



## Double Angle Shank Cutter Guide

Double angle shank cutters are extremely versatile tools. Harvey tool offers a variety of reaches and included angles to provide an answer for even the most difficult of applications. Due to the varying neck lengths and the applications, specific machining parameters must be calculated to avoid breakage.

### Speeds & Feeds calculations:

1. Determine the correct SFM and Base Chip Load (IPT) for the cutter, material and application (see application descriptions Figure 1)
2. Adjust Chip Load to account for neck length to neck diameter ratio. (see Table 1)
3. Calculate the Speed (RPM) and Linear Feed (IPM)
4. Determine correct number of passes (see Table 2)

Example: Tool #931916 to machine for a V-Grooving application in 4140 steel at 32 Rc.

1. Using Figure 1 (upper right), determine the type of application you will be performing.  
From Speeds & Feeds chart (next page), SFM is 200 and Base Chip Load (IPT) for V-Grooving is .00053.

2. Calculate the neck length to neck diameter ratio for the tool. Calculate adjusted chipload based on values in Table 1.

$$\begin{aligned} \text{Neck Length Ratio} &= (\text{Neck Length} / \text{Neck Diameter}) \\ &= (1.00 / .125) \\ &= 8 \end{aligned}$$

$$\begin{aligned} \text{Adjusted Chip Load} &= \text{Adjustment Factor} \times \text{Base Chip Load} \\ &= 0.9 \times .00053 \\ &= .000477 \end{aligned}$$

3. Calculate Speed (RPM) and Linear Feed (IPM)

$$\begin{aligned} \text{RPM} &= (\text{SFM} \times 3.82) / \text{Cutter Diameter} \\ &= (200 \times 3.82) / .250 \\ &= 3056 \end{aligned}$$

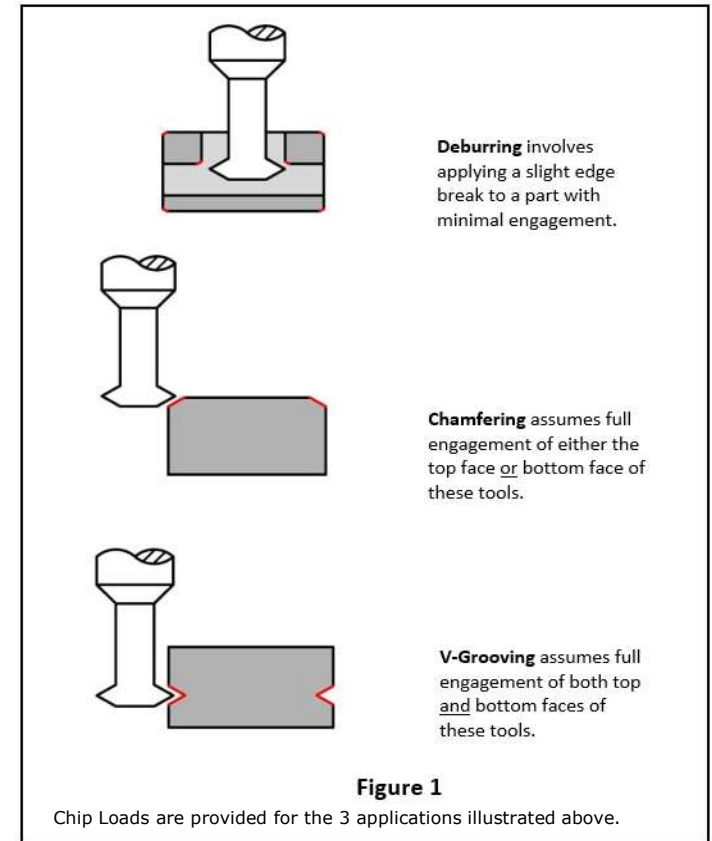
$$\begin{aligned} \text{Linear Feed (IPM)} &= \text{RPM} \times \text{IPT} \times \text{Number of Flutes} \\ &= 3056 \times .000477 \times 4 \\ &= 5.83 \end{aligned}$$

4. From Speeds & Feeds chart (table 2), the number of passes for a v-grooving operation in 4140 steel is 3 passes.

5. Conclusion

In this example, the tool would run at 3056 RPM, 5.83 IPM and make 3 pass.

Neck Length/Neck Diameter Ratio	0 - 28 Rc			29 - 37 Rc			38 - 45 Rc		
	Deburring	Front/Back Chamfer	V-Groove	Deburring	Front/Back Chamfer	V-Groove	Deburring	Front/Back Chamfer	V-Groove
2x - 8x	1	2	3	1	3	4	1	4	5
9x - 14x	1	3	4	1	4	5	1	6	7
15x - 20x	1	4	5	1	5	6	1	7	8



Neck Length/Neck Diameter Ratio	Adjustment Factor
3x	110%
5x	100%
8x	90%
10x	80%
14x	75%
18x	65%

