

# tecnocut aquatec

Waterjet cutting machine





CMS is part of SCM Group, a technological world leader in processing a wide range of materials: wood, plastic, glass, stone, metal and composites. The Group companies, operating throughout the world, are reliable partners of leading manufacturing industries in various market sectors, including the furniture, construction, automotive, aerospace, ship-building and plastic processing industries. SCM Group coordinates, supports and develops a system of industrial excellence in 3 large highly specialized production centres employing more than 4,000 workers and operating in all 5 continents. SCM Group: the most advanced skills and know-how in the fields of industrial machinery and components.

CMS SpA manufactures machinery and systems for the machining of composite materials, carbon fibre, aluminium, light alloys, plastic, glass, stone and metals. It was established in 1969 by Mr Pietro Aceti with the aim of offering customized and state-of-the-art solutions, based on the in-depth understanding of the customer's production needs. Significant technological innovations, originating from substantial investments in research and development and take-overs of premium companies, have enabled constant growth in the various sectors of reference.



**CMS Metal Technology** is the brand dedicated to the production of metalworking machines and technical articles offering a wide range of complete water-jet cutting systems, pressure intensifiers and dry or wet deburring and satin finishing machines. Since the 90's, thanks to the acquisition of Tecnocut and constant internal developments, **CMS Metal Technology** has been able to gain high international prestige, boasting more than 1,500 installations worldwide. CMS Metal Technology is the reliable partner of leading industries in various sectors such as automotive, aerospace, machining, furniture and industrial architecture.



# tecnocut aquatec

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# APPLICATIONS



Fabrication | Aerospace | Sheet metal | Components | Trimming & drilling of special materials



Blank cutting | Heavy metal plates | Machine Shop | Trimming of landing gear parts

**Unparalleled.**

**New.**

**Innovative.**

**Quality.**

**Ultra.**

**Effective solutions.**

The **UNIQUE** waterjet cutting machines.

Waterjet cutting machine



# TECNOCUT AQUATEC

## TECHNOLOGICAL BENEFITS

### 3- AND 5-AXIS HYDRO-ABRASIVE WATERJET CUTTING SYSTEM

Tecnocut Aquatec is an advanced, versatile, high-performance abrasive waterjet cutting system, able to accommodate the most diverse production demands in different application fields, delivering highly accurate cuts. The machine consists of a mobile bridge moving along separate high-thickness steel supports, fastened to the floor and providing outstanding structural rigidity. This structure delivers high performances even by the most demanding tasks.

- The motions - including the one of the cutting head - are carried out by high precision tempered ground rack, driven by brushless motors.
- Steel guards and the polyurethane bellows protect all motion components from water and powders.
- Loading and unloading the material is fast and simple thanks to 2 or 4 open sides, as well as checking the cutting process. Moreover it allows to possibly install additional equipment to handle the material.

### KEY BUYER BENEFITS

- + **Unmatched cutting performance:** the open frame structure with electric gantry on two separate thick supports on a basement anchored to the floor offer high rigidity even with rapid speed up to 54 m/min and acceleration up to 2 m/s<sup>2</sup>.
- + **The most compact solution on the market with infinite rotation** 33% less cutting cycle avoiding to recover the revolutions of the C axis to align internal wires and tubes.
- + **Access of worktop from 4 sides:** excellent access to the cutting area, the large gantry and modular frame allow configurations with wide space around the catch tank for easy loading and unloading operations.
- + **High flexibility to maximize the productivity:** the modular structure of frame and catch tank offer high flexibility for most demanding customers looking for large format heavy duty cutting solutions.



Double tank solution for pendular working (opt)



Maximum configuration flexibility thanks to the modular design

# ACCESSORIES

Control panel with real-time view of all machine parameters: consumption, electronic adjustment of the garnet flow, dredge, consumables and forecast of cutting time. (std)



Air conditioning system of the machine's electrical cabinet to keep internal temperature between 35°C and 40°C. (opt)



Remote control unit for driving up to 6 axes; it allows to operate close to the cutting table and set multiple starting points.



Cleaning system for the work area which reduces the chances of scratches on the cut piece. It also enables the feeler to detect correctly the thickness of the material (opt).

**PROBE**  
Probe system, continuous or periodic, available also with large ring for foam or glass cutting. It enables to maintain the same distance from the material being cut at all times even if the material is not perfectly flat.



Cross Laser device for setting one or multiple starting point on the sheet positioned on the cutting table (opt).



