EDGE3i

Precision Sinker EDM

SKÄRPVERKTYG AB

MAKINO
Promise of Performance

EDGE3i

The success story of our EDGE3i sinker electrical discharge machine started with selling thousands of machines to satisfied customers in Asia.
For the European market Makino launched a CE-version of the EDGE3i.

All highlights of this fully equipped precision die sinking EDM for precise and repeatable jobs are available as standard features to our customers in Europe:

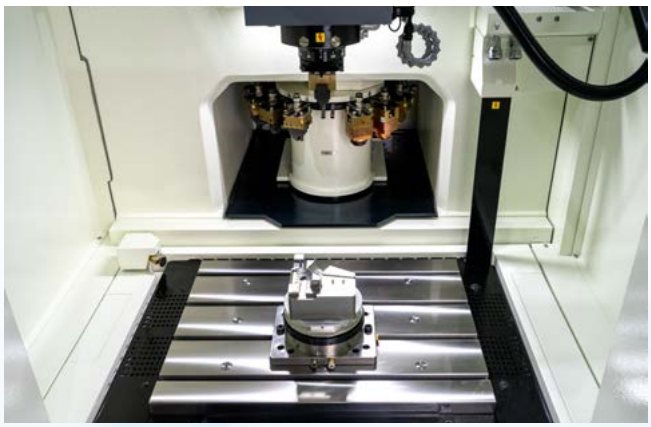
- **Easy to use with Hyper*i* with touch screen and intuitve operation.**
- **E-Tech doctor to assist the operator in the machining process optimization.**
- **16 position electrode changer to increase machining autonomy or machine multi cavity moulds and complex cavities.**
- **HyperConnect ensures peace of mind while away from the machine and connectivity to the ressources of the company.**

The EDGE3i machine offers best-in-range reliability and a similarly high level of precision as more complex machines – yet comes at an extremely favourable price, ask your local Makino Sales contact for more details.

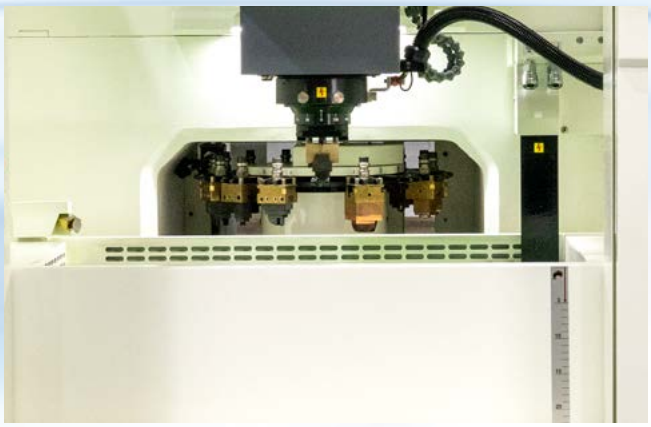
Universal design for enhanced operating area

OPC-UA/MT Connect Connectivity (option)
Provides job status and related information such as machining speed, completion time and time to next stop point. Critical status and alarms are illustrated in detail to indicate why the machine is (NOT) performing as expected.

Compact design
The compact machine allows easy operation. There is no need to add space for maintenance on either side of the machine. The ATC is built into the machine to allow installation in tight places without wasting any space.



The work tank height can be adjusted so that the dielectric fluid level matches the thickness of the workpiece. This allows excellent visibility for easily checking the machining process.



Hyper
TECHNOLOGIES

Makino's family of Hyper Technologies revolutionize the machining process in both sinker and wire EDM, and ensures the ideal mix of speed, finish, reduced electrode wear and reduced trim cuts, to achieve outstanding productivity.

Hyper *i*

The touch screen controller is available for both sinker and wire EDM and makes machining easy.

Hyper*i* Controller

*i*ntuitive | *i*ntelligent | *i*nteractive

The proven Hyper*i* Control revolutionizes the interface between the operator and the machine. With a clear and easy to learn interface, Makino's Hyper*i* Control makes use of intuitive hand gestures that provide the operator with a simple and natural feel that is comfortable and extremely efficient. The user friendliness of the Hyper*i* Control is further enhanced with the integration of on-board digital manuals, intelligent help functions, and e-Learning training system with videos.

