Reduce time-to-market with tooling produced from Ren laminating systems, casting materials and pastes.
The versatile product line of epoxies and several polyurethanes with a broad range of physical and performance properties for tooling applications. Vantico, Ren Tooling Systems manufactures and markets a full line of tooling systems and techniques that can help optimize product performance and tool quality. In addition to a complete product line, we offer customers technical support on the use of tooling systems and techniques.
Laminating Materials

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Mixing Ratio, Room to Hardener, By Weight</th>
<th>Gel Time, min.</th>
<th>Mixed Viscosity, Bloodfield, cP</th>
<th>Specific Gravity</th>
<th>Volumetric Weight, cu. in/lb.</th>
<th>Hardness, Shore D</th>
<th>Ultimate Compressive Strength, psi @ 77°F (25°C)</th>
<th>Ultimate Flexural Strength, psi @ 77°F (25°C)</th>
<th>Ultimate Tensile Strength, psi @ 77°F (25°C)</th>
<th>T.g.° F (°C)</th>
<th>Coefficient of Thermal Expansion, K/H/F</th>
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<tbody>
<tr>
<td><strong>Typical Properties of Room-temperature Laminating Materials</strong></td>
<td></td>
<td></td>
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<tr>
<td>RP 1700-1 R/H</td>
<td>100/26</td>
<td>20</td>
<td>2,000</td>
<td>(Cast 1.13)</td>
<td>18.5</td>
<td>90</td>
<td>28,000</td>
<td>37,000</td>
<td>26,000</td>
<td>164 (73)</td>
<td>10 x 10⁻⁶</td>
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<tr>
<td>RP 1710 R/H</td>
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<td>22</td>
<td>3,500</td>
<td>(Cast 1.35)</td>
<td>18.8</td>
<td>90</td>
<td>23,000</td>
<td>30,000</td>
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<td>RP 2720 R/H</td>
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<td>1.70</td>
<td>16.3</td>
<td>84</td>
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<td>21,701</td>
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<tr>
<td>TDT 231-1 R/H</td>
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<td>25</td>
<td>1,800</td>
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<td>18.7</td>
<td>90</td>
<td>23,000</td>
<td>36,000</td>
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<tr>
<td>TDT 232-1 R/H</td>
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<td>35</td>
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<td>1.36</td>
<td>20.5</td>
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<td>22,000</td>
<td>37,000</td>
<td>26,000</td>
<td>154 (68)</td>
<td>11 x 10⁻⁶</td>
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<td><strong>Typical Properties of Heat-resistant Laminating Materials</strong></td>
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<tr>
<td>RP 4005R/RP 1500H</td>
<td>100/14</td>
<td>50</td>
<td>1,900</td>
<td>1.19</td>
<td>23.3</td>
<td>90</td>
<td>28,000</td>
<td>35,000</td>
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<td>RP 4005R/RP 1500H</td>
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<td>100/14</td>
<td>90</td>
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<td>1.30</td>
<td>21.4</td>
<td>93</td>
<td>33,700</td>
<td>37,200</td>
<td>26,500</td>
<td>351 (177)</td>
<td>8.3 x 10⁶</td>
</tr>
<tr>
<td>RP 4017R/RP 1500H</td>
<td>100/15</td>
<td>90</td>
<td>8,000</td>
<td>1.42</td>
<td>29.6</td>
<td>93</td>
<td>44,000</td>
<td>77,000</td>
<td>80,000</td>
<td>385 (166)</td>
<td>34 x 10⁻⁶</td>
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<td>CGL 1310R/RP 1510H</td>
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<td>400</td>
<td>9,000</td>
<td>1.25</td>
<td>22.3</td>
<td>91</td>
<td>43,000</td>
<td>82,000</td>
<td>77,000</td>
<td>412 (177)</td>
<td>25 x 10⁻⁶</td>
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<tr>
<td><strong>Typical Properties of Room-temperature Laminating Pastes</strong></td>
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<td></td>
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</tr>
<tr>
<td>RP 569R/RP 569-1H</td>
<td>100/11</td>
<td>35</td>
<td>Dough-like</td>
<td>1.20</td>
<td>23</td>
<td>80</td>
<td>8,000</td>
<td>4,600</td>
<td>2,800</td>
<td>150 (63)</td>
<td>38 x 10⁻⁶</td>
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<td>RP 569R/RP 569-2H</td>
<td>100/14</td>
<td>50</td>
<td>Dough-like</td>
<td>1.14</td>
<td>21</td>
<td>80</td>
<td>5,000</td>
<td>4,000</td>
<td>1,800</td>
<td>138 (60)</td>
<td>48 x 10⁻⁶</td>
</tr>
</tbody>
</table>

