

# RENSHAP MODELING BOARDS

The first name worldwide in modeling & styling boards, RenShape is designed and formulated to meet the wide scope of tooling, modeling, prototyping and fabricating applications found throughout the industry today. RenShape continues to lead the industry in providing the perfect balance of machinability, surface finish, edge definition, stability, and durability, all available from the largest modeling board distributor in the world, Freeman.

## How to Choose a Modeling 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 #                                 | 440 | 5440 | BM-70 | 450 | 5460 | 460 |
|--|-----|------|-------|-----|------|-----|
| 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                          | ◐   | ◐    | ◐     | ◐   | ◐    | ◐   |
| Metallforming tools                        | ○   | ○    | ○     | ○   | ○    | ○   |

● Ideal   ◐ Acceptable   ○ Not recommended

\*Results may vary depending on your specific project



## Machining Parameters

### Cutters

#### Roughing

1" Ball End mill,  
4-Flute, Carbide

#### Finishing

3/8" 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) |
|-------|----------------------|---------------------|-----------------------|----------------------|
| 440   | 2,000                | 200                 | 15,000                | 200                  |
| 5440  | 2,000                | 100                 | 15,000                | 200                  |
| 450   | 2,000                | 100                 | 15,000                | 200                  |
| BM-70 | 2,000                | 100                 | 15,000                | 200                  |
| 5460  | 2,000                | 100                 | 15,000                | 200                  |
| 460   | 1,600                | 40                  | 10,000                | 100                  |

# RENSHAP<sup>®</sup> MODELING & STYLING BOARDS

## Quick Facts

- Formulated for styling, modeling, prototyping & fabricating applications
- Can be worked by hand or machine
- Less abrasive to cutting tools



## RenShape 5440 Polyurethane Styling Board

RenShape 5440 is a higher density version of 440, offering an improved surface finish without sacrificing ease of machining. These boards are manufactured in metric sizes (500mm x 1500mm). The Imperial equivalent sizes are provided below.

|                                   | SKU    | Thickness | Width | Length | Bd. ft. |
|-----------------------------------|--------|-----------|-------|--------|---------|
| ▶ 35 lb./ft. <sup>3</sup> density | 075501 | 0.98"     | 19.7" | 59.1"  | 7.92    |
| ▶ Light brown color               | 075502 | 1.97"     | 19.7" | 59.1"  | 15.85   |
| ▶ Ideal for master patterns       | 075503 | 2.96"     | 19.7" | 59.1"  | 23.9    |
|                                   | 075504 | 3.94"     | 19.7" | 59.1"  | 31.8    |

## RenShape 440 Polyurethane Styling Board

RenShape 440 is a medium-low density board used for master models, CNC styling models, prototypes, and visual models. RenShape 440 machines easily at fast cutting speeds, finishes to a good surface with excellent edge definition and produces very little tool wear.

- ▶ 34 lb./ft.<sup>3</sup> density
- ▶ Light red-brown color
- ▶ General purpose & economical

| SKU    | Thickness | Width | Length | Bd. ft. |
|--------|-----------|-------|--------|---------|
| 075236 | 2"        | 16"   | 60"    | 13.33   |
| 075240 | 4"        | 16"   | 60"    | 26.67   |
| 075146 | 1"        | 20"   | 60"    | 8.33    |
| 075147 | 2"        | 20"   | 60"    | 16.67   |
| 075148 | 3"        | 20"   | 60"    | 25      |
| 075149 | 4"        | 20"   | 60"    | 33.33   |
| 075151 | 6"        | 20"   | 60"    | 50      |



## RenShape 450 Polyurethane Modeling Board

RenShape 450 is the original medium density polyurethane modeling and styling board. An ideal material for models and prototypes, master patterns, and tooling aids, this material will produce very stable, dimensionally accurate tools with well-defined edges and surface detail. RenShape 450 can be machined using standard woodworking tools and will not result in objectionable dust particles when planed, milled, sawed or drilled. It resists warping and can be easily painted and finished for appearance and prototype models.

