



ANCA
CNC MACHINES



TX LINEAR

THE BEST JUST GOT BETTER!

TX7 Linear is the new industry benchmark for production grinding and machining of cutting tools and components. With its large working envelope and powerful grinding spindle, TX7 Linear will deliver precision and productivity across the widest range of applications.

TX7 Linear finds the perfect balance between proven designs combined with ANCA's newest technologies. The rigid bi-symmetrical column design on the solid polymer concrete base has been the foundation design of ANCA machines over the years. Now, in addition, ANCA's new LinX cylindrical linear motors and linear glass scales are fitted as standard on X, Y and Z for proven and unsurpassed long term reliability and accuracy. The result is a superior machine that ensures customers will meet ever increasing market demands of precision CNC tool grinding, no matter the industry.

Taking the step up to TXcell, keeps all the capabilities of the TX7 Linear and adds automatic tool changing and 9 wheel packs as standard, with the option of up to 24 wheel packs, delivering the ultimate in machine flexibility. Incorporating over 40 years of software experience, TX7 Linear and TXcell Linear run ANCA's ToolRoom application software. This will ensure you can easily program all the tools you know, while allowing scope for others you haven't yet thought of.



TX⁷ LINEAR

TX7 Linear is ANCA's premium grinding machine, aimed at the most demanding and diverse applications. The TX7 Linear's large working envelope allows you to grind the widest range of tools, from a simple 3mm endmill, to a 400mm long drill or a 300mm diameter face cutter. The 37kW grinding spindle, mounted in a rigid machine design, ensures heavy grinding operations too, can be completed with ease. TX7 Linear includes, LinX linear motors on X, Y and also Z axis, ensuring a life time of uncompromised precision. Automation and a range of machine accessories mean the TX7 Linear can be equipped to meet the specific needs of tomorrow's most stringent grinding applications.

TX^{CELL} LINEAR

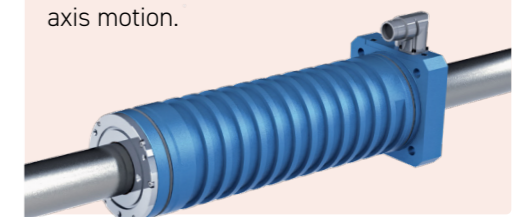
TXcell Linear enjoys all the function and features of the TX7 Linear, but has a standard robot loader, capable of changing wheel packs up to 300mm diameter and work pieces. Wheel packs can be substituted with endmills, polishing or deburring brushes or spindle speeders to further extend the range of applications and operations possible on the TXcell. In addition, using the robot's inherent flexibility, ANCA's Engineering team can develop customised solutions for pre and post grind operations such as part gauging, laser etch marking, cleaning and more.

POWERED BY LINX[®]

Our LinX[®] linear motor technology for axis motion (X, Y and Z axes), in conjunction with linear scales, achieves superior precision and performance.

Specially designed for a lifetime of operation in harsh grinding environments, the LinX[®] motors have a cylindrical magnetic field which means there is no additional down force on the rails or machine base.

With no temperature variations (meaning no need for a separate chiller unit), and being sealed to IP67, there is minimal wear and tear so that the machine accuracy remains over the lifetime of the machine. The LinX[®] linear motor has higher axis speed and acceleration, leading to reduced cycle times while maintaining a smoother axis motion.



ENHANCED ACCURACY

UPGRADED TECHNOLOGY



1. CONTROL PANEL

Including touch screen, USB ports and space for a standard keyboard. Ergonomic tilt adjust to suit different height operators.

2. HAND-HELD REMOTE PENDANT

ANCA's market leading versatile & intuitive tool design software is easy-to-use.

3. SOFTWARE

ANCA's market leading versatile & intuitive tool design software is easy to use.

4. TOOL / WHEEL MEASUREMENT OPTIONS

Automated for increased productivity. LaserPlus tool measurement and compensation system. Wheel Probe for automatic wheel qualification. Both are permanently mounted inside the machine for use at any time. iView camera is also offered.

