

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.

tecnocut aquatec

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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.



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/s².
- + **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.

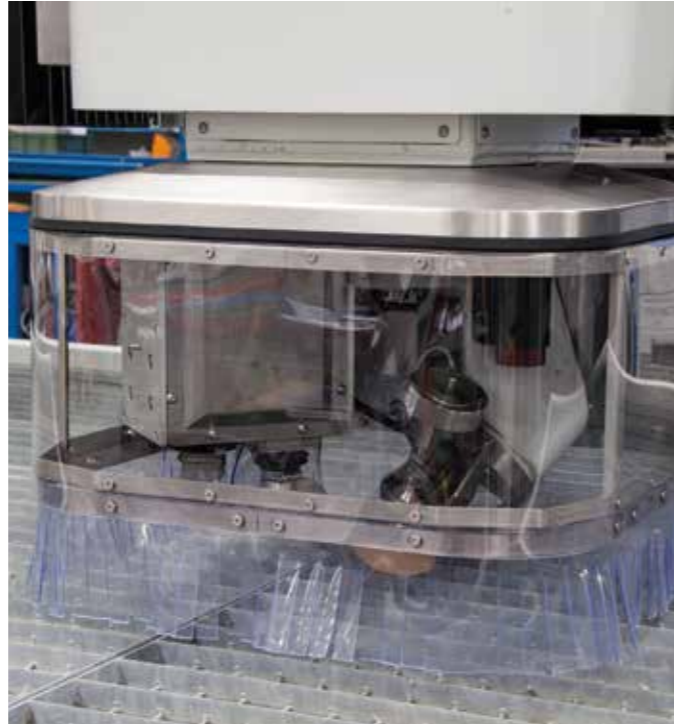


Cross Laser device for setting one or multiple starting point on the sheet positioned on the cutting table (opt).



