A complete line of easy to use, economical tooling and prototyping resins, these materials are widely used in many applications that demand the ideal balance between price and performance. Our flexible urethanes are generally more abrasion resistant than silicone rubber, making them preferred materials for concrete and architectural castings. Our semi-rigid urethanes are known for their excellent impact strength and abrasion resistance, making them ideal for foundry tooling as well as semi-rigid part production. Our rigid urethanes are designed to simulate injection molded plastic parts.

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. 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!
Rapid cure polyurethanes produce parts that simulate the appearance and performance of injection-molded thermoplastic parts. The short gel times permit fast demolding of durable parts. These low-viscosity systems are designed to be used with automated dispensing equipment (page 116) and low-cost tooling.

### RenPIM Polyurethanes

- **RenPIM 6450**
  - Very fast-setting polyurethane casting system that offers outstanding heat and impact resistance. The quick demold time of 15 to 30 minutes allows for the production of multiple parts per hour depending on part geometry and dispensing equipment capabilities. It is an excellent choice for replicating high-density polyethylene, polypropylene, and ABS parts and prototypes.
  - **Gel Time (min.)** 45-65
  - **Density (g/cc)** 1.13
  - **Viscosity** 23.9
  - **Volumetric Yield (in.³/lb.)** 0.0009
  - **Tensile Strength (psi)** 23,100
  - **Flexural Modulus (psi)** 77
  - **Compression Strength (psi)** 170
  - **Deflection Temp. (°F)** 208
  - **Shrink (in./in.)** 0.0009
  - **Color** Buff or Black
  - **SKU Size Net weight (lb.)**
    - 056553 5 Gallon (Resin) 32
    - 056554 5 Gallon (Hardener) 40

- **RenPIM 6452**
  - Rapid-curing system offers a high flex modulus that produces a tough prototype or short-run production part. RenPIM 6452 cures to an off-white color that may be easily pigmented and simulates many of the properties of polypropylene and ABS.
  - **Gel Time (min.)** 50-70
  - **Density (g/cc)** 1.21
  - **Viscosity** 22.9
  - **Volumetric Yield (in.³/lb.)** 0.0009
  - **Tensile Strength (psi)** 24,500
  - **Flexural Modulus (psi)** 30
  - **Compression Strength (psi)** 18,000
  - **Deflection Temp. (°F)** 261
  - **Shrink (in./in.)** 0.0009
  - **Color** Off-White
  - **SKU Size Net weight (lb.)**
    - 056571 5 Gallon (Resin) 32
    - 056572 5 Gallon (Hardener) 40

- **RenPIM 6458**
  - Very high flexural modulus urethane system is for creating rigid, stable, and extremely tough castings. This is the fastest curing RenPIM material with a demold time of 15 minutes or less and a user friendly 1:1 mix ratio. This is a good selection for duplicating the properties of high flex modulus ABS.
  - **Gel Time (min.)** 50
  - **Density (g/cc)** 1.15
  - **Viscosity** 24.1
  - **Volumetric Yield (in.³/lb.)** 0.0009
  - **Tensile Strength (psi)** 24,500
  - **Flexural Modulus (psi)** 80
  - **Compression Strength (psi)** 16,500
  - **Deflection Temp. (°F)** 261
  - **Shrink (in./in.)** 0.0009
  - **Color** Clear Amber
  - **SKU Size Net weight (lb.)**
    - 056607 5 Gallon (Resin) 45
    - 056608 5 Gallon (Hardener) 38.3

- **RenPIM 6460**
  - The best choice for parts and prototypes requiring elevated heat resistance. This quick-curing formulation (15 to 30 minute demold) is engineered with a glass transition temperature of 320°F.
  - **Gel Time (min.)** 50
  - **Density (g/cc)** 1.10
  - **Viscosity** 23.6
  - **Volumetric Yield (in.³/lb.)** 0.0009
  - **Tensile Strength (psi)** 24,500
  - **Flexural Modulus (psi)** 80
  - **Compression Strength (psi)** 16,500
  - **Deflection Temp. (°F)** 261
  - **Shrink (in./in.)** 0.0009
  - **Color** Buff
  - **SKU Size Net weight (lb.)**
    - 056674 5 Gallon (Resin) 32
    - 056671 5 Gallon (Hardener) 40
INTERMEDIATE CURE ELASTOMERS

These hand-pourable urethanes offer a wide range of hardnesses and working times, and can be demolded in as little as 15 minutes to 2 hours. This enables the production of multiple thermoplastic-like prototypes and short-run end-use parts per day.