- ▶ 41 lb./ft.<sup>3</sup> density
- ▶ Light brown color
- ▶ Superior machinability and stability

| SKU    | Thickness | Width | Length | Bd. ft. |
|--------|-----------|-------|--------|---------|
| 075139 | 2"        | 20"   | 15"    | 4.17    |
| 075202 | 2"        | 16"   | 60"    | 13.33   |
| 075205 | 4"        | 16"   | 60"    | 26.67   |
| 075140 | 1"        | 20"   | 60"    | 8.33    |
| 075141 | 2"        | 20"   | 60"    | 16.67   |
| 075142 | 3"        | 20"   | 60"    | 25      |
| 075143 | 4"        | 20"   | 60"    | 33.33   |
| 075203 | 1"        | 24"   | 60"    | 10      |
| 075206 | 2"        | 24"   | 60"    | 20      |
| 075211 | 3"        | 24"   | 60"    | 30      |



RenShape 440, 5440, and 450 offer excellent ease of machining.



# MODELING BOARDS CONTINUED



*Well-defined edges are possible with BM-70 due to its excellent surface finish.*



*RenShape 460 offers an excellent surface finish for many large and lightweight styling applications.*



## RenShape BM-70 Medium-Density Modeling Board

RenShape BM-70 is a polyurethane modeling board that features excellent machinability, while holding precise tolerances and well-defined edges. Applications include master patterns, models, prototype foundry patterns, and automotive and architectural models.

- ▶ 42 lb./ft.<sup>3</sup> density
- ▶ Light brown color
- ▶ Excellent edge definition

| SKU    | Thickness | Width | Length | Bd. ft. |
|--------|-----------|-------|--------|---------|
| 075532 | 1.97"     | 19.7" | 59.1"  | 15.9    |
| 075533 | 2.95"     | 19.7" | 59.1"  | 23.9    |
| 075534 | 3.94"     | 19.7" | 59.1"  | 31.8    |
| 075541 | 5.9"      | 19.7" | 59.1"  | 47.7    |
| 075535 | 2"        | 24"   | 60"    | 20.0    |
| 075536 | 3"        | 24"   | 60"    | 20.0    |
| 075537 | 4"        | 24"   | 60"    | 40.0    |
| 075539 | 6"        | 24"   | 60"    | 60.0    |



## RenShape 460 Polyurethane Modeling Board

RenShape 460 is a medium-high density polyurethane modeling and styling board. It was developed to meet the growing demand for higher-quality, more dimensionally accurate, machined master patterns and prototypes. With a smoother surface finish than RenShape 450, this board is an ideal material for prototype vacuum-forming tools, styling prototypes, master models, tooling aids, and automotive die models. Carbide cutters are recommended, but not necessary.

- ▶ 48 lb./ft.<sup>3</sup> density
- ▶ Light brown color
- ▶ Excellent surface finish

| SKU    | Thickness | Width | Length | Bd. ft. |
|--------|-----------|-------|--------|---------|
| 075213 | 2"        | 16"   | 60"    | 13.33   |
| 075214 | 4"        | 16"   | 60"    | 26.67   |
| 075229 | 1"        | 20"   | 60"    | 8.33    |
| 075219 | 2"        | 20"   | 60"    | 16.67   |
| 075221 | 3"        | 20"   | 60"    | 25      |
| 075222 | 4"        | 20"   | 60"    | 33.33   |
| 075169 | 1"        | 24"   | 60"    | 10      |
| 075170 | 2"        | 24"   | 60"    | 20      |
| 075171 | 3"        | 24"   | 60"    | 30      |
| 075172 | 4"        | 24"   | 60"    | 40      |



## RenShape 5460 Polyurethane Modeling Board

RenShape 5460 is lower density version of 460, offering excellent surface finish and ease of machining while minimizing the dust prevalent in many other modeling boards in this range.

