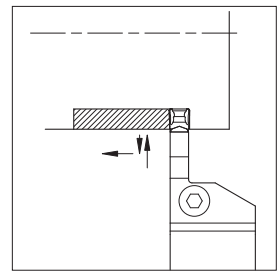
Guide for External Machining

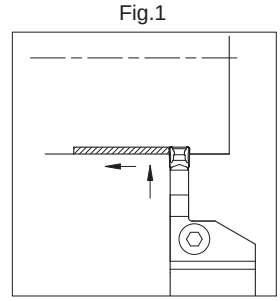
Point （Ⅰ）(Longitudinal turning after Grooving)

1）Grooving Depth Over 0.5mm: For roughing (Refer to Fig. 1)
Before longitudinal turning, pull the tool back about 0.1mm after grooving, instead of longitudinal turning subsequent to grooving.
(Failure to pull the tool back before traverse cutting will result in an unbalanced load applied on only one side of the cutting edge.)



Before Longitudinal turning, pull the tool back about 0.1mm after grooving, instead of Longitudinal turning subsequent to grooving.（Grooving Depth Over 0.5mm: At roughing）
Fig.1

2）Grooving Depth under 0.5mm: For finishing (Refer to Fig. 2)
Longitudinal turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge.
(Dwell-motion is not necessary.)



Traversing subsequent to grooving (Grooving Depth under 0.5mm: At finishing)
Fig.2

Point （Ⅱ）

1）When widening the groove width (Refer to Fig. 3)
Apply the “Step Turning”.
2）Then perform finishing.
(For better chip control, over 0.5 mm ap is recommended.)
Note) If machining is made toward the center but the center is not pressed, lower the feed rate.

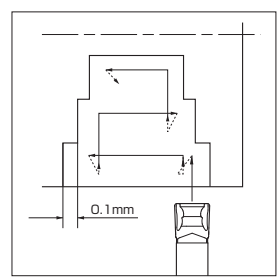
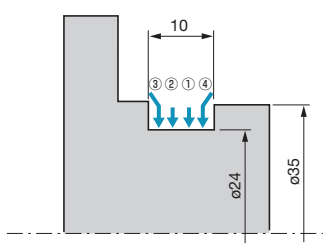


Fig.3

Case Studies

17Cr3 (SCr420H) (Grooving)

·Gear
·Vc=113～164 m/min
·f=0.06 mm/rev
·Wet
·GDM4020N-040GM (PR1225)
·KGDL2525X-3T10S



GM Chipbreaker (PR1225)	1500 pcs/C
Competitor K (PVD Coated Carbide)	250 pcs/C

x6 longer life

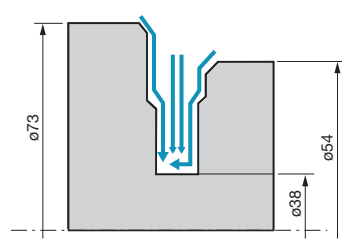
Result
·KGD type grooving toolholder + GM chipbreaker (PR1225) showed 6 times longer tool life than that of Competitor K.
·Good chip control without burned chips.

Competitor K　GM Chipbreaker

(Evaluation by the user)

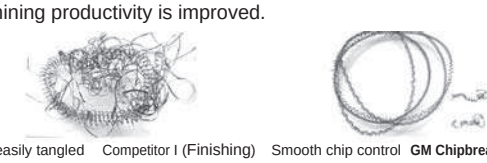
20CrMo5 (SCM420) (Grooving Traversing)

·Gear
·Vc=170m/min
·f=0.15 mm/rev (Roughing)
0.10 mm/rev (Finishing)
·ap=0.2mm (Finishing)
·Wet
·GDM4020N-040GM (PR1215)
·KGDR2525X-4T20S



GM Chipbreaker (PR1215)	250 pcs/C
Competitor L (Raughing: PVD Coated Carbide) (Finishing: Cermet)	200 pcs/C

Result
·GM chipbreaker reduced occurrence rate of tangle of chips (occurrence rate 80% => 10%). The problem was persistent with Competitor L. Machining productivity is improved.



Chips easily tangled　Competitor I (Finishing)　Smooth chip control　GM Chipbreaker (Finishing)

(Evaluation by the user)