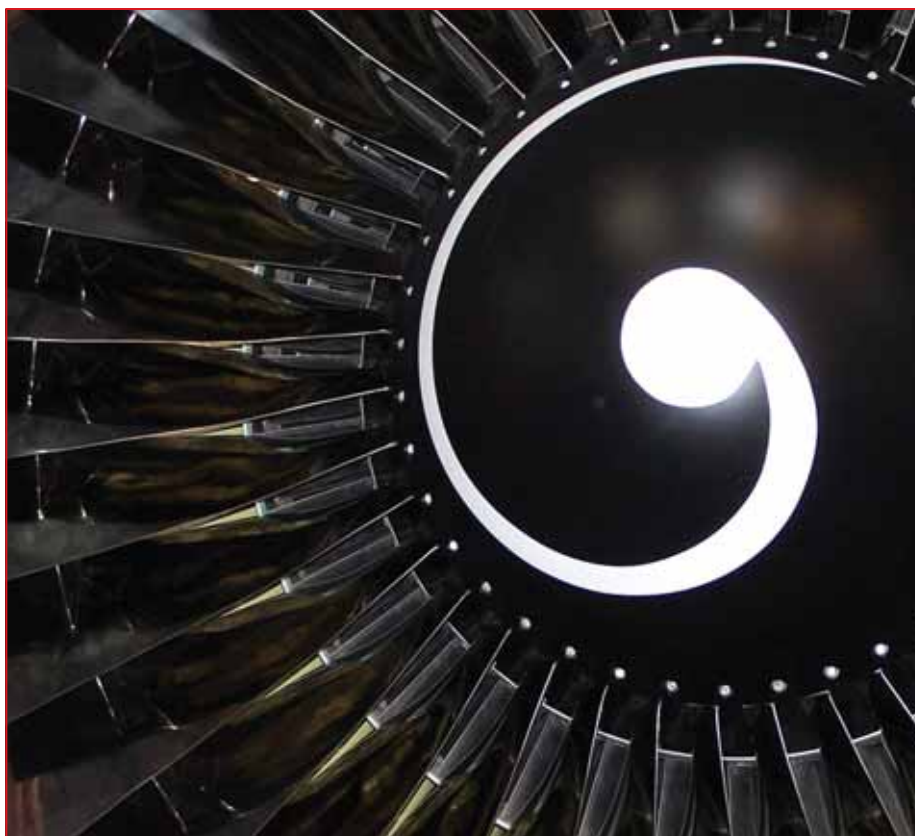




# Freeman

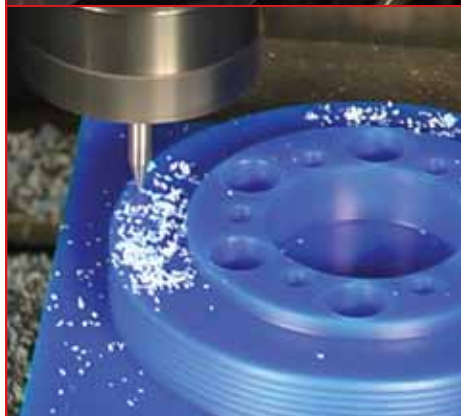
## Machinable Wax



### Machinable Wax

Formulated & manufactured by Freeman, this unique medium is an extremely hard synthetic wax that machines faster than polyurethane and epoxy tooling boards or metals without sacrificing quality of finish, surface detail, or dimensional accuracy.

Machinable Wax features a combination of properties unique to the tooling and prototyping world. Most notable is its non-abrasive, self-lubricating, and self-releasing characteristics, which make it an ideal material for many challenging applications.



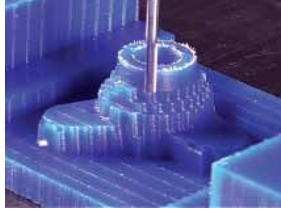
# Freeman Machinable Wax

The perfect complement to the wide range of polyurethane and epoxy modeling and tooling boards available today, Freeman Machinable Wax has carved a successful niche with its unique properties that enable both simple and complex applications to be completed with unsurpassed quality and speed.

## Machinable Wax is...

### Non-Abrasive

Most tooling media, from metal to polyurethane and epoxy, cause significant wear on cutting tools, therefore increasing the costs associated with frequently replacing tools. Because Machinable Wax is non-abrasive, it won't dull your cutting tools and it reduces the risk of tool breakage.