ACCESSORIES

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

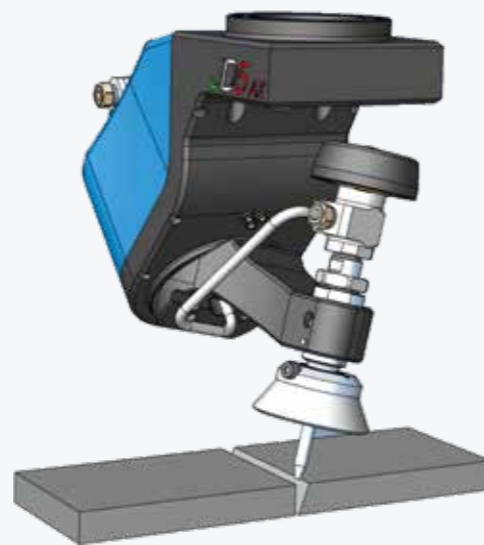


powered by
JDC

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

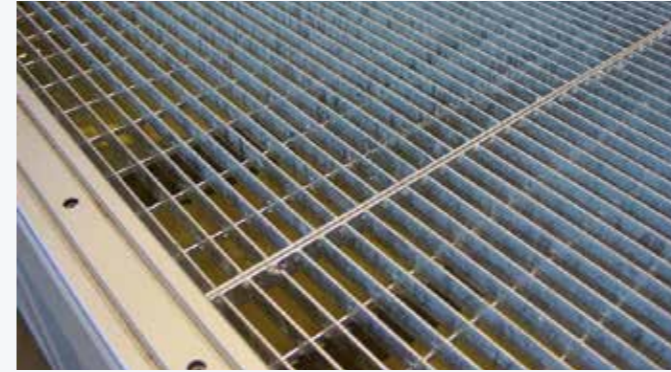


3-axis traditional machining



JDC technology

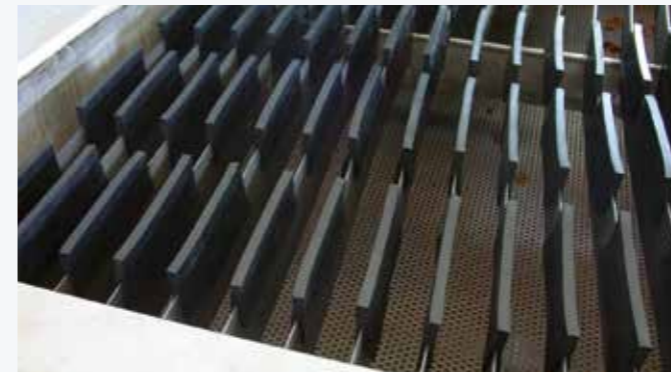
WORK TABLES INTENDED FOR DIFFERENT CUTTING APPLICATIONS



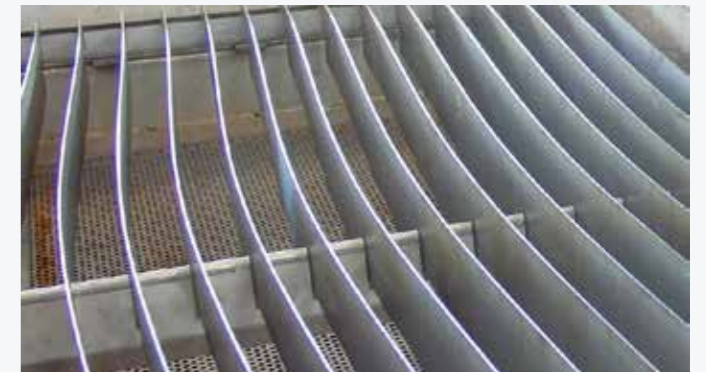
Standard Grid



High-thickness grid (opt)



Anti-reflective table for glass (opt)



Anti-reflective surface (opt)



Automatic lubrication of all axes (std)

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)



ELECTRIC INTENSIFIER ONBOARD THE CROSSBEAM

Positioning of the 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



3-AXIS HEAD

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



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.

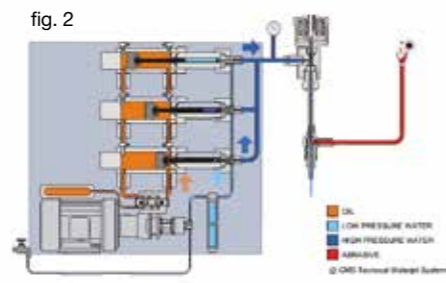
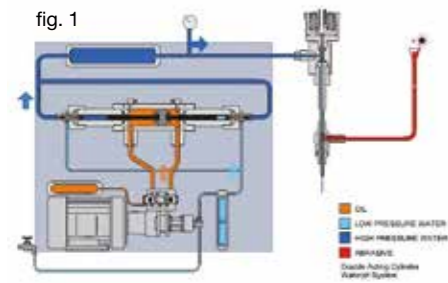
KEY BUYER BENEFITS

- + 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.