Room-temperature Laminating Materials

- **RP 286 R/H White, Fast Strength, Filled**
  - Thixotropic laminating system with easy-to-handle viscosity and outstanding compressive strength. For laminated tools and structures.
- **RP 1700-1 R/H Translucent, Low Viscosity, Unfilled**
  - Hand lay-up of fiberglass and other reinforcing fabrics and for bonding tools.
- **RP 1710 R/H**
  - Mixed viscosity, Bloodfield cP: 2,400; Specific Gravity: 1.42; Volumetric Weight, cu. in/lb: 19.6; Hardness, Shore D: 90; Ultimate Compressive Strength, psi @ 77°F (25°C): 40,400; Ultimate Flexural Strength, psi @ 77°F (25°C): 35,300; Ultimate Tensile Strength, psi @ 77°F (25°C): 26,500; T.g.° F (°C): --; Coefficient of Thermal Expansion, K/H/F: --.
- **RP 1720 R/H**
  - Mixed viscosity, Bloodfield cP: 2,200; Specific Gravity: 1.34; Volumetric Weight, cu. in/lb: 20.5; Hardness, Shore D: 86; Ultimate Compressive Strength, psi @ 77°F (25°C): 21,000; Ultimate Flexural Strength, psi @ 77°F (25°C): 32,000; Ultimate Tensile Strength, psi @ 77°F (25°C): 20,000; T.g.° F (°C): 164 (73); Coefficient of Thermal Expansion, K/H/F: 11 x 10⁻⁶.
- **RP 3270 R/H**
  - Mixed viscosity, Bloodfield cP: 3,600; Specific Gravity: 1.70; Volumetric Weight, cu. in/lb: 16.3; Hardness, Shore D: 84; Ultimate Compressive Strength, psi @ 77°F (25°C): 23,000; Ultimate Flexural Strength, psi @ 77°F (25°C): 30,000; Ultimate Tensile Strength, psi @ 77°F (25°C): 21,701; T.g.° F (°C): 171 (77); Coefficient of Thermal Expansion, K/H/F: 11 x 10⁻⁶.
- **TDT 231-1 R/H**
  - Mixed viscosity, Bloodfield cP: 1,800; Specific Gravity: 1.14; Volumetric Weight, cu. in/lb: 18.7; Hardness, Shore D: 90; Ultimate Compressive Strength, psi @ 77°F (25°C): 23,000; Ultimate Flexural Strength, psi @ 77°F (25°C): 36,000; Ultimate Tensile Strength, psi @ 77°F (25°C): 26,800; T.g.° F (°C): 160 (71); Coefficient of Thermal Expansion, K/H/F: 10 x 10⁻⁶.
- **TDT 232-1 R/H**
  - Mixed viscosity, Bloodfield cP: 2,000; Specific Gravity: 1.36; Volumetric Weight, cu. in/lb: 20.5; Hardness, Shore D: 94; Ultimate Compressive Strength, psi @ 77°F (25°C): 22,000; Ultimate Flexural Strength, psi @ 77°F (25°C): 37,000; Ultimate Tensile Strength, psi @ 77°F (25°C): 26,000; T.g.° F (°C): 154 (68); Coefficient of Thermal Expansion, K/H/F: 11 x 10⁻⁶.

