

BRA DRILLS type
GRINDING PROCEDURE

MITSUBISHI MATERIALS CORPORATION GIFU PLANT

BRA DRILLS type GRINDING PROCEDURE

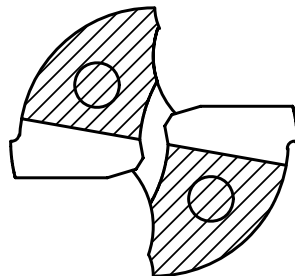
Confirmation of Cutting Edge

- Check the worn and/or damaged condition of the cutting edge.
- In case of extensive chipping on the cutting edge, eliminate the segment with a GC-wheel.

<Secondary Relief Grinding>

In case of much elimination or several times of regrinding, eliminate back metal as the secondary relief (oblique portion of Fig.1) with a WA-wheel.

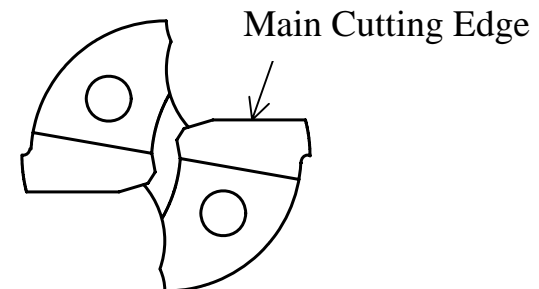
Fig.1



Primary Relief Grinding

- Use a collet chuck when installing a drill.
- Recommend to use the coolant, because a drill is easy to heat and cracks occurs.

Fig.2

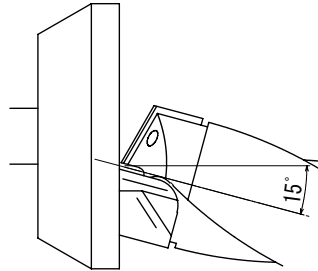


- The main cutting edge should be parallel from the drill's point view as shown in Fig.2.
- Set the rest on the rake face to adjust the drill position.

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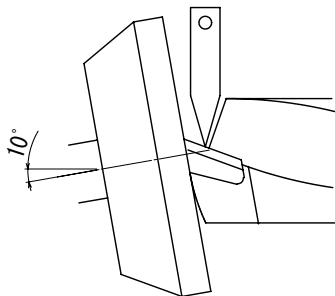
Primary Relief Grinding

Fig.3



- The point angle should be 150° with the swivel angle designated to 15° as shown in Fig.3.

Fig.4



- Incline the angle of the drill to 10° (Fig.4). The angle will be the primary relief angle of the cutting edge.

- After the completion of a single cutting edge, index the drill until another side of the rake face contacts the rest. Then regrind another cutting edge. The grinding depth is 0.02-0.03mm per pass.

<Spark Out>

Last, finish both cutting edges with the grind depth at 0.01mm. Repeat the procedure 2-3 times, including a spark out with a slow traverse for finishing.

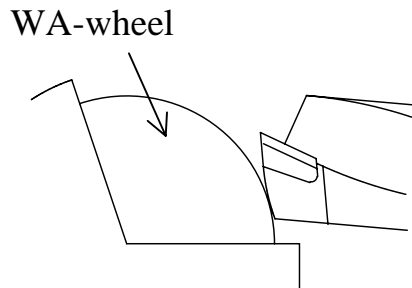
<Remark>

Grind until the worn and chipped segment of the cutting edge is eliminated. Pay extra attention to the wear on the major portion.