Any operator with a basic knowledge of machining can learn Makino's Hyper*i* Control. Operators quickly learn and appreciate the technology and power that the Hyper*i* Control provides, and most operators are able to produce sophisticated part details on the first day of installation. Hyper*i* brings a completely new level of user-friendliness, operator comfort, and efficiency to the shop floor.

Hyper *i* Controller

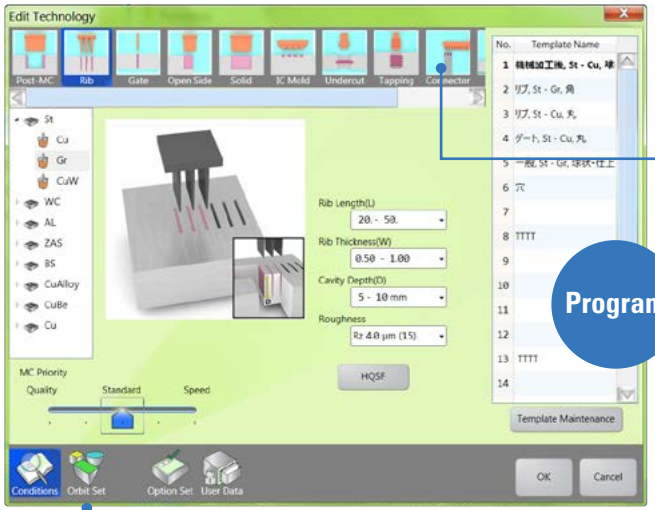
1. Program

2. Setup

3. Run

Easy programming

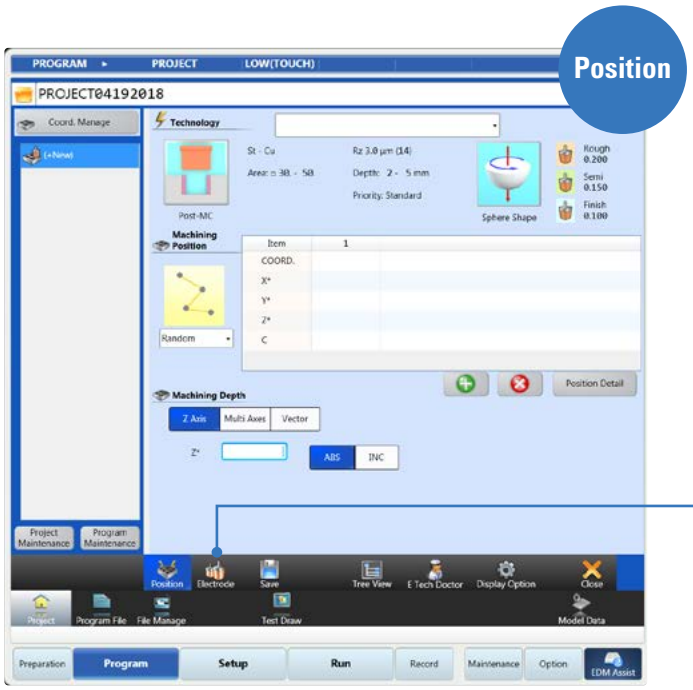
Machining program can be created easily on the user-friendly graphical screen.



Proper machining condition is automatically determined by selecting machining shape on the menu and inputting workpiece material and electrode material etc.