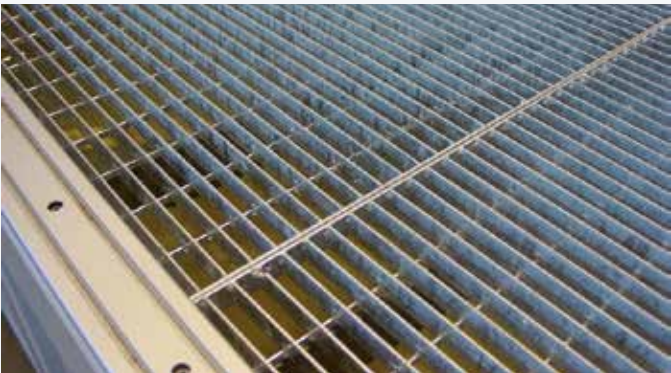


# ACCESSORIES

Head protection from water and powders during the cutting process. (available only for 5-axis cutting head Evo)



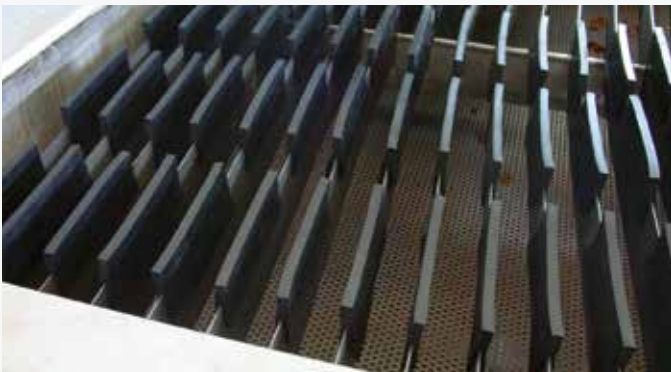
## WORK TABLES INTENDED FOR DIFFERENT CUTTING APPLICATIONS



Standard Grid



High-thickness grid (opt)



Anti-reflective table for glass (opt)

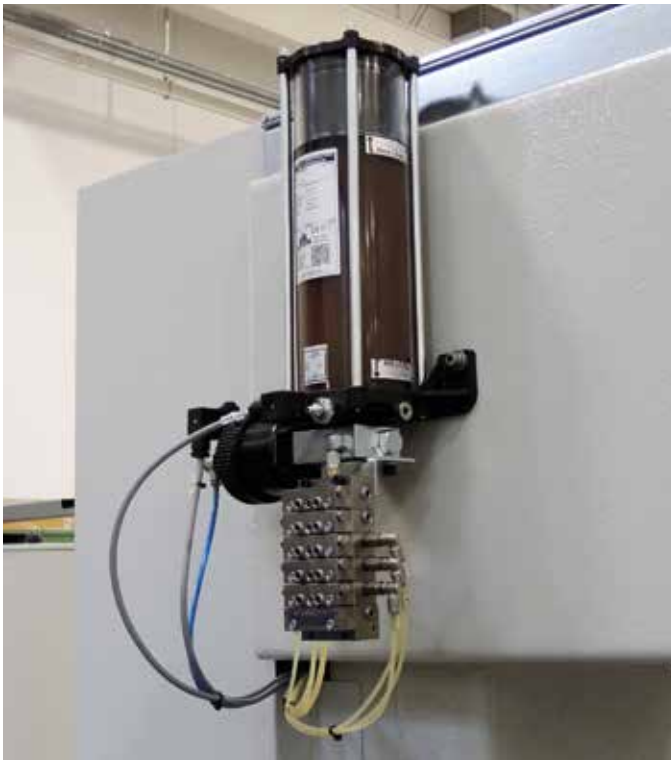


Anti-reflective surface (opt)