Typical Properties of Room-temperature Laminating Materials

- **RP 3270 R/H Blue, Fast Demolding, Glass Reinforced**
  - Epoxy-based, quick-setting material with good work life. Provides good cloth wet-out and moisture resistance. Requires postcure to attain full physical properties. Designed for use with RP 1124 R/H Surfacing coat to produce high-quality, durable tools.
- **RP 1124 R/H Surface Coat**
  - Wet lay-up system with a 90-minute work life that can withstand temperatures to 300°F (149°C). For use with RP 1124 R/H Surfacing coat to produce large vacuum-form and compression molds with intricate surface detail.
- **TC 4005R/RP 1500H Black, 400°F (200°C) System, Unfilled**
  - Multifunctional epoxy-based laminating system with a long three-hour work life. Provides excellent high-temperature performance after an elevated-temperature postcure. For fabricating high-strength tools that will be exposed to very high temperatures.
- **RP 569R/RP 569-1H Blue, Fast Demolding, Glass Reinforced**
  - Easy-to-handle paste for quick, one-step construction of room-temperature but requires an elevated-temperature postcure. Developed for fabricating large vacuum-form and compression molds as well as other high-temperature tooling.
Casting Materials

Typical Properties of Room-temperature Epoxy Casting Materials

<table>
<thead>
<tr>
<th>Product Mixing Ratio, Gel Time, min.</th>
<th>Mixed Viscosity, Brookfield, CP</th>
<th>Specific Gravity</th>
<th>Volumetric Weight, cu. in./lb.</th>
<th>Hardness, Shore D</th>
<th>Ultimate Compressive Strength, psi @ 77°F (25°C)</th>
<th>Ultimate Flexural Strength, psi @ 77°F (25°C)</th>
<th>Ultimate Tensile Strength, psi @ 77°F (25°C)</th>
<th>Tg, °F (°C)</th>
<th>Coefficient of Thermal Expansion, in./in./°F</th>
<th>Shrinkage, in./in. (Cast)</th>
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<tbody>
<tr>
<td>RP 300 R/H 20%</td>
<td>20,000</td>
<td>1.74</td>
<td>15.9</td>
<td>88</td>
<td>12,000</td>
<td>10,600</td>
<td>6,000</td>
<td>158 (70)</td>
<td>13 x 10⁻⁶</td>
<td>0.0017 Mold #0</td>
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<td>RP 306 R/H 20%</td>
<td>10,000</td>
<td>2.27</td>
<td>12.2</td>
<td>89</td>
<td>14,000</td>
<td>8,600</td>
<td>5,800</td>
<td>—</td>
<td>—</td>
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<tr>
<td>RP 3215 R/H 10%</td>
<td>4,500</td>
<td>0.90</td>
<td>30.7</td>
<td>80</td>
<td>12,500</td>
<td>4,400</td>
<td>3,100</td>
<td>145 (63)</td>
<td>48 x 10⁻⁶</td>
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<tr>
<td>RP 1774 R/H 20%</td>
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<td>0.25</td>
<td>102.0</td>
<td>57</td>
<td>450</td>
<td>380</td>
<td>—</td>
<td>117 (47)</td>
<td>32 x 10⁻⁶</td>
<td>0.003 Mold #0</td>
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<tr>
<td>RP 3209 R/H 10%</td>
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<td>2.04</td>
<td>13.5</td>
<td>75</td>
<td>16,500</td>
<td>8,400</td>
<td>5,500</td>
<td>160 (71)</td>
<td>26 x 10⁻⁶</td>
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</tr>
<tr>
<td>RP 3209-2 R/H 10%</td>
<td>15,000</td>
<td>2.15</td>
<td>12.9</td>
<td>85</td>
<td>11,500</td>
<td>8,000</td>
<td>5,000</td>
<td>138 (59)</td>
<td>32 x 10⁻⁶</td>
<td>0.006 Mold #0</td>
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<tr>
<td>RP 3215-1 R/H 10%</td>
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<td>1.76</td>
<td>15.9</td>
<td>90</td>
<td>13,300</td>
<td>7,600</td>
<td>6,000</td>
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<tr>
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<td>1.65</td>
<td>16.9</td>
<td>88</td>
<td>11,100</td>
<td>7,300</td>
<td>4,900</td>
<td>154 (68)</td>
<td>38 x 10⁻⁶</td>
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<tr>
<td>RP 3215-3 R/H 10%</td>
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<td>12,600</td>
<td>6,900</td>
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<tr>
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<td>9.3</td>
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<td>15,200</td>
<td>8,500</td>
<td>7,100</td>
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<td>88</td>
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<td>8,500</td>
<td>6,000</td>
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<tr>
<td>RP 3262 R/H 10%</td>
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<td>16.7</td>
<td>86</td>
<td>14,400</td>
<td>10,300</td>
<td>7,300</td>
<td>180 (82)</td>
<td>27 x 10⁻⁶</td>
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<td>2,000</td>
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<td>25.0</td>
<td>75</td>
<td>14,000</td>
<td>2,200</td>
<td>2,000</td>
<td>136 (58)</td>
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<tr>
<td>RP 3269-1 R/H 10%</td>
<td>4,300</td>
<td>1.78</td>
<td>15.6</td>
<td>87</td>
<td>14,400</td>
<td>13,000</td>
<td>8,700</td>
<td>171 (77)</td>
<td>38 x 10⁻⁶</td>
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<td>1.70</td>
<td>16.3</td>
<td>87</td>
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<td>11,600</td>
<td>7,300</td>
<td>146 (63)</td>
<td>—</td>
<td>0.003 Mold #0</td>
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</tbody>
</table>

