

### Conversion of Workpiece Material Rockwell (Optional)

number(HB) *Skip this step if you already know the Brinell hardness*

Hardness HRB OR HRC into   
Brinell Hardness (HB)

### Characteristics of Workpiece Materials

Brinell Hardness:  HB

Ultimate strength:  PSI

### End Mill Nomenclature

d1 Effective cutting diameter:  in.

z Number of inserts/cutter:

### Machining Conditions

$V_c$  Cutting speed:  sfm

$a_p$  Axial Depth of cut:  in. (DOC)

$a_e$  Radial width of cut:  in. (WOC)

$f_z$  Required feed per tooth:  in. IPT (chip load)

$C_m$  Machinability factor:  ?

$C_w$  Tool wear factor:  ?

E Machine efficiency factor:  ?

[Calculate](#)

### Calculated Machining Conditions

n Spindle speed: **17494.3** RPM

$V_f$  Feed rate: **31.49** IPM (no productivity formula)

Reduced feed per tooth: **0.0006** in. (chip load at the cut)

$F_p$  Feed rate: **31.5** IPM (with productivity formula)

Q Metal removal rate: **0.236** MRR

A Cross-sectional area of chip: **0.00002** in.<sup>2</sup>

$z_c$  Number of flutes in the cut: **1.5**

$a_e/d_1$  Ratio of radial width of cut to cutting diameter: **1**

### Calculated Required Power

$F_t$  Tangential cutting force: **1.35** lb

T Torque at the cutter: **0.17** in.-lb

**Machining Power**

$P_s$  at the cutter: **0.05** HPc

$P_m$  at the motor: **0.06** hp

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$V_c$  Cutting speed:  sfm

$a_p$  Axial Depth of cut:  in. (DOC)

$a_e$  Radial width of cut:  in. (WOC)

$f_z$  Required feed per tooth:  in. IPT (chip load)

$C_m$  Machinability factor:  ?

$C_w$  Tool wear factor:  ?

E Machine efficiency factor:  ?

[Calculate](#)

### Calculated Machining Conditions

n Spindle speed: **25057.4** RPM

$V_f$  Feed rate: **72.17** IPM (no productivity formula)

Reduced feed per tooth: **0.0014** in. (chip load at the cut)

$F_p$  Feed rate: **72.2** IPM (with productivity formula)

Q Metal removal rate: **4.513** MRR

A Cross-sectional area of chip: **0.00036** in.<sup>2</sup>

$z_c$  Number of flutes in the cut: **1**

$a_e/d_1$  Ratio of radial width of cut to cutting diameter: **1**

### Calculated Required Power

$F_t$  Tangential cutting force: **16.2** lb

T Torque at the cutter: **2.03** in.-lb

**Machining Power**

$P_s$  at the cutter: **0.81** HPc

$P_m$  at the motor: **0.95** hp

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Brinell Hardness:  HB

Ultimate strength:  PSI

### End Mill Nomenclature

d1 Effective cutting diameter:  in.

z Number of inserts/cutter:

### Machining Conditions

$V_c$  Cutting speed:  sfm

$a_p$  Axial Depth of cut:  in. (DOC)

$a_e$  Radial width of cut:  in. (WOC)

$f_z$  Required feed per tooth:  in. IPT (chip load)

$C_m$  Machinability factor:  ?

$C_w$  Tool wear factor:  ?

E Machine efficiency factor:  ?

[Calculate](#)

### Calculated Machining Conditions

n Spindle speed: **25057.4** RPM

$V_f$  Feed rate: **108.25** IPM (no productivity formula)

Reduced feed per tooth: **0.0014** in. (chip load at the cut)

$F_p$  Feed rate: **108.3** IPM (with productivity formula)

Q Metal removal rate: **6.769** MRR

A Cross-sectional area of chip: **0.00036** in.<sup>2</sup>

$z_c$  Number of flutes in the cut: **1.5**

$a_e/d_1$  Ratio of radial width of cut to cutting diameter: **1**

### Calculated Required Power

$F_t$  Tangential cutting force: **24.3** lb

T Torque at the cutter: **3.04** in.-lb

### **Machining Power**

$P_s$  at the cutter: **1.21** HPc

$P_m$  at the motor: **1.42** hp

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Brinell Hardness:  HB

Ultimate strength:  PSI

### End Mill Nomenclature

d1 Effective cutting diameter:  in.

z Number of inserts/cutter:

### Machining Conditions

$V_c$  Cutting speed:  sfm

$a_p$  Axial Depth of cut:  in. (DOC)

$a_e$  Radial width of cut:  in. (WOC)

$f_z$  Required feed per tooth:  in. IPT (chip load)

$C_m$  Machinability factor:  ?

$C_w$  Tool wear factor:  ?

E Machine efficiency factor:  ?

[Calculate](#)

### Calculated Machining Conditions

n Spindle speed: **29793.8** RPM

$V_f$  Feed rate: **85.81** IPM (no productivity formula)

Reduced feed per tooth: **0.0014** in. (chip load at the cut)

$F_p$  Feed rate: **85.8** IPM (with productivity formula)

Q Metal removal rate: **5.363** MRR

A Cross-sectional area of chip: **0.00036** in.<sup>2</sup>

$z_c$  Number of flutes in the cut: **1**

$a_e/d_1$  Ratio of radial width of cut to cutting diameter: **1**

### Calculated Required Power

$F_t$  Tangential cutting force: **16.2** lb

T Torque at the cutter: **2.03** in.-lb

### **Machining Power**

$P_s$  at the cutter: **0.96** HPc

$P_m$  at the motor: **1.13** hp

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Brinell Hardness:  HB

Ultimate strength:  PSI

### End Mill Nomenclature

d1 Effective cutting diameter:  in.

z Number of inserts/cutter:

### Machining Conditions

$V_c$  Cutting speed:  sfm

$a_p$  Axial Depth of cut:  in. (DOC)

$a_e$  Radial width of cut:  in. (WOC)

$f_z$  Required feed per tooth:  in. IPT (chip load)

$C_m$  Machinability factor:  ?

$C_w$  Tool wear factor:  ?

E Machine efficiency factor:  ?

[Calculate](#)

### Calculated Machining Conditions

n Spindle speed: **29793.8** RPM

$V_f$  Feed rate: **128.71** IPM (no productivity formula)

Reduced feed per tooth: **0.0014** in. (chip load at the cut)

$F_p$  Feed rate: **128.7** IPM (with productivity formula)

Q Metal removal rate: **8.044** MRR

A Cross-sectional area of chip: **0.00036** in.<sup>2</sup>

$z_c$  Number of flutes in the cut: **1.5**

$a_e/d_1$  Ratio of radial width of cut to cutting diameter: **1**

### Calculated Required Power

$F_t$  Tangential cutting force: **24.3** lb

T Torque at the cutter: **3.04** in.-lb

### **Machining Power**

$P_s$  at the cutter: **1.44** HP<sub>c</sub>

$P_m$  at the motor: **1.69** hp