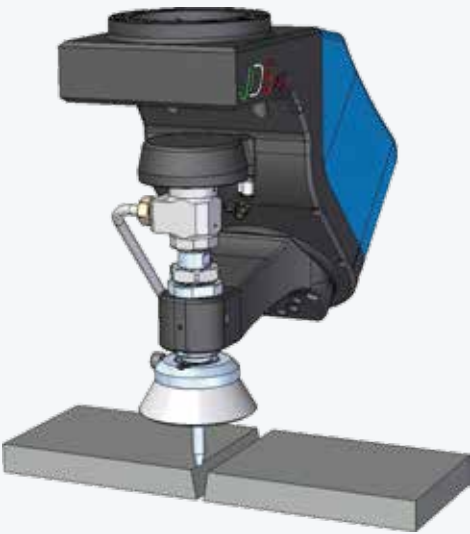


powered by  
**JDC**

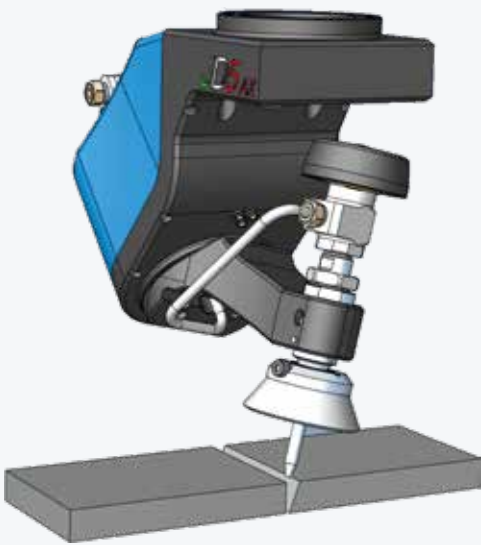
5-axis cutting head with JDC technology - Jet Drive Compensation -.  
Effective head management to carry out inclined cuts and check cut  
conicity (Opt)



Automatic lubrication of all axes (std)



3-axis traditional machining



JDC technology



# ACCESSORIES

Pneumatically controlled drilling unit on Z axis.  
It can be adjusted on the Z axis (0-30 mm) to fit different drill bits.  
It can be installed on a cutting system with a single or two Z axis.



“No maintenance” chain type dredger for exhausted abrasive removal. The removal system inside the tank is protected both by baskets for collecting scraps and by a metal cage. The tank is ready to install the dredger system at a later time. (opt)



Worktable cleaning system equipped with pump removes the possible material debris left on the sheet during the cut. A washing cycle at the end of the cut cleans completely the work area before loading/unloading the material.



**AUTOMATIC HOSE REEL:**  
Air and water sprayer kit, useful for cycle end clearing of cut material (std)

**ELECTRONIC FEEDER**  
Electronic hopper for the automatic control of the abrasive flow with patented system of coaxial adduction to the high pressure circuit up to the 5-axis cutting head. If the abrasive flow is interrupted for any reason, the system will automatically stop to prevent damage to the cutting head or to the material. Besides, a vacuum sensor connected to the mixing chamber constantly detects changes in the supply of abrasive to the water jet, providing real-time information on the wear state of the cutting head.



Pressurized abrasive feeding system with 330 kg capacity equipped with two tanks: one with a 330 kg capacity and another – pressurized – to supply the cutting head (electronic hopper). It is also available a 2-stage abrasive feeding system with a 2000 kg capacity to complete long cutting jobs without interruptions due to a lack of abrasive.





# ACCESSORIES

## AUTOMATIC WATER LEVEL

Built-in water level in the tail of the tank, with pump for automatic adjustment (maximum 45 mm) of the water level for submerged cutting, eliminating the noise generated by the ultrasonic waterjet and keeping the working environment clean. (opt)



## ROTATING AXIS FOR PIPE PROCESSING:

CN-Managed processing of round and square section pipes up to 800 mm with 5 axis cutting head. (opt)



## 3-AXIS HEAD

Hydro-abrasive waterjet cutting head positioned on the Z-axis carriage, wholly designed and assembled at CMS.

## ELECTRIC INTENSIFIER ONBOARD THE CROSSBEAM

Positioning of the Greenjet actuator and high-pressure circuit directly onboard the X-axis crossbeam. The solution avoids losing about 2 bar per meter of high-pressure pipe interfacing between the intensifier on the floor and the cutting head. The solution also enables reducing the installation layout of the system. (OPT)



## HIGH-PRECISION PACKAGE

X- and Y-axis transmission with rack and pinion helical gearboxes characterized by a higher accuracy class with respect to the standard gearboxes, to ensure strict positioning tolerances and repeatability

## ACCESS THE LOADING PLATFORM

Possibility of rotating the tank by 90° by extending the Y-axis base travel runway modules to provide greater access space around the worktable and facilitate the loading and unloading of the material. Alternatively, it is possible to configure the machine with a crossbeam up to 6 meters cutting envelope, guaranteeing a large front loading and unloading area, simplifying material handling with forklift trucks or crane.