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Secondary Relief Grinding

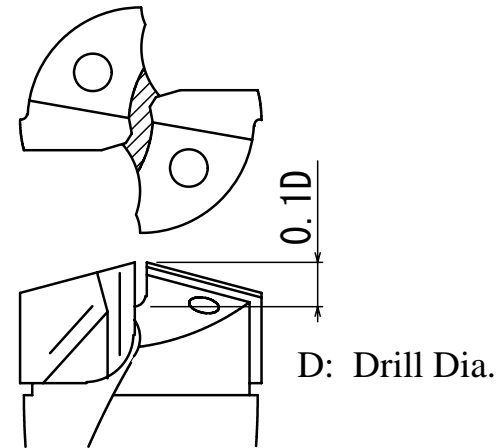
Fig.5



- After the completion of the primary relief, grind the secondary relief by the hands (oblique portion of Fig.1).
- Eliminate the back metal with a WA-wheel so that the secondary relief angle gets larger than the primary relief one, 10° (Fig.5).
- The wheel shouldn't contact the insert, if possible.
- Eliminate burrs with a file.

Slit

Fig.6



- After the completion of the secondary relief, cut the slit with a hand saw.
- The slit depth is approximately $0.1D$ (Fig.6).

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Honing

Fig.7

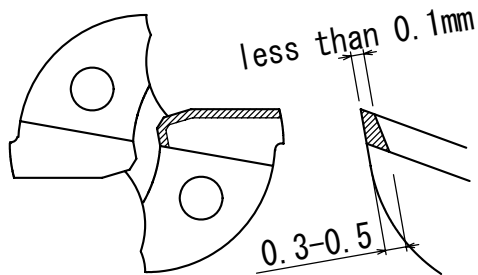
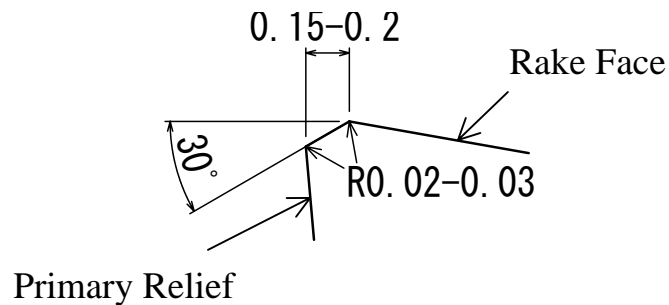


Fig.8



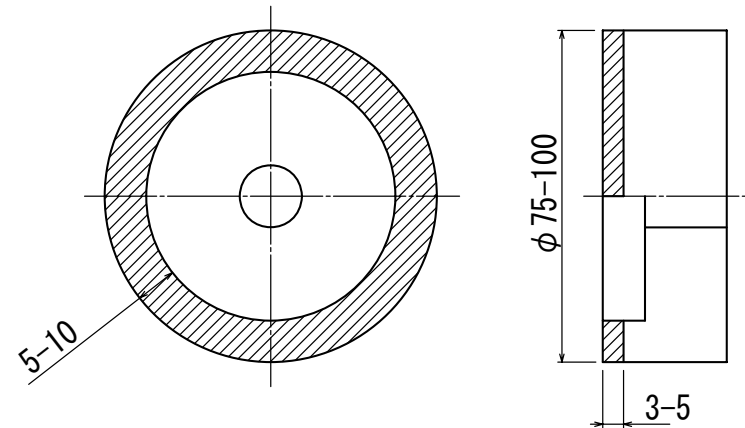
- Last, execute the honing.
- The honing should be done homogeneously on entire cutting edge as Fig.7.
- The honing angle is 30° as shown in Fig.8.
- The honing width is according to the work material. In case of cutting a general steel, the honing width is 0.15-0.20mm. On honing width, refer to the operating instruction.
- Chamfer on the drill corner as Fig.7.
- The honing face is finished with a hand lapper.

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- The regrinding process is completed.
Confirm the following criteria before using.
- (1) Within 0.03mm the lip height difference.
- (2) Complete grinding of damage segments of the cutting edge.
- (3) Optimal honing.
- (4) Grinding burr is eliminated.

Primary Relief Grinding

Diamond Wheel



Grit No.

Rough Grinding No.200

Finish Grinding No.400

If necessary, grind roughly before finish grinding.

BRA DRILLS type GRINDING PROCEDURE

Honing

Diamond file

Grit No.

Rough Grinding No.140

Finish Grinding No.400

Hand Lapper No.1500

If necessary, grind roughly before finish grinding.