Finepart

Beyond cutting edge

Your world-leading provider of non-thermal precision cutting.

Enjoy Swedish ultra-accuracy for virtually all materials.

FINECUT WMC500II – 5-AXIS, TYPE B4X

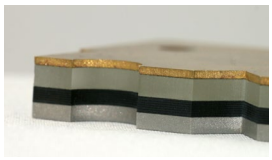
For ultimate flexibility

- Cutting width down to 0.2 mm
- 3 dimensional cutting
- 5-axis cutting with tool center point control
- High inclination angles and complex shapes
- Perfect for prototyping

Micro abrasive waterjet technology

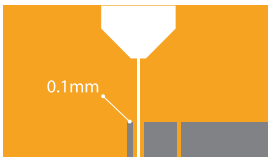
How small is the jet?

Whereas traditional abrasive waterjets have diameters down to 0.38 mm, micro abrasive waterjets are even finer. Typical micro abrasive waterjets are 0.3 mm and 0.2 mm.



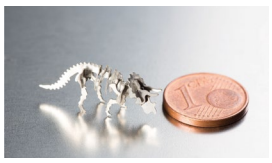
Cuts through layers of different materials

The micro abrasive waterjet is effective also in combined materials that have disparate properties, such as carbon fibre reinforced epoxy with titanium inlays.



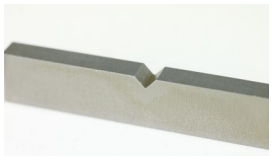
Narrow parallel cuts, ideal for thin sections

Even if the jet velocity is high, the force of the jet is low. Consequently, thin sections down to 0.1 mm can be cut without damaging the material.



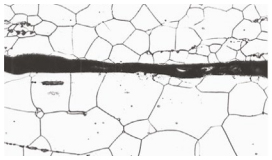
Fixturing solutions for complex geometry

The jet cuts omnidirectionally while the fixturing solutions reorient the workpiece. The movement of the jet and the workpiece is synchronized, allowing highly complex geometries and shell structrures to be created.



High tolerances and fine finish

Depending on the part material and size, tolerances can come down to ±0.01 mm. The technology can accomplish surface roughness values below 1,6 µm (Ra). For hard materials, roughness values can be down to 0.8 µm (Ra).



Non-thermal cutting

The micro abrasive waterjet is a non-thermal cutting pro-cess and does not change the material. Surfaces produced will be free from adverse mechanical and thermal effects. Also no subsequent processing is required.

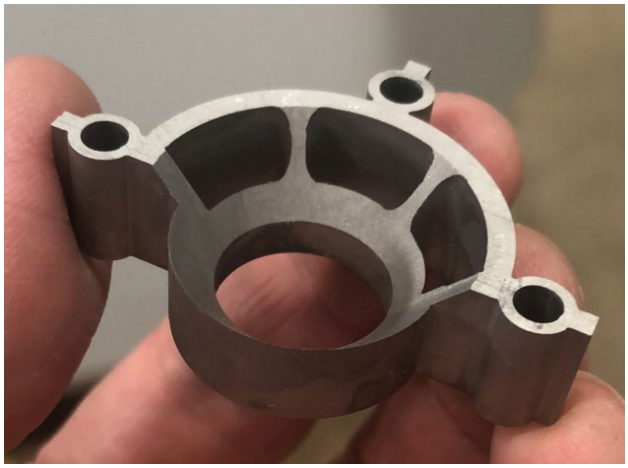
5-AXIS, TYPE B4X

Cut highly complex shapes

Our 5-axis motion systems can be used for slanting the cut surface in order to create 3D geometries, relief angles, or just to compensate for cut taper angle. With jet angle adjustments you can also avoid the jet kick-back at the lower part of sharp inner corners. All these functions are easily programmed using the CAD/CAM software provided for the machine.

Our standard 5-axis type B4X facilitates 3D cutting up to ± 45° degrees on the part. The A-axis is table-mounted and moves the work piece. This means that the A-axis can rotate beyond ± 45° degrees if desired.

The A-axis can alternatively be fitted with a chuck and used as a rotary axis with full 360 degrees rotation, which enables cutting helical geometries as well as rotational symmetries.



Finecut WMC500II – type B4X

Cutting system combining tiltable nozzle and rotating work piece

This manipulation system has a detachable A-axis. This enables combining the full versatility of filling the 500×500 mm work envelope with parts one day with 3 or 4 axis precision cutting, and then the next day produce highly complex 3D-shaped parts. The A axis has one driven spindle and one support bearing. Both can be fitted with custom made fixturing. As the A-axis can rotate the work piece 360 degrees it is possible to cut helical shapes that involves multiple full revolutions of the work.

The machine has an optional probe with an easy user interface, that helps to set up and true up the table-mounted A-axis quickly.

Designed for precision

To produce narrow tolerance parts, the micro abrasive waterjet cutting system must also be accompanied by a very precise motion capability that accurately reproduces the programmed geometry. The Finecut machine have been designed to optimise the part precision to a new level.

1. Dynamic, high precision motion system featuring linear motors and ultra-high resolution thermally stable positional feedback
2. Cutting table mechanically attached to the motion equipment for ultimate precision
3. Rigidly built machine tool frame
4. Easy set-up of machine fixtures for a wide variety of different applications with optional solutions including live fixturing with synchronous motion.
5. Software and operators panel developed especially for abrasive waterjet cutting.