Orbit pattern/electrode dimension reduction

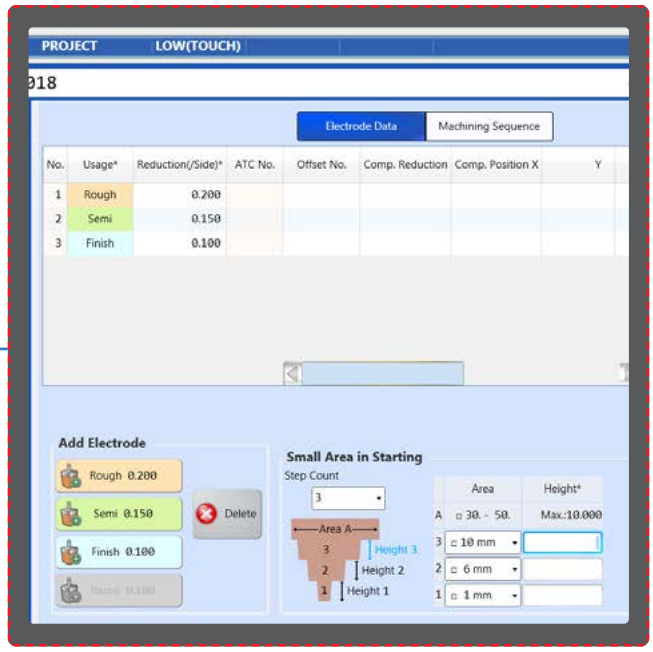
Three types of orbit patterns, Circle/Square/Sphere, are equipped. Each type has 2D and 3D motion patterns to create optimal programs for machining various shapes.



Screen for position and depth

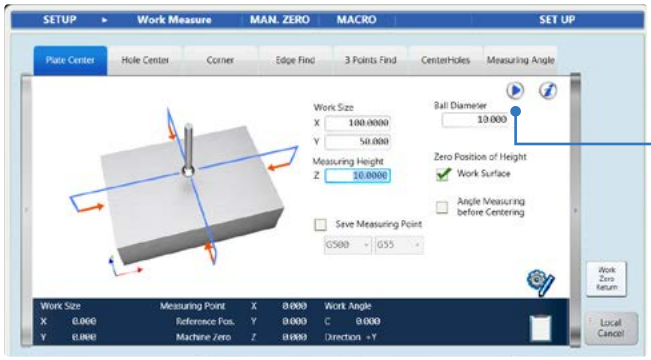
Electrode setting

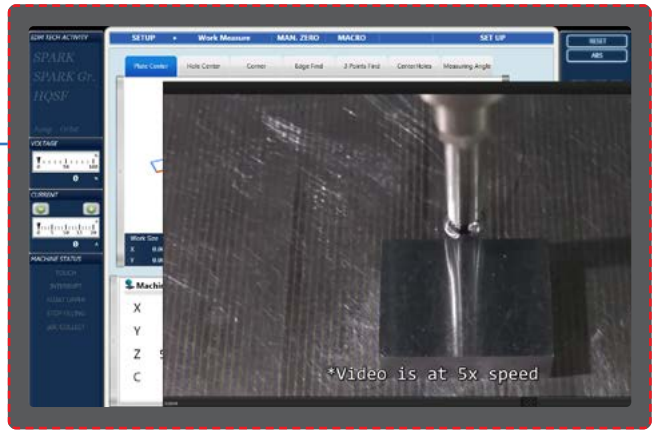
Screen for tool pot number and order of machining.



Setup

Setup screens such as plate centre, hole centre, corner, EDGE find, 3 point find, centre holes, measuring anglee, etc. help operators operate intuitively.





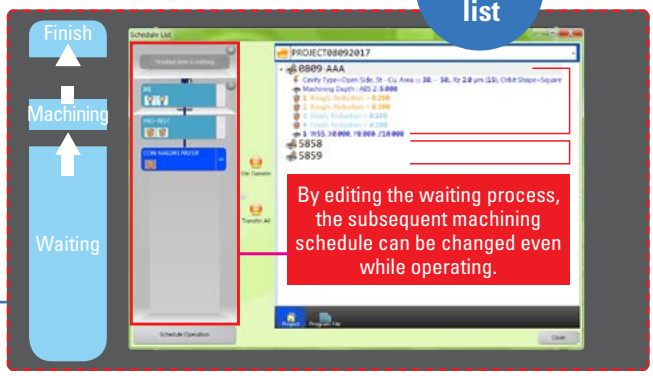
EDM assist

Explanation movies are available.

Hyper *i* Controller

Schedule-run

Continuous operation of multiple programs can be easily done.