fig. 1 Traditional opposing-cylinders intensifier

fig. 2 CMS parallel cylinders intensifier

Pressure



Software-based electronic control of cutting pressure



Pressure multipliers



Hydraulic unit



Oil/air heat exchanger

TECNOCUT E-PUMP

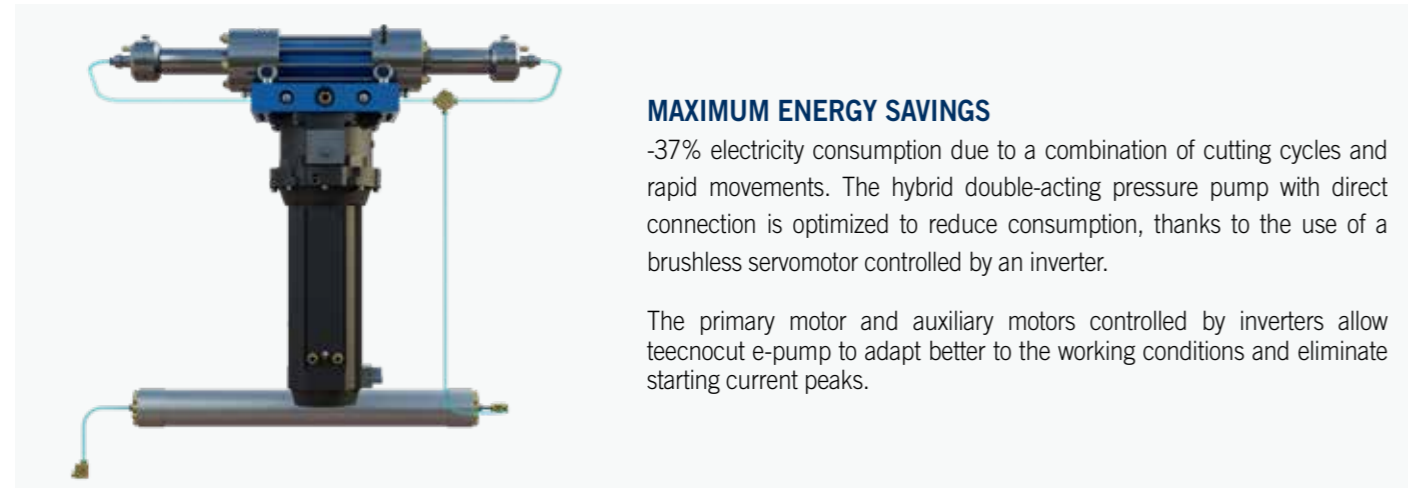
TECHNOLOGICAL BENEFITS

HYBRID INTENSIFIER

is the latest innovation in the range of CMS Metal Technology intensifiers created as a continuation of the quest by CMS for efficiency, performance, energy consumption and low environmental impact in the world of pressure intensifiers for waterjet cutting applications. This new project was carried out entirely in the CMS engineering department and has given rise to an innovative product that combines the power density of a hydraulic pump with the energy efficiency of a direct-drive mechanical architecture. The simplicity of the system translates into a significant reduction in components: up to 95% compared to a conventional hydraulic intensifier. Tecnocut E-pump exploits an electrohydrostatic unit connected directly to long-stroke pressure multiplier cylinders, achieving an operating efficiency of more than 31% compared to hydraulic intensifiers. The intensifier has an on-board intelligence with portable tablet (Wi-Fi) and touch display for monitoring and controlling operating parameters and performing diagnostics on hydraulic and high-pressure components. Tecnocut e-pump can be installed on any cutting table, even third-party ones.

KEY BUYER BENEFITS

- + High efficiency level: up to 31% more than conventional intensifiers.
- + Low maintenance, thanks to the use of 95% fewer hydraulic components.
- + Minimal use of hydraulic oil: -91% compared to conventional systems, with the benefit of lower environmental impact
- + Electricity consumption up to 37% lower due to a combination of cutting cycles and fast, closed-head movements



MAXIMUM ENERGY SAVINGS

-37% electricity consumption due to a combination of cutting cycles and rapid movements. The hybrid double-acting pressure pump with direct connection is optimized to reduce consumption, thanks to the use of a brushless servomotor controlled by an inverter.

The primary motor and auxiliary motors controlled by inverters allow tecnocut e-pump to adapt better to the working conditions and eliminate starting current peaks.

WI-FI TABLET WITH WEB HMI

The intensifier is controlled by an industrial PLC in the electrical cabinet in order to interface with CMS cutting tables, as well as third party ones.



The HMI control interface is accessible from the 10.4" Wi-Fi tablet and offers:

- remote diagnostics
- power management and control
- management and control of the cycle number per cylinder
- electronic cutting pressure control



CENTRAL SEAL LEAKAGE COLLECTION SYSTEM

An external manifold to collect leaks from HP seals, for easy and quick diagnostics without the need to open the covers. Depending on the location of the leak, it is possible to identify on which side it is and whether it is from static or dynamic seals. Two status green leds identify the running multiplier.



BOOSTER PUMP

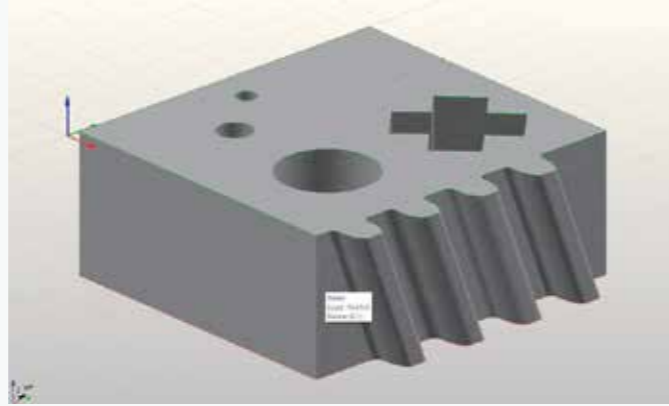
Inverter-powered booster pump for the inlet water supply, to optimize consumption by adapting to the mains water flow and pressure as well as to the cutting cycle (open/closed head). It is compatible with frequencies of 50 Hz and 60 Hz.

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.