- ▶ 43 lb./ft.<sup>3</sup> density
- ▶ Light brown color
- ▶ High-quality surface finish

| SKU    | Thickness | Width | Length | Bd. ft. |
|--------|-----------|-------|--------|---------|
| 075518 | 2"        | 24"   | 60"    | 20      |
| 075519 | 3"        | 24"   | 60"    | 30      |
| 075520 | 4"        | 24"   | 60"    | 40      |

## General Specifications

|                       | Hardness (Shore D) | Density (g/cc) | Density (lb./ft. <sup>3</sup> ) | 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     |
|-----------------------|--------------------|----------------|---------------------------------|------------------------|----------------------------|---------------------------|-------------------------|------------------------|----------------------------|-------------------------|-----------|
| <b>RenShape 440</b>   | 54                 | 0.55           | 34                              | 1,300                  | 1,400                      | 105,000                   | 2,300                   | 106,000                | 203                        | 34.4 x 10 <sup>-6</sup> | Red-Brown |
| <b>RenShape 5440</b>  | 60                 | 0.60           | 37                              | 1,300                  | 2,900                      | 101,526                   | 2,900                   | 106,000                | 203                        | 30.5 x 10 <sup>-6</sup> | Lt. Brown |
| <b>RenShape 450</b>   | 65                 | 0.66           | 41                              | 2,300                  | 2,800                      | 135,000                   | 4,000                   | 144,000                | 205                        | 36.0 x 10 <sup>-6</sup> | Lt. Brown |
| <b>RenShape BM-70</b> | 60                 | 0.67           | 42                              | 1,570                  | 3,600                      | 139,104                   | 4,340                   | 125,770                | 185                        | 27.7 x 10 <sup>-6</sup> | Lt. Brown |
| <b>RenShape 5460</b>  | 60                 | 0.70           | 43                              | 1,886                  | 3,625                      | 139,236                   | 4,351                   | 152,000                | 187                        | 30.5 x 10 <sup>-6</sup> | Lt. Brown |
| <b>RenShape 460</b>   | 64                 | 0.77           | 48                              | 1,800                  | 2,200                      | 181,000                   | 3,700                   | 185,000                | 219                        | 29.9 x 10 <sup>-6</sup> | Lt. Brown |
| <b>ASTM</b>           | 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 440 | RenShape 5440 | RenShape 450 | RenShape BM-70 | RenShape 5460 | RenShape 460 | Mix Ratio (by wt.) | Viscosity (cps) | Gel time (min.) @ 77°F | Light handling time (hr.) | Hardness (Shore D) | Density | Service temp. (°F) | Color      | Notes   |
|-------------------------|--------------|---------------|--------------|----------------|---------------|--------------|--------------------|-----------------|------------------------|---------------------------|--------------------|---------|--------------------|------------|---|
| <b>Adhesives</b>        |              |               |              |                |               |              |                    |                 |                        |                           |                    |         |                    |            |   |
| Repro Light             | X            | X             | X            | X              | X             | X            | 1:1                | 1,200           | 10-11                  | 4                         | 55                 | 0.59    | 128°F              | Tan        | Low-density polyurethane with good bond strength              |
| Fast Set 505            | X            | X             | X            | X              | X             | X            | 1:1                | 10,000          | 5                      | 0.5                       | 85                 | 1.11    | 200                | Clear      | Economical 5-minute epoxy                                     |
| Fast Set 517            | 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            | 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            | 100:26             | 2,000           | 20                     | 24                        | 90                 | 1.13    | 128                | Lt. Yellow | Low-viscosity epoxy laminating resin, excellent bond strength |
| <b>Repair Materials</b> |              |               |              |                |               |              |                    |                 |                        |                           |                    |         |                    |            |   |
| Quik-Fil                | X            | X             | X            | X              | X             | X            | 100:1.5            | 208,000         | 11                     | 0.5                       | 70                 | 0.89    | 128°F              | Brown      | Low-density and low-viscosity polyester repair paste          |
| TUF-Carv                | X            | X             | X            | X              | X             | X            | 100:1.5            | 581,000         | 10                     | 0.5                       | 71                 | 1.14    | 128°F              | 4 options  | Easy to machine polyester repair paste                        |

## LOCATIONS & TERMS

**FREEMAN MANUFACTURING & SUPPLY CO.**  
 1101 Moore Road, Avon, Ohio 44011  
 Phone 800-321-8511 • Fax 440-934-7200  
 www.FreemanSupply.com  
**FREEMAN** contactus@freemansupply.com



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