E-Tech doctor

E-Tech doctor is an advanced help function that suggests ways to improve various problems interactively.

Example: "Since the discharge state is bad, I want to know how to improve."

HyperConnect

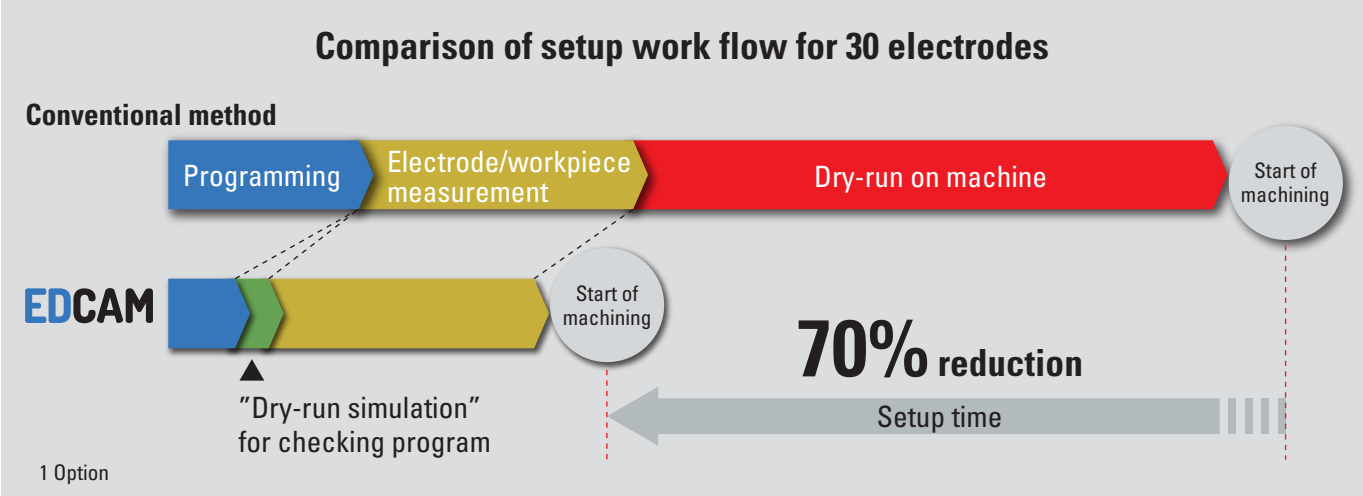
HyperConnect is a bidirectional remote connection that enables the operator to access either the machine control from a remote device or to access a PC from the machine controller.

Connectivity

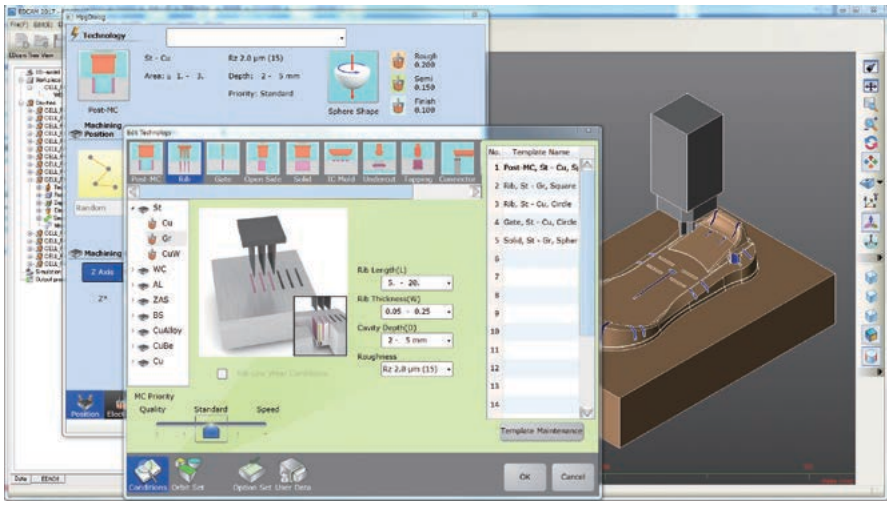
EDCAM

Less setup time - dry-run can be skipped

CAM system for EDM machines[1]



The CAM system which eliminates manual input and machine dry-run.