Specifications

<table>
<thead>
<tr>
<th></th>
<th>Mix Ratio (by wt.)</th>
<th>Resin:Hardener</th>
<th>Resin:Hardener</th>
<th>Gel Time (min.)</th>
<th>Viscosity R/H or Mixed (cps)</th>
<th>Density (g/cc)</th>
<th>Hardness (Shore D)</th>
<th>Volumetric Yield (in.3/lb)</th>
<th>Shrink (in./in.)</th>
<th>Compressive Strength (psi)</th>
<th>Tensile Strength (psi)</th>
<th>Flexural Modulus (psi)</th>
<th>Flexural Strength (psi)</th>
<th>Tensile Impact (ft.lb./in.)</th>
<th>Flexural Impact (ft.lb.)</th>
<th>Top Per DMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeman 1070</td>
<td>100:92</td>
<td>1:1</td>
<td>3</td>
<td>15 - 30 min.</td>
<td>70</td>
<td>80</td>
<td>1.05</td>
<td>26.6</td>
<td>0.004</td>
<td>3,650</td>
<td>4,500</td>
<td>132,000</td>
<td>3,000</td>
<td>–</td>
<td>140</td>
<td>–</td>
</tr>
<tr>
<td>Freeman 1080</td>
<td>115:100</td>
<td>1:1</td>
<td>20</td>
<td>2 - 4</td>
<td>80</td>
<td>150</td>
<td>1.12</td>
<td>24.7</td>
<td>0.003</td>
<td>8,300</td>
<td>9,500</td>
<td>288,000</td>
<td>6,650</td>
<td>0.31</td>
<td>134</td>
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<tr>
<td>Freeman 1085</td>
<td>1:1</td>
<td>1:1</td>
<td>6</td>
<td>30 - 120 min.</td>
<td>69</td>
<td>80</td>
<td>1.12</td>
<td>24.7</td>
<td>0.002</td>
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<td>5,600</td>
<td>170,000</td>
<td>3,300</td>
<td>0.35</td>
<td>137</td>
<td>172</td>
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<tr>
<td>RenCast 6432-1</td>
<td>100:50</td>
<td>1:1</td>
<td>5 - 6</td>
<td>1 - 2</td>
<td>72</td>
<td>50/100</td>
<td>1.13</td>
<td>24.5</td>
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<td>7,200</td>
<td>8,600</td>
<td>234,000</td>
<td>5,900</td>
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<tr>
<td>RenCast 6486</td>
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<td>1:1</td>
<td>7 - 8</td>
<td>8</td>
<td>67</td>
<td>7,800/75</td>
<td>1.16</td>
<td>23.9</td>
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<td>–</td>
<td>–</td>
<td>4,750</td>
<td>110,000</td>
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<tr>
<td>RenCast 6491</td>
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<td>89:100</td>
<td>4 - 5</td>
<td>30 - 40 min.</td>
<td>85</td>
<td>200/640</td>
<td>1.22</td>
<td>23</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>16,000</td>
<td>400,000</td>
<td>8,600</td>
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<td>205</td>
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<tr>
<td>RenCast 6492-1</td>
<td>1:1</td>
<td>97:100</td>
<td>6 - 8</td>
<td>4</td>
<td>84</td>
<td>40/1,800</td>
<td>1.30</td>
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<td>–</td>
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<td>453,000</td>
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<tr>
<td>RenCast 6497</td>
<td>1:1</td>
<td>4 - 5</td>
<td>2</td>
<td>70A</td>
<td>1.875</td>
<td>1.10</td>
<td>25.2</td>
<td>0.002</td>
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<td>–</td>
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<td>–</td>
<td>995</td>
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<tr>
<td>PRC 1700*</td>
<td>100:60</td>
<td>1:1</td>
<td>17 - 19</td>
<td>2*</td>
<td>87</td>
<td>500</td>
<td>1.10</td>
<td>25.2</td>
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<td>–</td>
<td>11,603</td>
<td>10,152</td>
<td>29.9</td>
<td>221</td>
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</table>

*The above properties for PRC-1700 are average values measured on specimens after curing 2 hours at 158°F, plus 16 hours at 212°F.

Freeman 1070

An easily mixed and economical urethane that can be used to create parts that simulate injection molded plastic, Freeman 1070 features an off-white color, low viscosity, ease of pouring, and a short demold time for multiple part production. It is castable up to ¼” in thickness.

- 3 min. gel time
- 15-30 min. demold
- 70 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>055500</td>
<td>Quart Kit</td>
<td>2.1</td>
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<td>055406</td>
<td>Gallon Kit</td>
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<tr>
<td>055405</td>
<td>5 Gallon Kit</td>
<td>77</td>
</tr>
</tbody>
</table>

Freeman 1080

This brilliant white, tough urethane elastomer features a 1:1 mix ratio by volume, a low viscosity for pouring thin-walled parts, and sufficient time to degas. It is castable up to ¼” in thickness.

