ALUMINUM BLOCK

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MET 127-ADVANCE MANUFACTURING PROCESSES
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OBJECTIVE

The objective of this project was for the student to gain experience in using two different vertical milling machines effectively. We also learned how to use various vices, and techniques on cutting angles and grooves. Certain equipment was also used by the students to align the machines to the parts so that all sides would be square. The knowledge used in this project will help build our fundamental skills in vertical milling and also serves as a stepping stone to make more accurate projects.
CUTTING CALCULATIONS

CUTTING SPEEDS:
Cutting speed=550

Face Mill:
RPM= (CS*4)/D
RPM= (550*4)/3.92
RPM= 561

End Mill:
RPM= (CS*4)/D
RPM= (550*4)/.312
RPM= 3846

FEED RATES:
Feed Rate: .009

Face Mill:
IPM= FR*N*RPM
IPM= .009*12*561
IPM= 60.6

End Mill:
IPM= .009*9*3846
IPM= 138.4

CUTTING TIME ESTIMATES:
TOTAL LENGTH OF CUTS (CINNI MILL)=(2.25*4)+(1.9*4)+(1.437*4)=22.35
IPM=60.6
TOTAL TIME=38 Sec.
TOTAL LENGTH OF CUTS (BRIDGEPORT)=(2.25*14)=31.5
IPM=138.4
TOTAL TIME=22 Sec.

TOTAL TIME FOR PROJECT=1 MINUTE.

Since we didn’t actually use the calculated feed rates and RPM, this time estimate doesn’t accurately reflect the total time for project.
## ROUTE SHEET

### FARMINGDALE STATE UNIVERSITY

**NAME OF PART:** ALUMINUM BLOCK  
**SHEET:** 1 OF 1  
**SHEET WRITER:** STEVEN ELLINGHAUS  
**DATE:** 2/27/2005

### ROUTE SHEET

<table>
<thead>
<tr>
<th>OPER. #</th>
<th>OPERATION</th>
<th>TOOL USED</th>
<th>MACHINE</th>
<th>DEPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>INSPECTION OF INCOMING MAT.</td>
<td></td>
<td></td>
<td>Q. CONTROL</td>
</tr>
<tr>
<td>200</td>
<td>ROUGH CUT, 2x1.5x2.30</td>
<td>SAW</td>
<td>BAND SAW</td>
<td>MACHINE ROOM</td>
</tr>
<tr>
<td>300</td>
<td>MILL 2 SURFACES FLAT</td>
<td>3.92 MILL</td>
<td>CINNI. MILL</td>
<td>MACHINE ROOM</td>
</tr>
<tr>
<td>400</td>
<td>MILL TO 1.9 HEIGHT</td>
<td>3.92 MILL</td>
<td>CINNI. MILL</td>
<td>MACHINE ROOM</td>
</tr>
<tr>
<td>500</td>
<td>MILL TO 1.437 WIDTH</td>
<td>3.92 MILL</td>
<td>CINNI. MILL</td>
<td>MACHINE ROOM</td>
</tr>
<tr>
<td>600</td>
<td>MILL TO 2.25 LENGTH</td>
<td>3.92 MILL</td>
<td>CINNI. MILL</td>
<td>MACHINE ROOM</td>
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<tr>
<td>700</td>
<td>MILL .312x.312 GROOVE</td>
<td>.312 MILL</td>
<td>BRIDGE MILL</td>
<td>MACHINE ROOM</td>
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<tr>
<td>800</td>
<td>MILL .125x 45 CHAMFER, 2 PLACES</td>
<td>.312 MILL</td>
<td>BRIDGE MILL</td>
<td>MACHINE ROOM</td>
</tr>
<tr>
<td>900</td>
<td>FINAL INSPECTION</td>
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<td></td>
<td>Q. CONTROL</td>
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