5. LARGE WORKING ENVELOPE

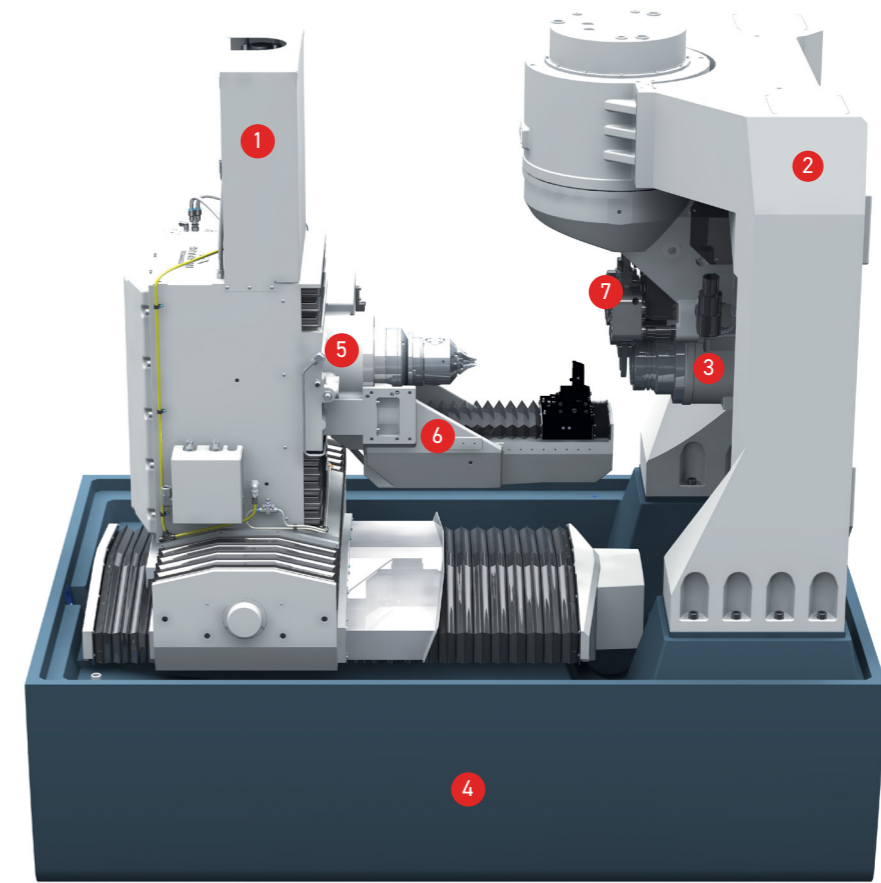
for tool lengths up to 400mm (16") long, and up to 300mm (12") diameter gives total flexibility to tackle any job.

6. LOADER OPTIONS

Robomate loader for loading rotary cutting tools on TX7 Linear, or TXcell for extra capacity of tool and wheel pack loading.

7. MACHINE CONTROL SYSTEM

ANCA Motions latest AM5C G5 High Performance CNC and AMD5X servo-drives provides all the computing power needed for sub-micron motion control.



1. ANCA MOTION LINX® LINEAR MOTORS ON X, Y AND Z

Z - and linear scales improve precision and performance for uncompromised accuracy and surface finish over the machine life.

2. BI-SYMMETRICAL GANTRY

Is a proven design for ultra-high precision grinding. It keeps the grinding spindle centre of rotation (C-axis) on the machine centreline which delivers superior rigidity and minimises effects of thermal growth.

3. 37KW (49HP) DIRECT DRIVE SPINDLE

Induction motor spindle runs up to 8000RPM, with options for 10,000RPM and 15,000RPM. Grinding wheel packs mount on a BT40 BigPlus taper for outstanding rigidity and repeatability.

4. POLYMER BASE (ANACRETE)

provides excellent thermal stability and vibration dampening properties delivering grinding process stability and outstanding tool surface finish.

5. RIGID HEADSTOCK

Will take ANCA's own Premier collet system for holding round cutting tools, but also includes a BT 50 taper workhead to mount customer specific work holding. Headstock can run up to 3000RPM supporting wheel dressing and cylindrical grinding operations.

6. TOOL-SUPPORT

Several tool support options can be mounted from the Z-Axis, ensuring tools are supported accurately. These include fixed position pop up steady, travelling steady (p-axis) and tailstock.

7. WHEEL PACK CHANGER

TX7 Linear features dual wheel pack changer. Upgrade to TXcell with 9 standard, but options for up to 24 wheel packs. Coolant manifolds also change with the wheel packs.

AUTOMATION

ROBOMATE LOADER



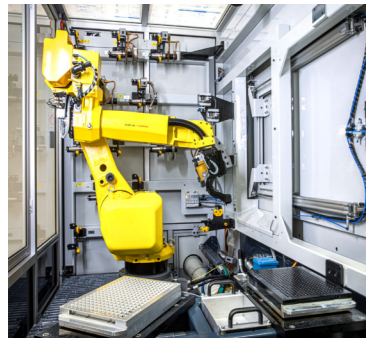
ANCA's RoboMate robot loader is a versatile and flexible automation solution that is equally efficient on a range of ANCA CNC tool and cutter grinders. Using the accuracy and reliability of the Fanuc robot, RoboMate takes the tool directly from the pallet to the collet in a single grip.

- ANCA's own RoboMate software makes setup and programming simple
- Designed with high levels of safety and ergonomics
- Available with 2 pallets (standard) or 4 pallets (optional)
- Cost-effective, efficient and fast
- Includes high capacity pallets
- Optional RoboTeach software allows operators to easily reteach robot positions if required

The RoboMate can load tool diameters from $\varnothing 3$ mm (1/8") to $\varnothing 32$ mm (1 1/4")

- Maximum tool length 350 mm (14")
- The size of the loader is: L 2379 mm (94") x W 722 mm x H 1865 mm
L 94" x W 28" x H 7'

TXCELL LINEAR

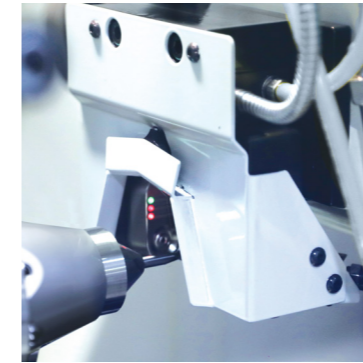


TXcell greatly extends the capabilities of the TX7 Linear machine. The highly flexible robot loader adds wheel pack capacity and tool changing as standard, and opens up options for custom solutions for pre-and post grinding operations.

