Production cell with 6 main spindles for flange drivers

HK CON MASCHINENBAU

Optimized for quantity + flexibility:

- Simultaneous machining of two geometrically identical or different flanges
- Fast, flexible loading of the system thanks to 2 robots

YouTube

Production cell for flange drivers

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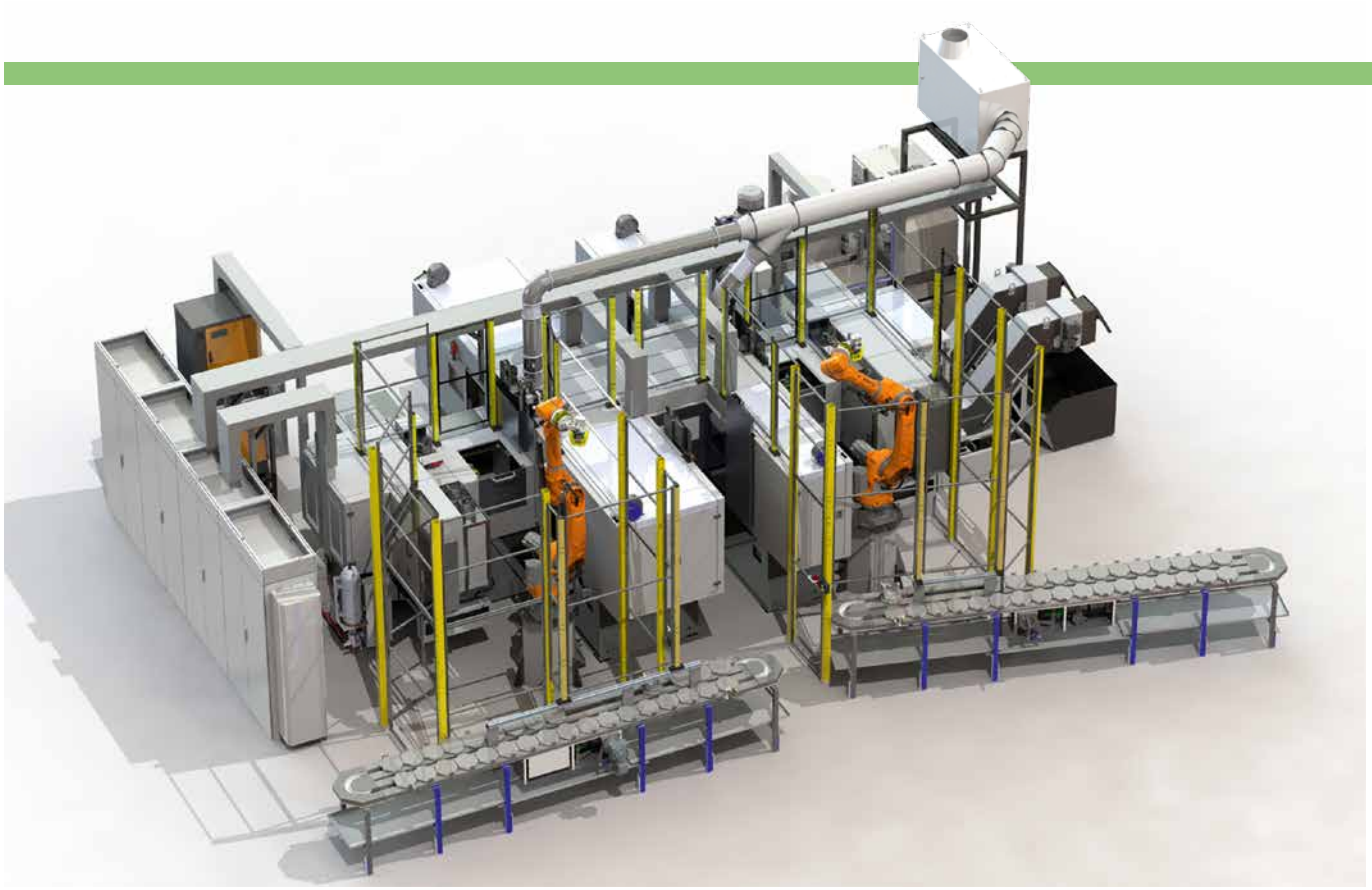
The concept: productivity gains through simultaneous processing of different flanges

