

RENSHAPE TOOLING & HIGH-TEMP BOARDS

These boards are designed and formulated to meet the needs of today's precise and demanding tooling applications, including duplicating aids, foundry patterns, hammer-form dies, metal-form and vacuum-form molds, nickel electroforming mandrels, and intermediate temperature-resistant tooling. The RenShape line also includes two epoxy formulations that are syntactic, pre-preg compatible and generally offer higher temperature resistance as well as chemical resistance when compared to polyurethane tooling boards.

How to Choose a Tooling Board

Consider your project requirements and refer to the chart below for recommended applications. More specifications tables can be found on the last page.

Application Guide*

RenShape #	470	472	473	474	5166	5169	5179	5008	5065
CNC Proofing	○	○	○	○	○	○	○	○	○
Models (Architectural, styling, temporary)	◐	◐	◐	◐	○	○	○	○	○
Low-density substructure	○	○	○	○	○	○	○	○	○
Tooling aids & fixtures	●	●	●	●	○	○	○	○	○
Intermediate-temp master & lay-up tools	○	○	○	○	○	○	○	●	◐
High-temp master & lay-up tools	○	○	○	○	○	○	○	◐	●
Foundry patterns	◐	◐	◐	◐	◐	●	●	○	○
Vacuum-form molds	◐	●	●	●	○	●	●	○	○
Metalforming tools	◐	○	○	○	●	○	○	○	○

● Excellent ◐ Good ○ Not recommended

*Results may vary depending on your specific project



Machining Parameters

Cutters

Roughing

1" Ball End mill, 4-Flute, Carbide

Finishing

5/8" Ball End mill, 2-Flute, Carbide

Depth

Roughing

Varied from 1/4" to 2 1/2" deep with a 40% stepover

Finishing

1/8" deep leaving 0.002" scallop height

Please Note

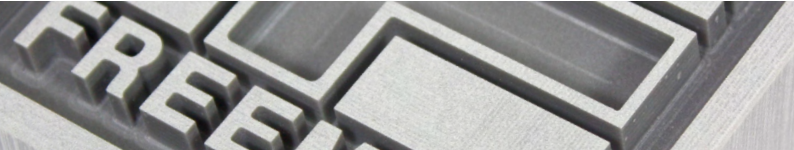
These machining parameters are starting points. Cutter type, material, spindle speed, feed rate, machine power, and rigidity all affect results. User must determine best parameters for specific applications.

	Roughing Speed (RPM)	Roughing Feed (IPM)	Finishing Speed (RPM)	Finishing Feed (IPM)
470	1,600	40	10,000	100
472	1,600	40	10,000	100
473	1,600	40	10,000	100
474	1,600	40	10,000	100
5166	1,600	40	10,000	100
5169	1,600	40	10,000	100
5179	1,500	60	10,000	100
5008	1,600	40	10,000	100
5065	1,600	40	10,000	100

RENSHAP TOOLING & HIGH-TEMP BOARDS

Quick Facts: RenShape Tooling Boards

- Designed for high-wear and high-temperature applications
- Excellent stability and machined edge definition
- High-quality machined surface finish
- Non-abrasive to cutting tools

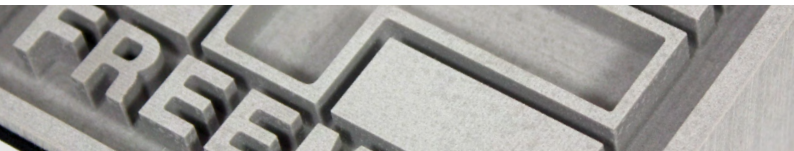


RenShape 470 Polyurethane Fixture Board

RenShape 470 is a high-density polyurethane board designed for CNC machining of production fixtures. This is the most durable fixture board in the RenShape line for the most demanding applications and is especially excellent for thermoforming tools designed to produce clear plastic parts.

