



by **Ultra-Dex**

ISO	MATERIAL	HARDNESS	GRADE	Vc (SFM)*	Fz (INCH PER TOOTH)* at 50% insert I.C. APMX**
<b>P</b>	<b>CARBON STEELS</b> 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 BHN or ≤ 28 HRC	<b>UD51 UD52 UD404 UD602</b>	300-850	.006 - .018
	<b>ALLOY STEELS</b> 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 17-4 PH	≤ 375 BHN or ≤ 40 HRC		200-700	.005 - .015
<b>M</b>	<b>STAINLESS STEELS (FREE MACHINING)</b> 303, 416, 420F, 430F, 440F	≤ 275 BHN or ≤ 28 HRC	<b>UD32</b>	200-650	.003 - .010
	<b>STAINLESS STEELS (DIFFICULT)</b> 304, 304L, 316, 316L	≤ 275 BHN or ≤ 28 HRC		260-700	.003 - .012
<b>K</b>	<b>GRAY IRONS</b> Class 20, 30, 40, 50, 60, G3000, G3500	≤ 220 BHN or ≤ 19 HRC	<b>UD21</b>	250-900	.005 - .020
	<b>DUCTILE IRONS</b> D&M series, 250, 300, 350, 400, 60-40-18, 65-45-12	≤ 260 BHN or ≤ 26 HRC		200-700	.005 - .015
<b>N</b>	<b>NON-FERROUS</b> Aluminum, Aluminum cast, Brass, Copper, Bronze, Non Metallic	≤ 271 BHN or ≤ 28 HRC	<b>UD1 UD2</b>	400-975	.006 - .020
<b>H</b>	<b>TOOL STEELS</b> A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 BHN or ≤ 55 HRC	<b>UD32 UD404</b>	80-400	.004 - .012
<b>S</b>	<b>HR SUPER ALLOYS</b> Inconel 718, Waspaloy, Hastelloy, Inconel 625, Stellite 31, Haynes 25, Rene 41	≤ 275 BHN or ≤ 28 HRC	<b>UD32 UD52 UD404</b>	40-250	.003 - .008
	<b>TITANIUM</b> 6AL-4V, ASTM 1, 2, 3, 6AL-2S	≤ 275 BHN or ≤ 28 HRC		100-550	.003 - .010

**Recommendations:**

Productivity and tooling performance is not only influenced by grade and geometry, but also by clamping the tool securely and accurately as possible.

It is recommended to use precision holders i.e. hydraulic, shrink fit

*\*Speeds & feeds are starting recommendations only. Factors such as machine type, fixture, tooling rigidity, available horsepower, coolant delivery method and others will affect the performance significantly.*

**\*\* If the axial depth of cut (Ap) is less than 50% of the full radius Insert I.C., increase the feed rate (Fz) to compensate for the thinning (Hex) of the actual chip thickness.**