- 20 min. gel time
- 2-4 hour demold
- 80 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
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<tbody>
<tr>
<td>055419</td>
<td>Quart Kit</td>
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<td>055412</td>
<td>Gallon Kit</td>
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<td>055411</td>
<td>5 Gallon Kit</td>
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Freeman 1085

Freeman 1085 is an excellent general-purpose prototyping urethane elastomer. It offers a tan color, 1:1 mix ratio by weight or volume for quick and easy mixing along with a very low viscosity to ensure void-free castings. It is castable up to 3” in thickness.

- 6 min. gel time
- 1/2-2 hour demold
- 69 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
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<tbody>
<tr>
<td>055502</td>
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<td>055127</td>
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<tr>
<td>055125</td>
<td>5 Gallon (Resin)</td>
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</tr>
<tr>
<td>055126</td>
<td>5 Gallon (Hardener)</td>
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</table>
**RenCast 6432-1**
RenCast 6432-1 is a low viscosity polyurethane casting system for simulating injection molded plastic parts. The 5 to 6 minute gel time permits hand mixing and pouring, yet the parts are demoldable in 1 to 2 hours. This enables production of multiple parts in 1 day without the expense of a meter-mix machine.

- 5-6 min. gel time
- 1-2 hour demold
- 72 Shore D

<table>
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<tr>
<th>SKU</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>056678</td>
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</table>

**RenCast 6486**
This extremely tough material features a notched IZOD impact strength over 6 ft. lb./in. This system is designed to closely simulate the performance characteristics of polyethylene and polypropylene.

- 7-8 min. gel time
- 8 hour demold
- 67 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
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<tbody>
<tr>
<td>056636</td>
<td>5 Gallon (Resin)</td>
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</tr>
<tr>
<td>056637</td>
<td>5 Gallon (Hardener)</td>
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</tbody>
</table>

**RenCast 6491**
RenCast 6491 is specifically designed for simulating ABS parts. A flexural modulus of 400,000 psi and impact resistance of 1.2 ft. lb./in. gives this product an excellent combination of rigidity & durability. Its heat resistance is 224°F Tg per DMA.

- 4-5 min. gel time
- 30-40 min. demold
- 85 Shore D

<table>
<thead>
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<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
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<tbody>
<tr>
<td>056675</td>
<td>Gallon Kit</td>
<td>16</td>
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</tbody>
</table>

**RenCast 6492-1**
RenCast 6492-1 offers high flexural strength and was developed to simulate flame retardant ABS plastics, meeting UL-VO standards. A 6-8 minute gel time permits hand mixing and pouring, yet the rapid cure rate enables demolding in 4 hours. This enables multiple parts production without the investment in a meter mixing machine.

- 6-8 min. gel time
- 4 hour demold
- 84 Shore D

<table>
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<tbody>
<tr>
<td>056686</td>
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<tr>
<td>056685</td>
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</table>

**RenCast 6497**
RenCast 6497 is a flexible polyurethane casting system used to produce rubber-like parts quickly and easily. A 4-5 minute gel time permits hand mixing and pouring, yet the rapid cure enables multiple parts to be made in one day without the use of a meter-mix machine.

- 4-5 min. gel time
- 2 hour demold
- 70 Shore A

<table>
<thead>
<tr>
<th>SKU</th>
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<tbody>
<tr>
<td>056723</td>
<td>Gallon Kit</td>
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</table>
OVERNIGHT CURE ELASTOMERS

OVERNIGHT CURE - FLEXIBLE

Urethane rubber is generally less expensive than silicone rubber and more abrasion resistant, making it a preferred material for concrete and architectural castings. However, flexible urethanes are not self-releasing and therefore require a release procedure to facilitate clean and easy part release.

