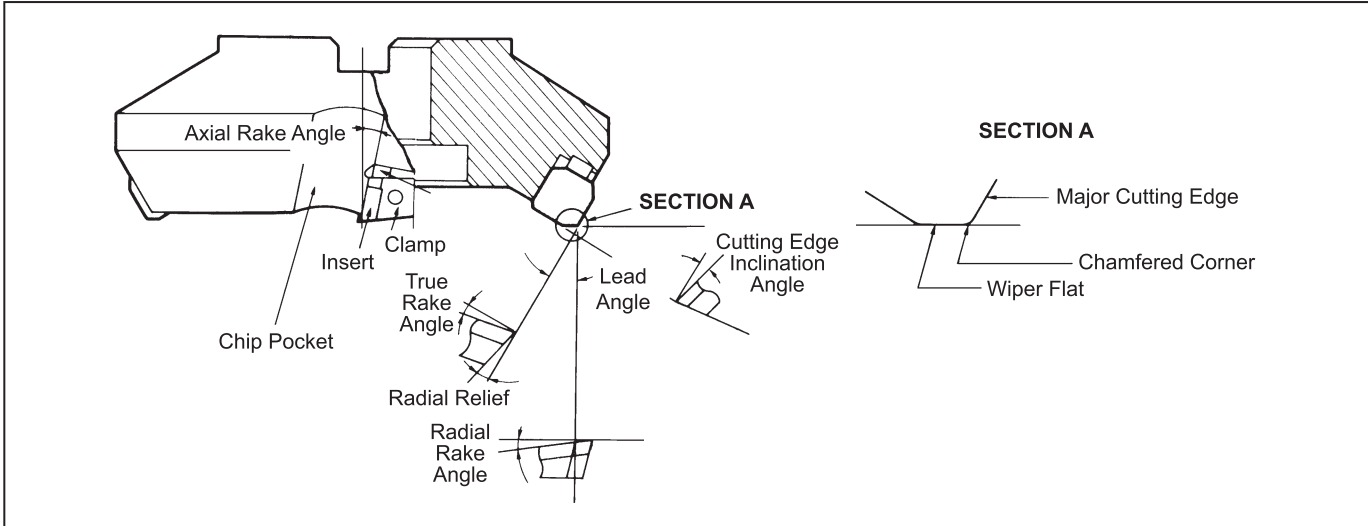


# Technical Information

APPLICATIONS
Milling

## Cutter Body Geometry



## Calculation Formulas

• Cutting speed (SFM)	=	$\frac{\pi \times D \times N}{12}$	(feet / min.)	
• Feed rate (IPM)	=	$IPT \times Q \times N$	(inch / min.)	<b>D:</b> Diameter of milling cutter (inch)
• Chip Load (IPT)	=	$\frac{IPM}{Q \times N}$	(inch / tooth)	<b>N:</b> Revolution (r.p.m.)
• Machining time (T)	=	$\frac{L}{IPM}$	(min.)	<b>Q:</b> Number of tooth
				<b>L:</b> Total length of feed rate (inch)

## Horsepower Consumption Formula

$$HP = \frac{W \times D \times F}{K}$$

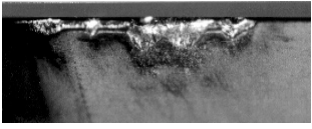
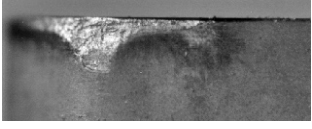
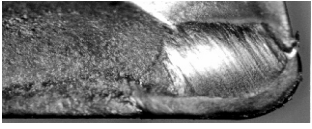
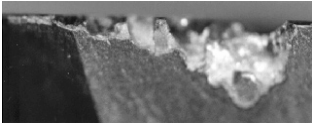
**W:** Width of cut (inch)  
**D:** Depth of cut (inch)  
**F:** Feed rate (inches / minute)  
**K:** "K" factor for material

"K" Factor for Material							
Steel		Stainless Steel		Cast Iron		Others	
up to 150	1.0	free machining	1.0	ferrite	1.5	magnesium	4.0
up to 300	0.8	others	0.6	pearlitic	1.0	aluminum	4.0
up to 400	0.5			chilled	0.6	copper	2.0
up to 500	0.4					brass	2.5
Titanium		High-Tensile Alloys		High-Temperature Alloys		bronze	2.0
under 100,000 psi	0.8	180,000-220,000 psi	0.5	nickel base alloys	0.4	malleable iron	1.0
100,000-135,000 psi	0.6	220,000-260,000 psi	0.4	cobalt base alloys	0.4		
135,000 psi and over	0.4	260,000-300,000 psi	0.3	austenitic alloys	0.4		

## Technical Information

APPLICATIONS
Milling

### Troubleshooting

PROBLEM	CAUSE	RECOMMENDED ACTION
<b>Chipping</b> 	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• speeds &amp; feeds</li> </ul>	<ul style="list-style-type: none"> <li>• Change to tougher grade</li> <li>• Increase the cutting speed</li> <li>• Reduce the feed/tooth</li> </ul>
<b>Flank Wear</b> 	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• speeds &amp; feeds</li> </ul>	<ul style="list-style-type: none"> <li>• Use a more wear-resistant grade</li> <li>• Reduce the cutting speed</li> <li>• Increase the feed/tooth</li> </ul>
<b>Crater Wear</b> 	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• speeds &amp; feeds</li> </ul>	<ul style="list-style-type: none"> <li>• Use a more crater wear-resistant grade</li> <li>• Reduce the cutting speed</li> <li>• Reduce the feed/tooth</li> </ul>
<b>Broken Nose</b> 	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• speeds &amp; feeds</li> <li>• insert shape</li> </ul>	<ul style="list-style-type: none"> <li>• Use a tougher grade</li> <li>• Adjust the cutting speed</li> <li>• Adjust the feed/tooth</li> <li>• Use a thicker insert</li> </ul>
<b>Poor Surface Finish</b>	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• speeds &amp; feeds</li> <li>• insert shape</li> <li>• tool shape</li> </ul>	<ul style="list-style-type: none"> <li>• Use a more wear-resistant grade</li> <li>• Increase the cutting speed</li> <li>• Use a polished insert</li> <li>• Use a higher rake cutter</li> </ul>
<b>Burrs, Chipping, etc.</b>	<ul style="list-style-type: none"> <li>• insert grade</li> <li>• tool shape</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the cutting speed</li> <li>• Reduce the feed/tooth</li> <li>• Use a higher rake cutter</li> </ul>
<b>Vibration</b>	<ul style="list-style-type: none"> <li>• speeds &amp; feeds</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the cutting speed</li> <li>• Reduce the feed/tooth</li> </ul>