

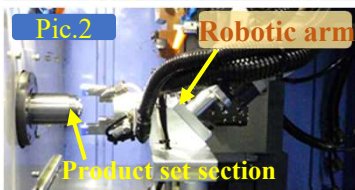
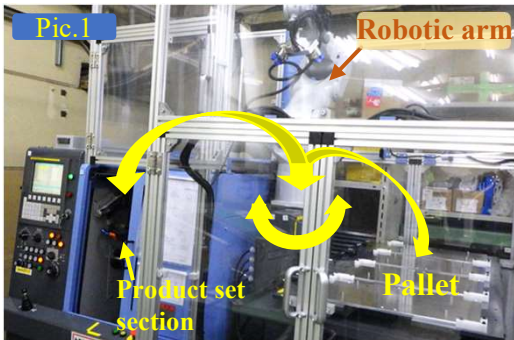
Automation of attachment/detachment of precision machined products, unmanned operation of robots

Production lots range from just one to as many as 1000 pieces per day. High-volume products are 24 hours a day. We are working on the robotization and automation of product mounting and dismounting so that unmanned operation is possible.

It is important how to automate the mounting and dismounting of products while ensuring the required precision of microns in precision machining.

As well as product setting methods that do not cause displacement Correcting the machining tool position by accurately measuring the product position is the point of non-defective manufacturing.

Cutting of NC lathes



Methods of supplying products

- Teach and program the robot motion.
- The product aligned with the pallet is taken out by the robot arm, Set the product on the lathe from the top of the NC lathe. (Pic.1~2)

Improvement of processing accuracy for product desorption

Required accuracy $\pm 10 \mu\text{m}$ Ability $\pm 5 \mu\text{m}$

- (1) The product is firmly pressed against the chuck jig before machining
- (2) **Measured by the sensor and processed after correcting the position shift dimension.**
- (3) After machining, the finished dimensions are measured and recorded automatically.

Point: Robotized product attachment/detachment and unattended operation. We were able to guarantee the quality of all parts, from measurement to inspection before machining.

Cutting of 5-axis machining center



Methods of supplying products

- The products are screwed onto each jig and fixed, and the jig storage area outside the robot is located. Place side by side. (Pic.3)
- From the inside of the shelf with the robot arm, one jig with the product set. Take them, and attach the jig from the side to the machine. (Pic.4~5)

Improvement of processing accuracy for product desorption

Position accuracy from center $\pm 20 \mu\text{m}$

- (1) **Measure product mounting variation using a sensor.**
- (2) **To the machining tool position by calculating from the measured position data You compensate.**

Points: The jig and product position are measured one by one, and the machining is performed with position correction.

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