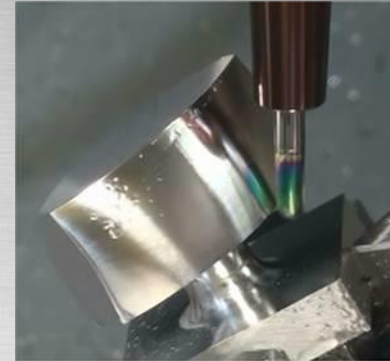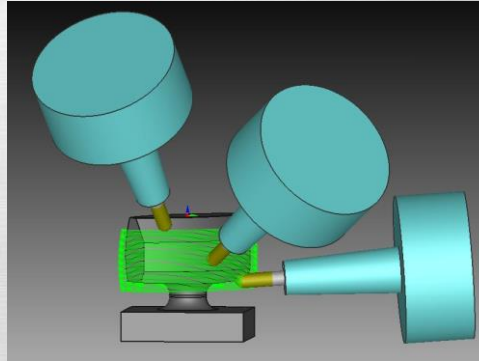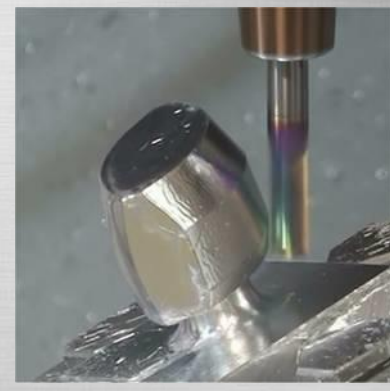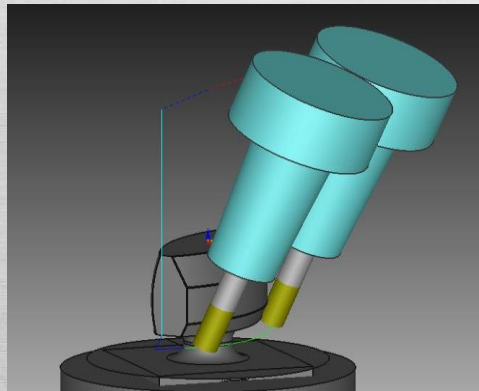# CAM-TOOL

Simultaneous 5axis Cutting modes are developed at Version 5.

"Undercut Z-level Finishing" creates tool paths at undercut part.

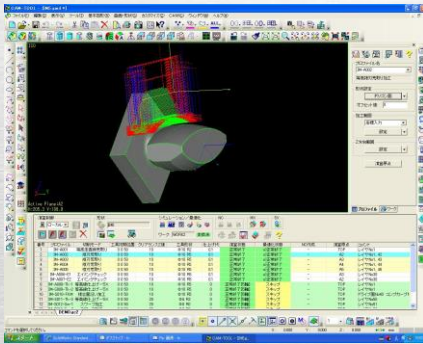"Swarf cutting" machines with the side of flat end mill.

## Undercut machining
## Undercut Z-level Finishing
**D6R3 Ball End Mill**
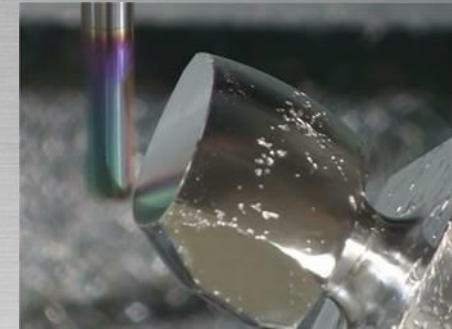


## Side machining
## Swarf cutting
**D8 Flat**

# Cutting process

**Rough 2**
**3+2 axis machining**



**Finish 1**
**Undercut Z-level finishing**



**Finish 3**
**Swarf cutting**

| NO. | Process | Tool Dia. （mm） | XY step （mm） | Z step （mm） | Stock （mm） | Speed (r.p.m) | Feed （mm／min） | Cutting Time (h:mm:ss) |
|---|---|---|---|---|---|---|---|---|
| 1 | Rough1 | 10 | 4 | 0.6 | 0.1 | 8,000 | 2,000 | 0:43:34 |
| 2 | Rough2（3+2Axis） | 10 | 0.8 | 0.5 | 0.1 | 10,000 | 1,000 | 1:27:43 |
| 3 | Semi Finish（5Axis） | 10 | 0 | 0.001 | 0.1 | 10,000 | 500 | 0:22:10 |
| 4 | Finish1（5Axis） | 10 | 0 | 0.01 | 0 | 10,000 | 500 | 0:23:45 |
| 5 | Finish2（5Axis） | 6 | 0 | 0.001 | 0 | 10,000 | 1,000 | 0:26:48 |
| 6 | Finish3（5Axis） | 8 | 5 | 0 | 0 | 8,000 | 500 | 0:02:21 |
| | | | | | | | CuttingTime | 3:26:21 |

**Material :YH 75（13HRC）**
**50mm x 50mm x 50mm**

Cutter: Hitachi Tool Engineering , Ltd.

**DLC Ball End Mill**