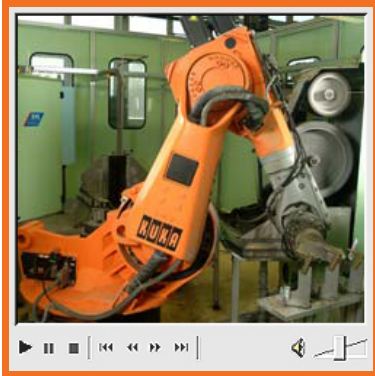


Grinding of household knives

Starting point / Task definition

WMF Aktiengesellschaft relies increasingly on automatic processes. For its branch factory in Hayingen, Germany, the company was looking for a way to grind the handles and backs of household knives automatically. One requirement: to be able to process a series of household knives in various sizes.

Implementation / Solution



The solution was found in the form of a dual robotic cell with two KUKA KR 45 robots. One of the robots is used in place of manual handling for the grinding of household knives. The second was introduced later to carry out the subsequent process steps. The cells are interlinked to allow automatic transfer of the parts being processed.

An employee loads knives into a feeding magazine, which is subsequently placed on a conveyor belt and advanced into the robotic cell. In each cycle, the KR 45 takes a knife out of the magazine, grips it in a defined position, and moves it for grinding of the underside of the handle. This grinding takes place at two stations, each of which is equipped with one coarse-grained and one fine-grained abrasive belt. In order not to overheat the knives and to retain their geometric form, the grinding pressure in the stations must be adjusted very sensitively. After processing has been carried out at both of the grinding stations, the KR 45 dips the knife into a spray cleaning system, and secures it in an intermediate clamping station so that it remains in the defined position. A gripper change is carried out, followed by grinding operations at two additional stations. After that the robot places the knives back into the magazine, which is then moved automatically to the second cell. There the other KR 45 grips the knife by the handle in a precise position to enable coarse and fine grinding on the knife's bolster and the back of the handle at the two subsequent conveyor stations. In order to extend the service life of the abrasive belt, several grinding positions are used along the width of the belt. After that the relevant processes from the first cell are repeated, i.e. spray cleaning, intermediate clamping and gripper exchange. The dual stations which follow are used to process both surfaces of the handle. The last grinding station carries out finishing of the handle surface using a special grinding set. When the robot has filled a magazine, the magazine is transported out of the cell and forwarded for precision grinding of the blades.

System components / Scope of supply

- :: Two KUKA KR 45 robots
- :: Two PC-based KUKA robot controllers, including control panel with familiar Windows interface
- :: Two complete robotic cells
- :: Robot programming
- :: Commissioning

Supplied by the KUKA systems partner SHL Automatisierungstechnik AG, Böttingen, Germany.

Results / Success

- :: Greater cost-effectiveness

With this automation WMF achieves greater cost-effectiveness.

- :: High repeatability

The extremely high repeatability of the robots, which is measured in tenths of a millimeter, gives WMF maximum process reliability and therefore optimum quality.



Number of report:
R 217

Industry:
Metal products

Application:
Handling
Machining
Polishing, grinding and
deburring

Product:
Controller
KR C (Robot Controller)
Robots
Medium payloads (30-60
kg)

Implementation:
01.11.2002

Customer:
WMF AG, Hayingen,
Deutschland

∴ Shorter cycle times

The high acceleration capacity of the KR 45 reduces cycle times significantly.

∴ Continuous availability

The user benefits from the fact that robots never “call in sick” – the production system has nearly 100% availability.



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