- ANCA's own RoboMate software makes setup and programming simple
- Proven Fanuc reliability
- Two size cells. Small has 2 tool pallet stations, large has 4 tool pallet stations
- Small cell has 9 wheel packs with option up to 14.
- Large cell has 9 wheel packs with option up to 24.
- Maximum wheel diameter 300mm (12") on selected stations.
- Maximum payload (wheel pack or tool) is 8kg.
- TXcell can load tool diameters 3mm to 32mm.
- Maximum tool length is 350mm (14")

ACCESSORIES

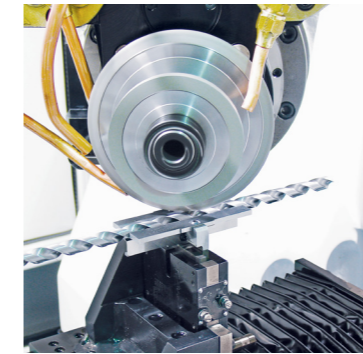
LASERULTRA



The LaserUltra provides accurate and repeatable measurement of tools. It provides similar capability to iView, but is instead permanently mounted inside the machine and runs automatically and in process. LaserPlus can automatically measure and compensate tool OD, run-out, nominal radius of ball nose and corner radius endmills, and profile of ballnose, corner radius and profile form tools. Typically, the LaserPlus can achieve ± 0.003 mm accuracy or better. Air blast unit on the laser ensures coolant or contaminants do not interfere with the measurement process.

- Batch grinding consistency
- Faster set-up times with less scrap
- Measures the tool inside the machine
- Air purge prevents coolant ingress
- Maximum tool diameter 45mm
- Laser OD SPC cycle also available

TRAVELLING STEADY



The Travelling Steady (P-axis) provides the machine with an additional programmable axis for support of tools with long aspect ratio (length : diameter). Different tooling options are offered. Hydraulic Arobotech and standard bush are typically used for grinding of long drills, keeping the support under the grinding wheel at all times. Tailstock will support tools with a centre at the end.

- Ensures rigid support for long tools
- Reduction of vibration and chatter when grinding
- Fully programmable position
- Arobotech supports helical drills with a back taper
- Tailstock has programmable force control
- Increased machine output and high productivity
- Higher feedrates and reduced cycle times are possible

CUSTOMER SUCCESS STORY

AUTOMATING TECHNOLOGY DEVELOPMENT



Matching machine and software performance with production goals is made possible with ANCA machines at LMT Fette, leaders in the fields of gear cutting and rolling tools.

“ The ANCA machines have a high degree of flexibility due to the easy (automated) change of (grinding) wheel packs. They are very robust machines and are very suitable for technology development. ”

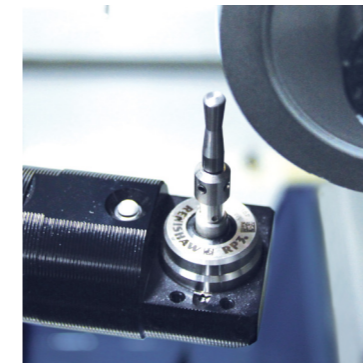
UWE KRETZSCHMANN, HEAD OF R&D, LMT FETTE



Scan to learn more



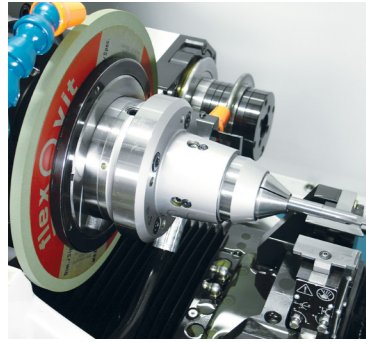
WHEEL PROBE



The auto wheel pack qualification probe accurately measures grinding wheels inside the machine. Permanently mounted inside the machine, the wheel probe uses a Renishaw probe arm to qualify the wheel pack. It is possible to measure the front and back surface location, wheel diameter and toroid radius of a grinding wheel. It eliminates the need for operator intervention which ensures consistent measurement results.

- Automatically measures a wide variety of wheel shapes
- Eliminates the need to manually qualify the wheel pack
- Eliminates the need to remove the wheel pack from the grinder
- Increases machine productivity
- Reduces first tool rejections

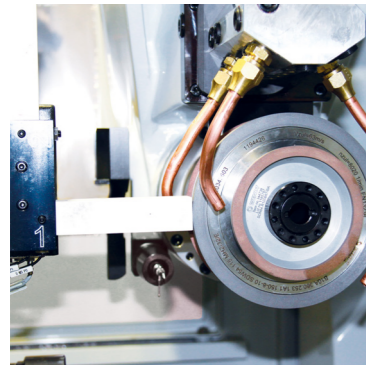
WHEEL DRESSERS



Two wheel dressing options are available. Able to run at 3000RPM, the machine headstock can run a 200mm dresser roll. Additionally, a secondary motorised dresser can be added. This features quick change HSK arbor and can hold multiple wheel dressing rolls on one arbor.

