

## 加工數據計算公式 Calculation for Cutting Speed, Spindle Speed and Feed

$$\text{Cutting Speed (V)} = \frac{\pi \times D \times N}{1,000}$$

$$\text{Spindle Speed (N)} = \frac{V \div \pi \div D \times 1,000}{1}$$

$$\text{Feed (F)} = N \times fz \times Z$$

$$\text{Feed per Tooth (fz)} = \frac{F}{N \times Z}$$

切削速度 V = Cutting Speed (m/min)

圓周率  $\pi = 3.14$  The circular Constant

直徑 D = Diameter (mm)









主軸轉速 N = Spindle Speed ( $\text{min}^{-1}$ )

進給 F = Feed (mm/min)

單刃進給量 fz = Feed per Tooh (mm/tooth)

刃數 Z = Number of Flutes

## 選擇刀具刃數 Selection of Number of Flute

	2刃 2-Flutes	3刃 3-Flutes	4刃 4-Flutes	6刃 6-Flutes
溝銑 Slotting				
側銑 Side Milling				

通常兩刃和三刃的刀會被選擇用在插槽的加工,因為他們有比較大的容屑槽。  
四刃和六刃因切屑處理佳,建議用在側銑的部份。

Generally 2-flutes and 3-flutes are selected for slotting because of the larger chip pocket.  
4-flutes and 6-flutes are recommended for side milling as no promble of chip disposal.

## 切削速度 Cutting Speed (V)

決定切削速度的因素有：刀具的材質,刀具直徑,刃長,加工材質,切削機器,夾持的剛性,機器的結構,精準度,切削液...等等。一般刀具材質和加工材質是決定切削速度主要因素。

Appropriate Cutting Speed should be decided by parameters such as tool material, diameter, length of cut, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy, cutting fluid, and etc.

Generally tool material and work material are main factors to determine the Cutting Speed.

工件 Work Materials	切削速度 V Cutting Speed (m/min)	
	鎢鋼 Carbide	塗層鎢鋼 Coated Carbide
碳鋼 Carbon Steels (S50C)	20~40	40~80
合金鋼 Alloy Steels (SCM,SKD)	20~35	35~60
調質鋼 Prehardened Steels (NAK,HPM)	15~30	30~50
不鏽鋼 Stainless Steels (SUS304)	5~20	10~30
熱處理鋼 Hardened Steels (SKD61,HRC60)	-	20~40

## 單刃進給量 Feed per Tooth (fz)

刀具每刃進給速率 是影響加工的重要因素,決定它的因素有:刀具的直徑,類型,加工材質,切削機器,夾持的剛性,機器的結構,精準度,和切削深度。

Feed per Tooth is an important element for efficient machining which should be determined by parameters such as tool diameter,type, work material, cutting machine, rigidity of tool holder, machining configuration, accuracy and cutting depth.

刃徑 Diameter(mm)	單刃進給量 Feed per tooth (mm/tooth)	
	2刃 2-Flutes	4刃 4-Flutes
1	0.001~0.005	
6	0.02~0.04	0.01~0.03
10	0.04~0.08	0.03~0.06
20	0.08~0.12	0.06~0.1