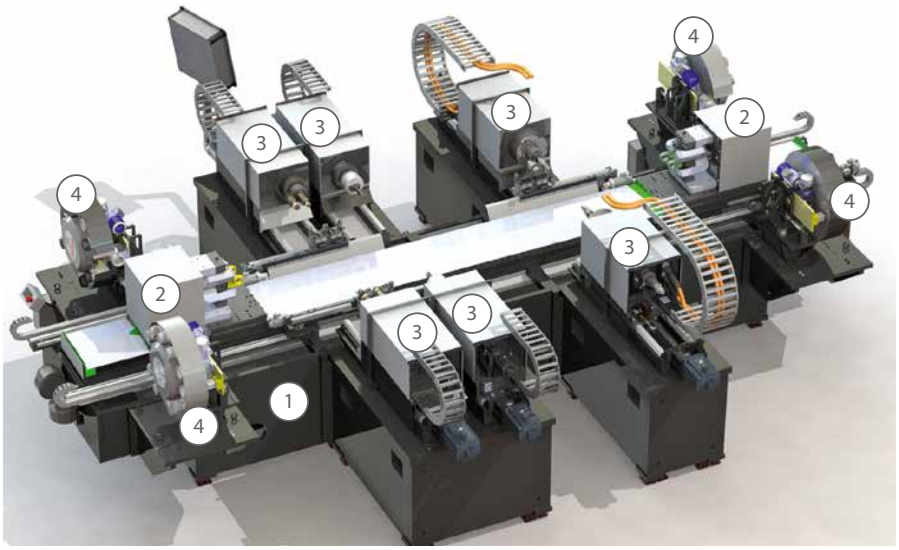


The production cell is based on an x-axis support on which two machine tables are guided. The tables with their hydraulic clamping elements move the workpiece independently of each other to the positions of the main spindles. These, designed as motorized spindles, are arranged in pairs opposite each other and result in 3 machining stations.

At both ends of the x-axis, the raw and finished parts are inserted into and removed from the clamping devices of the tables. For the greatest possible flexibility in production, the precision machining center has 4 tool stores, each with 12 places for the external main spindles. All common production processes are possible: milling, turning, drilling, countersinking, thread cutting, reaming, boring and much more.

Application – suitable for:

- Flange drivers
- Drive shafts
- Fork flanges
- End machining of shafts, tubes



1. Machine bed as support of the x-axis and the main spindles arranged laterally on it
2. Variable work table with hydraulic clamping elements
3. Main spindles
4. 12-station tool magazine

... on one machine bed

High cycle rate: loading and unloading

The system is loaded and unloaded via two independent stations:

- One robot is assigned to each of the two work tables.
- The robots load and unload the hydraulic clamping devices on the two work tables at staggered intervals.
- Up to 4 main spindles are engaged at the same time.

Conveyor belts for loading and unloading serve serve as workpiece storage.

Loading by robot


Blank before processing


Loading/unloading conveyor belt


Variable work table with hydraulic clamping elements

The processing

The production cell has three machining stations with main spindles arranged opposite each other. The advantages of the machine concept become apparent: the simultaneous machining of 2 flange drivers on their two cheeks.

Loading/unloading
The clamping device holds the workpiece to be machined to be machined.

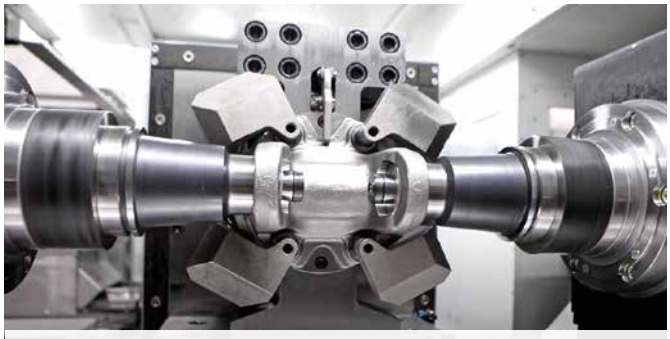
Station 1
The system simultaneously drills two holes "into the solid" (eye holes) on both cheeks of the blank - the blank does not yet have any holes. In addition, both outer flat surfaces are mirrored.

Station 2
The contours and an additional groove are precisely inserted into both eye holes using facing slides.

Station 3
The inside diameters of the two holes are reamed.


Machining the inside diameter


Multi-stage indexable insert drill


Simultaneous processing of both eye holes

YouTube

Production cell for flange drivers

Production of different workpieces – during operation

Four 12-station tool magazines exchange tools with the external main spindles via changing devices in order to produce different workpieces during operation.

The two eye holes are machined without changing tools using the attachment tools of the facing slides. Diameters from 42 mm to 65 mm can be machined continuously.

Highlights

- **4 tool magazines, each with 12 slots, ensure flexibility and speed.**
- **Simultaneous/parallel machining of two different workpieces.**
- **Production of all types of the "flange driver" workpiece on one machine on one machine – without set-up.**

12-station tool magazine

Tool change

Facing slide

Standard equipment

- 4 driven tools (HSK 100)
- 2 driven facing slide tools
- 4 tool stores with 12 places each
- Chip conveyor
- Coolant filter system
- Extraction system
- Camera monitoring for position-oriented insertion of the blanks
- Special clamping device with servo-controlled clamping force adjustment and servo-controlled clamping jaw control
- Air system control
- 2 robots
- 2 unloading belts

Complete machining of the flange driver:
Cycle time max. 34.4 seconds depending on version

Special equipment

- Rotary table
- NC swivel head
- y-axis on main spindle side

Machine dimensions

- Machine tool incl. peripherals: 9100 mm x 10900 mm

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