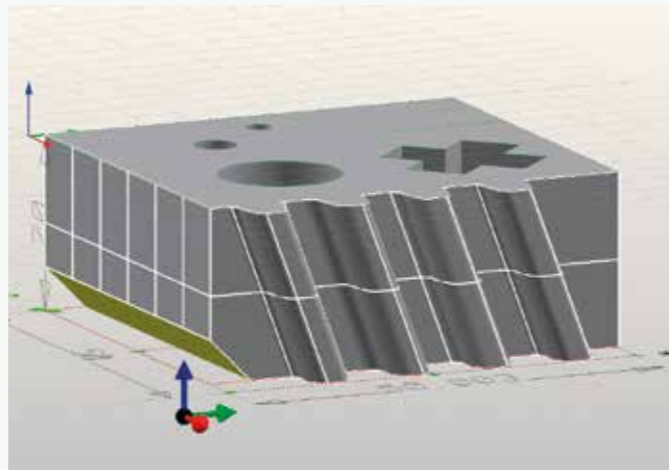
THE GENERAL FUNCTIONS INCLUDE:

- 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



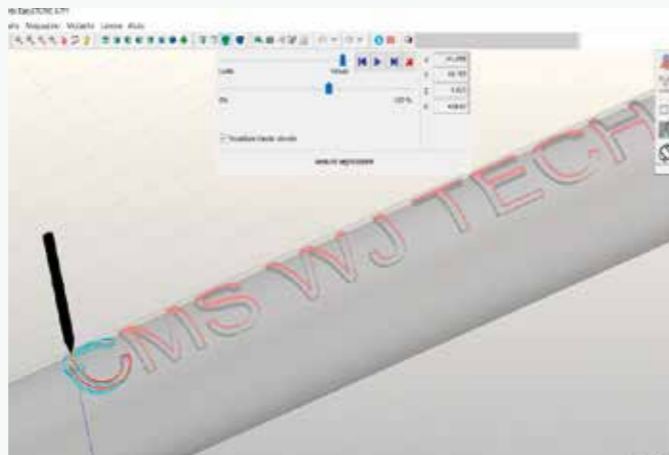
THE CAD FUNCTIONS INCLUDE:

- 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

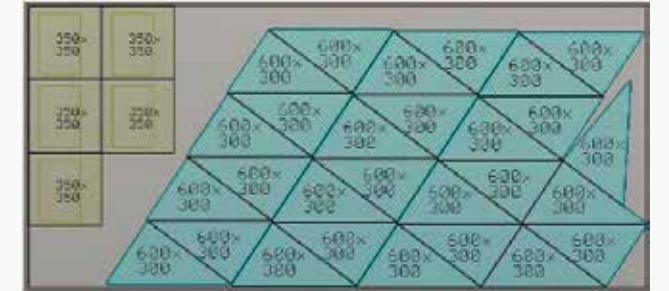


THE CAM FUNCTIONS INCLUDE:

- 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 feeling 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.



