Finepart

Beyond cutting edge

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

Enjoy Swedish ultra-accuracy for virtually all materials.

FINECUT WMC500II TYPE 4X

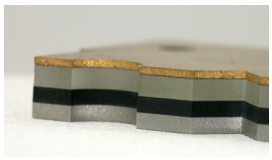
Precision with rotating work piece

- 4 axes working synchronously
- Cutting width down to 0.2 mm
- Live fixturing for cutting part from different sides
- Rotates workpiece synchronously with cutting
- High inclination angles
- Utilizes 5-axis control with tool center point function
- All functionality of the Finecut WMC500II type 4X

Micro abrasive waterjet technology

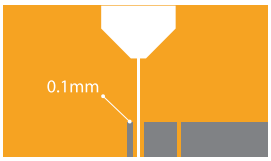
How small is the jet?

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.



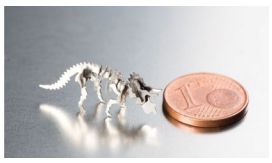
Cuts through layers of different materials

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



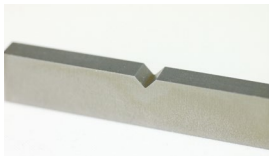
Narrow parallel cuts, ideal for thin sections

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.



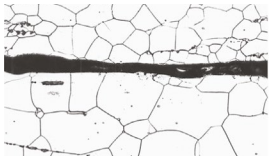
Fixturing solutions for complex geometry

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 process and does not change the material. Surfaces produced will be free from adverse mechanical and thermal effects. Also no subsequent processing is required.

Finecut WMC500II -4X

The A-axis can be fitted with a work table plate on which any work piece can be placed. With this mechanism the part can be re-oriented to provide access for cutting from different sides of the part. This motion system setup allows the jet nozzle to cut along a contour, following the part's 3D curvature, moving all four axes in synchronuous motion.

The machine has a 5-axis controller with capability for tool center point programming. All these operations are easily programmed using the CAD/CAM software provided for the machine.

Finecut WMC500II – 4X

Cutting system combining 3X cutting with rotating work piece

With our 4-axis motion system, the 3 axis cutting system is supplemented with a capability of turning the work piece synchronuously with the X-Y-Z motion of the tool. In the 4X machine a table-mounted A-axis is used to manipulate the work piece. The A-axis has a 360 degrees rotation capablity. The rotating axis may be fitted with a chuck and be used as a rotary axis, which enables cutting helical geometries, rotational symmetries and contours in rotational parts (tube cutting). The A-axis can be fitted with a work table plate on which any work piece can be placed.

This manipulation system has a detachable A-axis. The machine has an optional probe with a easy user interface, that helps to set up and true up the table-mounted A-axis quickly. This enables combining the full versatility of filling the 500×500 mm work envelope with parts one day with 3-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 depending on the requirements of the machined part.

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 4X

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

The Finecut WMC500II- 3X can be retrofitted with 5-axis manipulation system. All Finecut WMC500II have a 5-axis controller and pre-assembled cable set up for any of our 5-axis manipulation systems.

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

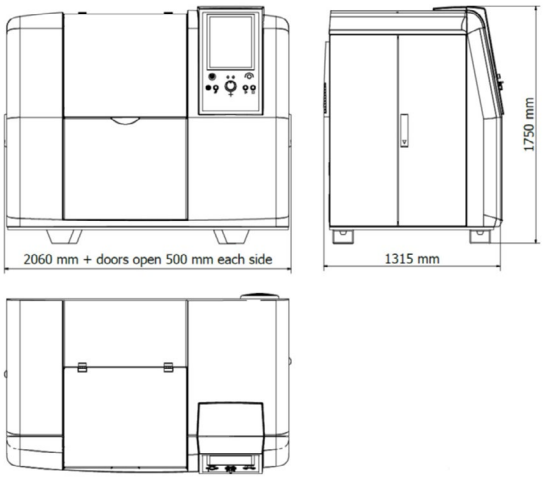
The Finecut machine is a compact fully integrated high-precision waterjet machining center. It has a compact footprint so it is easy and convenient to place in your workshop. The fully encapsulated design keeps water and grit in the machine, so it can operate alongside your other CNC machines.

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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