Room-temperature Epoxy Casting Materials

RP 200 R/H Gray, Low Shrinkage, Aluminum Filled

Low-viscosity, machinable system that reproduces fine detail with minimal voids. For stretch form dies, lost wax molds and patterns.

RP 206 R/H Black, High Density, Filled

Low-viscosity, low-shrink epoxy that reproduces fine surface detail. For forming molds, patterns and checking or holding fixtures.

RP 306 R/H Brown, Low Density, Microballoon Filled

Easy-to-mix and pour syntactic foam that reproduces fine detail, is virtually unaffected by high humidity and is hand carvable. Designed for patterns, cores and surface castings up to 1-in. (2.5-cm) thick.

RP 3214 R/H Black, Impact Resistant, Iron Oxide Filled

Low-shrinkage product with long work life and high compressive and flexural strength. Can be cast to 2-in. (5-cm) thick for production of stretch press forms, foundry patterns, core boxes, holding fixtures and drop hammer dies.

RP 3209-2 R/H Black, Thick Casting, Iron Oxide Filled

Easy-to-handle system with an extended gel time that can be cast against metal up to 6-in. (15-cm) thick. Formulated for chuck jaws, production castings, patterns, molds and backfilling.

RP 3215-1 R/H Black, Impact Resistant, Iron Oxide Filled

Low-shrinkage, low-viscosity system that produces good wear resistance. For casting forming dies, foundry patterns and fixtures up to 3/4-in. (2-cm) thick.

RP 3215-2 R/H Black, Thick Casting, Iron Oxide Filled

General purpose, low-viscosity material with slower cure cycle to permit backfilling and casting of dies and foundry patterns, up to 4-in. (10-cm) thick, against metal.

RP 3215-3 R/H Black, Variable Hardness, Iron Oxide Filled

Low-viscosity, machinable system that produces resilient, chip-resistant castings with hardnesses from Shore 45D to 85D. Can be cast against metal up to 4-in. (10-cm) thick for dies, fixtures and patterns.

RP 3253 R/H Black, Wear Resistant, Iron Oxide Filled

Tough material with outstanding resistance to surface abrasion. Designed for thin (1/4-in., 2-cm) castings used in dies, punches, core boxes and hammer forms.

RP 3261 R/H Black, Impact Resistant, Iron Oxide Filled

Casting system with excellent flow which also can be used as a surface coating. Accurately reproduces surface detail from patterns and models and forms castings with high compressive and flexural strengths. For foundry patterns, hammer form dies, core boxes and holding fixtures cast against metal up to 1/2-in. (1-cm) thick.

RP 3262 R/H Gray, High Strength, Aluminum Filled

Low-viscosity, machinable material with long work life. Reproduces fine detail in castings, up to 4-in. (10-cm) thick, formed against metal. Developed for patterns, hammer forms, holding fixtures, drop hammer dies and backfilling.

RP 3266 R/H Gray, High Strength, Aluminum Filled

Low-shrinkage system with high strength and good machinability. For casting duplicate models, stretch dies and contour checking blocks up to 3/4-in. (2-cm) thick as well as for surface casting fixtures, dies and lost wax molds.

