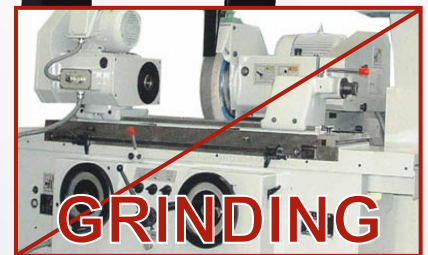
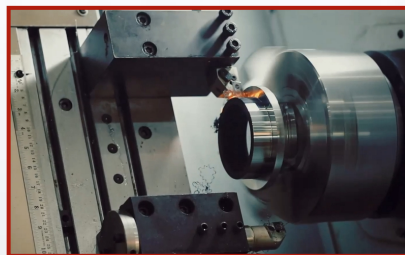




presents

SmartHardTurn

Closed Loop Hard Turning technology



5 Elements essential for PERFECT Hard turning to replace Grinding

- Machine with special design and features.
- **SmartCorrect** Gauging Station for auto-measurement & auto-correction
- Insert life optimization technology
- Industry 4.0: Machine Monitoring & Predictive maintenance
- **SmartCut**- 1st part OK after insert change without skilled operator

#1 THE MACHINES

FOUR ESSENTIAL MACHINE QUALITIES FOR HARDTURNING

HIGH RIGIDITY

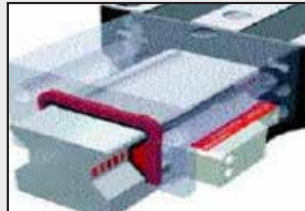


High RIGIDITY of machine elements is required to RESIST CUTTING FORCES. We have 'Monoblock' Single Piece 'True Slant Bed' Casting with torque tube design. We also have Medium Preload ROLLER LM Guideways for both axis & highly stiff Spindle design. All these result in high rigidity.

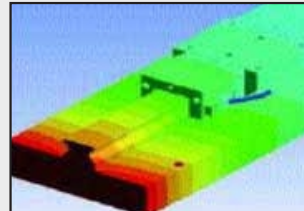
HIGH REPEATABILITY



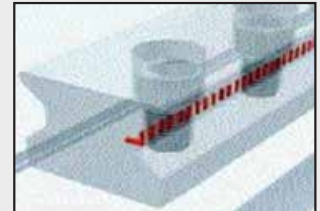
Integrated linear scales



Magneto-resistive measuring principle



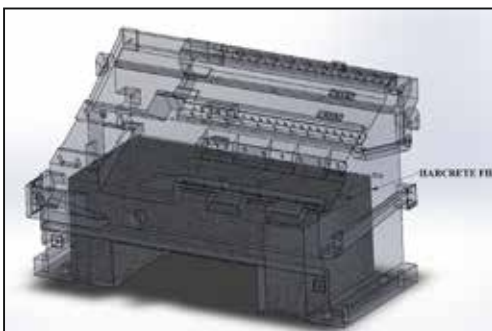
Thermal expansion like steel



Position measurement close to the process

HIGH REPEATABILITY of both Axis.: Schneeberger (Germany) L.M.Rails with integrated Linear Measuring system (Magneto-Resistive Type) with excellent repeatability (± 0.7 Microns)

HIGH VIBRATION DAMPING



PASSIVE DAMPING TECHNOLOGY: The Monoblock structure is filled with special mixture (Harcrete) to absorb vibration and hence, improve surface finish and enhance tool life.

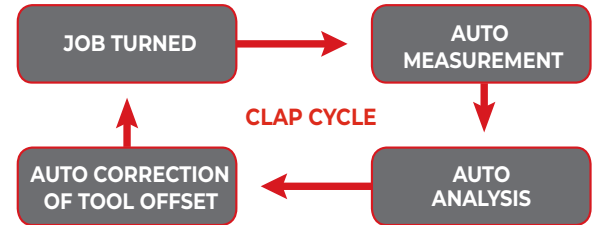
HIGH THERMAL STABILITY



The Headstock has a special 'symmetric' design that ensures that thermal growth due to temperature rise does not cause size shift.