Specifications

<table>
<thead>
<tr>
<th>OverElastomer</th>
<th>Mix Ratio</th>
<th>Mixed Viscosity</th>
<th>Top Hardness (Shore A)</th>
<th>Cast Time (min.) @ 72°F</th>
<th>Density (g/cc)</th>
<th>Yield (in.3/lb)</th>
<th>Tensile Strength (psi)</th>
<th>Tear Strength (psi)</th>
<th>Elongation (%)</th>
<th>Shrink (in./in.)</th>
<th>Volumetric Yield (in.)</th>
<th>Demold Time (hr.)</th>
<th>Gel Time (min.)</th>
<th>Resin:Hardener</th>
<th>Color</th>
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<tbody>
<tr>
<td>Freeman 1035</td>
<td>1:1</td>
<td>1,500</td>
<td>2</td>
<td>35</td>
<td>16</td>
<td>1.02</td>
<td>27.2</td>
<td>420</td>
<td>1,000</td>
<td>–</td>
<td>85</td>
<td>–</td>
<td>0.001</td>
<td>Lt. Brown</td>
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</tr>
<tr>
<td>Freeman 1040</td>
<td>10:100</td>
<td>1,350</td>
<td>2</td>
<td>45-55</td>
<td>24</td>
<td>1.04</td>
<td>26.6</td>
<td>1,257</td>
<td>225</td>
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<td>–</td>
<td>0.001</td>
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<tr>
<td>RenCast 6400-3</td>
<td>10:100</td>
<td>1,700</td>
<td>2</td>
<td>52</td>
<td>24</td>
<td>1.04</td>
<td>26.6</td>
<td>1,143</td>
<td>251</td>
<td>132</td>
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<td>0.001</td>
<td>Off-White</td>
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<tr>
<td>RenCast 6401-3</td>
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<td>1,200</td>
<td>1.5</td>
<td>65</td>
<td>16-24</td>
<td>1.07</td>
<td>25.9</td>
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<td>1.04</td>
<td>26.6</td>
<td>504</td>
<td>340</td>
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<td>–</td>
<td>–</td>
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<tr>
<td>ISOMold URP-4102</td>
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<td>1,025</td>
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<td>25-30</td>
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<td>27.2</td>
<td>907</td>
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<td>1.11</td>
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<td>450</td>
<td>–</td>
<td>78</td>
<td>9</td>
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<td>48-52</td>
<td>7-8</td>
<td>1.04</td>
<td>26.6</td>
<td>910</td>
<td>530</td>
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<td>25</td>
<td>20</td>
<td>0.001</td>
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<td>ASTM</td>
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<td>D-2393</td>
<td>–</td>
<td>D-2240</td>
<td>D-2471</td>
<td>–</td>
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<td>D-792</td>
<td>D-638</td>
<td>D-624</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<td></td>
</tr>
</tbody>
</table>

Freeman 1035

This flexible beige material is excellent for making molds with deep undercuts or where a flexible mold makes demolding easier. This economical urethane features a one to one mix ratio by weight or volume, making mixing easy and convenient. It is castable up to 2” thick.

- 30 min. gel time
- 16 hour demold
- 35 Shore A

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>055129</td>
<td>Pint Kit</td>
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<tr>
<td>055401</td>
<td>Gallon Kit</td>
<td>16</td>
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<tr>
<td>055402</td>
<td>5 Gallon Kit</td>
<td>80</td>
</tr>
<tr>
<td>055403</td>
<td>Drum Kit</td>
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</table>

Freeman 1040

This flexible urethane is an excellent low-cost alternative to RTV silicone rubber mold making materials. Like most castable urethane rubber systems, it is ideal for general flexible mold construction, flexible parts and gaskets, plaster casting, and prototypes. Freeman 1040 is off-white, flows easily, features a high tear strength and is castable up to 2” thick.

- 38 min. gel time
- 24 hour demold
- 52 Shore A

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>055130</td>
<td>Gallon Kit</td>
<td>8.8</td>
</tr>
<tr>
<td>055131</td>
<td>2 Quarts (Resin)</td>
<td>4</td>
</tr>
<tr>
<td>055132</td>
<td>5 Gallons (Hardener)</td>
<td>40</td>
</tr>
</tbody>
</table>

Freeman 1040 offers excellent flexibility and a high tear strength.
OVERNIGHT CURE - FLEXIBLE CONTINUED

RenCast 6400-1 / Ren 6400-3
RenCast 6400 is ideal for making flexible molds which can be stripped from parts having undercuts or backdraft. This off-white material can be cast as resilient parts and pads. It is very flexible and tear-resistant and is castable up to 2" thick.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>056548</td>
<td>0.5 lb. Thickening Agent (Resin)</td>
<td>0.5</td>
</tr>
<tr>
<td>056923</td>
<td>1 Gallon Kit</td>
<td>8.8</td>
</tr>
<tr>
<td>056531</td>
<td>2 Quart (Resin)</td>
<td>4</td>
</tr>
<tr>
<td>056922</td>
<td>5 Gallon (Hardener)</td>
<td>40</td>
</tr>
<tr>
<td>056900</td>
<td>5 Gallon (Resin)</td>
<td>40</td>
</tr>
<tr>
<td>056921</td>
<td>55 Gallon (Hardener)</td>
<td>400</td>
</tr>
</tbody>
</table>

SKU Size Net weight (lb.) | 26 min. gel time | 16 hour demold | 65 Shore A
056926 | Gallon Kit | 10 | |
056928 | 1 Gallon (Resin) | 9 | |
056924 | 5 Gallon (Hardener) | 36 | |
056551 | 5 Gallon (Resin) | 40 | |
056925 | 55 Gallon (Hardener) | 450 | |