RP 3269 R/H Gray, Low Shrinkage, Alloyed

Low-shrinkage system with low shrinkage. For mold back-ups and other applications. Easy-to-handle, slow-rising (1-3x expansion), three-component epoxy system with low shrinkage. For mold back-ups and other lightweight tools.
### Casting Materials

#### Typical Properties of Room-temperature Polyurethane Casting Materials

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Mixing Ratio, Resin to Hardener, By Weight</th>
<th>Gel Time, min.</th>
<th>Mixed Viscosity, Brookfield cP</th>
<th>Specific Gravity</th>
<th>Volumetric Weight, cu. in./lb.</th>
<th>Hardness, Shore D</th>
<th>Ultimate Compressive Strength psi @ 77°F (25°C)</th>
<th>Ultimate Flexural Strength psi @ 77°F (25°C)</th>
<th>Ultimate Tensile Strength psi @ 77°F (25°C)</th>
<th>Tg* °F (°C)</th>
<th>Coefficient of Thermal Expansion, in./in./°F</th>
<th>Shrinkage, in./in. (Cast)</th>
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<td>1.79</td>
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<td>83</td>
<td>6,800</td>
<td>4,250</td>
<td>2,800</td>
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<td>33 x 10^-6</td>
<td>0.002 Musl #1</td>
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<tr>
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<td>81</td>
<td>7,200</td>
<td>5,000</td>
<td>3,300</td>
<td>203 (95)</td>
<td>25 x 10^-6</td>
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<tr>
<td>RP 200 R/H</td>
<td>100/100</td>
<td>7-10</td>
<td>1,500</td>
<td>1.78</td>
<td>15.6</td>
<td>83</td>
<td>7,400</td>
<td>4,900</td>
<td>3,100</td>
<td>190 (88)</td>
<td>25 x 10^-6</td>
<td>0.0017 Musl #1</td>
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<tr>
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<td>7-10</td>
<td>4,500</td>
<td>2.03</td>
<td>13.7</td>
<td>80</td>
<td>6,800</td>
<td>3,000</td>
<td>1,800</td>
<td>189 (87)</td>
<td>36 x 10^-6</td>
<td>0.005 Musl #1</td>
</tr>
<tr>
<td>RP 132 R/H</td>
<td>100/100</td>
<td>5-7</td>
<td>5,000</td>
<td>1.71</td>
<td>16.3</td>
<td>84</td>
<td>8,200</td>
<td>6,700</td>
<td>4,200</td>
<td>192 (89)</td>
<td>19 x 10^-6</td>
<td>0.0028 Musl #1</td>
</tr>
</tbody>
</table>

#### Typical Properties of Silicone Rubber Moldmaking System

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Mixing Ratio, Resin to Hardener, By Weight</th>
<th>Gel Time, min.</th>
<th>Mixed Viscosity, Brookfield cP</th>
<th>Specific Gravity</th>
<th>Volumetric Weight, cu. in./lb.</th>
<th>Hardness, Shore D</th>
<th>Ultimate Compressive Strength psi @ 77°F (25°C)</th>
<th>Ultimate Flexural Strength psi @ 77°F (25°C)</th>
<th>Ultimate Tensile Strength psi @ 77°F (25°C)</th>
<th>Tg* °F (°C)</th>
<th>Coefficient of Thermal Expansion, in./in./°F</th>
<th>Shrinkage, in./in. (Cast)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP 6473 Si R/H</td>
<td>100/7</td>
<td>150-200</td>
<td>30,000-60,000</td>
<td>1.01</td>
<td>27.5</td>
<td>30A</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

#### Typical Properties of Heat-resistant Epoxy Casting Materials

<table>
<thead>
<tr>
<th>Product Number</th>
<th>Mixing Ratio, Resin to Hardener, By Weight</th>
<th>Gel Time, min.</th>
<th>Mixed Viscosity, Brookfield cP</th>
<th>Specific Gravity</th>
<th>Volumetric Weight, cu. in./lb.</th>
<th>Hardness, Shore D</th>
<th>Ultimate Compressive Strength psi @ 77°F (25°C)</th>
<th>Ultimate Flexural Strength psi @ 77°F (25°C)</th>
<th>Ultimate Tensile Strength psi @ 77°F (25°C)</th>
<th>Tg* °F (°C)</th>
<th>Coefficient of Thermal Expansion, in./in./°F</th>
<th>Shrinkage, in./in. (Cast)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP 4036/R/RP 1511H</td>
<td>100/13</td>
<td>140</td>
<td>15,000</td>
<td>1.58</td>
<td>17.6</td>
<td>91</td>
<td>25,800</td>
<td>9,300</td>
<td>6,300</td>
<td>350 (177)</td>
<td>22 x 10^-6</td>
<td>0.005 Musl #3</td>
</tr>
<tr>
<td>Cast-IT 2000</td>
<td>100/7</td>
<td>60</td>
<td>50,000</td>
<td>2.1</td>
<td>13.2</td>
<td>91</td>
<td>25,500</td>
<td>14,000</td>
<td>9,000</td>
<td>408 (209)</td>
<td>15 x 10^-6</td>
<td>0.001 Musl #2</td>
</tr>
</tbody>
</table>

