanently attaching fabric, paper, plastics, and light-weight foams to rigid base materials.

**#78 Insulation Spray Adhesive** may be used for quickly bonding foam boards.

**High Strength 90 Adhesive** produces a secure bond for heavier items such as laminates, particle board, wood, metal, and many plastics. This product is the recommended adhesive for **Freeman Machinable Wax**.

Catalog Number	Description	Availability	Mfg. Number
054516	3M #77 Super Adhesive Spray	24 fl. oz.	21210-9
054514	3M #78 Adhesive Spray	16 fl. oz.	41593-7
054515	3M #90 High Strength Adhesive Spray	24 fl. oz.	30023-3





## Hot Melt Foundry Adhesives

Manufactured by Power Adhesives Ltd. and specifically formulated for instant bonding of foundry cores, these hot melt adhesives are comprised of 100% solids, containing no solvents or water.



### Tecbond 501

Specifically formulated for instant bonding of foundry cores, Tecbond 501 has a low viscosity for easy flow and can tolerate temperatures to 145-150° F. Each rigid stick is 1¾" in diameter and 1½" long for maximum glue flow. Each stick has the product number and batch number clearly printed for quality control purposes. The Tec 3200 Industrial Duty Dispensing Gun must be used to dispense this glue. Sold in 22 pound boxes.

### Tecbond 601

Specifically formulated for instant bonding of foundry cores, Tecbond 601 is higher in viscosity & faster setting than Tecbond 501 and can tolerate temperatures to 185° F. Each rigid stick is 1¾" in diameter and 1½" long for maximum glue flow. Each stick has the product number and batch number clearly printed for quality control purposes. The Tec 3200 Industrial Duty Dispensing Gun must be used to dispense this glue. Sold in 22 pound boxes.

Catalog Number	Description	Net Wt. (Lbs.)
176071	Hot Melt Adhesive Tecbond 501	22
176072	Hot Melt Adhesive Tecbond 601	22

### Tec 3200 Hot Melt Glue Applicator

The Tec 3200 High Output Applicator is designed for continuous industrial hot melt glue applications. Loaded with two 1¾" diameter Tecbond glue sticks, this gun can dispense up to eight pounds of glue per hour.

Features Include:

- 400 watt stainless steel heater cartridge
- 4 minute warm up
- Solid state temperature control
- Automatic "stand-by" mode to prevent overheating of glue
- Operates on standard 110 voltage
- One year warranty

Catalog Number	Description
176070	Tec 3200 Hot Melt Glue Applicator

## Blehm Adhesives

Blehm BP 9024 Fast Set Adhesive is a one to one, quick curing epoxy suitable for many bonding applications. This material offers a five minute gel time and will achieve handling strength after 15 minutes. BP 9024 will be at full structural strength with an eight hour cure.

Blehm BP 8002 (Green) and BP 8003 (Cream) foamed styrene adhesive is a water based rubber bonding agent for laminating styrene foam. This adhesive will not attack or dissolve the surface of foamed styrene while creating a strong bond suitable for foundry applications. This material provides a quick set bond which may be handled within a few hours while achieving full strength with an overnight cure.

Catalog Number	Description	Availability	Net Wt. (Lb.)
054006	Blehm BP9024 – 5-Min. Epoxy	Pint	2.2
054008	Blehm BP9024 – 5-Min. Epoxy	5 Gallon	80.0
054544	Blehm BP8002 – Styrene Adhesive	5 Gallon	38.0
054548	Blehm BP8003 – Styrene Adhesive	Gallon	8.0
054547	Blehm BP8003 – Styrene Adhesive	5 Gallon	41.4

## Styro Glue

This brush-on adhesive product is specifically designed for the gluing of polystyrene patterns. Styro Glue will not attack polystyrene and it will burn off without ash residue.

Catalog Number	Description	Availability	Net Wt. (Lb.)
022030	Styro Glue – Green	Gallon	7.8

## Sheet Wax Spray Adhesive

The easiest way to coat Plain Sheet Wax for fabrication. It can also be used on paper, plastics, leather, metal or glass.

Catalog Number	Description	Availability
054510	Sheet Wax Spray Adhesive	15.6 fl. oz.



## Cold Glue & Dispensers

Freeman White Cold Glue has proven itself suitable for all types of pattern shop applications. This glue is fast drying and transparent when it sets. It will bond wood, paper, leather, cloth, or any porous material. This glue will not dull woodworking tools. For those jobs where an extra tacky and more tenacious bond is required, we offer Gold Cold glue. All Cold Glues are freeze/thaw stable and have a six month shelf life.

### White Cold Glue

#### Medium Viscosity Cold Glue

Medium Viscosity White Cold Glue is widely used by the trade for all classes of work. The relatively fast setting time, high strength, and thin glue line makes this an excellent wood glue.

#### High Viscosity Cold Glue

A heavier viscosity glue preferred by many users for general work, gluing-in leather fillets, easier application to vertical walls and similar other uses.

#### Fast Set Cold Glue

Fast Set Cold Glue is ideal for those jobs that require very fast setup along with strong bonding qualities. 50% quicker setting. Minimum clamping time one hour.

**NOTE:** Although Fast Set Cold Glue obtains a higher strength in a shorter time, it reaches maximum strength overnight.

Catalog Number	Description	Availability	Net Wt. (Lb.)
022128	Medium Viscosity White Cold Glue	Gallon	9
022640	Medium Viscosity White Cold Glue	5 Gallon	45
022663	High Viscosity White Cold Glue	Gallon	9
022664	High Viscosity White Cold Glue	5 Gallon	45
023639	Fast Set White Cold Glue	Gallon	9
023640	Fast Set White Cold Glue	5 Gallon	45



### Gold Cold Glue

Freeman Gold Cold Glue is light yellow in color and features a high viscosity and fast set time making it ideal for assembly and fillet work.

Catalog Number	Description	Availability	Net Wt. (Lb.)
023635	High Viscosity Gold Cold Glue	Gallon	9
023636	High Viscosity Gold Cold Glue	5 Gallon	45

### Cold Glue Dispensers

Non-stick, plastic glue dispensing bottles are available in convenient sizes for pattern shop use. The screw-on plastic spout can be cut to desired opening for precise application.

Catalog Number	Description	Availability
023658	Glue Bottle with Spout	2 oz.
023660	Glue Bottle with Spout	8 oz.
023665	Glue Bottle with Spout	16 oz.
023670	Glue Bottle with Spout	32 oz.
023673	Additional Spout for Glue Bottle	2 oz.
023662	Additional Spout for Glue Bottle	8 oz.
023672	Additional Spout for Glue Bottle	16 & 32 oz.