SKU Size Net weight (lb.) | 26 min. gel time | 16 hour demold | 37 Shore A
057434 | Gallon Kit | 10 | |
056540 | 5 Gallon (Resin) | 35 | |
056942 | 5 Gallon (Hardener) | 35 | |

RenCast 6410-1 / Ren 6410-3
Ideal for producing very flexible molds and resilient parts, this off-white elastomer features a 1:1 mix ratio by weight with low viscosity and is castable up to 4" thick.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>056926</td>
<td>Gallon Kit</td>
<td>14</td>
</tr>
<tr>
<td>056540</td>
<td>5 Gallon (Resin)</td>
<td>35</td>
</tr>
<tr>
<td>056942</td>
<td>5 Gallon (Hardener)</td>
<td>35</td>
</tr>
</tbody>
</table>

SKU Size Net weight (lb.) | 25-30 min. gel time | 16 hour demold | 29 Shore A
057472 | 10 Gallon Kit | 80 | |
057473 | 55 Gallon Kit | 880 | |

SKU Size Net weight (lb.) | These overnight cure elastomers offer incredible flexibility. They are not self-releasing, so make sure to use the appropriate release system to ensure a clean and easy demolding process. You can also use Machinable Wax (page 69) shown above, which naturally features self-releasing properties.
057404 | 2 Quart Kit | 4.6 | |
057405 | 2 Gallon Kit | 18.5 | |
057406 | 10 Gallon Kit | 92.5 | |

ISOMold URP-4106
This blue flexible urethane is used to make molds of detailed masters that contain shallow undercuts. The most common uses include architectural and sculpture reproductions, taxidermy, prototypes, and general moldmaking applications. This economical material features a 1:1 mix ratio by volume for easy use.

SKU Size Net weight (lb.) | 20 min. gel time | 16 hour demold | 35 Shore A
057476 | 10 Gallon Kit | 80 | |
057477 | 55 Gallon Kit | 880 | |

ISOMold UMC 501
Used to make molds of detailed masters that do not contain undercuts, this flexible, beige-colored elastomer is ideal for making concrete molds and form lines.

SKU Size Net weight (lb.) | 20 min. gel time | 16 hour demold | 50 Shore A
057475 | 2 Gallon Kit | 16 | |
057476 | 10 Gallon Kit | 80 | |
057477 | 55 Gallon Kit | 880 | |
Freeman and Ren semi-rigid urethanes are known for their excellent impact strength and abrasion resistance, making them ideal for foundry tooling as well as semi-rigid part production.

**Specifications**

| OverNight Cure - Semi-Rigid | Mix Ratio (by wt.) | Resin:Hardener | Density (g/cc) | Viscosity @130°F (cp) | Density (g/cc) | Volumetric Yield (in.³/lb.) | Shrink (in./in. @ 72°F) | Temp. Strength ( psi ) @ 72°F | Elongation (%) | Tear Strength (psi) @ 72°F | Deflection Temp. (°F) | Mix Ratio (by vol.) | Resin:Hardener | Gel Time @ 72°F | Shore Hardness | Color |
|-----------------------------|--------------------|----------------|---------------|----------------------|---------------|-----------------------------|-------------------------|---------------------------|-----------------|---------------------------|------------------|----------------|----------------|---------------|--------|
| Freeman 1050                | 1:1                | 100:94         | 4             | 26                   | 16            | 85A                         | 1,650                   | 1.10                      | 25.2           | 0.001                     | 2,050           | 510            | 280            | Lt. Amber      |        |
| Freeman 1060                | 100:60             | 100:60         | 2             | 28                   | 16            | 600                         | 2,600                   | 1.05                      | 26.4           | 0.001                     | 3,200           | 300            | 510            | Red, Black     |        |
| Freeman 1066                | 100:50             | 100:50         | 2             | 15-17                | 2-4           | 65D                         | 3,200                   | 1.03                      | 26.9           | 0.0025                    | 3,100           | 140            | 630            | Red, Black     |        |
| RenCast 6402-1/Ren 6402-3   | 35:100             | 31:100         | 1             | 31-33                | 24            | 82A                         | 940                      | 1.08                      | 25.6           | 0.001                     | 2,172           | 270            | 285            | –              |        |
| RenCast 6403-1/Ren 6403-3   | 50:100             | 44:100         | 0.5           | 30                   | 24            | 85-90A                      | 710                      | 1.10                      | 25.2           | 0.001                     | 3,334           | 328            | 419            | Off-White      |        |
| RenCast 6442                | 1:1                | 100:94         | 4             | 28                   | 24            | 85A                         | 1,610                   | 1.09                      | 25.4           | <0.001                    | 2,100           | 525            | 290            | Lt. Amber      |        |
| RenCast 6443                | 100:60             | 100:60         | 2             | 19                   | 24            | 95A                         | 2,450                   | 1.06                      | 26.1           | 0.001                     | 3,500           | 475            | 375            | Lt. Amber      |        |
| RenCast 6444                | 100:60             | 100:60         | 2             | 27                   | 24            | 600                         | 2,500                   | 1.08                      | 25.6           | 0.001                     | 3,400           | 325            | 550            | Lt. Amber      |        |
| RenCast 178-88/Ren 6444     | 100:60             | 100:60         | 2             | 27                   | 24            | 600                         | 2,500                   | 1.05                      | 26.4           | 0.001                     | 3,400           | 325            | 550            | –              |        |
| Flexane 80                  | 77:23              | –              | 4             | 30                   | 10            | 87A                         | 10,000                  | 1.04                      | 26.5           | 0.0018                    | 2,100           | 650            | 350            | –              |        |
| Flexane 94                  | 69:31              | –              | 4             | 10                   | 5             | 97A                         | 6,000                   | 1.04                      | 26.5           | 0.0014                    | 2,800           | 500            | 415            | –              |        |
| ISOMold URP-5122            | 96:100             | 1:1            | 2             | 12                   | 24            | 70-74A                      | 2,650                   | 1.06                      | 26.1           | 0.001                     | 1,568           | 900            | 264            | –              |        |
| ASTM                       | –                  | –              | –             | –                   | D-2471        | –                          | D-2240                   | –                         | –               | –                          | –               | –              | –              | –              |        |
| Both Freeman 1060 and 1066 are available in Red or Black. |