Dry-run simulation

Dry-run is performed on PC.
It is possible to check the machining position, the electrode shape, interference between electrode and the workpiece, etc.

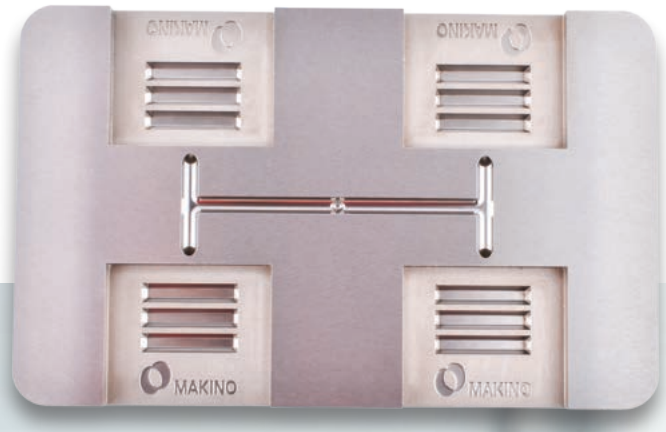
Easy programming

The data necessary for machining can be read directly from CAD. Mistakes caused by manual input are totally eliminated. Furthermore, proper machining condition can be automatically selected based on machining area. As the user interface is as same as that of machine controller, the operator can easily use EDCAM.

Applications

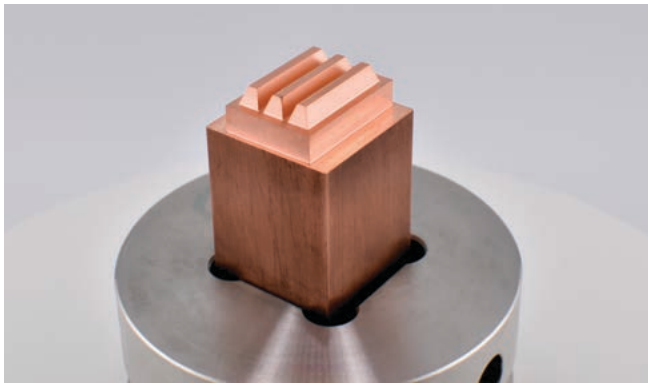
Submarine gate machining

- On dedicated input screen, positioning of submarine gate electrode requiring C-axis indexing can be performed easily.
- Rough machining time is shortened with new machining conditions.



Super Surface

Workpiece material:	Stavax
Electrode material:	Copper
Undersize:	0.15 mm/side
Surface finish:	0.2 µm Ra