# TECNOCUT JETPOWER EVO

## TECHNOLOGICAL BENEFITS

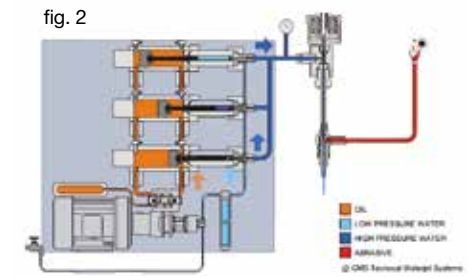
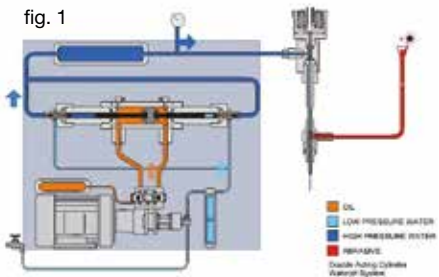
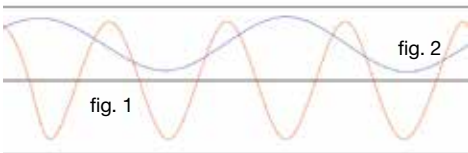
### PRESSURE INTENSIFIER ENTIRELY MADE BY CMS

CMS brought about a new concept in ultrahigh pressure intensifiers, enhanced by technological solutions designed to satisfy the needs of most demanding users. This new technology is based on an intensifier equipped with several pressure multipliers independent, parallel and electronically synchronized. This innovative solution results in an everconstant pressure avoiding any drops typical of traditional opposecylinder intensifiers.

fig. 1 Traditional opposing-cylinders intensifier

fig. 2 CMS parallel cylinders intensifier

Pressure



Software-based electronic control of cutting pressure



Pressure multipliers

### KEY BUYER BENEFITS

- + Hydraulic intensifier with 2 or 3 independent and electronically synchronized parallel cylinders to guarantee a constant signal of output pressure without the use of attenuator.
- + The technology with 3 independent cylinders allows the bypass of a single cylinder that needs maintenance, while the machine is working, avoiding unnecessary downtime.
- + The parallel cylinders architecture is designed for a low cycle frequency that reduce the high pressure components wear and consequently the maintenance costs.
- + Reduction of oil consumption and operating costs: Water flow rate up to 5 l/min to satisfy a wide range of cutting applications, adapting the oil consumption thanks to an independent variable flow pump for hydraulic circuit.



Hydraulic unit



Oil/air heat exchanger

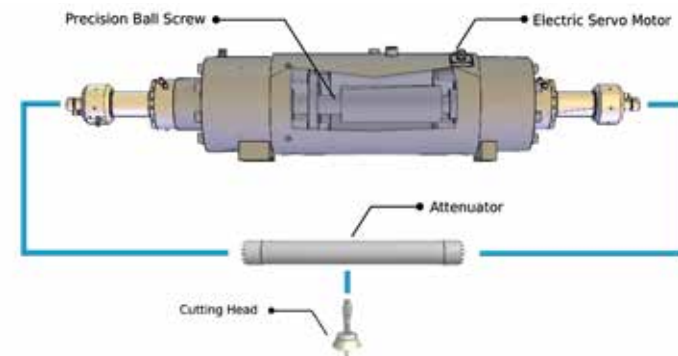


# TECNOCUT GREENJET EVO

## TECHNOLOGICAL BENEFITS

### THE HIGHEST EFFICIENCY, THE LOWEST CONSUMPTION

Tecnocut Greenjet Evo is a groundbreaking, highly efficient electric pump. A top-performance torque servomotor supplies a very high pressure level while removing the hydraulic unit and up to 80% of components compared to a traditional hydraulic intensifier. Tecnocut Greenjet Evo is equipped with one electrically driven actuator and a pair of opposed-piston high-pressure cylinders. Such a structure - electrically driven - delivers an extremely constant pressure level, a monitoring of the pressurization cycle and an efficiency at least 30% higher than hydraulic intensifiers.



Double-acting pressure multipliers, electrically driven, manufactured with materials highly resistant against mechanical stress and corrosion.



### KEY BUYER BENEFITS

- + Electric pump actuated by a brushless servomotor capable of generating a constant pressure signal with an efficiency greater than 35% compared to traditional hydraulic intensifiers.
- + Reduced environmental impact: The electric actuator generates the high pressure without the hydraulic components with the advantage to avoid the disposal of the exhausted oil typically 200 liters every 2000 h.
- + Less than 81% of hydraulic and mechanic components and 73% less intensifying cycle than a direct drive pump, with consequently less maintenance costs and machine downtime.
- + 33% less power consumption than a traditional hydraulic intensifier thanks to precise power control of the motor when required and setting down near to zero when the cutting head is closed.