#### Room-temperature Polyurethane Casting Materials

PUR-FECT TOOL 1: Gray, Fast Curing, Filled

Low-shrinkage polyurethane with a Shore 83D hardness, excellent dimensional stability, good abrasion and impact resistance and high compressive strength. Useful for duplicating molds, assembly jigs and fixtures, and short-run foundry patterns, core boxes and molds cast up to 4-in. (10-cm) thick.

Pro-Cast 10 Black or Tan, 30-60 Minute Demold, Filled

Fast-setting, low-shrinkage polyurethane that reproduces fine detail. For prototype parts, molds and shapes. RP 1220 R/H Green, Sag Resistant

Tough, low-shrinkage, machinable system that is useful as a base coat for spinned aircraft/containers and as a repair paste for router fixtures and a potting material for bushings and inserts.

Pro-Cast 20 Off-White, Blue or Gray, 60-90 Minute Demold, Filled

Fast-setting, low-shrinkage polyurethane with a Shore 85D hardness. For molds, patterns and shop aids.

Pro-Cast 30 Gray, Thermally Conductive, Aluminum Filled

Machinable polyurethane that reproduces fine detail and can be demolded after 60 minutes. For patterns, molds and shop aids.

Pro-Cast 10 Gray, Fast Setting, Filled

Tough, fast-curing polyurethane that offers accurate reproduction of detail. For holding fixtures, foundry patterns and vacuum-form molds.

Silicone Rubber Moldmaking System

RP 6473 Si R/H Clear, High Elongation

Tough, flexible silicone rubber with a Shore hardness of 30A, elongation of 300 and tear strength of 60 psi. Designed for casting vacuum-form and compression injection molds.

Room-temperature Paste Materials

RP 1220 R/H Green, Sag Resistant

Tough, low-shrinkage, machinable system that is useful as a base coat for spinned aircraft/containers and as a repair paste for router fixtures and a potting material for bushings and inserts.

RP 1232 R/H Gray, Fast Setting, Filled

Tough, fast-curing polyurethane that offers accurate reproduction of detail. For holding fixtures, foundry patterns and vacuum-form molds.

Room-temperature Temperature Paste Materials

RP 1220 R/H Green, Sag Resistant

Tough, low-shrinkage, machinable system that is useful as a base coat for spinned aircraft/containers and as a repair paste for router fixtures and a potting material for bushings and inserts.
**Accessories**

**Coloring Pastes**
Easy-to-blend pastes packaged in tubes and galsons for custom-coloring of epoxy, polyurea and polyurethane materials. Available colors:
- DW-0137 - Black
- DW-0135 - Blue
- DW-0136 - Brown
- DW-0133 - Red
- DW-0134 - Green
- DW-0131 - White
- DW-0132 - Yellow

Colors available for Parts-in-Minutes® polyurethanes:
- PIM - Blue
- PIM - Red
- PIM - Black
- PIM - Green
- PIM - Yellow

**RP 32 Fiberglass Milled Fibers**
Fibers measuring approximately 1/32 in. (1 mm) that can increase impact strength, heat-distortion temperature and dimensional stability of epoxy compounds.

**RP 34 Aluminum Powder**
Powder that retains high strength at high loading levels. Easy to dry and machine with minimal breakage and chip-out.

**RP 35 White Floc**
Easy-to-use cellulose floc for thickening epoxy materials.

**RP 37 Aluminum Alloy Puffs**
Measuring 3/8 in. to 1/2 in. (1 cm), puffs are easy to mix and wet-out when added to laminating and casting systems. Provide high-strength-to-weight ratio in mixed systems and minimize shrink and exotherm. Designed for filling vacuum chambers and constructing tool backups.