- Integrated Dressing Software on the machine for complete flexibility of in process dressing
- Seamless integration with ANCA's iFlute wheel design software
- Automatically update grinding wheel size after dressing
- Mount plated diamond or aluminium oxide dresser rolls
- On machine dressing ensures zero runout on grinding wheels
- Maintain wheel form and grinding performance to maximise machine productivity

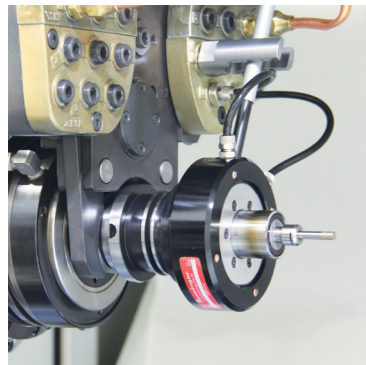
AUTO WHITE STICK



Automatic wheel conditioning system improves the life and grinding performance of resin bond grinding wheels. When continually grinding, wheels become glazed, or loaded. The sticking process exposes the wheel grit and removes chips (swarf) embedded in the wheel so the wheel cuts better.

- Reduces tool burn and wheel glazing
- Improves feed rates and reduces cycle times
- Increases life expectancy of grinding wheels
- Saves time and increases operator safety
- Two white sticks available
- Integrated Software on the machine for complete flexibility of in process sticking

SPINDLE SPEED INCREASER



The spindle speed increaser gives you options to run grinding wheels up to 42,000RPM. Driven by the main grinding spindle, the speed increaser will ensure smaller grinding wheels, such as those used for PCD pocket grinding, run at their optimum operating speed.

- Used in place of a regular wheel pack
- Includes BigPlus BT40 taper
- Can be changed out automatically, same as a regular wheel pack in TX7 or TXcell
- Opens up new applications such as PCD pocket grinding and internal grinding where small grinding wheels are required
- Includes a range of collet sizes top to 7mm

IVIEW



iView is a measuring system that is able to measure the ground tool while it is still in the work-holding on the machine. The image of the ground tool as taken by the iView camera is compared with an ideal overlay shape generated by the software. The tool size can then be compensated automatically based on the overlay.

- Eliminates the need to remove a tool from the grinder in order to check the dimensions
- Reduces errors caused by relocating tool and manually compensating
- 90x – 360x range of tool magnification
- Provides measuring accuracy to 2 microns
- iView is permanently mounted inside machine

SOFTWARE

TOOLROOM



ANCA's ToolRoom software suite caters for a wide range of tool types and applications with an easy-to-use interface to input tool geometry parameters. ToolRoom ensures that the FX Linear machines will efficiently handle any regrinding or manufacture challenge.

The machine operator is able to easily and quickly set up or modify tool programs, depending upon the required tool type. For more proficient users, advanced software pages exist to access complex tool designs and operations. ToolRoom supports the grinding of drills, end mills, profile tools, burrs, routers and many other special applications.

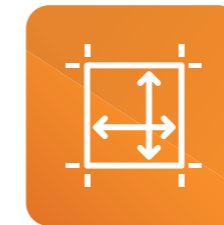
CIM3D



CIMulator3D simulates the programmed tool path exactly as it would be ground on the machine. New tool programs can be verified for size, shape, machine clearance and even cycle time estimates. CIMulator3D maintains continuous work flow through the machine by reducing development time and trial grinding.

ANCA was the first to introduce true 3D simulation technology for CNC tool and cutter grinding. CIM3D delivers advanced tool simulation quality and an enhanced user-friendly interface for high performance and increased efficiency.

TOOLDRAFT



ToolDraft is used for creating 2D cutting tool drawings from a simulated tool or direct from ToolRoom. This is built on the foundation of CIM3D engine projecting a 3D model into accurate 2D projection views. This will help customers to create drawings of cutting tools manufactured on ANCA machines without relying on third party software.

- Dimension all tool features with tolerances and surface finish requirements
- Annotate drawing with text, images, and drafting symbols from the drafting symbols library
- Load and save customer defined drawing templates with defined text, line and colour styles
- Export drawing as PDF or DXF with ability to print drawing

MANAGEMENT SUITE



Management Suite provides customers with the ability to manage their tool production, tool files and wheel files. This standalone software comes with three main features:

- REDAX monitors machine production 24/7 in real-time and delivers up-to-date information, greatly enhancing the visibility and control of the tool manufacturing operation. This system will enable customers to improve the productivity of their machines by reducing machine downtime, analysing tool production, and past production history.
- Wheel management is a server-based wheel library which provides means to easily share wheel packs and qualification data between machines.
- Tool management is a server-based application which makes it easy to transfer grinding files between simulators and machines. This also maintains version control and history of all tool files, and has read/write user permissions for better control of tool files.

CUSTOMISED SOLUTIONS ON TX

Tomorrow's manufacturer, no matter the industry, must always be searching for new ways to improve quality, reduce cost and enhance productivity.