#### CONTROL PANEL

Near the electric pressure intensifiers it's available a 4.3" touch panel to set the running parameters during service operations and hydraulic and high pressure diagnostic.



#### HEAT EXCHANGER

Air/oil heat exchanger for working environments with a temperature up to 30°C. The solution allows for the consumption of water typical of water/oil cooling systems to be reduced, keeping noise levels down while operating.



#### SERVOMOTOR

The high pressure is generated by the movement of a recirculating screw driven by a female screw directly keyed on a direct drive torque motor controlled by an inverter for less wear and greater performance.

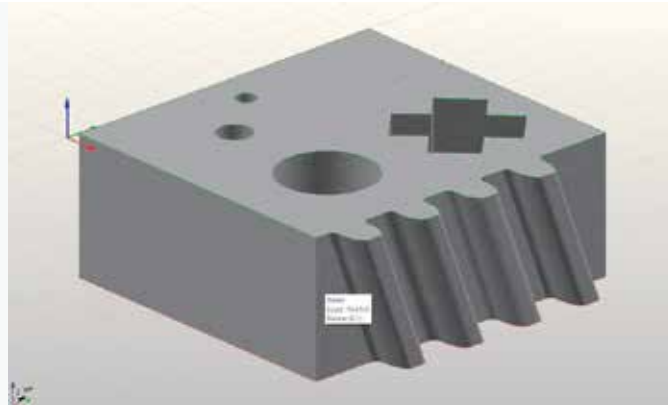


# EASYJET DDX SOFTWARE

Easyjet is a complete CAD/CAM suite for all-round management of every aspect of the 3 and 5-axis waterjet machining, that eliminates purchasing costs, maintenance and training of further third-party software products.

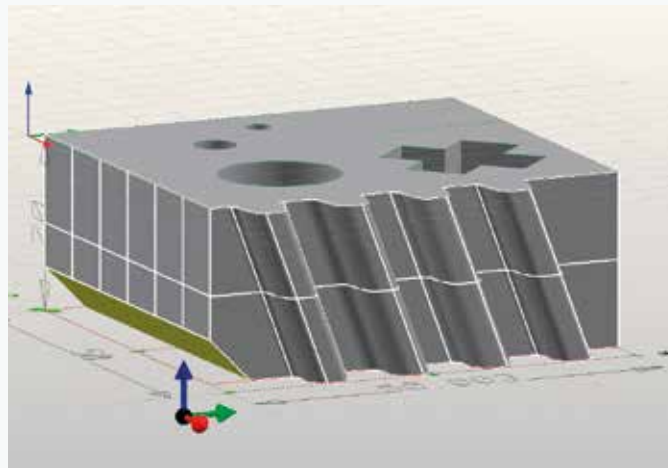
## THE GENERAL FUNCTIONS INCLUDE:

- Graphic management of the zoom and shift tools
- 3D and photo-realistic rendering of the project
- Functions to measure the profile and analysis of the individual entities
- Functions to delete and reset the most recent operations
- Option to configure the parameters database on-line to share it with numerous software stations
- Automatic e-mail management to request assistance
- Python Module and Scl included to customise software and interface with other systems



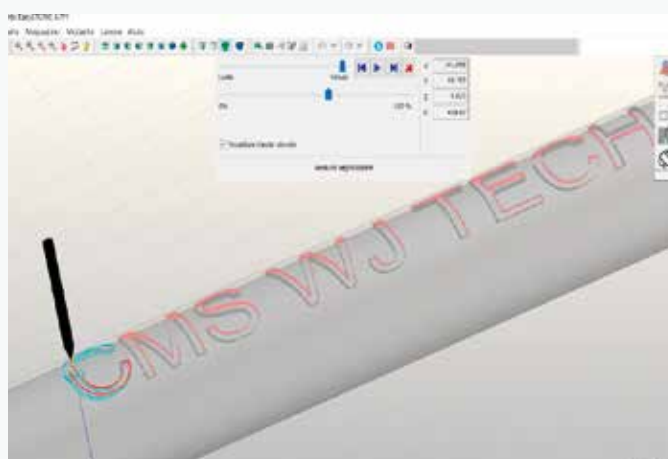
THE CAD FUNCTIONS INCLUDE:

- Free drawing of geometrical entities like arches, lines, polylines, rectangles, squares, ellipses, circles, regular polygons, radii, clip-pings, nurbs, etc..
- Advanced surface drawing (loft, swept, polimesh, gordon) curve grid surface drawing
- PNT importing
- Definition of the surface using a point file elaborated by a laser scan
- Interactive change of surfaces, even complex ones, to insert chamfers, trimmings, insertion of sloping sides etc
- Definition of construction tables
- Associating different colours to each tool path
- Change and elaboration of projects (shearing, extension, sub-division, union, interpolation, duplicate, symmetrical, rotation, deletion, etc.)
- Importing DXF, ISO, IGES, STEP, PARASOLID, 3DM and STL files
- Dimensioning

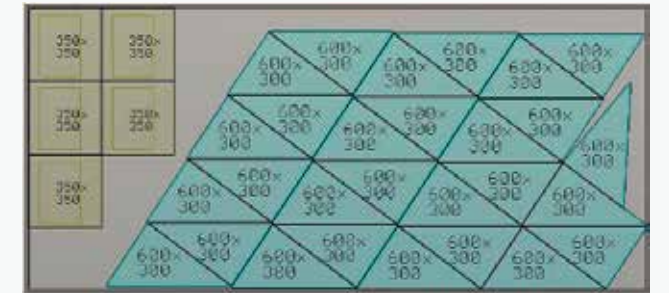


THE CAM FUNCTIONS INCLUDE:

- Automatic generating of cutting paths with WaterJet head
- Automatic generation of input and output paths, boring included with interactive graphic change (optional)
- Continuous automatic management of the feeding cycles, at the start of the profile or the sole detection of the plate thickness
- Projection cutting management, adhesion and development for pipe machining.
- Interpolated 5-axis control + 1
- Estimating project times and costs.
- Production of the ISO program optimised for the CNC
- Cutting management in common with the different algorithms to optimise the tool path
- Cutting with semi-automatic technology in the space.
- Automatic and/or custom-designed optimisation of the machining sequence to reduce cycle times.
- Automatic and/or manual management of the micro-joints and bridges.
- Cam-Auto module to automatically and intelligently create machining technology 18



In addition, the Easyjet software has powerful, fast multiple nesting algorithms in the work area, even with entities that differ from one another, with the possibility of graphically changing the arrangement of the objects and defining customised points of origin.



The JDE plug-in is included in the package to manage the cutting technologies archived in a complete materials database. The machine program is automatically generated on the basis of the selection of the cutting quality required out of 5 options (Q1, Q2, Q3, Q4 and Q5) that establish the speed advancement and acceleration settings in the internal/external corners. The ISO program can then be transferred to the machine using the local network or via USB drive.

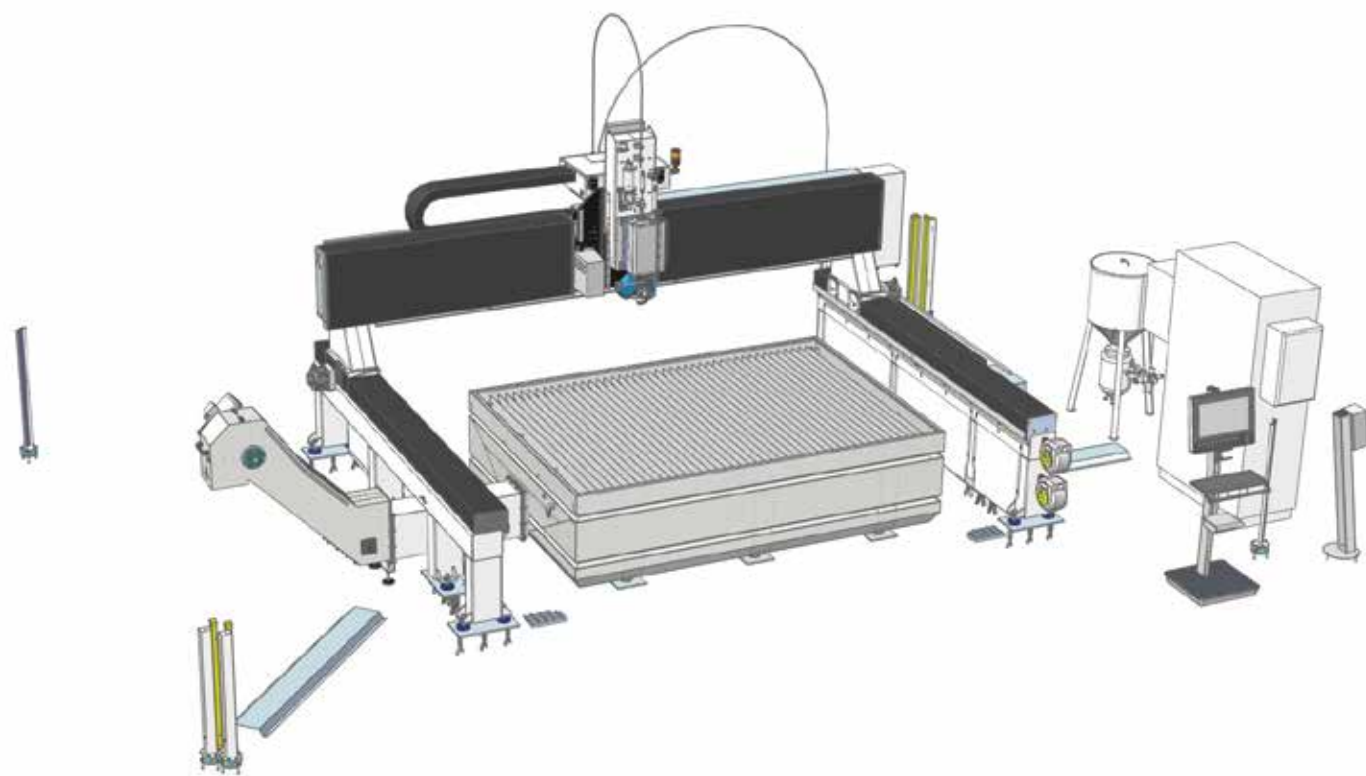
The correct setting of the machining parameters can be checked in advance thanks to the 3D simulation of the machining process using a 3D graphic model of the CNC that reproduces the table, handling axes, tool and pieces arranged on the table.