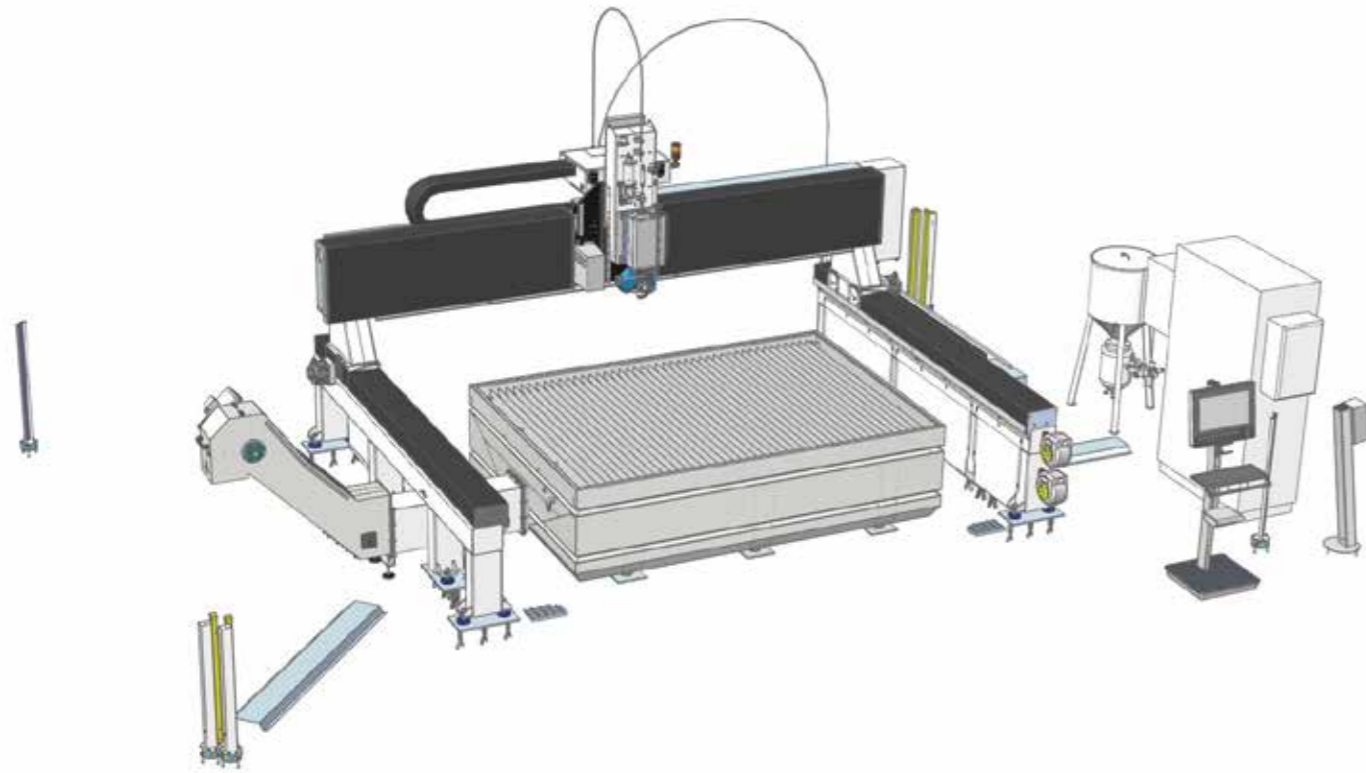
The JDE plug-in is included in the package to manage the cutting technologies archived in a complete materials database. The machine program is automatically generated on the basis of the selection of the cutting quality required out of 5 options (Q1, Q2, Q3, Q4 and Q5) that establish the speed advancement 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 °/s ²
C AXIS	infinite	infinite	infinite	13400 °/min	850 °/s ²
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	40 HP	60 HP
POWER	30 kW / 40 HP	45 kW / 60 HP
MULTIPLIERS	2	3
MAX WATER PRESSURE	4150 bar	4150 bar
MAX WATER PRESSURE	2,7 L/min	5 L/min
MAX DIAMETER ORIFICES	0,3 mm	0,40 mm
VOLTAGE	400V +/- 5% 50-60 Hz (Different voltages and frequencies on request)	



TECNOCUT E-PUMP: TECHNICAL DATA *

POWER CONSUMPTION (0.38 ORIFICE AT 3800 BAR)	30 Kw / 40 HP
MAXIMUM POWER CONSUMPTION WITH CLOSED HEAD	2,4 Kw / 3 HP
MAXIMUM OPERATING PRESSURE	4130 bar
MAXIMUM WATER FLOW RATE AT 3700 BAR	5 l/min
MAXIMUM ORIFICE DIAMETER AT 3700 BAR	0,40 mm
OVERALL DIMENSIONS L X W X H	1666x906x1529 mm 65x36x60 in
WEIGHT	1400 Kg / 3086 lb
VOLTAGE (THREE-PHASE)	400,60 hz
OIL TANK CAPACITY	13 L
PRESSURE ATTENUATOR CAPACITY	1.15 L
CYLINDER STROKE	200 mm / 8 in
REQUIRED INLET WATER TEMPERATURE (ACCEPTABLE MIN - MAX)	5 - 25 °C
NOMINAL ENVIRONMENT TEMPERATURE (ACCEPTABLE MIN - MAX)	5 - 40 °C
NOMINAL NOISE	70 db

* BFT Technology. The technical data may vary with different configurations

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 E-PUMP

DRY DEBURRING-FINISHING MACHINES



DMC M950



DMC EUROSYSTEM



DMC METALSYSTEM

WET DEBURRING-FINISHING MACHINES



DMC M950 WET



DMC TOP METAL



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