Nachi developed the EXEO series alloys in company-wide combined and connected engineering system by first analyzing and determining necessary characteristics and then applying Nachi original design and special melting technologies. EXEO-M21 shows superior strength and toughness even with notches because of few impurity inclusions.

- Ageing and nitriding are in the same temperature range so they can be done at the same time.
- It has superior workability at hot and cold temperature, good machinability and excellent weldability.
- High strength (2000 MPa) and toughness are achieved by an approximately 500°C aging process.

### Mechanical properties

<table>
<thead>
<tr>
<th>Steels being compared</th>
<th>Hardness (HRC)</th>
<th>Yield strength (MPa)</th>
<th>Tensile strength (MPa)</th>
<th>Elongation (%)</th>
<th>Reduction of area (%)</th>
<th>Tensile strength with notch (MPa)</th>
<th>Strength ratio with notch</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXEO-M21</td>
<td>55</td>
<td>2000</td>
<td>2100</td>
<td>11</td>
<td>50</td>
<td>2900</td>
<td>1.4</td>
</tr>
<tr>
<td>SCM435</td>
<td>32</td>
<td>790</td>
<td>950</td>
<td>18</td>
<td>45</td>
<td>1030</td>
<td>1.1</td>
</tr>
<tr>
<td>SUS420J2</td>
<td>52</td>
<td>1500</td>
<td>1800</td>
<td>6</td>
<td>35</td>
<td>1900</td>
<td>1.1</td>
</tr>
</tbody>
</table>

[Heat treatment conditions: Solution treatment 820°C × 1h, ageing 490°C × 5h]

### Applications

- Automotive parts (CVT belts etc.)
- Racing car parts
- Aircraft and satellite parts
- Precision molds for plastics
- Ejector pins
- Zinc die cast molds, core pins
- Welding rods for repairing mold
- Punch for cold forging
- Machine parts require high strength etc.
Heat treatment conditions

<table>
<thead>
<tr>
<th>Solution treatment process</th>
<th>Aging process</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended conditions</strong></td>
<td><strong>Recommended conditions</strong></td>
</tr>
<tr>
<td>EXEO-M21</td>
<td>820°C × 1h cooling</td>
</tr>
<tr>
<td></td>
<td>32HRC</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Solution treatment temperature and aging hardness

Aging temperature (°C)

Aging time: 5 h

Solution treatment: 780°C

Hardness (HRC)

420 - 58

Aging 5 h

Solution treatment: 820°C × 1h

Hardness (HRC)

420 - 58

Aging time: 3 h

Production range

- Available either finished or semi-finished.
- Contact us for production specifications, delivery times, and minimum orders.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Range of dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forged round bar</td>
<td>φ40 - 200</td>
</tr>
<tr>
<td>Rolled round bar</td>
<td>φ13 - 100</td>
</tr>
<tr>
<td>Forged flat bar</td>
<td>Contact us for details (30 - 200)</td>
</tr>
<tr>
<td>Rolled flat bar</td>
<td>Contact us for details (1.3 - 48)</td>
</tr>
<tr>
<td>Polishing wire</td>
<td>φ2 - 13×2000L</td>
</tr>
<tr>
<td>Drawn coil</td>
<td>φ1.3 - 12</td>
</tr>
</tbody>
</table>

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- Please note that the characteristics and values provided here are typical examples which may differ from the characteristics of the actual product.

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