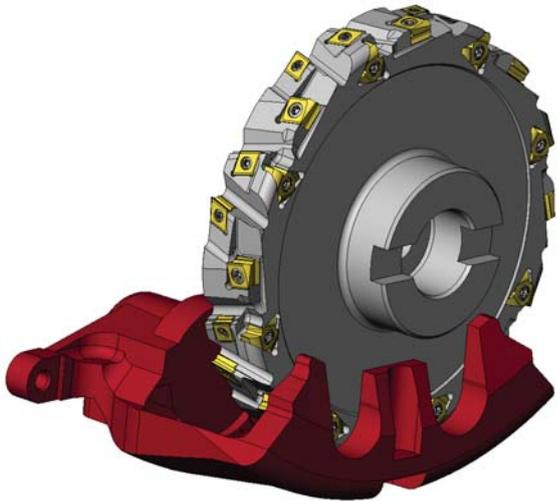


# First comes the solution. Then comes our tool.

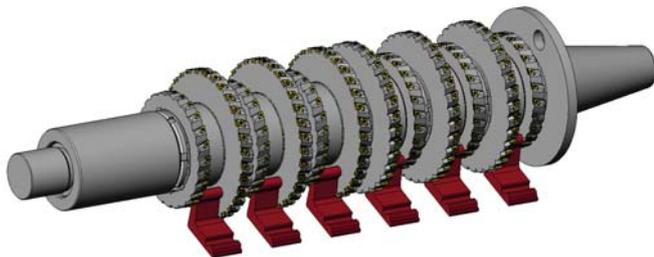


## Challenge

Work piece | Brake caliper  
 Operations | milling the brake disk slot  
 Material | GJS  
 Requirement | machining the contact face and the brake disk slot with a single tool in 2 cuts

## Solution

Tool | Xtra side milling cutter  
 Special features | **1 tool** | **1 cut**  
 Advantages | 20% cycle time reduction | 62% increase of tool life



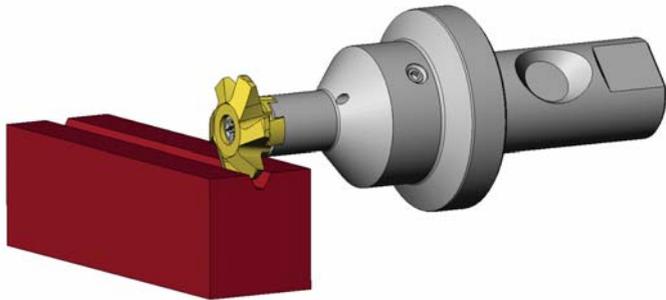
## Challenge

Work piece | Hinge  
 Operations | side cutting | mouth milling  
 Material | Plain steel  
 Requirement | Boost in machining performance | prevention of tool breakage as a result of vibration | noise level reduction / reduction of the change and set-up time

## Solution

Tool | Special side milling cutter kit  
 Special features | Pre-adjusted set comprising 12 side milling cutters with max-Ø 200 mm and zz = 16  
 Advantages | **No set-up times** | elimination of damaging vibrations | machining of 6 work pieces in one cut | high precision

## And then your success. (Part 1)



### Challenge

Work piece | Palette profile

Operations | Profile milling

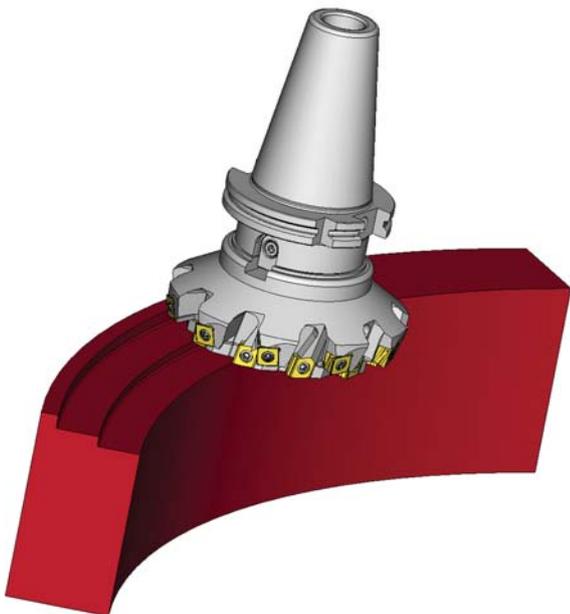
Material | Titanium

Requirement | Procession time reduction | lowering the storage and regrinding costs | significant tool life expansion

### Solution

Tool | Special slot milling cutter Easy-Change-Program

Special features | **50% faster** | **50% longer tool life** | no regrinding | no tool breakage | minimal storage costs | consistent quality



### Challenge

Work piece | Casing

Operations | Milling of a multi-stage special contour

Material | GJS

Requirement | Considerably reduced machining time | unstable setting of the work pieces | low vibration milling | reduced noise level

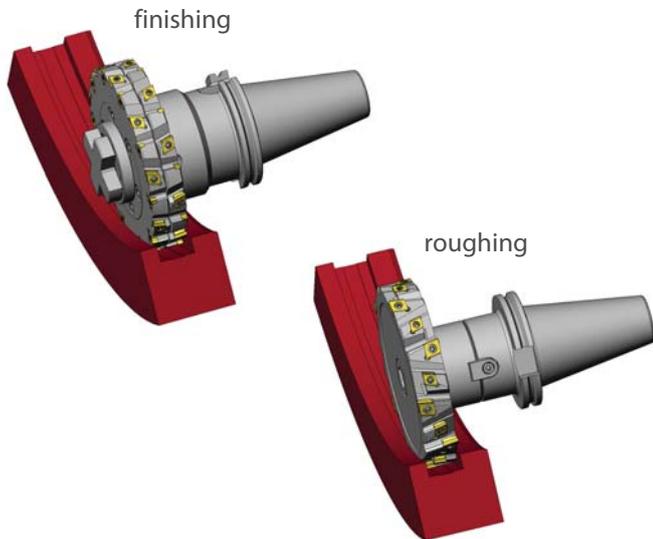
### Solution

Tool | Multi-stage contour milling cutter

Special features | combination tool with  $\varnothing 63/120/140$  mm and  $z z = 10$