- ▶ 104 lb./ft.³ density
- ▶ Light gray color
- ▶ Extremely tough and dense

SKU	Thickness	Width	Length	Bd. ft.
075209	2"	20"	60"	16.67

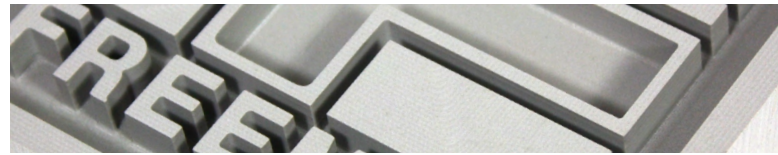


RenShape 472 Polyurethane Fixture Board

RenShape 472 is a polyurethane board designed for machining of production fixtures capable of withstanding extended use and handling. It combines light weight with toughness and abrasion resistance to withstand typical production environments.

- ▶ 55 lb./ft.³ density
- ▶ Light gray color
- ▶ Ideal for foundry patterns and thermoform tools

SKU	Thickness	Width	Length	Bd. ft.
075242	1"	20"	60"	8.33
075243	2"	20"	60"	16.67
075245	3"	20"	60"	25
075244	4"	20"	60"	33.33
075238	5"	24"	30"	25
075239	6"	24"	30"	30

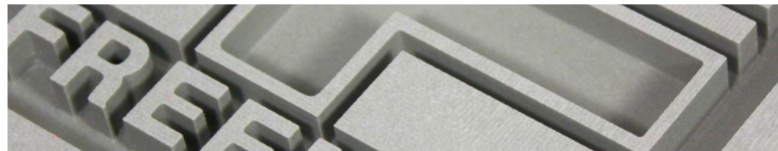


RenShape 473 Polyurethane Fixture Board

RenShape 473 is a polyurethane fixture board that offers a lighter density than traditional fixture boards. It may be used for check fixtures, model bases, patterns, and thermoform tools where requirements are less demanding.

- ▶ 50 lb./ft.³ density
- ▶ Light gray color
- ▶ Most economical fixture board

SKU	Thickness	Width	Length	Bd. ft.
075153	2"	16"	60"	13.33
075154	3"	16"	60"	20
075155	4"	16"	60"	26.67
075156	6"	16"	60"	40

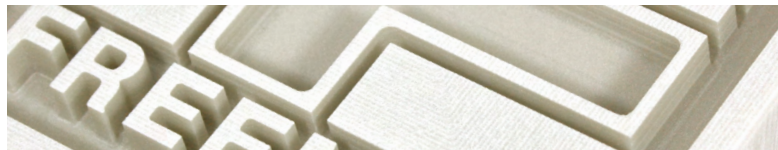


RenShape 474 Polyurethane Fixture Board

This gray polyurethane board is engineered to machine well and produce good detail with less dust than other fixture boards. It is ideal for creating economical check fixtures, trim fixtures, and drill fixtures.

- ▶ 50 lb./ft.³ density
- ▶ Light gray color
- ▶ Excellent combination of durability, surface finish and light weight

SKU	Thickness	Width	Length	Bd. ft.
075614	2"	24"	60"	20
075622	3"	24"	60"	30
075630	4"	24"	60"	40

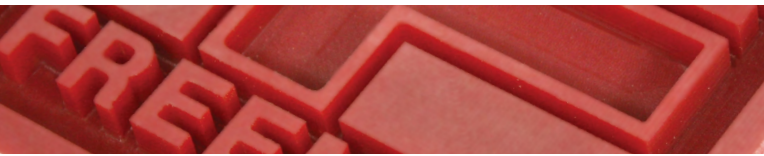


RenShape 5166 Metal-Forming Board

RenShape 5166 is a polyurethane board that is designed for use in forming metal parts for prototype and low volume production.