# TECNOCUT AQUATEC

## OVERALL DIMENSIONS & TECHNICAL DATA



TECNOCUT AQUATEC: TECHNICAL DATA					
MODEL*	2030	2040	6030	RAPIDS	ACCELERATION
X AXIS	3800 mm 149 in	4020 mm 158 in	3000 mm 118 in	54 m/min	2 m
Y AXIS	2650 mm 104 in	2650 mm 104 in	6650 mm 262 in	54 m/min	2 m
Z AXIS	650 mm 25 in	650 mm 25 in	650 mm 25 in	12,6 m/min	1 m
B AXIS	± 60°	± 60°	± 60°	17200 °/min	1450 °/s²
C AXIS	infinite	infinite	infinite	13400 °/min	850 °/s²
WORKABLE AREA	2000 x 3000 mm / 78x118 in	2000 x 4000 mm / 78x157 in	6000 x 3000 mm / 236x118 in		
OVERALL DIMENSIONS	5886 x 4039 mm / 232x159 in without light barriers	5886 x 4039 mm / 232x159 in without light barriers	8195x6832 mm / 323x269 in without light barriers		

\*Standard configuration available up 60120 (12000x6000 mm)  
Dynamic precision (3-axis)  
Repeatability of "ps" positioning

# PRESSURE INTENSIFIERS

## TECHNICAL DATA



TECNOCUT JETPOWER EVO: TECHNICAL DATA		
MODEL	TECNOCUT JETPOWER EVO 30 HP	TECNOCUT JETPOWER EVO 60 HP
POWER	22,5 kW / 30 Hp	45 kW / 60 Hp
MULTIPLIERS	2	3
MAX WATER PRESSURE	4150 bar / 60.000 psi	4150 bar / 60.000 psi
MAX WATER FLOW	2,5 L/min / 0,66 gpm	5 L/min / 1,32 gpm
MAX DIAMETER ORIFICES	0,28 mm / 0,011 in	0,40 mm / 0,016 in
VOLTAGE	400V +/- 5% 50-60 Hz (Different voltages and frequencies on request)	



TECNOCUT GREENJET EVO: TECHNICAL DATA				
MODEL	TECNOCUT GREENJET 4139	TECNOCUT GREENJET 6200	TECNOCUT GREENJET 4139 SA	TECNOCUT GREENJET 6200 SA
POWER	34 kW / 45 HP	34 kW / 45 HP	34 kW / 45 HP	34 kW / 45 HP
MULTIPLIERS	2	2	2	2
MAX PRESSURE	4139 bar / 60.000 psi	6200 bar / 90000 psi	4139 bar / 60000 psi	6200 bar / 90000 psi
MAX FLOW RATE	5 L/min / 1,32 gpm	2,61 L/min / 0,66 gpm	5 L/min / 1,32 gpm	2,61 L/min / 0,66 gpm
MAX DIAM ORIFICES	0,4 mm / 0,015 in	0,28 mm / 0,015 in	0,4 mm / 0,015 in	0,28 mm / 0,015 in
VOLTAGE	400V +/- 5% 50-60 Hz (Different voltages and frequencies on request)			