Recognising different customer applications and processes can require new and innovative solutions, ANCA has its Custom Solutions Team at your disposal. Working with ANCA's professional Engineering Team, your solution can be designed and built to meet the needs of your specific part and factory processes, ensuring maximum gains in quality, productivity and profit.



DUAL ROBOT AUTOMATION CELL



Application

Turbine blade root form grinding

Custom Solution:

- Secondary robot for (un)loading workpiece into fixture
- Secondary robot also used for integration to workpiece cleaning and external measurement system for process compensation and control
- Serialised ID marking of workpiece with laser
- Multi pallet staker

Future Applications:

Unattended grinding of complex 3D part grinding where specialised fixtures are required.



SOLUTION FOR 72 HOURS UNATTENDED PRODUCTION



Application

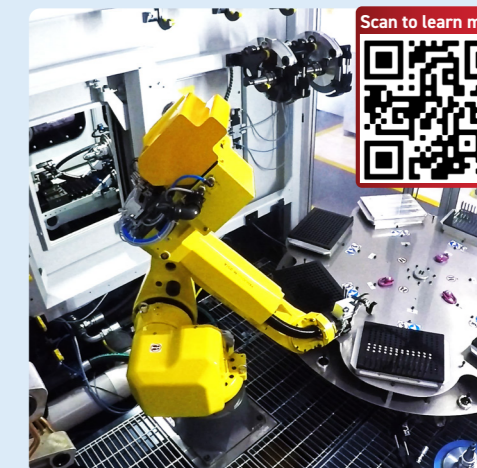
Tap tool grinding over multiple shifts

Custom Solution

- Extra loader tool capacity with addition of rotary pallet table
- Automated collet change for variable tool diameter
- Additional dresser roll capacity
- In process tool measurement and compensation

Future Applications

Future Applications: extended loader capacity for unattended tool grinding over multiple shifts.



PUNCH GRINDING AUTOMATION AND FACTORY INTEGRATION



Application

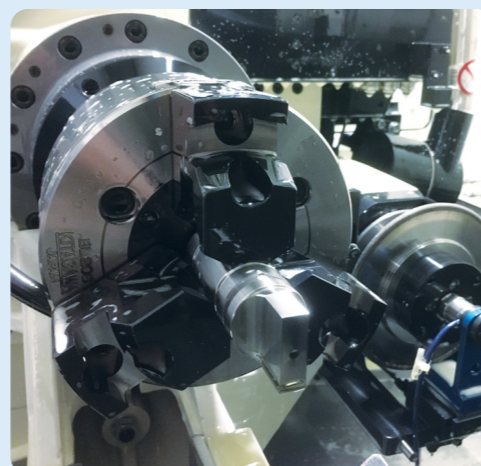
Unattended punch tool grinding

Custom Solution

- Integration of TXcell to factory wide tool processing system
- Automated transfer (in/out) of tool from external tool palletizing system to TXcell
- Automatic program generation by integration to factory ERP and data management systems
- Flexible work holding solution for varying tool sizes

Future Applications

ANCA Integrated Manufacturing System (AIMS) with unlimited and continuous workpiece supply to the grinding machine and seamless integration to factory ERP and production demand management system.



AUTOMATED FEMORAL RASP GRINDING



Application

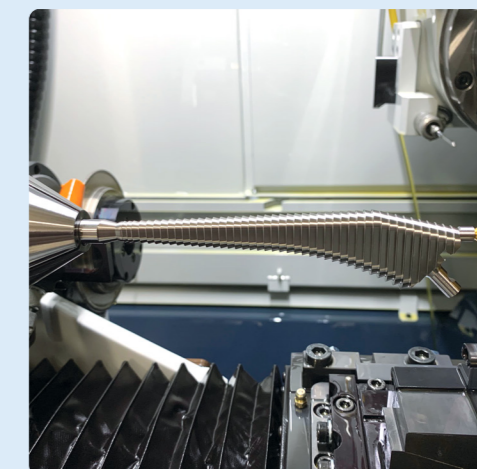
Automated femoral rasp grinding

Custom Solution

- Fixture design to accurately hold workpiece during grinding
- Grinding program development using Siemens NX and ANCAM software
- Automated loading of parts from TXcell loader