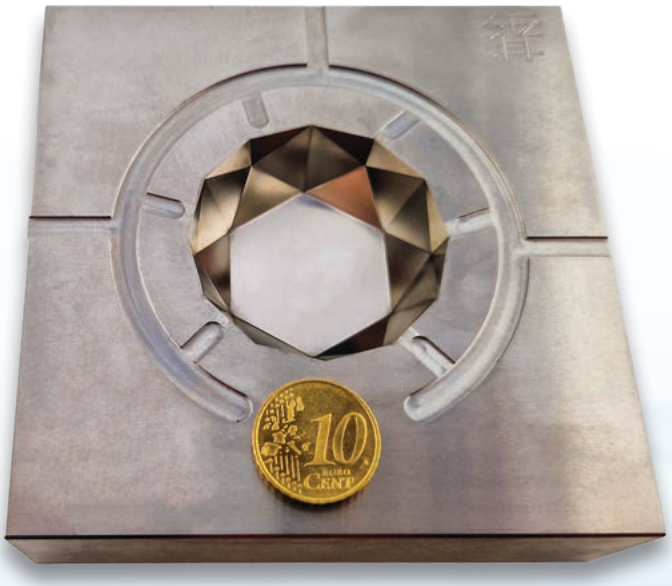


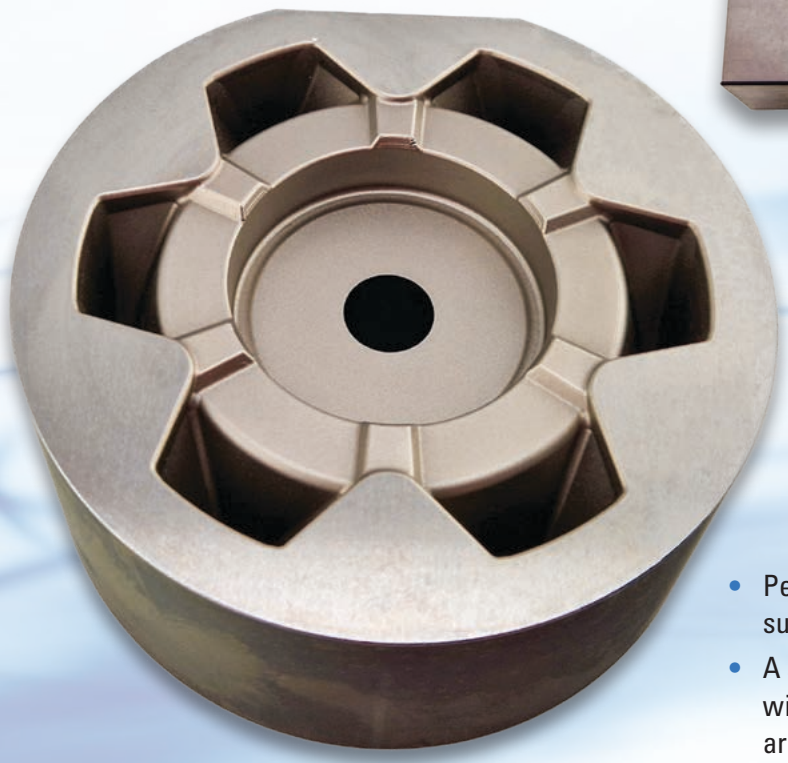
Super Surface

- Provides an exceptional fine satin finish of uniform quality.
- Super Surface enables the possibility of corner R smaller 0.01 mm.
- Super Surface helps to improve and maintain part detail accuracy by minimizing the need of hand polishing.

High-gloss EDM to perfection

Surface roughness of Ra ≤ 0.20 µm
even with medium component sizes.





- Perfect and homogeneous erosion surface for complex geometries.
- A surface quality of VDI 20 produced with graphite electrodes, with a surface area to be eroded of over 100 mm².

Gear mould

Workpiece material:	Steel
Electrode material:	Graphite
Machining time:	Roughing 55 min Finishing 4 hrs
Surface finish:	1 µm Ra (5 µm Rz)

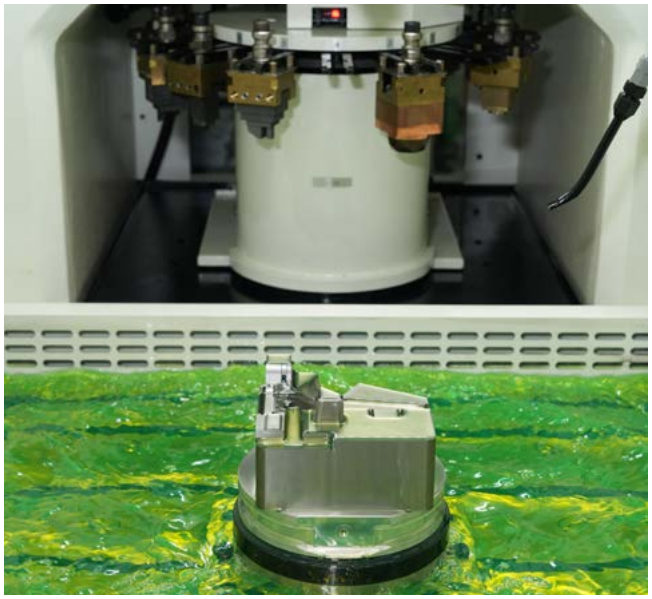
EDGE3i

Connectivity

- Prepare your work from your office while supervising your machining.
- Modify the EDCAM program (option) from the machine controller.