# CMS connect the IoT platform perfectly integrated with the latest-generation CMS machines

CMS Connect is able to offer customised micro services through the use of IoT Apps that support the daily activities of industry operators - improving the availability and use of machines or systems. The platform displays, analyses and monitors all data from connected machines. The data collected by the machines in real time become useful information to increase machine productivity, reduce operating and maintenance costs and cut energy costs.



# CMS active a revolutionary interaction with your CMS machine

Cms active is our new interface. The same operator can easily control different machines as the CMS Active interfaces maintain the same look&feel, icons and iteration approach.



## APPLICATIONS

**SMART MACHINE:** Section designed for the continuous monitoring of machine operation, with information on:

**Status:** machine status overviews. The representations provided allow machine availability to be checked - to identify possible bottlenecks in the production flow.

**Monitoring:** instantaneous, live display of the operation of the machine and its components, of currently running programs and potentiometers.

**Production:** list of machine programs run within a given timeframe with best time and average running time.

**Alarms:** active and historical warnings.

### SMART MAINTENANCE

This section provides a first approach to predictive maintenance by sending notifications when machine components indicate a potentially critical state associated with reaching a certain threshold. In this way, it is possible to take action and schedule maintenance services, without any down-time.

### SMART MANAGEMENT

Section designed for KPI presentation for all the machines connected to the platform. The indicators provided assess of the availability,

productivity and efficiency of the machine and the quality of the product.

### MAXIMISED SECURITY

CMS Connect uses the standard OPC-UA communication protocol, which guarantees the encryption of data at Edge interface level. CMS Connect's Cloud and DataLake levels meet all state-of-the-art cyber-security requirements. Customer data are encrypted and authenticated to ensure total protection of sensitive information.

## ADVANTAGES

- ✓ Ottimizzazione delle performance produttive
- ✓ Diagnostica a supporto dell'ottimizzazione della garanzia dei componenti
- ✓ Aumento della produttività e riduzione dei fermi macchina
- ✓ Miglioramento del controllo della qualità
- ✓ Riduzione dei costi di manutenzione

## EASY OF USE

The new interface has been especially developed and optimized to be immediately used via touch screen. Graphics and icons have been redesigned for user-friendly and comfortable navigation.

## ADVANCED ORGANIZATION OF PRODUCTION

CMS Active enables configuring different users with different roles and responsibilities according to the operation mode of the machining center (e.g.: operator, maintenance man, administrator, ...). It is also possible to define the work shifts on the machining center and then survey activities, productivity and events that have occurred in each shift.

## ABSOLUTE QUALITY OF THE FINISHED WORKPIECE

With CMS Active the quality of the finished workpiece is no longer jeopardized by worn-out tools. The new Tool Life Determination system of CMS Active sends warning messages when the tool life is running out and recommends its replacement at the most appropriate time.

## TOOL SET-UP? NO PROBLEM!

CMS Active guides the operator during the tool magazine set-up phase, also allowing for the programs to be run.



# THE RANGE OF CMS METAL TECHNOLOGY

# FOR METAL AND TECHNICAL ARTICLES PROCESSING

## WATERJET CUTTING MACHINES



**TECNOCUT SMARTLINE**



**TECNOCUT PROLINE**



**TECNOCUT AQUATEC**



**TECNOCUT WATERSPEEDY S**

## PRESSURE INTENSIFIERS



**TECNOCUT EASYPUMP**



**TECNOCUT JETPOWER EVO**



**TECNOCUT GREENJET EVO**

## DRY DEBURRING-FINISHING MACHINES



**DMC M950**



**DMC EUROSYSTEM**



**DMC METALSYSTEM**

## WET DEBURRING-FINISHING MACHINES



**DMC M950 WET**



**DMC TOP METAL**





**C.M.S. SPA**  
via A. Locatelli, 123 - 24019 Zogno (BG) - IT  
Tel. +39 0345 64111  
[info@cms.it](mailto:info@cms.it)  
[cms.it](http://cms.it)

a company of **scm**  **group**