Marshall

C Citius

A Altius

F Fortius

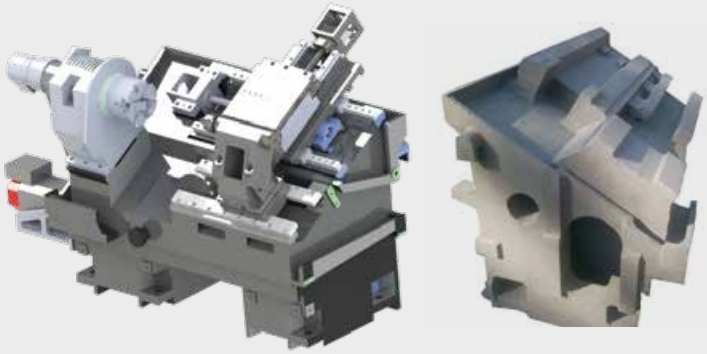
CAF

SPEED ACCURACY RIGIDITY

TRANSFORMING Manufacturing... *Smartly!*

Inspired by the Olympic Motto: Citius- Altius - Fortius (meaning Faster - Higher - Stronger) Marshall has studied the best compact turning centres in the world and created a TRIAD of class leading machines which raise the bar for performance in the three vital areas of SPEED, ACCURACY & RIGIDITY.

#1 STRUCTURE

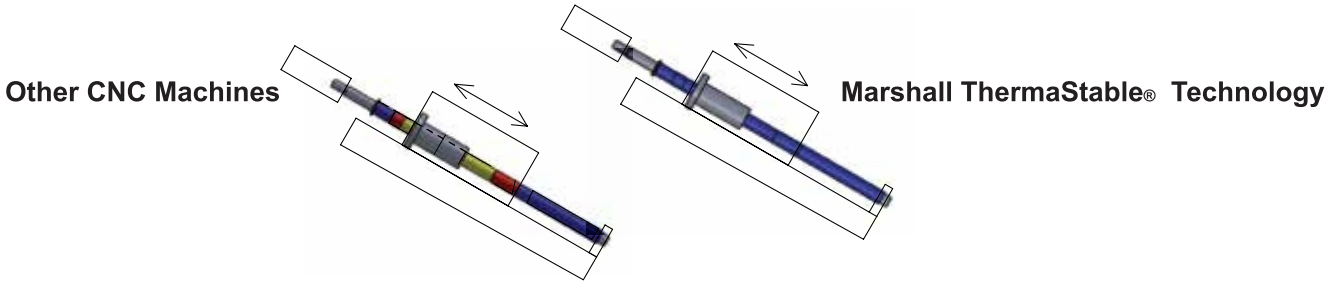


The single piece structure (Bed + Base) has 30 degrees slant angle and is made of high grade cast iron for highest rigidity. It is filled with a special epoxy 'Harcrete' for vibration damping to enable heavy cuts with best surface finish & tool life.

#2 THERMOSTABLE TECHNOLOGY

One of the major problems in almost all CNC Lathes in the market is variation in size when machine is re-started after stoppage (e.g. Lunch Break). The shift in size before and after stoppage can be between 10-20 microns. This is because the movement of the preloaded nut on the ball screw cause temperature rise which leads to expansion of the ballscrew (Thermal growth). If operator is not experienced & alert, it can result in many jobs being rejected.

Marshall's 'ThermaStable®' technology (introduced for the 1st time in India) results in Zero Thermal Growth of Ballscrew. This is ensures no variation in size after machine is re-started after stoppage.



THIS TECHNOLOGY IS NOT AVAILABLE WITH COMPETITORS

#3 TAILSTOCK GUIDEWAYS

Tailstock guideways of most CNC turning centres are of unhardened materials (cast iron of steel). These are easily damaged by denting & wear and lose accuracy. Operators have to struggle to produce jobs within tolerances. For the first time in India, Marshall introduces INDUCTION HARDENED & GROUND Alloy Steel tailstock guideways for very long life & highest accuracy.