Technical information

Finecut Waterjet Machining Center 500II type BX4

CNC Control:	Fanuc 31i-B5 and ALPHA Servo Drive with Nano Control
Motion system:	Linear motors and zero backlash reduction gears for precise motion
Absolute encoders:	Thermically stable Invar® linear encoders, 50 nm resolution

Motion Axis

- Linear servo motor drive on X-Y axes motion
- Precision ball screw servo drive on Z
- Max cutting speed: 20 m/min
- Max traverse speed: 40 m/min
- Acceleration: 0.5g (X, Y axes)
- Positioning accuracy*: ± 2,5 µm
- Repeatability*: ± 2 µm
- Typical tolerance down to ± 10 µm

* According to ISO 230-2

Cutting System Options

- FAW200: Ø 0.2 mm; jet power 2.3 kW; 0.2 liter/min
- FAW300: Ø 0.3 mm; jet power 5.6 kW; 0.4 liter/min
- FAW400: Ø 0.4 mm; jet power 11.7 kW; 0.9 liter/min
- FAW500: Ø 0.5 mm; jet power 14.6 kW; 1.2 liter/min
- PWJ: Non-abresive cutting, Ø 0.08 - 0.25 mm

FAW = Fine Abrasive Waterjet, PWJ = Pure Waterjet
Jet power and hp water consumption @ 4000 bar

Work Area

- Cutting envelope (X, Y, Z): 500 mm x 500 mm x 80 mm
- Fixturing area: 700 mm x 700 mm (max depth 700 mm)
- Machine table size: 900 mm x 900 mm (W x D)
- Back door allows for inserting work pieces

Extra features for B4X

- Work envelope 500 x 500 mm for 3 axis cutting
- Work envelope ca 370 x 200 mm between centers in A-axis fixure depending on fixturing
- ±360º tilting capability on A axis, A axis can be removed when not required
- ±45º tilting capability on B axis (optionally 40º with safety zone)
- Selection to run in 3X+2 rotation axis mode or using 5 axis Tool Center Point (TCP) programming
- Possibility to set up safe zones to prevent tilting jet from damaging fixtures

Three types of cutting systems

Depending on material, part complexity and level of miniaturization our precision cutting can be made with any of our cutting systems that are available in 3 different categories; micro/fine abrasive waterjet, conventional abrasive waterjet and pure waterjet. A range of sizes from 0.2 mm to 0.76 mm is available, whereas the larger jet facilitates a greater cutting power.

Advanced option portfolio

The Finecut can be equipped with several options like measuring probe, 5-axis cutting head, turning axis, High-Frequency Spindle, vision system, and more. We also develop new options that serves the customer's needs for efficient production. All options are retrofittable to existing machines.

A precision machine for any workshop

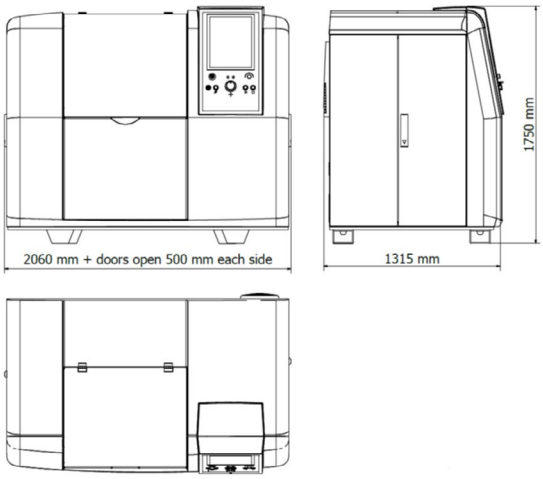
The Finecut machine is a compact fully integrated high-precision waterjet machining center. It has a compact footprint so it is easy and convenient to place in your workshop. The fully encapsulated design keeps water and grit in the machine, so it can operate alongside your other CNC machines.

The cutting process is powered by an ultra-high pressure pump. Compressed water is supplied from the pump to the Finecut machine through high-pressure hard tubing. If desired, the pump can be placed on a distance from the machine, in another room, or on another floor. Pump functionality including pressure settings are CNC controlled from the Finecut.

CAM Software IGEMS 5x

Programming of 3D models are significantly more demanding than following 2D contours. However, the IGEMS 5X software makes this task easy. IGEMS 5X is available as an upgrade to the standard IGEMS CAD/CAM/AWJ software.

- Make toolpaths from STEP or IGES files.
- Analyses the geometry to optimise for waterjet cutting.
- Automatic speed calculation depending on thickness and cutting parameters.
- Automatic speed ramping depending on geometry.
- Add bridges and tabs to fixate the part in the material.



Always at Finepart

Flexible fixturing for any application

– several solutions for different applications and requirements

State Of The Art Machine components

– latest technology for high dynamic capacity and accuracy

Additional functions offer practical solutions

– great assisting techs for improved automation, setup and handling

High-end support systems from reliable partners

– high pressure technologies for enhanced precision and control

User-friendly panel with Finesoft™ software

– easy to use Interface for software & operators panel

Retrofitable developments

– always gain from the latest technology and innovations

Finepart

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