



Machining Guidelines for Chip Control – Grooving

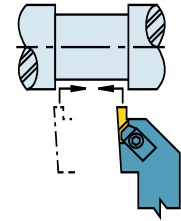
- Center height of insert should be positioned at the center of the workpiece, or up to .005 inch (0,13 mm) above.
- Dwell time in the bottom of the groove, more than three revolutions, is not recommended.
- Chip control is feed rate related, and should be adjusted to fit the particular situation. Recommended feed range is .003-0.012 ipr (0,08-0,3 mm/rev).

Machining Guidelines for Chip Control – Turning/Profiling

- Maximum depth of cut for side cutting (turning/profiling) depends upon material being cut and width of the tool. However, some general guidelines are:
 - 1) .031 - .062 inch (0,79-1,6 mm) wide insert can cut up to .025 inch (0,6 mm) deep.
 - 2) .067 - .128 inch (1,7-3,3 mm) wide insert can cut up to .040 inch (1,0 mm) deep.
 - 3) .138 - .189 inch (3,5-4,8 mm) wide insert can cut up to .080 inch (2,0 mm) deep.
 - 4) .197-.375 inch (5,0-9,5 mm) wide insert can cut up to .120 inch (3,0 mm) deep.

Finish turning the groove

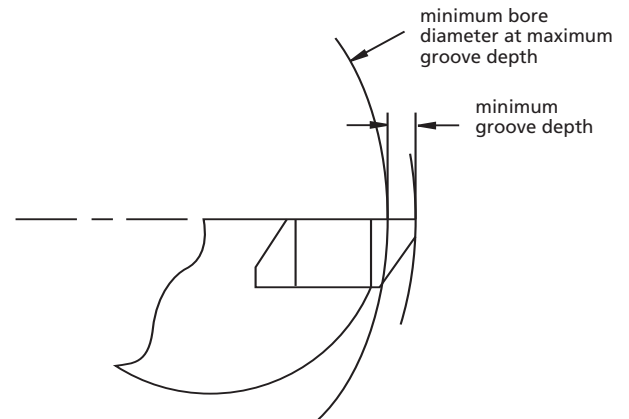
1. Plunge both sides of groove width.
2. Plunge center area to remove web of material remaining.
3. To avoid insert chipping and to achieve groove wall perpendicularity, follow the tool path outlined here.
4. Use the lightest depth of cut that still allows good chip breaking, tool life, and surface finish.



Groove Limits (Maximum Internal Groove Depth Versus Minimum Bore Diameter)

insert	maximum groove depth		minimum bore diameter	
	inch	mm	inch	mm
NG-2031R/L NG-2041R/L NG-2047R/L NG-2058R/L	.050	1,27	.730	18,54
NG-2062R/L NG-2094R/L NG-2125R/L	.110 .102 .098 .080 .055	2,79 2,59 2,49 2,03 1,40	2.500 1.750 1.500 1.000 .730	63,5 44,45 38,10 25,40 18,54
NG-3047R/L NG-3062R/L NG-3072R/L NG-3078R/L NG-3088R/L	.094 .090 .075	2,39 2,29 1,91	1.750 1.625 1.375	44,45 41,28 34,93
NG-3094R/L NG-3097R/L NG-3105R/L NG-3110R/L NG-3122R/L NG-3125R/L NG-3142R/L NG-3156R/L NG-3178R/L NG-3185R/L NG-3189R/L	.150 .145 .138 .125 .110	3,81 3,68 3,51 3,18 2,79	2.375 2.125 1.875 1.625 1.375	60,33 53,98 47,63 41,28 34,93
NG-4125R/L	.150	3,81	2.750	69,85
NG-4189R/L NG-4213R/L NG-4219R/L NG-4250R/L	.250 .245 .240 .218 .200	6,35 6,22 6,10 5,54 5,08	5.750 5.000 4.500 3.250 2.500	146,05 127,00 114,30 82,55 63,50

Internal Groove Depth Versus Bar Interference



NOTE: Internal grooving depth limits are a function of bar clearance versus bore diameters.

*The same maximum groove depth and minimum bore diameter values also apply to metric, NG-K (chip control), and NR (full radius) inserts of similar size.