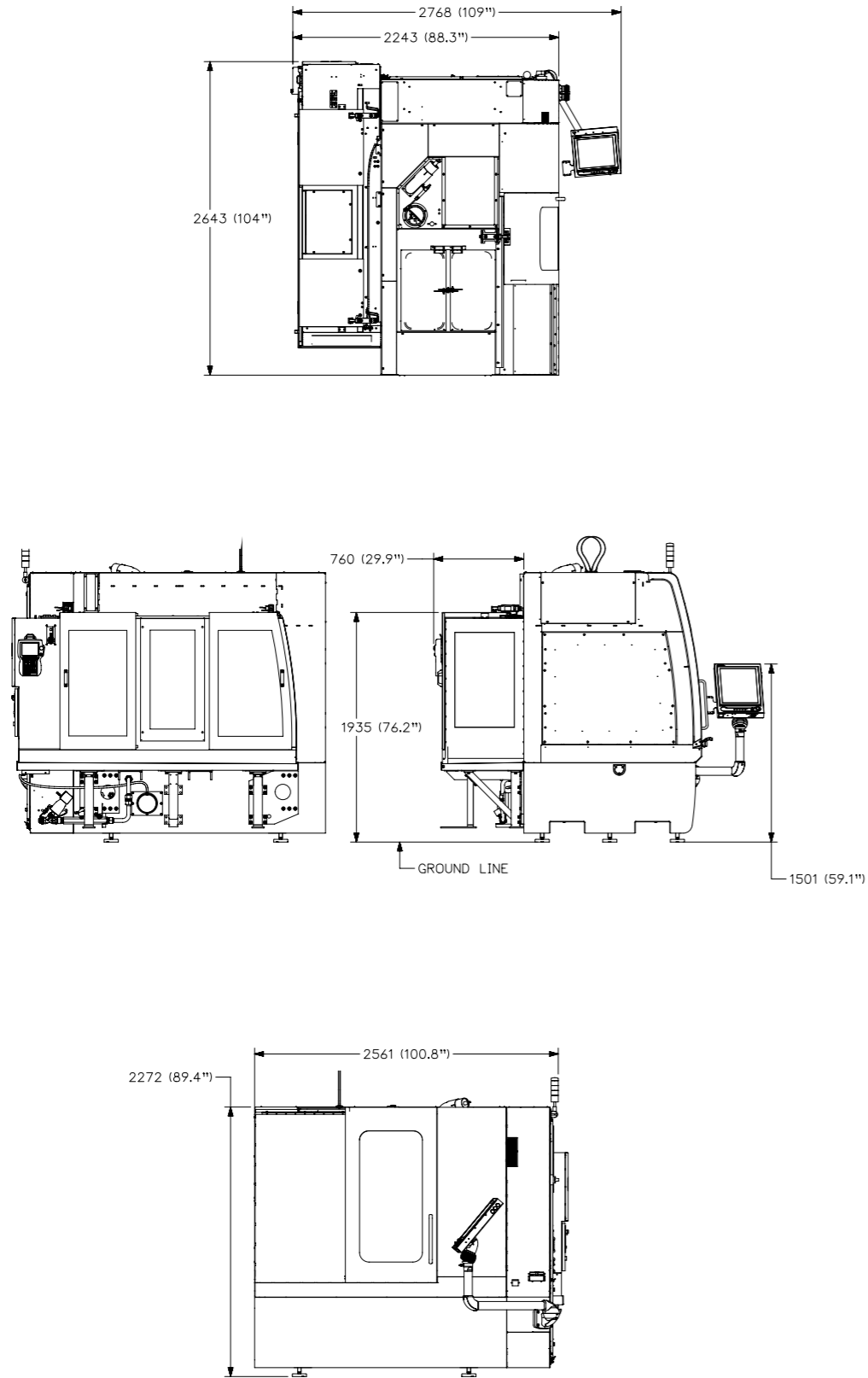
Future Applications

Manufacture 3D parts with ability to develop programs using Siemens NX and ANCAM software