SPECIFICATIONS

SPECIFICATIONS	CITIUS 2540	ALTIUS 2540	FORTIUS 3050
CAPACITY			
Swing Over Bed	Ø 500 mm	Ø 500 mm	Ø 500 mm
Max.Turning Diameter	Ø 250 mm	Ø 250 mm	Ø 300 mm
Max.Turning Length	400 mm	400 mm	500 mm
MAIN SPINDLE			
Spindle Nose	A2-5	A2-5	A2-6
Spindle Bore	52 mm	85 mm	65 mm
Max. Bar Capacity	38 mm	42 mm	45 mm
SPINDLE SPINDLE			
Spindle Motor SIEMENS	9/11 KW (12/16 KW OPT.)	9/11 KW (12/16 KW OPT.)	9/11 KW (12/16 KW OPT.)
FANUC	7.5/11 KW (11/15 KW OPT.)	7.5/11 KW (11/15 KW OPT.)	7.5/11 KW (11/15 KW OPT.)
Spindle Range	50-5000 RPM	50-5000 RPM	50-4000 RPM
RAPID TRAVERSE			
X- Z Axis	30 m/min	30 m/min	30 m/min
TAILSTOCK			
TAPER IN QUILL	MT-4	MT-4	MT-4
ADJUSTABLE THRUST	600	600	600
TOOL TURRET			
Nos. Of Stations	8-Stations	8-Stations	8-Stations
Tools Cross Section	25x25	25x25	25x25
POSITIONING REPEATABILITY			
X-Axis	± 1 Microns	± 0.7 Microns	± 1 Microns
Z-Axis	± 2.0 Microns	± 2.0 Microns	± 2.0 Microns
L X W X H	2200x1600 x1700	2200x1600x1700	2400x1600x1700

True to its name, Citius 2540 is the **'Fastest'** compact CNC Turning Centre with max. Spindle Speed of 5000 Rpm & X/Z Axis Rapids of 30/30 meters/min. It is the perfect turning solution for all components where most of the diameters are below 25mm, because 20-25% extra productivity can be achieved as compared to competitor machines for some jobs e.g. Two wheeler Shafts, Pump Shafts, Motor Shafts, Aluminium & Brass Components.

PERFORMANCE

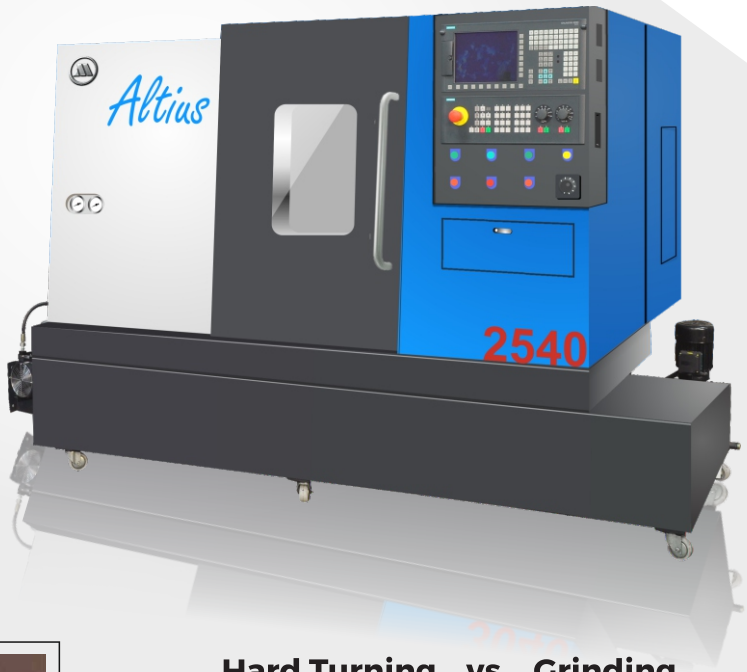
CASE STUDY:

JOB: HONDA ACTIVA CRANKSHAFT

CITIUS MACHINING TIME	91 SEC.
COMPETITOR'S MACHINING TIME	110 SEC.
EXTRA PRODUCTIVITY	110/91=1.21=21%EXTRA

EXTRA PRODUCTIVITY = EXTRA PROFITS!

As its name suggests, Altius 2540 is made for **'Higher'** performance in terms of accuracy & surface finish, and is most suitable for 'Hardturning' to replace grinding and also for those un-hardened components which require very close tolerances. It is provided with extra rigid, vibration damping elements & has linear scales which ensure repeatability ± 0.7 Microns.