- ▶ 103 lb./ft.³ density
- ▶ Cream color
- ▶ Ideal for metal-forming applications

SKU	Thickness	Width	Length	Bd. ft.
075237	2"	20"	60"	16.67
075199	4"	20"	30"	16.67

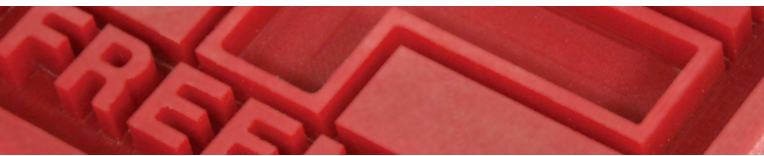


RenShape 5169 Foundry Pattern & Tooling Board

RenShape 5169 is a polyurethane board that is designed for machining extremely durable and wear resistant foundry patterns, core boxes and other tools that require high wear and impact resistance. Its superior edge definition, dimensional stability and polishing characteristics also make it an excellent material for thermoforming tools designed to produce clear plastic parts.

- ▶ 75 lb./ft.³ density
- ▶ Red color
- ▶ Highest wear resistance

SKU	Thickness	Width	Length	Bd. ft.
075246	1"	20"	60"	8.33
075232	2"	20"	60"	16.67
075233	3"	20"	60"	25
075234	4"	20"	60"	33.33
075127	5/8"	24"	30"	3.125
075131	3/4"	24"	30"	3.75
075247	5"	24"	30"	25
075248	6"	24"	30"	30
075128	1"	24"	60"	10
075129	1 1/4"	24"	60"	12.5
075130	1 1/2"	24"	60"	15
075164	2"	24"	60"	20
075165	3"	24"	60"	30
075166	4"	24"	60"	40



RenShape 5179 Foundry Pattern & Tooling Board

RenShape 5179 is a red polyurethane board specifically designed for machining highly accurate, dimensionally stable, and wear resistant foundry patterns. It machines well with minimal chipping and is excellent for thermoforming tools designed to produce clear plastic parts.

- ▶ 73 lb./ft.³ density
- ▶ Red color
- ▶ Machines well with minimal chipping

SKU	Thickness	Width	Length	Bd. ft.
075546	1"	24"	60"	10
075554	2"	24"	60"	20
075562	3"	24"	60"	30
075570	4"	24"	60"	40
075577	5"	24"	30"	25
075585	6"	24"	30"	30



RenShape 5008 Epoxy Modeling Board

RenShape 5008 is an epoxy modeling board designed for tooling use up to 230°F (110°C) and is well-suited for building master models, layout tools for low and medium temperature curing prepregs, and other heat-resistant tooling. This medium density epoxy material features a very low coefficient of thermal expansion to produce outstanding accuracy and dimensional stability.

- ▶ 42 lb./ft.³ density
- ▶ Light blue color
- ▶ Dimensional stability & prepreg compatibility

SKU	Thickness	Width	Length	Bd. ft.
075288	1"	24"	60"	10
075289	2"	24"	60"	20
075290	4"	24"	60"	40
075291	6"	24"	60"	60



RenShape 5065 High-Temperature Epoxy Board

RenShape 5065 High-Performance, High-Temperature Epoxy board was developed for use at temperatures up to 400°F (204°C) in applications such as aerospace master models and lay-up tools for high temperature curing prepregs. RenShape 5065 offers good edge definition, good surface finish, and excellent dimensional stability with a high glass transition temperature of 470°F (243°C).

- ▶ 49 lb./ft.³ density
- ▶ Gray color
- ▶ Ideal for aerospace master modeling

SKU	Thickness	Width	Length	Bd. ft.
075272	2"	24"	60"	20
075273	4"	24"	60"	40
075274	6"	24"	60"	60