Technical Data

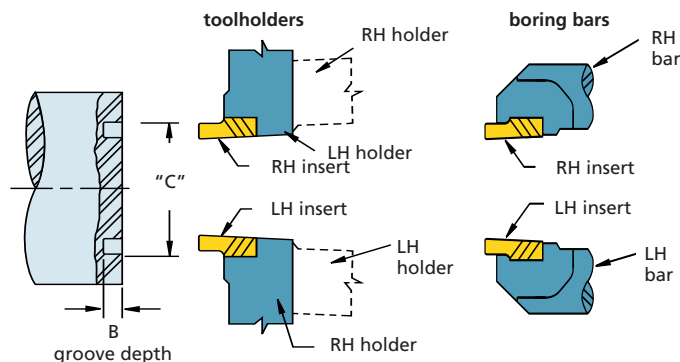


Top Notch Grooving

Machining Guidelines for Face Grooving Operations – External

Standard NG/NGD Inserts

insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NG-2	.050	1,27	2.13	54,0
NG-2	.110	2,79	3.50	88,9
NG-3	.094	2,39	4.00	101,6
NG-3	.125	3,18	5.00	127,0
NG-3	.150	3,81	5.50	139,7
NGD-3	.250	6,35	6.88	174,6
NG-4	.150	3,81	6.00	152,4
NG-4	.250	6,35	8.25	209,6
NGD-4	.375	9,53	8.75	222,3
NGD-4	.500	12,70	8.75	222,3



Top Notch Threading

Inch-sized 60° V-Threading Limits

Internal threading limitations NT-1, NT-2 V-threading inserts

threads per inch	nominal thread size	minimum minor diameter (inch)
	NT-2	NT-2
6	1 7/8	1.695
7	1 3/4	1.595
8	1 5/8	1.490
9	1 9/16	1.442
10	1 1/2	1.392
11	1 7/16	1.339
11 1/2	1 3/8	1.281
12	1 3/8	1.285
13	1 5/16	1.229
14	1 1/4	1.173
16	1 1/4	1.182
18	1 1/8	1.065
20	1 1/8	1.071
24*	1 1/16	1.017

*Twenty-four threads per inch and finer can be cut with an NT-2 insert provided the minor diameter is 1.000 inch or larger.

Internal threading limitations NT-3 and 4 V-threading inserts

threads per inch	nominal thread size	minimum minor diameter (inch)
4**	3	2.729
4 1/2**	2 7/8	2.634
5	2 3/4	2.534
6	2 1/2	2.320
7	2 1/4	2.095
8	2	1.865
9	1 15/16	1.817
10	1 7/8	1.767
11	1 13/16	1.714
11 1/2	1 3/4	1.656
12	1 3/4	1.660
13	1 5/8	1.542
14	1 9/16	1.485
16*	1 7/16	1.370

*Sixteen threads per inch and finer can be cut provided minor diameter is 1.370 inch or larger.

** NT-4 insert only.

Metric 60° V-Threading Limits

Internal threading limitations NT-1 and NT-2 60° V-threading

thread pitch (mm)	nominal thread size	minimum minor thread diameter (mm)
	NT-2	NT-2
4,00	M48 x 4.00	43,67
3,00	M42 x 3.00	38,75
2,50	M39 x 2.50	36,29
2,00	M33 x 2.00	30,84
1,75	M32 x 1.75	30,11
1,50	M32 x 1.50	30,38
1,25	M29 x 1.29	27,65
1,00*	M27 x 1.00	25,92
0,75	M22 x 0.75	21,19

*Thread pitch of 1 mm and less can be cut with an NT-2 insert provided the core thread diameter is 25 mm or larger.

Internal threading limitations NT-3 and NT-4 60° V-threading

thread pitch (mm)	nominal thread size	minimum minor thread diameter (mm)
6,00**	M76 x 6.00	69,50
5,50**	M73 x 5.50	67,05
5,00	M70 x 5.00	64,59
4,00	M64 x 4.00	59,67
3,00	M52 x 3.00	48,75
2,50	M48 x 2.50	45,29
2,00	M42 x 2.00	39,84
1,75	M40 x 1.75	38,11
1,50*	M38 x 1.50	36,38

*Thread pitch of 1,5 mm and less can be cut provided core thread diameter is 35 mm or larger.

**NT-4-insert only.

For additional threading technical information, visit

www.kennametal.com.