**Freeman 1050**

A tough, semi-flexible urethane that is ideal for creating molds requiring some degree of flexibility, as well as for producing semi-rigid prototypes and finished parts. It features a light amber color, 1:1 mix ratio by weight for easy mixing, and a 26 minute gel time providing ample time for degassing. It is castable up to 4” thick.

- 26 min. gel time
- 16 hour demold
- 85 Shore A

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>055142</td>
<td>Quart Kit</td>
<td>2.5</td>
</tr>
<tr>
<td>055141</td>
<td>Gallon Kit</td>
<td>10</td>
</tr>
<tr>
<td>055139</td>
<td>5 Gallon (Resin)</td>
<td>25</td>
</tr>
<tr>
<td>055140</td>
<td>5 Gallon (Hardener)</td>
<td>25</td>
</tr>
</tbody>
</table>

**Freeman 1060**

An industry standard, Freeman 1060 semi-rigid polyurethane casting resin is renown throughout the industry for its excellent impact strength and abrasion resistance, particularly in foundry tooling and other modeling and prototyping applications requiring strength and durability. Freeman 1060 is available in either red or black, with a maximum cast thickness of 2”.

- 28 min. gel time
- 16 hour demold
- 60 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>065108</td>
<td>Quart Kit (Black)</td>
<td>2.5</td>
</tr>
<tr>
<td>065106</td>
<td>Gallon Kit (Black)</td>
<td>10</td>
</tr>
<tr>
<td>065110</td>
<td>Gallon Kit (Red)</td>
<td>10</td>
</tr>
<tr>
<td>065107A</td>
<td>5 Gallon (Resin)</td>
<td>31.3</td>
</tr>
<tr>
<td>065107B</td>
<td>5 Gallon (Hardener - Black)</td>
<td>18.8</td>
</tr>
<tr>
<td>065118</td>
<td>5 Gallon (Hardener - Red)</td>
<td>18.8</td>
</tr>
<tr>
<td>065116</td>
<td>55 Gallon (Resin)</td>
<td>460</td>
</tr>
<tr>
<td>065117</td>
<td>55 Gallon (Hardener - Black)</td>
<td>280</td>
</tr>
</tbody>
</table>

**Freeman 1066**

With a 65 Shore D hardness, this black or red polyurethane elastomer is specifically designed for highly abrasion resistant foundry tooling. Harder than our Freeman 1060, this product will not deflect as much under high pressure molding processes. It also has increased rigidity in thin wall sections and is able to be machined or sanded without softening. Freeman 1066 features a heat deflection temperature of 181°F, and a maximum cast thickness of 2”.