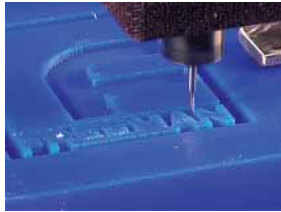
### User-Friendly

Most tooling media can produce a significant amount of dust during the machining process, a primary concern for many modern toolmakers and educational institutions. Machinable Wax, when machined, produces chips instead of dust, creating a cleaner and safer work environment.



### Self-Lubricating

Whether you are milling it, cutting it, carving it, scraping it, threading it, or chamfering it, Machinable Wax won't gum up your tools and enables all machining operations to be performed without the need for coolants or cutting fluids, regardless of cutter speed. This greatly reduces the mess associated with such fluids and promotes a cleaner work environment.



### Available in a Wide Variety of Sizes

Most tooling media is only available in large, standard sizes. Machinable Wax is available in a wide range of standard sized blocks from as small as 1 1/2" x 2" x 3" to as large as 8" x 24" x 48" or in cylinders from 1 1/2" to 9" in diameter. This flexibility is a main reason why Machinable Wax is an especially popular tooling medium for owners of smaller benchtop mills, since it eliminates much of the waste incurred when ordering media in sizes much larger than your projects' requirements.



### Self-Releasing/Self-Sealing

One of the most common frustrations in working with liquid tooling plastics is the required application of sealers and releases to avoid parts sticking to molds. Such applications can also lessen the detail of your model or mold. Since Machinable Wax is self-releasing, you may pour epoxy, urethane, or silicone rubber into it without requiring the use of sealers or release agents.



...plus, Machinable Wax can be polished, glued,& painted.

## Machinable Wax Applications:

### Prototyping

Machinable Wax can produce in a wide range of accurate and functional molds and prototypes. Its self-releasing properties also make it an ideal medium for challenging applications where complex geometry or high detail requirements exceed the capabilities of other tooling media.

### Education

Machinable Wax has long been a favorite in educational institutions. Students and teachers alike can produce highly accurate models and molds while working with a material that is much more environmentally friendly and promotes a safer working environment.

### CNC Systems Set-up and Demonstrations

For a variety of reasons, trade shows and in-house demonstrations are often not the best venues for machining difficult media. Machinable Wax is a favorite among CNC equipment manufacturers because it illustrates the capabilities of many CNC systems in a safer, user-friendly way.

### Proofing CNC Machining Programs

Machinable Wax has proven itself as a cost effective medium for proofing large or complicated machining projects.



## Machinable Wax Specifications

Hardness (Shore D)	50-55
Specific Gravity	0.92
Flash Point	575° F
Melting Point	226° F
Volumetric Shrinkage @ Room Temp.	7%
Coefficient of Thermal Expansion (in./in. °F)	9.5 x 10 <sup>-5</sup>
Color	blue

## Machinable Wax Machining Guidelines

	Spindle Speed	Feed Rate
Roughing	3,000 rpm	100 inches per minute
Finishing	8,000 -10,000 rpm	40 -100 inches per minute

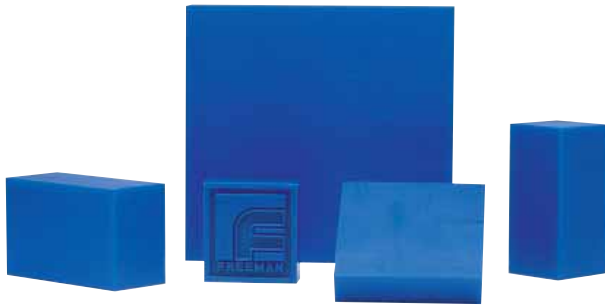
\*Data obtained using a 1/2" ball end mill

## How to Calculate Machinable Wax Weight

$$\frac{\text{Length} \times \text{Width} \times \text{Thickness (inches)}}{28.8} = \text{Weight (Lbs)}$$

## Original Sizes

Catalog Number	Description	Thickness	Width	Length
108003	Wax Block	1½"	2"	3"
108011	Wax Block	1½"	3"	7"
108021	Wax Block	3"	3"	7"
108031	Wax Block	3"	4½"	7"
108051	Wax Block	3"	5"	10"



