THE STRATEGY

OSG brought in the HYPRO® CARB VGM5 to take on the application. By utilizing a proper chipload with high efficiency milling (HEM) we are able to have even wear on the cutting edge and better productivity while also increasing tool life.

OVER $50,000 ANNUAL SAVINGS!

THE DETAILS

BACKGROUND
A large brake manufacturer is struggling with cycle time while milling an A2 brake pad component.

GOALS
The goal is to increase part production by improving cycle time and tool life.

DETAILS

INDUSTRY
Automotive

PART
A2 Brake Pad Component

MATERIAL
Carbon Steel

MACHINE
Matsuura | Water Soluble Coolant

SPINDLE
CAT40

ORIGINAL TOOLING
Competitor End Mill
1/2" | 4 Flute | Multi Layer TiAIN

NEW TOOLING
HY-PRO® CARB VGM5
1/2" | 5 Flute | EXO® Coated

SNAPSHOT

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<table>
<thead>
<tr>
<th>Original Process</th>
<th>NEW Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool Diameter (Inch)</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>SFM</td>
<td>275</td>
</tr>
<tr>
<td>RPM</td>
<td>2,101</td>
</tr>
<tr>
<td>IPM</td>
<td>10.08</td>
</tr>
<tr>
<td>MMR</td>
<td>0.27 in³/min</td>
</tr>
<tr>
<td>Aa</td>
<td>2.7&quot;</td>
</tr>
<tr>
<td>Ar</td>
<td>0.01&quot;</td>
</tr>
<tr>
<td>Cycle Time (Seconds)</td>
<td>53.55</td>
</tr>
</tbody>
</table>

OVER $50,000 ANNUAL SAVINGS!
THE RESULTS

The OSG HYPRO® CARB VGM5 performed above and beyond the competitor increasing tool life from 4 parts to 14 per tool!

- SFM was increased from 275 to 375 due to utilizing HEM
- Feed per tooth was increased from 0.0012 to 0.002. This has greater effect due to OSG having 5 flutes vs the competitor’s 4.
- Cycle time was reduced by 15.85 seconds per part ($3.55 sec to 37.7 sec)
- A total savings of $50,545

<table>
<thead>
<tr>
<th>Results Overview</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle Time Saved per Part (Seconds)</td>
<td>15.85</td>
</tr>
<tr>
<td>Number of Parts Per Year</td>
<td>1400</td>
</tr>
<tr>
<td>Cycle Time Saved Annually (hours)</td>
<td>369.83333</td>
</tr>
<tr>
<td>Cost to Machine (Per Hour)</td>
<td>$40</td>
</tr>
<tr>
<td>Annual Mill Cost Savings</td>
<td>$48,632</td>
</tr>
<tr>
<td>Tool Life Improvement (Parts)</td>
<td>1988</td>
</tr>
<tr>
<td>Annual Tool Change Cost Savings</td>
<td>$1667</td>
</tr>
<tr>
<td>Total Machining Cost Saved Annually</td>
<td>$50,545</td>
</tr>
</tbody>
</table>

THE CONCLUSION

Annual mill usage with OSG is now 100 vs the old processes 350 tools per year. This alone saves $48,632 per year with an overall savings of over $50,000!

OVER $50,000 ANNUAL SAVINGS!