Autonomy

- Equipped with 16 position changer to increase the autonomy (overnight machining).
- Ease the processing of multicavity molds or the machining of multiple parts in one setup.
- Integrated design to save overall machine floorspace.



Precision

- Proven Makino mechanical design with large castings and integrated dielectric tank.
- The bed tank method suppresses the deformation of the machine's posture.
- The design contributes to space saving and is less vulnerable to temperature changes (improved thermal behavior).

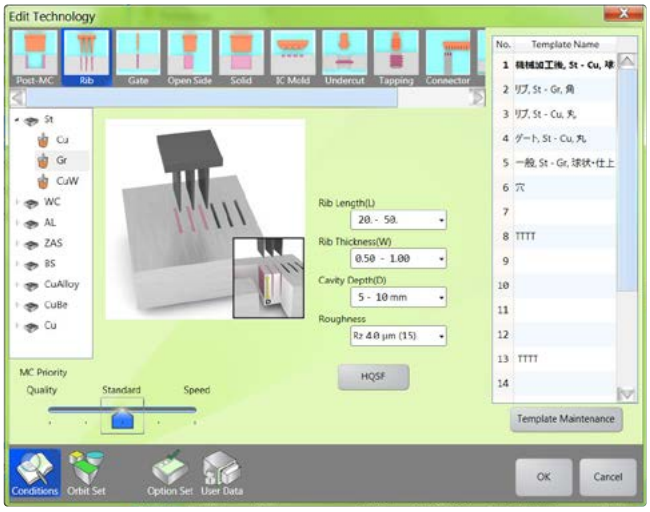
Easy Usage

Hyper*i* Controller

- Easy programming: machining program can be created easily on the user-friendly graphical screen.
- Setup: easy to use workpiece measurement and electrode measurement.
- Schedule run: continuous operation of multiple programs can be easily done.

Universal Performance

The onboard standard technologies include the machining conditions for many electrode and workpiece material combinations and various machining situations and electrodes shapes are easily selected by the operator.



Specifications

EDGE3*i*

	Description	EDGE3*i*
Axis travels	X x Y x Z	450 x 300 x 320 mm
Work tank	Inner dimensions (Width x Depth x Height)	800 x 550 x 350 mm
Fluid	Max. fluid height	300 mm
Table	Max. working area (Width x Depth)	600 x 450 mm
	Max. height	890 mm
	Rapid traverse	5,000 mm/min
Electrode	Max. electrode weight	50 kg
Workpiece	Max. workpiece weight	800 kg
Lowest point of Z-axis	Standard head (distance from electrode mounting surface to table)	230 mm
	Automatic chuck and MR head specification (distance from chuck bottom to table)	(EROWA) 160 (3R) 142.5
Electrode mounting	Plate dimension (Z axis)	125 mm dia.
Table T-slots	Width x Number	14 mm x 4
Machine	Height	2,480 mm
	Dimensions (W x D)	2,100 x 2,310 mm
	Weight (incl. power supply case)	5,000 kg

Dielectric Fluid Supply Unit	Description	EDGE3*i*
Type		Integrated with machine
Dielectric fluid	Volume	380 l
Dielectric fluid filtration system	Type	External pressure-type paper filter
	Number of filter elements	2
Number of dielectric fluid ports	Suction	1
	Flushing	1

Power Supply Unit	EDGE3*i*
Power supply specification	AC 3-phase, 200/220 V +/+ 10 %, 50/60 Hz
Total power consumption	9 kVA
Breaker capacity	50 A
Circuit breaker	Inverter circuit: 50 mA current sensitivity
Power line size	8 mm^2
Air supply	0,6 MPa, 200 l/min (connection port: dia. 8 mm)

