ANCORBOND® FLM Alloys

Typical Analysis and Properties

<table>
<thead>
<tr>
<th>Apparent Density</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 g/cm³</td>
<td>29 s/50 g</td>
</tr>
</tbody>
</table>

ANCORBOND® FLM Alloys are press-ready, binder-treated Mn-Mo hybrid alloy systems that are Ni and Cu free. These cost-effective alloys can be sintered at 1120 °C (2050 °F) using N₂-H₂ atmospheres and conventional sintering practices. Excellent hardness and strength can be achieved with accelerated cooling in the sintering furnace, delivering properties comparable with more highly-alloyed, diffusion-alloyed and hybrid steels.

Composition (wt%)

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Fe</th>
<th>Mn</th>
<th>Mo</th>
<th>O₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCORBOND FLM-4000</td>
<td>Balance</td>
<td>1.3</td>
<td>0.5</td>
<td>0.1</td>
</tr>
<tr>
<td>ANCORBOND FLM-4400</td>
<td>Balance</td>
<td>1.3</td>
<td>0.8</td>
<td>0.1</td>
</tr>
</tbody>
</table>

The Effects of Compaction Pressure on Green Properties

- **Green Density**
  - Compaction Pressure (tsl)
  - Green Density (g/cm³)

- **Green Strength**
  - Compaction Pressure (tsl)
  - Green Strength (MPa)

0.6% graphite
0.75% Acrawax CLubricant

FLM-4005
FLM-4405
Effect of Density on Mechanical Properties

Samples sintered at 1120 °C (2050 °F) for 15 minutes at temperature in 90 vol% N₂ – 10 vol% H₂
Average cooling rate 0.7 °C/s (1.3 °F/s) and 1.6 °C/s (2.9 °F/s) from 650 to 315 °C (1200 to 600 °F)
Tempered at 205 °C (400 °F) for 1 hour

- Dimensional Change (%)
- Apparent Hardness (HRA)
- Ultimate Tensile Strength (MPa)
- Elongation (%)
- Impact Energy (J)

mixes containing 0.6% graphite