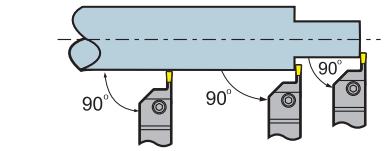
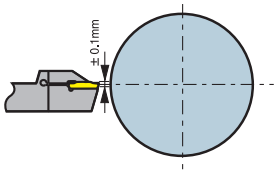
Center height control of parting and grooving tools

- No matter which parting or grooving tools you select, the ideal surface quality is only achieved by ensuring that insert is vertical from the center line of workpiece, which can also effectively reduce vibration during machining.
- The height tolerance between insert edge bottom and the center height of workpiece should be remained in ±0.1mm, especially for lever parting and grooving workpieces with small diameter. This can improve tool life, reduce cutting resistant force, and diminish burrs.

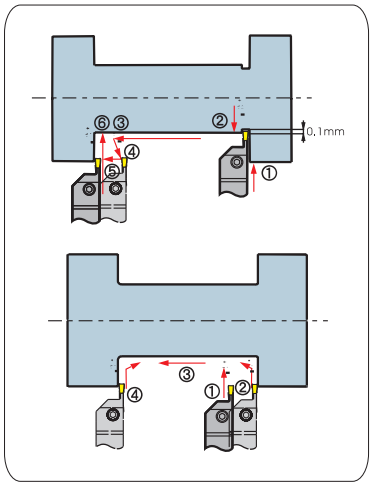




Conventional diagram of height difference of tool center line

Parting

- When the insert is approaching the center of workpiece, the cutting speed should be reduced by 30%, which is good for improving life and surface quality.
- As long as conditions allow, try to shorten the overhang of tools as much as possible to ensure good stability.

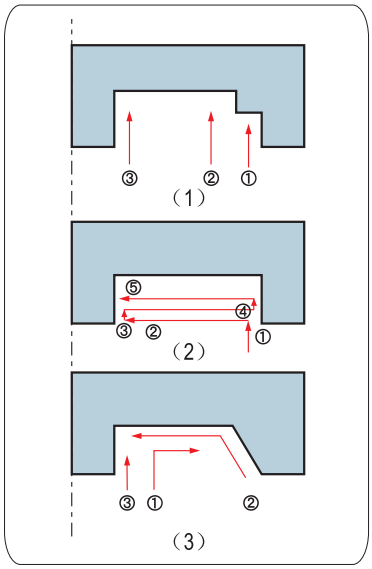


External grooving, turning and profiling

- In-feed sequence: When cutting depth>0.5mm, radial in-feed (Max. cutting depth can be 0.75×insert edge width S) → radial out-feed about 0.1mm → axial in-feed →flank out-feed → axial in-feed → radial machining to required depth.
- When finishing, adopt the sequence shown in the diagram. It can reduce vibration caused by the friction between tools and chips.

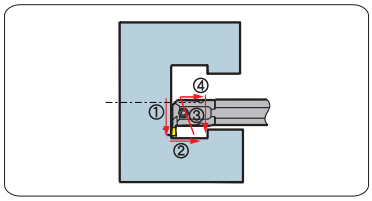
Surface grooving and turning

- Finishing (Multi-slot cutting)
  Cut inwards from Max. diameter. Inserts offset to inward flange when retracting, as is shown in diagram (1).
- Recess turning
  Axial turning depth should not exceed 0.75×S (cutting edge width).
  If slot width is larger than slot depth, it is recommended to adopt recess turning, as is shown in diagram (2).
  If slot depth is larger than slot depth, it is recommended to adopt multi-slot cutting.
- Finish machining
  First finish bottom and external diameter fringe, then finish the internal diameter to required size, as is shown in diagram (3).



Internal grooving and turning

- To facilitate chip flow, always feed along the direction of moving from the deepest in the hole to outside.



Application information of parting and grooving

The cutting parameters recommended are suitable for wet machining.

Insert size	Recommended feed rate(mm/r)					
Insert width(mm)	Parting	Grooving	Grooving(-MM)	Turning	Turning(-MM)	Profiling
2.5	0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.15	0.05-0.2	0.05-0.15
3	0.05-0.15	0.05-0.15	0.05-0.2	0.07-0.15	0.07-0.2	0.1-0.2
4	0.05-0.2	0.05-0.2	0.05-0.25	0.07-0.25	0.07-0.3	0.1-0.2
5	0.07-0.2	0.07-0.22	0.07-0.25	0.1-0.25	0.1-0.3	0.15-0.3
6	0.1-0.3	0.07-0.25	0.07-0.3	0.1-0.3	0.1-0.35	0.15-0.3
8			0.1-0.4		0.15-0.45	

Workpiece material		Hardness	YBG302	YBG202 YBG205	YBG105	YBG212	YBC151	YBC251	YD101	YD201	YBG102	YC10	YC40
P	Carbon steel	125≤HB≤170	120-260	150-280			140-280	150-280				130-280	110-260
	Low alloy steel	180≤HB≤275	80-175	110-200			100-240	110-200				90-200	70-175
	High alloy steel	180≤HB≤325	80-160	110-190			100-220	110-190				90-190	70-160
	Cast steel	180≤HB≤250	75-140	100-170			80-160	100-170				80-170	60-140
M	Ferrite, Martensite	200≤HB≤300	70-170	100-200				100-200				80-200	60-170
	Austenite	180≤HB≤300	80-200	110-220				110-220				90-220	70-200
K	Malleable cast iron	130≤HB≤230	100-200	130-220						90-160			
	Grey cast iron	180≤HB≤220	90-170	120-200						80-140			
	Nodular cast iron	160≤HB≤250	80-150	110-180						60-140			
N	Al alloy	--							200-400				
S	High temperature alloy	≤400			40-70	20-50			20-50		30-60		

The cutting parameters recommended are suitable for wet machining.
Advice: internal machining and end machining, The cutting speed should be reduced by 30%-40%.