**RP 38 Aluminum Granules**
Fine, 145-mesh granules that permit high filler loading to improve impact and compressive strength in laminating systems. For use in dies, compression and injection molds.

**RP 39 Aluminum Grain**
Particles measuring 3/16 in. (2 mm) in diameter and from 1/8-in. to 1/4-in. (3-mm to 6-mm) long for easy mixing and pouring of mass-casting systems. Designed for casting back-up structures on a variety of patterns and tools.

**RP 40 Aluminum Shot**
Very easy-to-mix particles measuring approximately 3/16 in. (5 mm) in diameter. Feature high cured compressive strength.

**RP 64 Treated, Glass Cloth Tape**
Style 7500. Epoxy-based, fiberglass tape with selvaged edges supplied in widths of 1-1/2 in., 3 in., 6 in. and 12 in. (4 cm, 8 cm, 15 cm and 30 cm). For a broad range of laminating applications.

**RP 70-5 Hand Cleaner**
All-purpose cleaner for use with and without water to remove grease, uncured plastics and adhesives, paint, stains and other shop dirt from hands and tools.

**RP 78-2 Release Agent**
Aerosol silicone-based release film that forms a slick surface that is non-melting and heat-resistant up to 400°F (204°C). Formulated specifically for use on epoxies and polyurethanes. It is not recommend-ed for releasing silicone rubber from silicone rubber.

**RP 79-2 Release Agent**
Aerosol, semi-permanent, dry-film Teflon®-based release agent formulated without wax or silicone. Resists transfer from the mold to the part. Designed for use on epoxies, polyurethanes and polyesters.

**RP 802 Sealer**
Green, PVC-based lacquer sealer that can be sprayed or brushed on plaster or wood surfaces.

**RP 803 Release Agent**
White, wax-based, liquid parting agent that produces an exceptionally thin film to ensure accurate pick-up of minute detail. Contains a trace amount of silicone. Dries clear and can be polished to a high gloss. Can be used on metal, wood, plastic and composites.

**RP 804 Release Film**
Water-soluble, FVA-based, film-forming material with good flow. Dark green film can be sprayed or brushed on most substrates. For releasing surfaces with complex contours in conjunction with a second release agent such as RP 78-2 or RP 79-2. Should not be used as a sealer.

**Ren Shape Sealer No. 1**

**Ren Shape Sealer No. 2**

**Ren Tooling Systems CD Rom**
A comprehensive CD Rom including descriptions of Ren Tooling Systems products, technical data sheets, video clips, illustrated customer success stories, technical papers and recommended tooling techniques is available. To obtain a CD Rom, call 800-955-5509, or write: Product Literature, Vantico, 4917 Dawn Avenue, East Lansing, Michigan 48823.

**Ren Tooling Systems**
300°F (149°C). This cure schedule will produce a tool that can perform at temperatures up to 300°F (149°C). To reduce potential mold shrinkage and warpage problems, postcure tools to a temperature only 50° higher than their anticipated operating temperature.

**Ren Tooling Systems**

**Epoxy Application, Handling and Storage**

**Storage Temperatures and Conditions**
Store epoxy resins and hardeners at temperatures from 65°F to 90°F (18°C to 32°C), unless the product label indicates otherwise. Avoid storing materials near outside walls or doors.

**Epoxy Shelf Life**
The shelf life is the maximum amount of time a compound can be stored in its original, unopened container at temperatures from 65°F to 90°F (18°C to 32°C). After this period, or if the can has been opened or damaged or the temperature parameters have been exceeded, the material may degrade and not attain its full physical performance characteristics.

**Curing/Post Curing**
To determine the correct cure/postcure schedule for a material, refer to the product’s data sheet. A typical cure/postcure schedule for a heat-resistant epoxy is:
- Cure at room temperature for 16 to 24 hours;
- Postcure in an oven or autoclave, on the pattern if possible, for two hours each at 150°F (66°C), 200°F (93°C), 250°F (121°C) and 300°F (149°C).

This cure schedule will produce a tool that can perform at temperatures up to 300°F (149°C). To reduce potential mold shrinkage and warpage problems, postcure tools to a temperature only 50° higher than their anticipated operating temperature.
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branes, abraded skin, or blood is intended; or for uses for which implantation
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