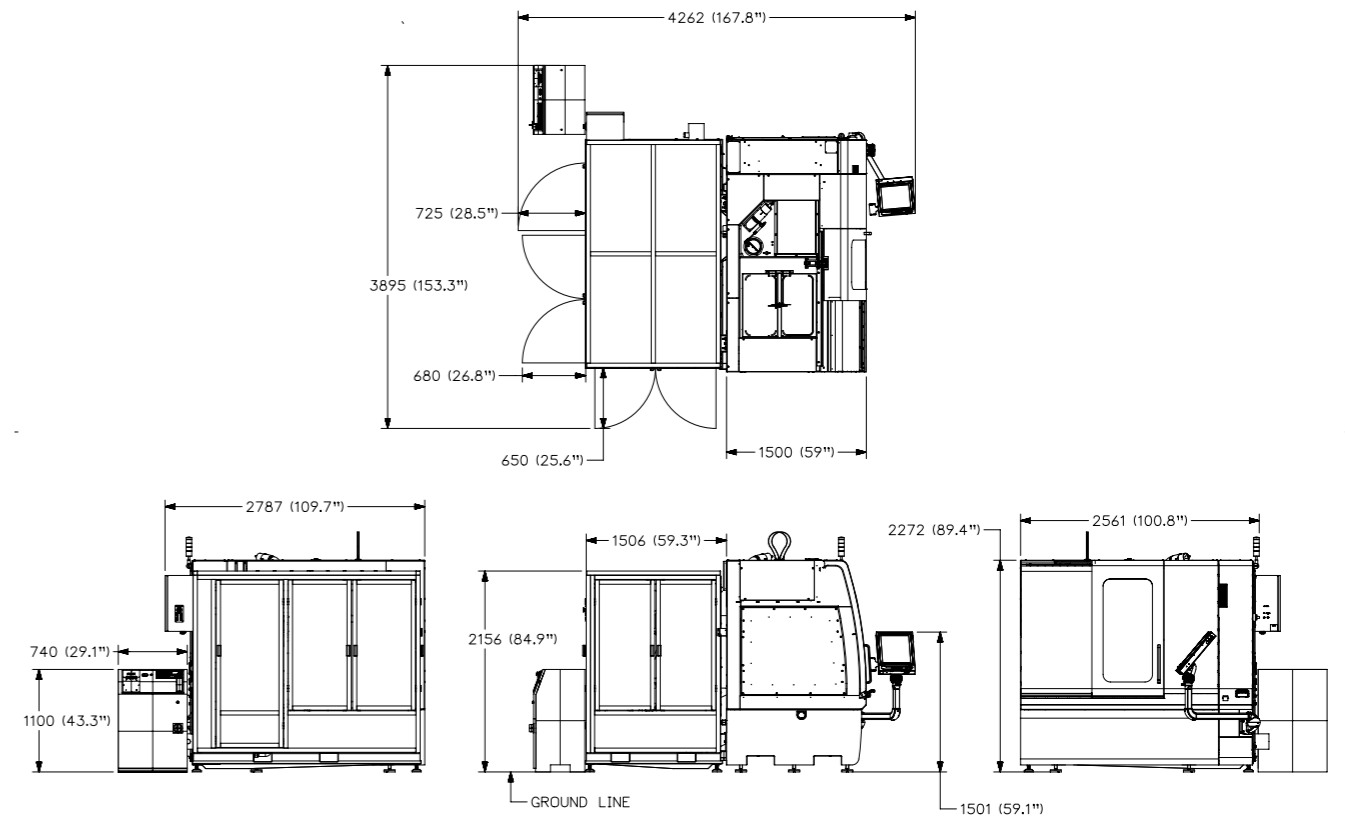


FLOOR PLAN

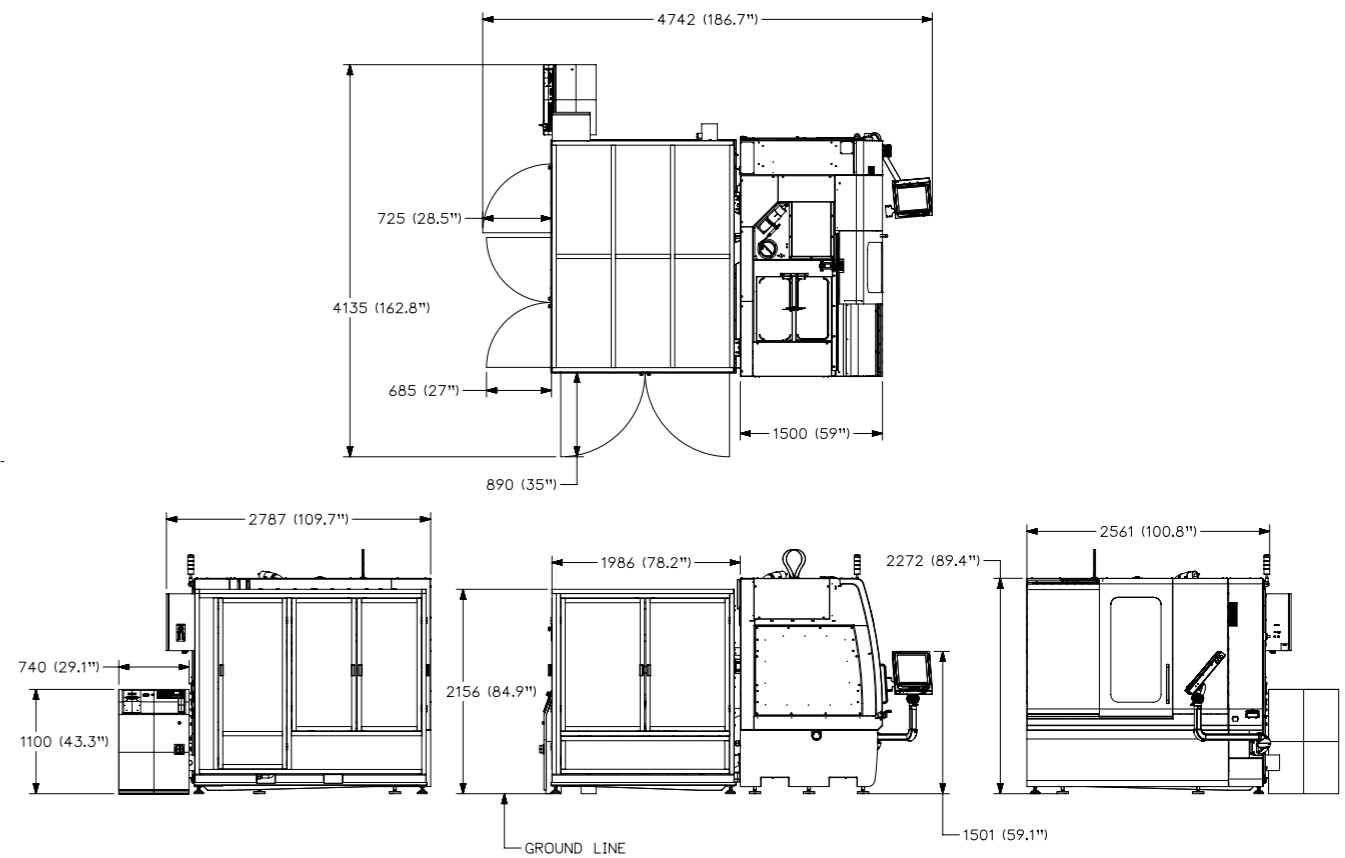
TX7 LINEAR WITH ROBOMATE



SMALL TXCELL LINEAR



LARGE TXCELL LINEAR



TECHNICAL SPECIFICATIONS



TX7 LINEAR



TX CELL LINEAR

Spindle Power	37kW (49hp) (peak power)			37kW (49hp) (peak power)		
Loader Tool Capacity (with loader)	Tool Diam	2 Pallet	4 Pallet	Tool Diam	Small cell (2 Pallet)	Large cell (4 Pallet)
	3mm	840	2520	3mm	840	2520
	16mm	154	462	16mm	154	462
	25mm	63	189	25mm	63	189
Spindle Orientation	Included			Included		
Tool Load Time	15 sec			20 sec		
Pneumatic Collet Actuator	Option			Option		
MicroPlus	Option			Option		
Overhead Top Clamp	Option			Option		
Pop-up Steady	Option			Option		
Manual Tailstock	Option			Option		
Headstock Mounted Coolant Outlet	Yes			Yes		
AutoStick	1 to 4 Sticks (option)			1 to 4 Sticks (option)		
LaserUltra	Option			Option		
Automatic Wheel Probe	Option			Option		
iView (semi-automatic tool inspection)	Option			Option		
iBalance	Option			Option		

TECHNICAL SPECIFICATIONS

CNC DATA

ANCA AMC5 G2 High Performance CNC, High Speed SSD, Ethercat, Intel processor, Windows 10.

MECHANICAL AXES

	X-axis	Y-axis	Z-axis	C-axis	A-axis
Resolution	0.0001 mm 0.0000039"	0.0001 mm 0.0000039"	0.0001 mm 0.0000039"	0.0001 deg	0.0001 deg
Travel	586 mm 23.1"	408 mm 16.1"	242 mm 9.5"	264 deg	360 deg

