CRUCIBLE REX M2

Carbon 0.85%
Chromium 4.15%
Vanadium 1.95%
Tungsten 6.40%
Molybdenum 5.00%

Physical Properties
Elastic Modulus 30 X 10^6 psi (207 GPa)
Density 0.294 lbs./in^3 (8.14 g/cm^3)
Coefficient of Thermal Expansion
<table>
<thead>
<tr>
<th>Temperature</th>
<th>in/in/^°F</th>
<th>mm/mm/^°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-500°F</td>
<td>6.28X10^-6</td>
<td>(11.3X10^-6)</td>
</tr>
<tr>
<td>100-800°F</td>
<td>6.67X10^-6</td>
<td>(12.0X10^-6)</td>
</tr>
<tr>
<td>100-1000°F</td>
<td>6.97X10^-6</td>
<td>(12.5X10^-6)</td>
</tr>
</tbody>
</table>

Mechanical Properties
Impact Toughness

<table>
<thead>
<tr>
<th>Heat Treatment</th>
<th>Tempering Temperature</th>
<th>HRC</th>
<th>Impact Toughness (ft.-lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2175°F (1190°C)</td>
<td>1025°F (550°C)</td>
<td>64</td>
<td>17 (23)</td>
</tr>
<tr>
<td>2150°F (1175°C)</td>
<td>1050°F (565°C)</td>
<td>63</td>
<td>19 (26)</td>
</tr>
<tr>
<td>2100°F (1150°C)</td>
<td>1075°F (580°C)</td>
<td>61</td>
<td>21 (28)</td>
</tr>
</tbody>
</table>

(1) Heat Treatment: Austenitized as indicated and tempered to hardness.
(2) Charpy C-Notch Impact Test

Tool Steel Comparagraph

Typical Applications
Punches  Thread Roll Dies
Dies    Form Tools
Broaches Lathe Tools
Milling Cutters

Note: These are some typical applications. Your specific application should not be undertaken without independent study and evaluation for suitability.

Crucible Industries LLC

The Crucible logo, Crumark, CPM, Rex, Rex 20, Rex 45, Rex 54, Rex 76 and Rex 121 are trademarks of Crucible Industries.

Rex M2 is a tungsten-molybdenum general purpose high speed steel. It is suitable for a wide variety of cutting tools and is often used for metalworking tools such as punches and dies. Rex M2 is a good choice for cutting tools which require moderate feeds and speeds. It provides sufficient red hardness along with outstanding toughness for a high speed steel. For cold work applications, Rex M2 offers higher hardness and wear resistance than D2. Its high attainable hardness provides superior compressive strength for deformation resistance, reducing susceptibility to such problems as peening, denting and edge rollover. Its high tempering temperature and red hardness make it an excellent substrate for most surface treatments.

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**Heat Treat Response**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Austenitizing Temperature</th>
<th>Min. time at Austenitizing Temp.</th>
<th>Oil Quenched</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975°F (1080°C)</td>
<td>2125°F (1165°C)</td>
<td>2225°F (1220°C)</td>
<td>30 min.</td>
</tr>
</tbody>
</table>

**Minimum number of Tempers**

- Austenitized Parts: About 2
- Annealed Parts: About 3
- Hardened Parts: About 3

Results may vary with hardening method and section size. Salt or oil quenching will give maximum response. Vacuum or atmospheric cooling may result in up to 1-2 HRC points lower.

**Surface Treatments**

Because of its high tempering temperatures (>1000°F), Rex M2 is suitable for nitriding, PVD coating or similar surface treatments. CVD coating processes may result in non-predictable dimensional changes.

**Crucible Industries LLC**

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