- 15-17 min. gel time
- 2-4 hour demold
- 65 Shore D

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Net weight (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>055120</td>
<td>Gallon Kit (Black)</td>
<td>9.75</td>
</tr>
<tr>
<td>055119</td>
<td>Gallon Kit (Red)</td>
<td>9.75</td>
</tr>
<tr>
<td>055121</td>
<td>5 Gallon (Resin)</td>
<td>32.5</td>
</tr>
<tr>
<td>055122</td>
<td>5 Gallon (Hardener - Black)</td>
<td>16.3</td>
</tr>
<tr>
<td>055118</td>
<td>5 Gallon (Hardener - Red)</td>
<td>16.3</td>
</tr>
<tr>
<td>055123</td>
<td>55 Gallon (Resin)</td>
<td>420</td>
</tr>
<tr>
<td>055124</td>
<td>55 Gallon (Hardener - Black)</td>
<td>210</td>
</tr>
<tr>
<td>055112</td>
<td>55 Gallon (Hardener - Red)</td>
<td>210</td>
</tr>
</tbody>
</table>
RenCast 6402-1 / Ren 6402-3
This product is a tough, flexible elastomer that features an off-white color and low viscosity for easy mixing and excellent detail reproduction. This system is ideal for production models, metal-forming pads, and a variety of mechanical parts. It is castable up to 1” thick.

- 31-33 min. gel time
- 24 hour demold
- 82 Shore A

RenCast 6403-1 / Ren 6403-3
Ideal for durable parts such as impellers, rollers, gears and wheels, this off-white elastomer features low viscosity, fast cure, high tensile strength and good load recovery. It is castable up to ½” in thickness.

- 30 min. gel time
- 24 hour demold
- 85-90 Shore A

RenCast 6442
Ideal for vibration-dampening applications as well as production and prototype parts, RenCast 6442 features a 1:1 mix ratio by weight, low pot life, light amber color, low viscosity and good wear resistance. It is castable up to 4” in thickness.

- 28 min. gel time
- 24 hour demold
- 85 Shore A

RenCast 6443
RenCast 6443 is light amber in color, cures semi-rigid in mass and is flexible in thin cross-sections. This material is used for foundry patterns and core boxes because it features good abrasion resistance and is moisture tolerant during casting. It is castable up to 2” in thickness.

- 19 min. gel time
- 24 hour demold
- 95 Shore A

RenCast 6444
RenCast 6444 is highly specified for the most demanding wear applications such as foundry patterns and core boxes. It features low viscosity and good working life allowing for ease of handling and release of entrapped air. It is castable up to 2” in thickness.

- 27 min. gel time
- 24 hour demold
- 60 Shore D

RenCast 178-88
This is the red-colored version of RenCast 6444 for foundry patterns. It uses the RenCast 6444 hardener.

- 27 min. gel time
- 24 hour demold
- 60 Shore D

Devcon Flexane 80
Featuring low shrink and high chemical and abrasion resistance, this black-colored material is ideal for creating flexible molds and holding fixtures. The Flex-Add additive may be used with Flexane 80 Liquid to produce a lower durometer castable urethane.

- 30 min. gel time
- 10 hour demold
- 87 Shore A

Devcon Flexane 94
Flexane 94 features low shrink and high chemical and abrasion resistance. It is a black, semi-rigid material for creating extremely tough, flexible molds and non-marring holding and assembly fixtures.

- 10 min. gel time
- 5 hour demold
- 97 Shore A

ISOMold URP-5122
This semi-rigid urethane is used to make molds of detailed masters that do not contain undercuts. The most common uses include foundry patterns and core boxes, gaskets, liners, and fixtures. This dark amber, economical material features a 1:1 mix ratio by volume for ease of use.

- 15 min. gel time
- 16 hour demold
- 70 Shore A
OVERNIGHT CURE - RIGID

These harder polyurethanes have a variety of uses including prototyping thermoplastic-like parts, constructing molds for low-volume metal forming applications, and heat-resistant foundry tooling. The long gel time to provide sufficient time to vacuum degas prior to pouring. A 16-24 hour cure time is required before demolding.

Specifications

| RenCast 6405-1 | Mix:Resin:Hardener 90:100 | Gel Time: 45-55 minutes | Demold Time: 24 hours | Shore D: 75 | Viscosity @ 73°F (cP): 6400 | Density (g/cc): 1.13 | Shrink: 0.001 | Compressive Strength: 220 psi | Flexural Modulus: 24.5 MPa | Tensile Strength: 14,500 psi | Flexural Strength: 17.2 MPa |
| Synthene HRI 120 | Mix:Resin:Hardener 100:75 | Gel Time: 22 minutes | Demold Time: 24 hours | Shore D: 87 | Viscosity @ 73°F (cP): 650400 | Density (g/cc): 1.18 | Shrink: 0.001 | Compressive Strength: 220 psi | Flexural Modulus: 23.4 MPa | Tensile Strength: 16,218 psi | Flexural Strength: 17.2 MPa |

POLYURETHANE ACCESSORIES

Devcon Flexane FL-10 Primer
This blue, one-component adhesion promoter increases the bonding strength of liquid polyurethanes to metal surfaces. To use, apply two coats to a clean and roughened metal surface permitting 15 minutes between applications and 30 minutes prior to pouring the urethane. Offered in a 4 oz. can. (SKU #054635)