#2 Smartcorrect gauging station for closed loop hard turning

SmartCorrect uses **Marshall's** patented **CLAP** (Closed Loop Auto-corrected Production) technology for near ZERO defects production & helps to shift from OBQ (Operator based Quality) to SBQ (System based Quality)



#3 Smartinsert

Tool Life Optimization Technologies (Patent Applied)

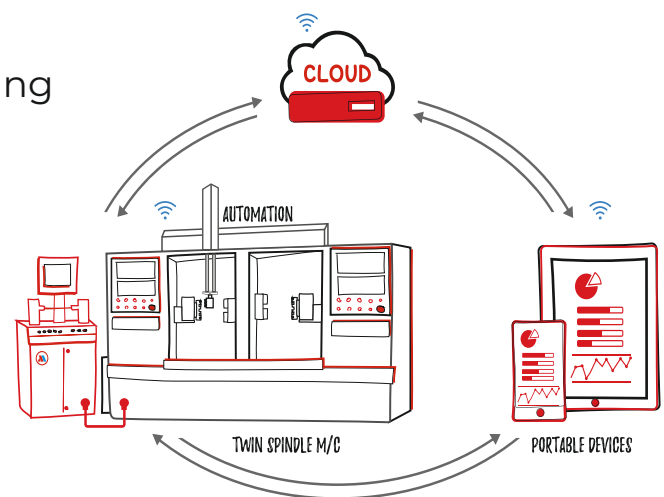
BENEFITS

- Upto 30% extra insert life
- Lower tooling cost/component
- Higher machine OEE because of lesser stoppages
- Our **CLAMP** technology (Cutting Load Analysis based Machine Protection) prevents breakage of inserts, thereby preventing accidents.



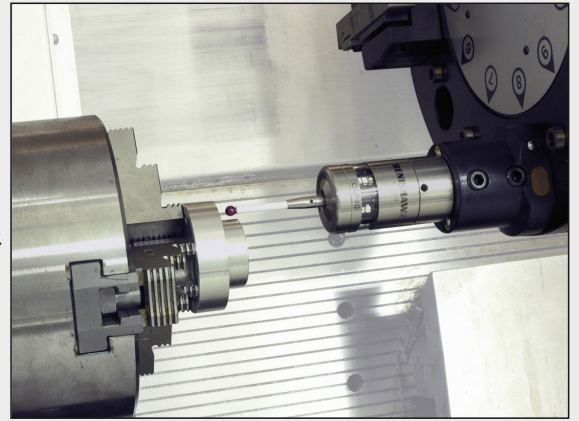
#4 INDUSTRY 4.0: machine monitoring & predictive maintenance

SmartFAC-Universal machine monitoring system monitors productivity and quality in 'real time'. **SmartPredict** monitors the functioning of vital sub-assemblies and ensures Predictive Maintenance is carried out based on detection of symptoms of problems. This ensures that machine process capacity (Cp) does not deteriorate.



#5 *SmartCut*- first part right after insert change

After changing insert, Operator presses 'Insert Change' button, Machine automatically runs program where 'Reference Cut' is taken & 'TOUCH PROBE' measures the size produced, corrects tool offset & machine finish turns the job. **1st part OK-Everytime.**



		Altius 3050 (Turret)	Altius 3070 (Turret)	UNO (Linear Tooling)
CAPACITY				
Swing Over Carriage Cover	mm	500	500	360
Maximum Turning Dia.	mm	300	300	250
Maximum Turning Length	mm	500	700	160
Chuck Size		200	200	165
MAIN SPINDLE				
Spindle Nose	(std.)	A2-6	A2-6	A2-5
Front Bearing Bore	mm	100	100	85
Maximum Bar Capacity (Std.)	mm	52	52	38
Max. Speed	Rpm	4000	4000	4500
SPINDLE DRIVE				
Spindle Motor Siemens	KW	9/11	9/11	9/11
Fanuc	KW	7.5/11	7.5/11	7.5/11
TOOL TURRET				
No. of Stations (std.)		8	8	8
Tool Cross Section	mm	25x25	25x25	25x25
POSITIONING REPEATABILITY				
X-Axis		± 0.7 Microns	± 0.7 Microns	± 0.7 Microns
Z-Axis		± 2.0 Microns	± 2.0 Microns	± 2.0 Microns
CNC Controls		SIEMENS 828 (SL) / FANUC 0iTF		
Weight (approx.)	Kg	4000	5500	4000

Note: Product improvement in a continuous process at "Marshall". Design & Specifications are therefore, subject to change without prior notice.



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