



Machining Guidelines

Machining Guidelines for Chip Control – Grooving

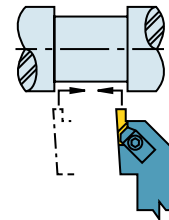
- Center height of insert should be positioned at the center of the workpiece, or up to .005 inch (0,13 mm) above.
- Dwell time in the bottom of the groove, more than three revolutions, is not recommended.
- Chip control is feed rate related, and should be adjusted to fit the particular situation. Recommended 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:
 - .031 - .062 inch (0,79-1,6 mm) wide insert can cut up to .025 inch (0,6 mm) deep.
 - .067 - .128 inch (1,7-3,3 mm) wide insert can cut up to .040 inch (1,0 mm) deep.
 - .138 - .189 inch (3,5-4,8 mm) wide insert can cut up to .080 inch (2,0 mm) deep.
 - .197-.375 inch (5,0-9,5 mm) wide insert can cut up to .120 inch (3,0 mm) deep.

Finish turning the groove

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

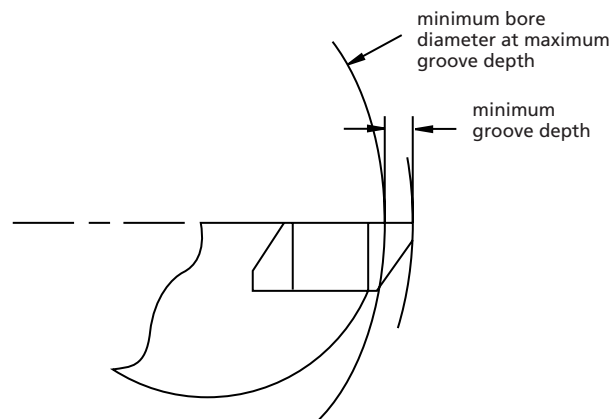


Groove Limits (Maximum Internal Groove Depth Versus Minimum Bore Diameter)

insert	maximum groove depth		minimum bore diameter		
	inch	mm	inch	mm	
NG-1094L	.075	1,91	.800	20,32	
	.040	1,02	.440	11,18	
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	2,79	2.500	63,5	
	.102	2,59	1.750	44,45	
	.098	2,49	1.500	38,10	
	.080	2,03	1.000	25,40	
	.055	1,40	.730	18,54	
NG-3047R/L NG-3062R/L NG-3072R/L NG-3078R/L NG-3088R/L	.094	2,39	1.750	44,45	
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	3,81	2.375	60,33	
	.145	3,68	2.125	53,98	
	.138	3,51	1.875	47,63	
	.125	3,18	1.625	41,28	
	.110	2,79	1.375	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	6,35	5.750	146,05
		.245	6,22	5.000	127,00
		.240	6,10	4.500	114,30
		.218	5,54	3.250	82,55
		.200	5,08	2.500	63,50

insert	maximum groove depth		minimum bore diameter	
	inch	mm	inch	mm
NG-5250R/L NG-5281R/L NG-5312R/L NG-5344R/L NG-5375R/L	.375	9,53	28.812	731,82
	.361	9,17	15.812	401,62
	.344	8,74	10.812	274,62
	.327	8,31	7.312	185,72
	.294	7,47	4.812	122,22
	.257	6,53	3.562	90,47
NG-6250R/L NG-6281R/L NG-6312R/L NG-6344R/L NG-6375R/L	.215	5,46	2.812	71,42
	.250	6,35	5.750	146,05
	.245	6,22	5.000	127,00
	.240	6,10	4.500	114,30
	.218	5,54	3.250	82,55
NG-6375R/L	.200	5,08	2.500	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.

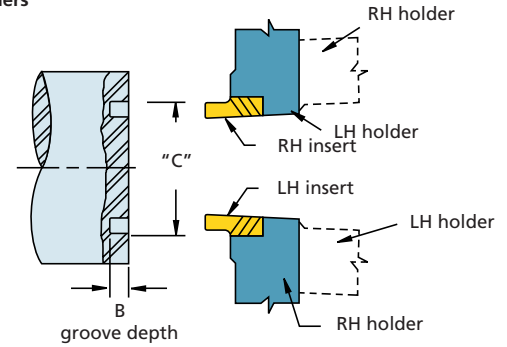


Machining Guidelines for Face Grooving Operations – External

Standard NF/NFD Inserts

insert family	maximum groove depth "B"		minimum groove diameter "C"	
	inch	mm	inch	mm
NF-3	.060	1,52	.94	23,9
NF-3	.094	2,39	1.20	30,5
NF-3	.125	3,18	1.42	36,1
NF-3	.150	3,81	1.63	41,3
NFD-3	.250	6,35	1.88	47,6
NF-4/6	.060	1,52	.94	23,9
NF-4/6	.094	2,39	1.20	30,5
NF-4/6	.125	3,18	1.42	36,1
NF-4/6	.150	3,81	1.63	41,3
NF-4/6	.188	4,78	1.88	47,6
NF-4/6	.250	6,35	2.25	57,2
NFD-4	.375	9,53	2.25	57,2
NFD-4	.500	12,70	2.25	57,2

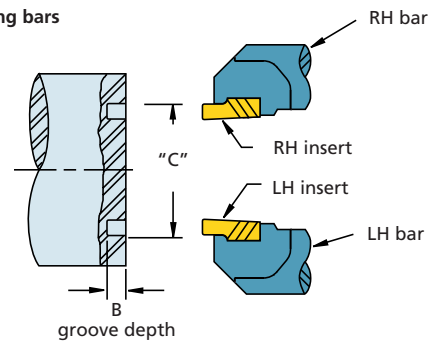
toolholders



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
NG-5	.375	9,53	13.00	330,2

boring bars

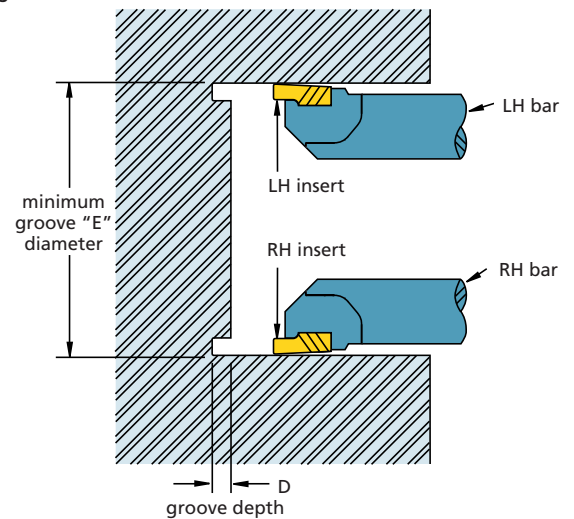


Machining Guidelines for Face Grooving Operations – Internal

insert family	maximum groove depth "D"		minimum groove diameter "E"	
	inch	mm	inch	mm
NFD-3-KI	.250	6,35	2.25	57,2

Also check minimum bore diameter of boring bar. See page B32.

boring bars



NOTE: For internal applications, use only NFD-KI inserts.