General & Machining Specifications

	Hardness (Shore D)	Density (g/cc)	Density (lb./ft. ³)	Tensile Strength (psi)	Compressive Strength (psi)	Compressive Modulus (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Glass Transition Temp (°F)	C.T.E. (in./in./°F)	Color
RenShape 470	90	1.67	104	4,700	9,500	866,000	8,700	983,000	232	22.7 x 10 ⁻⁶	Light Gray
RenShape 472	81	0.88	55	7,000	10,900	460,000	9,540	416,000	248	25.8 x 10 ⁻⁶	Light Gray
RenShape 473	72	0.80	50	2,500	3,500	210,000	4,000	200,000	212	30.0 x 10 ⁻⁶	Light Gray
RenShape 474	73	0.80	50	6,750	8,000	227,000	8,000	325,000	230	26.5 x 10 ⁻⁶	Light Gray
RenShape 5166	90	1.66	103	4,875	9,500	840,000	8,000	965,000	228	22.0 x 10 ⁻⁶	Cream
RenShape 5169	85	1.20	75	9,000	8,800	366,000	14,000	380,000	206	40.8 x 10 ⁻⁶	Red
RenShape 5179	84	1.18	73	10,790	11,600	400,100	14,900	404,000	210	41.7 x 10 ⁻⁶	Red
RenShape 5008*	68	0.67	42	3,500	8,200	350,000	4,600	350,000	253	20.0 x 10 ⁻⁶	Light Blue
RenShape 5065*	70	0.79	49	3,076	8,264	203,863	4,900	425,000	470	18.0 x 10 ⁻⁶	Gray
ASTM	D-2240	D-792	D-792	D-638	D-695	D-695	D-790	D-790	D-4065	D-3386	-

*Epoxy boards

Matched Adhesives & Repair Materials Guide

	RenShape 470	RenShape 472	RenShape 473	RenShape 474	RenShape 5166	RenShape 5169	RenShape 5179	RenShape 5008	RenShape 5065	Mix Ratio (by wt.)	Viscosity (cps)	Get time (min.) @ 77°F	Light handling time (hr.)	Hardness (Shore D)	Density	Service temp. (°F)	Color	Notes
Adhesives																		
Fast Set 505	X	X	X	X	X	X	X			1:1	10,000	5	0.5	85	1.11	200	Clear	Economical 5-minute epoxy
Fast Set 506	X	X	X	X	X	X	X			1:1	1,500	5	1	80	1.15	266	Clear	Epoxy w/excellent bond strength and high-service temp
Fast Set 517	X	X	X	X	X	X	X			1:1	14,000	15-20	4	80	1.15	200	Clear	Epoxy w/longer gel times and short light handling time
Ren-Weld 103	X	X	X	X	X	X	X			100:26	2,100	20	10	68	1.08	128	Lt. Yellow	Low-viscosity epoxy, flow control agents prevent run-out
RenLam 1700-1	X	X	X	X	X	X	X			100:26	2,000	20	24	90	1.13	128	Lt. Yellow	Low-viscosity epoxy laminating resin, excellent bond strength
RenLam 4005	X	X	X	X	X	X	X			100:14	1,900	50-60	24	90	1.19	289	Amber	Epoxy w/excellent bond strength for high-temp applications
RenLam 4017								X		100:15	8,000	90	3-4	93	1.42	350	Black	Hi-Temp epoxy laminating resin for RenShape 5065
RenWeld 5008								X		100:20	-	75	4	68	0.65	200	Lt. Blue	Medium-speed adhesive, hardness-matched and color-matched for RenShape 5008
Repair Materials																		
TUF-Fil	X	X	X	X						100:1.5	912,000	11	0.5	81	1.74	128	Brown	81 Shore D polyester repair paste for room-temp applications
TUF-Fil White	X				X					100:1.5	400,000	9	0.5	95	2.5	128	White	95 Shore D polyester repair paste for room-temp applications
Hi-Temp TUF-Fil	X	X	X	X			X	X		100:1.5	581,000	10	0.5	71	1.14	350	4 options	Polyester repair paste for high-temp applications
RenPatch 5169					X	X				100:89	Paste	45-75 sec.	0.25	85	1.12	167	Red	Polyurethane repair paste for RenShape 5169 and 5179

LOCATIONS & TERMS

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Please see our website, www.FreemanSupply.com/aboutus for complete details and contact information on all of our locations.

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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.

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