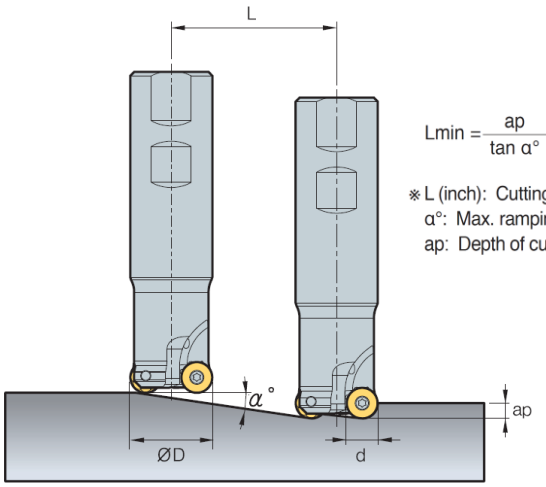
Technical Details

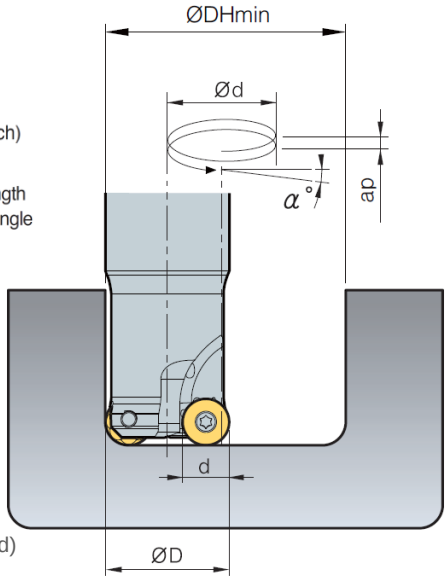
1. Linear Ramping

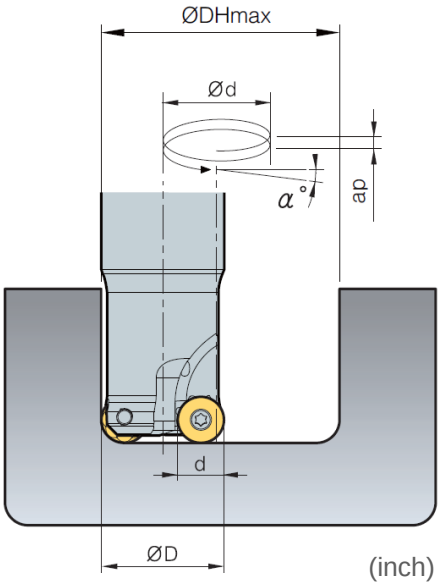


$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (inch)}$$

※ L (inch): Cutting length
α°: Max. ramping angle
ap: Depth of cut

2. Helical Ramping





- Ød (Tool path, inch) = ØDH Min, Max – ØD
- ØDH Min (Minimum hole diameter) = ØD × 2 - Insert size (d)
- ØDH Max (Maximum hole diameter) = ØD × 2 – 2

(inch)

1. Linear Ramping

Tool Diameter ØD	ap Max.	Max. Ramping Angle α°	Cutting length L by ap							
			ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=1.97	ap=0.236
1.00	0.236	4.34	0.519	1.038	1.297	1.557	1.816	2.076	2.594	3.113
1.25		14.94	0.148	0.295	0.369	0.443	0.517	0.59	0.738	0.886
1.50		10.44	0.214	0.427	0.534	0.641	0.748	0.855	1.069	1.282
2.00		6.49	0.346	0.692	0.865	1.038	1.211	1.384	1.73	2.076
2.50		4.71	0.478	0.957	1.196	1.435	1.674	1.913	2.391	2.87
3.00		3.69	0.611	1.221	1.526	1.832	2.137	2.442	3.053	3.663

2. Helical Ramping (ØDHmin)

Tool Diameter ØD	ap Max.	Max. Ramping Angle α°	ØDHmin	Ød	Ramping angle by ap							
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=1.97	ap=0.236
1.00	0.236	4.34	1.53	0.53	0.054	0.107	0.134	-	-	-	-	-
1.25		14.94	2.03	0.78	0.036	0.073	0.091	0.109	0.127	0.146	0.182	0.219
1.50		10.44	2.53	1.03	0.028	0.055	0.069	0.083	0.096	0.11	0.138	0.165
2.00		6.49	3.53	1.53	0.019	0.037	0.046	0.056	0.065	0.074	0.093	0.111
2.50		4.71	4.53	2.03	0.014	0.028	0.035	0.042	0.049	0.056	0.07	0.084
3.00		3.69	5.53	2.53	0.011	0.022	0.028	0.034	0.039	0.045	0.056	0.067

2. Helical Ramping (ØDHmax)

Tool Diameter ØD	ap Max.	Max. Ramping Angle α°	ØDHmax	Ød	Ramping angle by ap							
					ap=0.039	ap=0.079	ap=0.098	ap=0.118	ap=0.138	ap=0.157	ap=1.97	ap=0.236
1.00	0.236	4.34	1.92	0.92	0.031	0.061	0.077	0.092	0.108	0.123	-	-
1.25		14.94	2.42	1.17	0.024	0.048	0.06	0.072	0.085	0.097	0.121	0.145
1.50		10.44	2.92	1.42	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.12
2.00		6.49	3.92	1.92	0.015	0.029	0.037	0.044	0.052	0.059	0.074	0.088
2.50		4.71	4.92	2.42	0.012	0.023	0.029	0.035	0.041	0.047	0.058	0.07
3.00		3.69	5.92	2.92	0.01	0.019	0.024	0.029	0.034	0.039	0.048	0.058

- In ramping and helical machining, use coolant and air.
- Helical angle adjusted by ap cannot exceed maximum angle.
- Ramping angle by ap (α°) = $\tan^{-1}\left(\frac{ap}{\pi \times \emptyset d}\right)$
- ap = Depth of cut
- ØD = Tool dia. (inch)

TESTED. PROVEN.