**HCX™ Grinding Elements for Vertical Mills**

Extend time between Mill overhauls while decreasing total cost of ownership

### Output – Extended LifeCycle
- HCX™ life of up to 6X over high chrome and HC overlay
- HCX2™ life up to 2X longer than competitor ceramic

GE is the world’s leading supplier of coal mill parts & services. With over 100 years of experience grinding all types of coal in most mill models we specialize in reducing the total cost of ownership. Our Ceramic Inserted Grinding Elements – HCX™ and the next generation HCX2™, are grinding rolls and segments cast from a metal matrix of high chrome and ceramics. This matrix combines the extreme wear resistance of ceramics with the mechanical properties of cast alloys.

Our HCX™ portfolio of products is available for most vertical mill types and sizes- GE and other OEM fleet mills. And is applicable to any coal type.

### Benefits
- Reduced operations and maintenance cost via extension of time between overhauls
- Improved mill availability
- Longer acceptable coal fineness results from longer lasting grinding surface profile
- Reduced frequency of grinding roll to grinding segment gap adjustments
- No spauling which can occur with other materials
- Maintains grinding surface profile longer than any other material available

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HCX™ Grinding Elements for Vertical Mills

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Features
- Composite construction with hard inserts embedded in nodular iron
- Hard inserts made of highly wear resistant material comprised of non-metallic refractory oxides and chromium carbides
- Composite casting is heat treated to obtain optimized hardness for high wear resistance and desired toughness

Case Study Results:
GE Design Mill with 40+% ash coal

<table>
<thead>
<tr>
<th>Properties</th>
<th>Conventional (HC Alloys and Overlay)</th>
<th>HCX™ Rolls &amp; Segments</th>
<th>Competitor Product #1</th>
<th>Competitor Product #2</th>
<th>HCX™ Rolls &amp; Segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFE IMPROVEMENT (Typical)</td>
<td>X</td>
<td>2X to 4X</td>
<td>2X to 4X</td>
<td>Up to 5X</td>
<td>Up to 6X</td>
</tr>
<tr>
<td>LIFE IMPROVEMENT</td>
<td>X</td>
<td>3.5X</td>
<td>3.5X</td>
<td>5.1X</td>
<td>8.1X</td>
</tr>
<tr>
<td>WEAR over 1000 hours</td>
<td>36.75 mm (1.45&quot;)</td>
<td>10.5mm (0.41&quot;)</td>
<td>10.5mm (0.41&quot;)</td>
<td>7.18mm (0.28&quot;)</td>
<td>4.52mm (0.18&quot;)</td>
</tr>
<tr>
<td>GRINDING SURFACE PROFILE CONSISTENCY</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
</tr>
</tbody>
</table>

Low Profile Tire Option:

Benefits
- Motor amp reduction
- Increased fineness
- Longer life

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