Standard specifications

- Drop tank design
- Dielectric fluid cooling unit
- ES 100 A power supply unit 80 A peak
- Automatic fire extinguisher
- Super Spark IV
- Portable control panel
- Centering probe measuring probe set
- Super Surface and Super Edge
- HyperCut
- Hyper*i* Controller
- Network connection Ethernet 1,000 BASE T/100 BASE-TX
- Power supply line filter
- EDM Explorer
- USB interface
- HyperConnect
- MR Head (spindle rotation type)
- 16 tools
- Work light (LED)

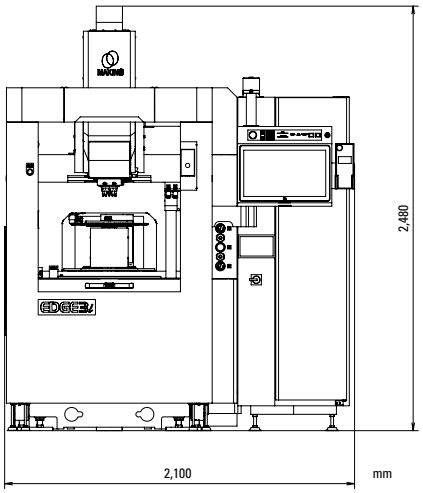
★ Optional equipment

★ EDCAM

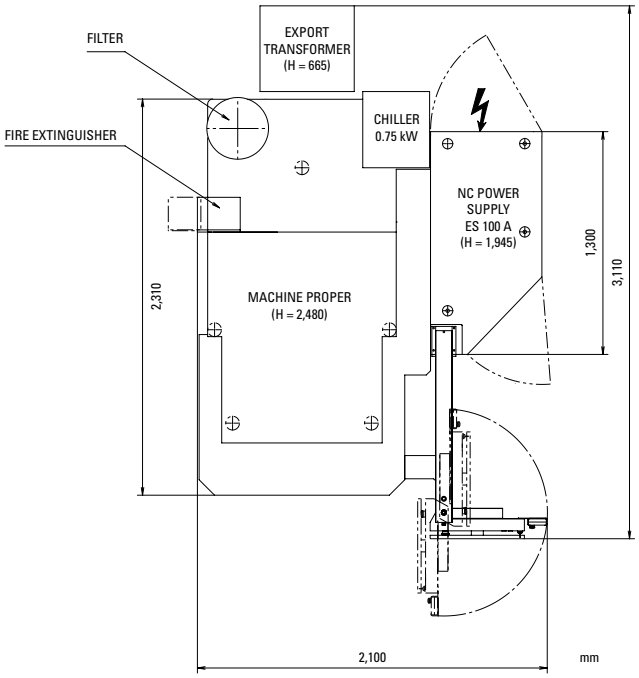
Programme guidance available in various languages e.g. English, German, French, Spanish, Italian.

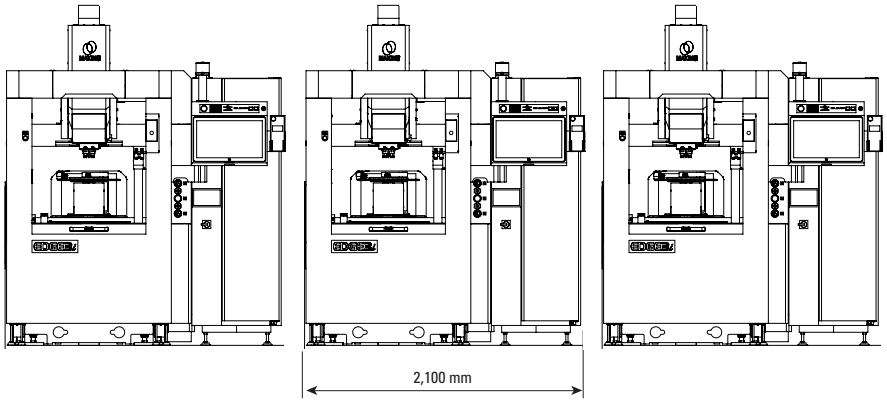
Please contact Makino or your Makino dealer for more details and optional equipment. The specifications and pictures in this catalogue may be changed without prior notice to incorporate improvements from ongoing R&D programs.

Front view



Floor plan





EDGE3*i*

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