SOFTWARE AXES (PATENTED)

B, V, U, W

WORKPIECE*

Max Tool Diameter: Ø300mm (12"), Max. Tool Length (flute & endface grind) : 400mm (15.75")
Max Tool Weight: 40kg, optimal size range for solid endmill manufacture 3mm-40mm

DRIVE SYSTEM

ANCA Digital AMD5x (EtherCAT standard)
Machine Axes:
ANCA LinX Linear Motors (X, Y & Z Axis)
Direct drive rotary axis (A & C axis)

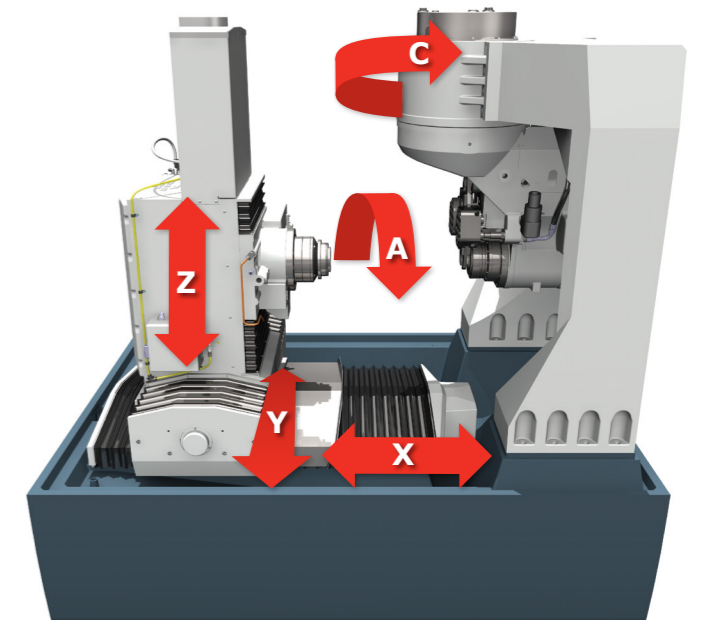
MACHINE DATA

Grinding spindle:
37kW (49hp) (peak power)
ANCA Bi-directional, with spindle orientation
8000RPM (optional 10,000RPM and 15,000RPM)
Direct drive induction motor
BigPlus BT40 wheel arbors
Wheel bore: 20mm, 31.75mm (1.25"), 32mm, 50.4mm (2"), 76.2mm (3")

OTHER DATA

Probe System: Renishaw
Coolant System: External
Machine Base: ANCAcrete (polymer concrete)
Colour: RAL 7035 / RAL 5008
Control Panel: 19" touch screen
Machine Structure: Bi-symmetrical column

* Dependent on tool geometry and weight, program and tooling layout
ANCA reserves the right to update or amend specifications without prior notice



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Available in nine languages, every month we share customer success stories, latest products, services, and tips on how to get the most from your grinding investments.



TOOL TIP TUESDAY

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