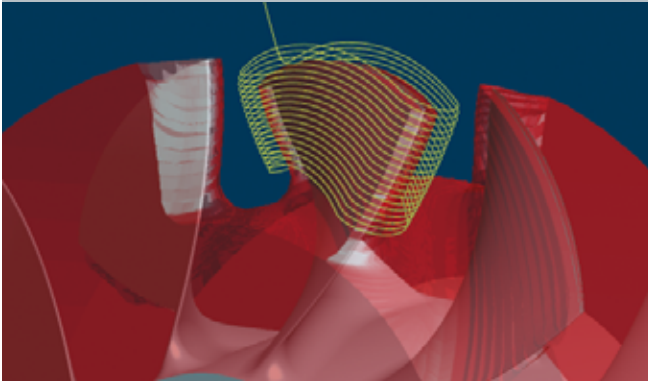


## Blisk milling on an MIKRON HSM 400U

Very twisted and thin blades with narrow clearances place great demands on process reliability. *hyperMILL*® multiblade package makes the programming and milling of these geometries very easy and reliable thanks to, amongst other things, the numerous integrated automated functions and fully automated collision avoidance.

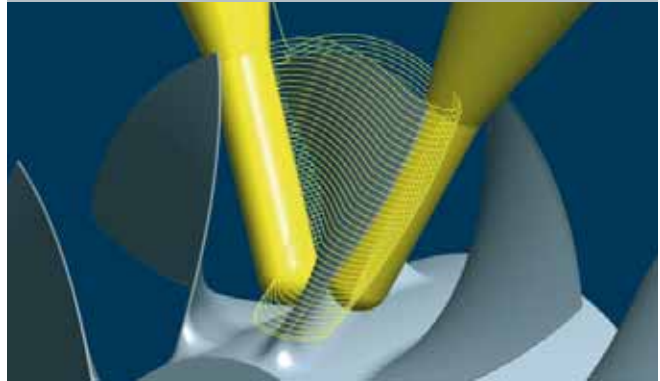
### Multiblade roughing

Due to stability problems, thin blades are often alternately roughed and finished during machining. The special roughing function for blisks makes it easy to define a pre-machining cycle for a succession of roughing and finishing jobs.



### Point finishing

This strategy machines the blades in point contact mode following a continuous spiral path. Point finishing mills a perfect transition between contiguous areas.



| Processing              | Tool       | Diameter [mm] | Corner Radius [mm] | Number of Teeth | Spindle Speed [min <sup>-1</sup> ] | Feed Rate [mm/min] | Lateral Feed [mm] | Axial Feed [mm] | Processing Time [min'] |
|-------------------------|------------|---------------|--------------------|-----------------|------------------------------------|--------------------|-------------------|-----------------|------------------------|
|                         |            | D             | R                  | z               | n                                  | v <sub>f</sub>     | a <sub>e</sub>    | a <sub>p</sub>  | t                      |
| Drilling                | Drill tool | 3             | –                  | 2               | 6.500                              | 350                | –                 | –               | 0'15"                  |
| Outside roughing        | End mill   | 4             | 0                  | 3               | 7.500                              | 1.000              | –3                | 0,5             | 2'25"                  |
| Blade roughing          | Ball mill  | 1             | 0,5                | 2               | 40.000                             | 1.000              | 0,3               | 0,2             | 38'00"                 |
| Blade finishing         | Ball mill  | 1             | 0,5                | 2               | 42.000                             | 2.500              | 0,1               | 0,02            | 33'35"                 |
| Hub finishing           | Ball mill  | 1             | 0,6                | 2               | 42.000                             | 2.500              | 0,1               | 0,1             | 2'55"                  |
| Cutting                 | End mill   | 2             | 0                  | 2               | 20.000                             | 600                | 2                 | 0,2             | 2'00"                  |
| Processing time (total) |            |               |                    |                 |                                    |                    |                   |                 | 79'10"                 |

**Machine** MIKRON HSM 400U, 42.000 min<sup>-1</sup> **Material** Titanium 5 (3.7165) **Specifications** small blisk with 11 blades, sophisticated machine dynamics, machining using small tools



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