Drilling Test

Test Condition

- Machine : Vertical type M/C

- Coolant : Synthetic soluble type

- Coolant pump :
  460W
  96 L/min
  6.5m(60Hz)

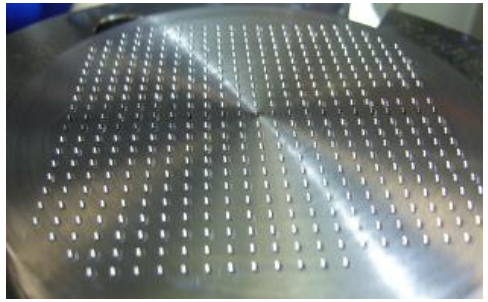
- Material : SS400
  (Steel for general structure)

-Perform center process before drilling process

-Drill tool
-Solid Carbide Drill (Straight shank drill)
size : ϕ1.01

- Drilling condition
  Spindle Speed : 10000min-1
  Feed : 20mm/min
  Depth : 6.0mm
  Step process : No

Conditions in which chips are thin and stretchy



- Case of Wavy Nozzle use
  Mode : SWEEP
  Swing Angle : 1 Count
  Nozzle Speed : 25 Count

- Case of fixed nozzle
  Two 1/2 inch Round nozzle are used.

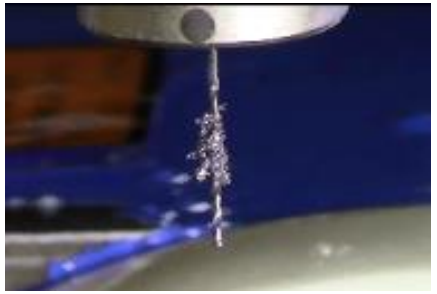
Result of Drill test

Normal coolant nozzle

Hole number until drill breakage : 30

Chips remaining to the drill was always confirmed before and after breakage of the drill.

During processing



Broken drill

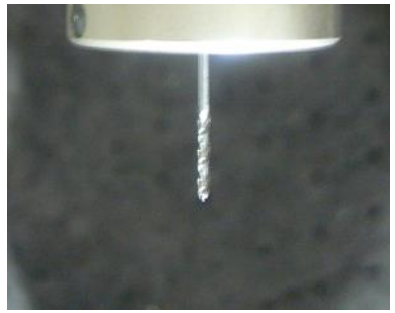
Wavy Nozzle(Sweep mode)

Hole number until drill breakage : 84

Chips remaining to the drill was not confirmed before and after breakage of the drill.

During processing

Broken drill

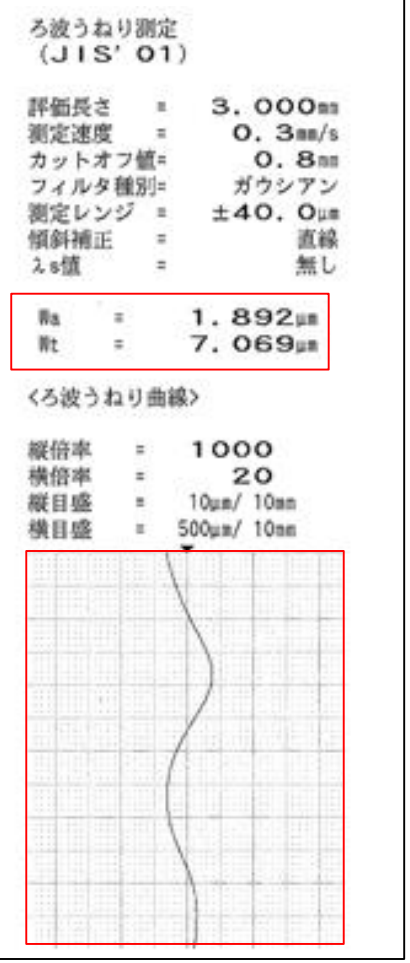


It was confirmed that Wavy Nozzle contributes to longer life of the drill tool by using other drill.

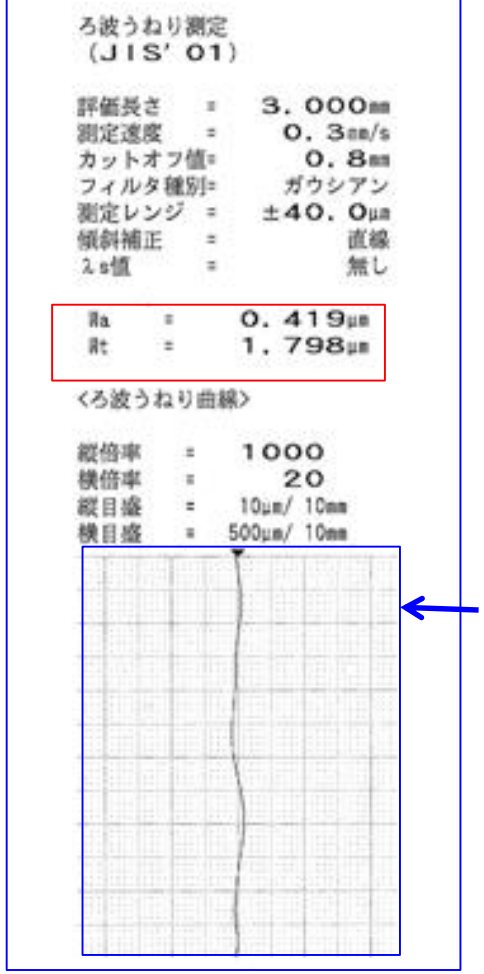
Shape of cross section of hole using Drill

* Comparison of the shape of the first hole without chips on the drill

Normal coolant nozzle



Wavy Nozzle



Normal coolant nozzle:
- Poor chips discharge
- Chips becomes an obstacle to the process.
- Drill can not proceed straight.
- As a result, shape of the hole is disturbed.

Wavy Nozzle
- Good chips discharge
- Chips do not become an obstacle.
- Drill can proceed straight.
- As a result, shape of the hole becomes good.