## Standard Block Sizes

Width x Length	Thickness							
	2"	3"	4"	5"	6"	7"	8"	
6" x 6"	108250	108300	108350	108400	108450	108500	108552	
6" x 12"	108252	108071	108352	108402	108452	108502	108554	
6" x 18"	108254	108304	108354	108404	108454	108504	108556	
6" x 24"	108256	108306	108356	108406	108456	108506	108558	
6" x 30"	108258	108308	108358	108408	108458	108508	108560	
6" x 36"	108260	108310	108360	108410	108460	108510	108562	
6" x 42"	108262	108312	108362	108412	108462	108512	108564	
6" x 48"	108264	108314	108364	108414	108464	108514	108566	
12" x 12"	108266	108316	108366	108416	108466	108516	108568	
12" x 18"	108268	108318	108368	108418	108468	108518	108570	
12" x 24"	108270	108320	108370	108420	108470	108520	108572	
12" x 30"	108272	108322	108372	108422	108472	108522	108574	
12" x 36"	108274	108324	108374	108424	108474	108524	108576	
12" x 42"	108276	108326	108376	108426	108476	108526	108578	
12" x 48"	108278	108328	108378	108428	108478	108528	108580	
18" x 18"	108280	108330	108380	108430	108480	108530	108582	
18" x 24"	108282	108332	108382	108432	108482	108532	108584	
18" x 30"	108284	108334	108384	108434	108484	108534	108586	
18" x 36"	108286	108336	108386	108436	108486	108536	108588	
18" x 42"	108288	108338	108388	108438	108488	108538	108590	
18" x 48"	108290	108340	108390	108440	108490	108540	108592	
24" x 24"	108222	108342	108392	108442	108492	108542	108594	
24" x 30"	108292	108344	108394	108444	108494	108544	108596	
24" x 36"	108294	108346	108396	108446	108496	108546	108598	
24" x 42"	108296	108348	108398	108448	108498	108548	108600	
24" x 48"	108298	108243	108244	108245	108246	108550	108248	



## Standard Cylinder Sizes

Catalog Number	Description	Diameter (Nominal)	Length
108114	Wax Cylinder	1"	12"
108115	Wax Cylinder	1½"	12"
108125	Wax Cylinder	2"	12"
108135	Wax Cylinder	3"	12"
108145	Wax Cylinder	4"	14"
108155	Wax Cylinder	5"	16"
108165	Wax Cylinder	6"	18"
108175	Wax Cylinder	7"	18"

## Non-Standard Sizes and Bulk Machinable Wax

In addition to the above blocks and cylinders, machinable wax is also available in custom sized blocks. Please call our customer service department for information on custom sizes at 800-321-8511.

Catalog Number	Description
108099	Non-Standard Size Block
108199	Non-Standard Size Cylinder
108001	Bulk Wax 1-5 lb. pieces

## 3M™ Spray Adhesive

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.

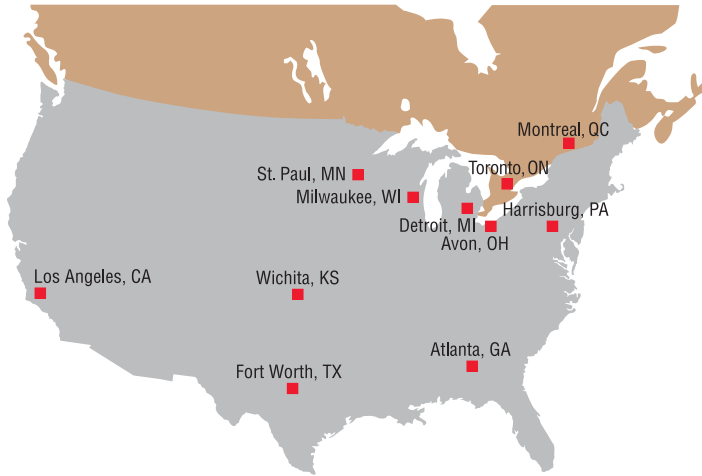


Catalog Number	Description	Availability	Mfg. Number
054515	3M #90 High Strength Adhesive Spray	24 fl. oz.	30023-3

# Freeman Has Eleven Strategic North American Locations and Worldwide Distribution

## Ohio (Headquarters)

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



## California

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

## Pennsylvania

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

## Georgia

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

## Ontario

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

## Kansas

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

## Quebec

13475 boul Pitfeild  
Montreal, QC H4S 1H3  
TEL 800-263-7699  
TEL 514-335-3530  
FAX 514-335-3225

## Michigan

27655 Groesbeck Hwy.  
Roseville, MI 48066  
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  
TEL 800-558-0866  
TEL 262-789-9800  
FAX 262-789-5407

## Terms and Conditions

### Ordering

For fast and accurate ordering, always refer to the catalog number for each product.

### Quotations & Prices

Quotations will be given upon request. Prices are subject to change without prior notice and do not include sales or excise taxes which may be applicable in your area.

### Shipping Information

When specific shipping information is NOT given by the customer, we will make every attempt to ship best way.

### 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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