Devcon Flexane FL-20 Primer
FL-20 is an orange, one-component adhesion promoter that increases the bonding strength of liquid polyurethanes to concrete, rubber, urethane, wood, fiberglass, and cured epoxy surfaces. To use, apply two coats to the clean and roughened surface permitting 15 minutes between applications and 30 minutes prior to pouring the urethane. Offered in a 4 oz. can. (SKU #054639)

Freeman 302 Urethane Protectant
Freeman 302 is an inert gas used to preserve and prolong the usable life of moisture sensitive polyurethanes. Before sealing the containers, spray a short burst of Freeman 302 in the open container and seal immediately. Repeat after every use. Offered in a 10 oz. aerosol can. (SKU #054706)

Ren Accelerators
These liquid catalysts accelerate the curing process and reduce demold times. Mix thoroughly in the hardener before adding the required amount of resin. Ren 178-57 is for use ONLY with RenCast 6442, 6443, 6444, Freeman 1050, or Freeman 1060. Ren 178-62 is for use ONLY with RenCast 6400, 6401, 6402, 6403, 6405, 6410 or Freeman 1040. (SKU #054706)
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.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Description</th>
<th>Cups/package</th>
<th>Cups/Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>054037</td>
<td>Lined Paper Cups (16 oz.)</td>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td>054042</td>
<td>Lined Paper Cups (32 oz.)</td>
<td>25</td>
<td>500</td>
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<tr>
<td>054048</td>
<td>Untreated Paper Cups (83 oz.)</td>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>054050</td>
<td>Untreated Paper Cups (165 oz.)</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

Plain Plastic Cups
These cups are ideal for all types of tooling and reproduction plastics. They are made of high-density polyethylene (HDPE), white in color, and unmarked. Cups sold individually.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Cups/case</th>
</tr>
</thead>
<tbody>
<tr>
<td>054031</td>
<td>12 oz. Cups</td>
<td>500</td>
</tr>
<tr>
<td>054036</td>
<td>16 oz. Cups</td>
<td>500</td>
</tr>
<tr>
<td>054041</td>
<td>32 oz. Cups</td>
<td>500</td>
</tr>
<tr>
<td>054047</td>
<td>64 oz. Cups</td>
<td>200</td>
</tr>
<tr>
<td>054049</td>
<td>85 oz. Cups</td>
<td>200</td>
</tr>
<tr>
<td>054055</td>
<td>128 oz. Cups</td>
<td>120</td>
</tr>
<tr>
<td>054051</td>
<td>166 oz. Cups</td>
<td>120</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Cups/case</th>
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</thead>
<tbody>
<tr>
<td>054025</td>
<td>24 oz.</td>
<td>100</td>
</tr>
<tr>
<td>054026</td>
<td>48 oz.</td>
<td>50</td>
</tr>
</tbody>
</table>

Wood Mixing Paddles
Wood mixing paddles for both gallon and 5 gallon containers. Both paddles are ideal for paint, urethanes, epoxies, or any other liquid. Sold by the box.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Description</th>
<th>Thickness</th>
<th>Width</th>
<th>Length</th>
<th>Qty/box</th>
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</thead>
<tbody>
<tr>
<td>054524</td>
<td>Paddles for 1 Gallon</td>
<td>⅛”</td>
<td>1⅛”</td>
<td>14”</td>
<td>50</td>
</tr>
<tr>
<td>054521</td>
<td>Paddles for 1 Gallon</td>
<td>⅛”</td>
<td>1⅛”</td>
<td>14”</td>
<td>500</td>
</tr>
<tr>
<td>054525</td>
<td>Paddles for 5 Gallon</td>
<td>7⁄32”</td>
<td>13⁄8”</td>
<td>21”</td>
<td>250</td>
</tr>
</tbody>
</table>

Tongue Depressors
These polished hardwood depressors are excellent for mixing small quantities of tooling plastics and repair materials.

<table>
<thead>
<tr>
<th>SKU</th>
<th>Size</th>
<th>Qty/box</th>
</tr>
</thead>
<tbody>
<tr>
<td>054520</td>
<td>¼” x 6”</td>
<td>500</td>
</tr>
</tbody>
</table>

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.
- Sheet Wax should be seated with aerosol version.
- 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.
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 x W x H

Volume of a Cylinder
R x R x H x 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

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

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.
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.

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.

Ontario
3600B Laird Road Unit 8
Mississauga, ON L5L 6A7
TEL 800-345-9259
FAX 586-774-1019

Quebec
3475 boul Pitfield
Montreal, QC H4S 1H3
TEL 800-263-7699
TEL 514-335-3530
FAX 514-335-3225

Ohio (Headquarters)
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Avon, OH 44011
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