Advantages | **1 tool and 1 milling operation** instead of 3 tools and 3 milling operations | drastic reduction of the machining time | process secure and low vibration milling

# First comes the solution. Then comes our tool.

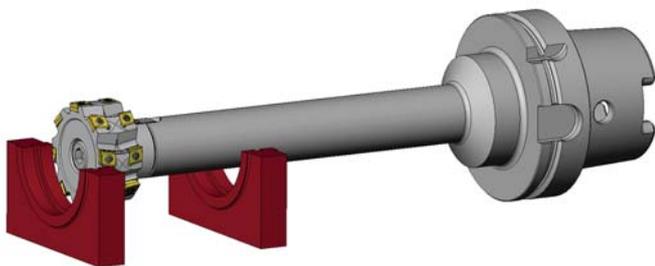


## Challenge

Work piece | Bearing housing  
 Operations | Roughing and finishing  
 Material | GJS500  
 Requirement | Reduction of machining time | roughing and finishing with 1 each tool instead of each 2 tools in 3 rounds as before | tool life increase | no adjustable finishing cutter

## Solution

Tool | Special counter milling  
 Special features | **Roughing**  $\varnothing$  160 mm and  $zz = 5 \times 4$  and **finishing**  $\varnothing$  160 mm and  $zz = 10 \times 4$  in **1 each cut**  
 Advantages | 50% faster | 50% increase of tool life



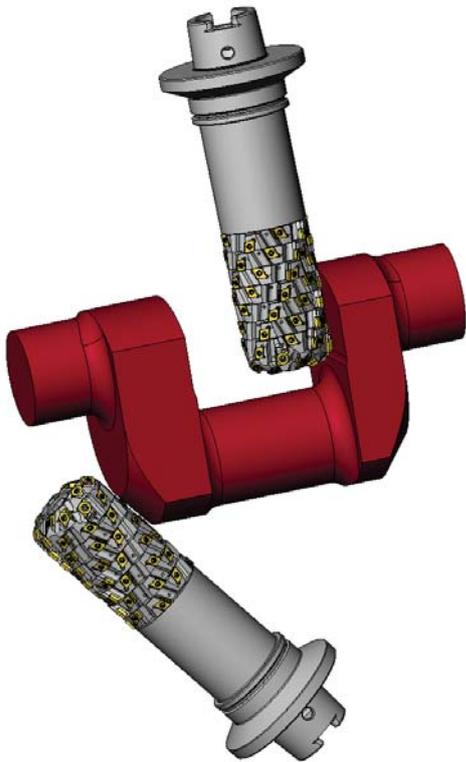
## Challenge

Work piece | Engine block/crankcase  
 Operations | Roughing and finishing flange bearing width  
 Material | GJL250  
 Requirement | Highly precise, low vibration machining despite wide overhang | adjustable tool not desired | consolidation of multiple tools into just one

## Solution

Tool | Xtra side milling cutter kit EB18  
 Special features | Pre-adjusted set of 12 disk milling cutters with  $\varnothing$  57 mm and  $zz = 8 \times 2$   
 Advantages | **1 tool for roughing and finishing** | no adjusting time | high feed rates attainable | reduced machine wear and tear

## And then your success. (Part 2)

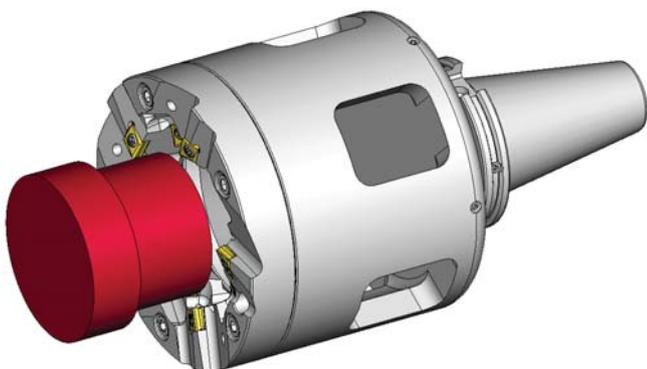


### Challenge

Work piece | Large crank shaft  
 Operations | Milling the hub wideness and the pin chamfer  
 Material | 42 CrMo4  
 Requirement | Reduction of machining time and of immense tooling costs | significantly increase of tool life

### Solution

Tool | Multiring EM90  
 Special features | Modular shell end mill with  $\varnothing$  125 mm and  $z = 8 \times 4$   
 Advantages | Extreme cutting length in case of radial chip removal of up to 6 mm | **1200% more Q** | lowering of costs by using a standard solution | high process security



### Challenge

Work piece | Asymmetric castings  
 Operations | Diameter-/roughing machining  
 Material | GJS700  
 Requirement | Drastic machining time reduction | flexible tool for the machining of various diameters | faster and simpler replacement of cutting rings | high process security

### Solution

Tool | Special countersinking tool  
 Special features | Flexible system  
 Advantages | Highly stable insert pockets | indexable inserts have 4 cutting edges | easy and quick handling | feed rate increased multiple times compared to existing tool systems