



ITC



Intelligent
Thermal
Control



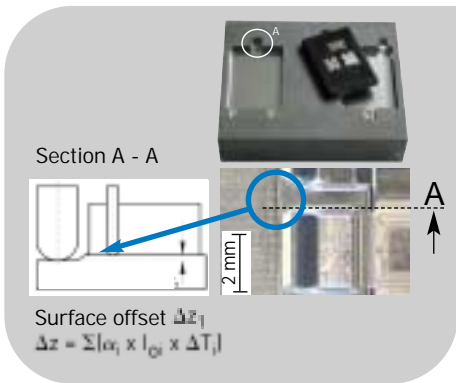
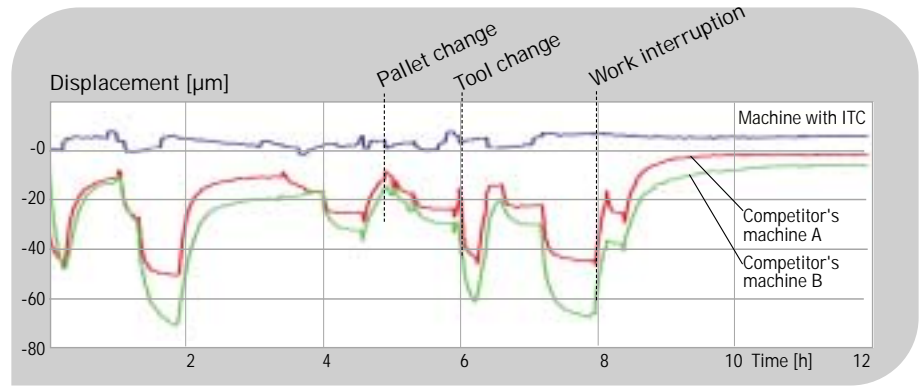
smart
machine

Example

Thermal displacement of the tool origin (Z-axis) under different machine loads

Example

Surface offset between successive machining operation.



When accuracy and machining time are not mutually eliminate

When maximum precision is required in milling work, the machine operator usually waits for the thermal steady-state of the machine. With the Intelligent Thermal Control, the operator only has to concentrate on the work-piece-specific requirements. The machine possesses the thermal process knowledge.

Your benefit

- A warm-up phase is no longer necessary for standard machining. This results in a time-saving of between 15 and 25 minutes compared to commercially available competitor's machines
- The warm-up phase is considerably reduced for demanding machine applications
- This makes it easy for any machine operator to achieve high surface and shape accuracy

The facts

Challenges

- Higher productivity
- Higher accuracy
- Increased process safety
- Smaller batch sizes with more complex tools



Optimisation of the thermal deformation behaviour of the machine tool.

Methods of resolution with new thermal problem fields

HSC machining



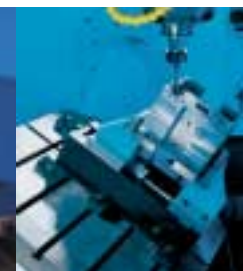
- Higher:
- Spindle speed
 - Axis speed
 - Axis acceleration
 - Machining torque

Dry machining



- Increasing use of oil-air-lubrication
- Dry machining

Complete machining



- Greatly changing machining tasks
- Greatly changing machining times
- Additional 4/5 axes

Automation



- Greatly differing work-piece and tool temperatures
- Fluctuating machining room temperatures

Consequence

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