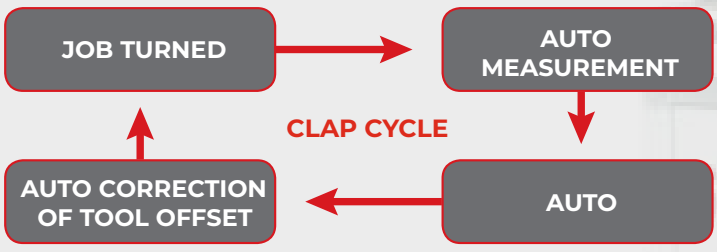


Hard Turning vs Grinding

Hard Turning	Grinding
• Lathes relatively Inexpensive	• Grinders are more expensive
• Multiple Operations in One Set-up	• One operation One Set-up
• Higher Material Removal Rate	• Low Metal Removal Rate
• Produces chips	• Produces Swarf
• Dry Cutting	• Wet Cutting

Essential elements for 'CLOSED LOOP' super precision hard turning

Turret Touch Probe



SmartCorrect® Gauging Station

Altius

Super Precision CNC Turning Centres

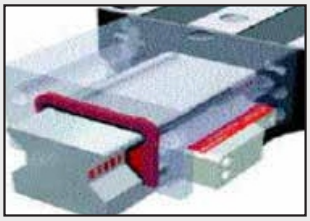
THREE ESSENTIAL MACHINE QUALITIES FOR HARDTURNING:.

#1 HIGH RIGIDITY

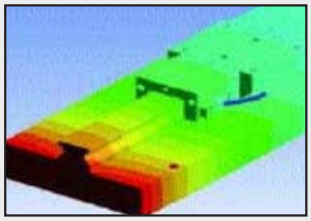
HIGH RIGIDITY of machine elements to RESIST CUTTING FORCES: Altius has 'Monoblock' Single Piece 'True Slant Bed' Casting with torque tube design. It also has Medium Preload ROLLER LM Guideways for both axes & highly stiff Spindle design. All these result in high rigidity.

#2 HIGH REPEATABILITY

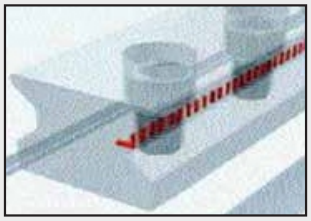
Integrated linear scales



Magneto-resistive measuring principle



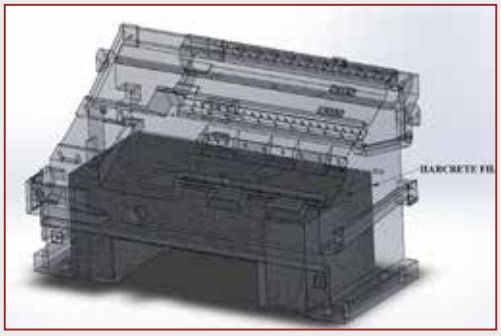
Thermal expansion like steel



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 (± 1/4 T).

#3 HIGH REPEATABILITY



HIGH VIBRATION DAMPING : The Monoblock structure is lled with concrete like mixture to absorb vibration and hence, improve surface nish and enhance tool life.

It is the **'Strongest'** compact CNC Lathe in India & can achieve a diametric depth of cut of 10mm in single pass. It has an A2-6 Spindle and a maximum turning length of 500 mm. It is provided with 7.5/11 Kw spindle power with full power available at 950 Rpm.

PERFORMANCE

FORGING

FINISHED

CASE STUDY:

JOB: TURNING OF FORGED SPINDLE

FORTIUS MACHINING TIME	187 SEC.
COMPETITOR'S MACHINING TIME	223 SEC.
EXTRA PRODUCTIVITY	223/187=1.19=19%EXTRA

EXTRA PRODUCTIVITY = EXTRA PROFITS!

Our clients who use SmartCorrect™ supply parts to:

Factories & Works:

Headoffice & Works (Ludhiana, India)

Automation Unit (Ludhiana, India)

Tech Center (Delhi, India)

Tech Center (Atlanta, USA)

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