

TCI cutting®
waterjet & laser systems

Dynamic
Solutions
for accurate cutting

# Waterjet
DIVISION

V3.0 · 2014
English Version

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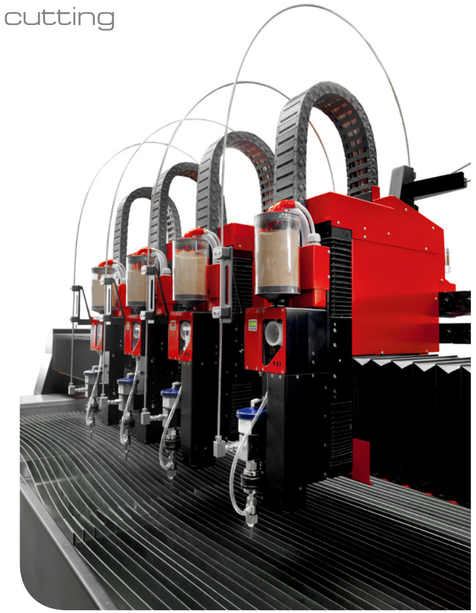

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# Dynamic Solutions
## for accurate cutting

**TCI Cutting** meets its challenge of consistently proposing the best solutions for changing industrial applications by combining **engineering and experience in the constant persuit of efficiency and productivity.**

We create customised machines to meet the specific needs of each company. At **TCI Cutting** our philosophy is that the best machines combines the latest technology with personalised service.



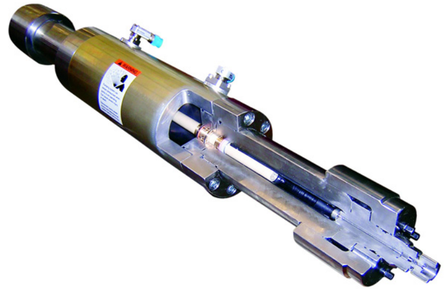
01 • TCI Cutting: Professional Cutting

# waterjet versus laser

## Two effective ways of cutting

**TCI Cutting's wealth of experience in designing and manufacturing industrial precision water jet cutting machines has made us a market leader.**

In order to better meet the needs of our clients, we have taken our experience and knowledge in the area of laser cutting to develop a new technological and engineering branch of **TCI Cutting**. **We are the first Spanish company to design and manufacture industrial laser cutting machines. TCI Cutting's laser machines have unique, customisable features that allow for maximum performance and efficiency, while returning high profitability.**



# Minimum maintenance

At **TCI Cutting** we believe that good products are low maintenance. We make low maintenance products by focusing on the engineering. **From our aeronautical customers, we have learned how to manufacture equipment with the finest components and assemble them with "error impossible" procedures.** Thus, our machines optimise working time, but minimize maintenance.

# Focus on service
## anywhere



What sets our company apart is our focus on providing the best after-sales customer service. **TCI Cutting has established a customer service structure that operates all around the world via telephone, data transmission or by skilled engineers.**

Our goal is to grow alongside our customers. **TCI Cutting** believes that the real work begins after the sale. For this reason our day to day focus is on providing the best answers and solutions in a timely manner, shipping all consumables and accessories quickly, and ensuring that each customer gets the appropriate training courses. By focusing on customer service, we allow our customers to optimise the performance of their machine and to receive the greatest return on their investment.

WATERJET
division

**TCI Cutting** offers versatile, customisable machines developed for either abrasive water jet cutting on hard materials (steel, glass, porcelain, marble, aluminium, titanium, stainless steel, etc) or water jet only cutting for soft materials (foams, rubber, etc.).

The machines we currently manufacture can be divided into two series:

- **BP** Series
- **SM** Series

We provide cutting solutions for all types of customers with a variety of cutting needs. Our engineering department does not start designing a machine until a thorough study of the customer's specific cutting requirements is performed.



## All TCI Cutting machines include:

- Protection against vibration.
- Optimal protection of the operator in the cutting zone.
- Simple programming.
- A modern drive system that reduces maintenance costs.
- **TCI Cutting** technical assistance hot-line.





The "Waterjet" cutting systems developed by **TCI Cutting** combine our engineering experience with the latest high pressure water technology to achieve a high capacity single cut on a wide variety of materials.

High-precision cuts that are impossible to perform using other methods are achieved with our "Waterjet" technology by pumping water at speeds three times faster than the speed of sound and with a pressure of over 6,500 bar.

The cutting systems offered by **TCI Cutting** are developed by careful, individualised consideration of all the components to obtain the highest quality final product.



## Technological advantages:

- The most versatile cutting systems on the market today, encompassing the full range of materials and thicknesses, including painted surfaces. These machines cut everything!
- Low temperature cutting that prevents thermal changes and residual stresses.
- Clean cut that does not damage the material making subsequent finishing work unnecessary.
- The cutting surface does not crack or bend.
- Optimal usage of raw materials with negligible shrinkage.
- Strict tolerances.
- Possibility of achieving different types of cuts simultaneously.
- Very cost effective, both in small runs as well as long repetitive runs.
- Reduced operating costs.

# Advantages and characteristics

- Vacuum travelling speeds of up to 70,000 mm/min.
- Smart processing system to move up to 4 independent cutting heads, which allows for the maximum use of materials.
- State of the art, real-time machine consumables tracking software that allows for preventative maintenance and prevents downtime.
- Fully automated machine sludge cleaning system.
- CNC, intensifier, peripherals and control box protected from the work area of the machine.
- Materials can be both front and side loaded.
- Stand-alone operation system.
- Collision avoidance system with digital sensitivity regulation.
- On-line technical service provided by the expert **TCI Cutting** team for mechanical engineers, industrial electronic and automatic control systems engineers and industrial design engineers
- Installation and start-up in 7 days.








# Application sectors

**Aerospace:** alloys, insulators, carbon fibre, titanium.
**Foodstuffs:** meat, chocolate, pastries, fish.
**Automotive:** alloys, rubber, composites, leather.
**Construction:** bars, ceramics, marble, beams.
**Toys:** foams, synthetic fibres, polymers, polypropylene.
**Metallurgy:** steel, stainless steel, alloys, brass.
**Furniture:** glass, mirrors, wood, fabric.
**Advertising:** plexiglas, polyethylene, PVC, vinyl.



# BP Series
## Robust and powerful.

The machines in **TCI Cutting**'s BP series are characterised by a bridge-type construction that makes them very robust and enables them to cut large surface areas.

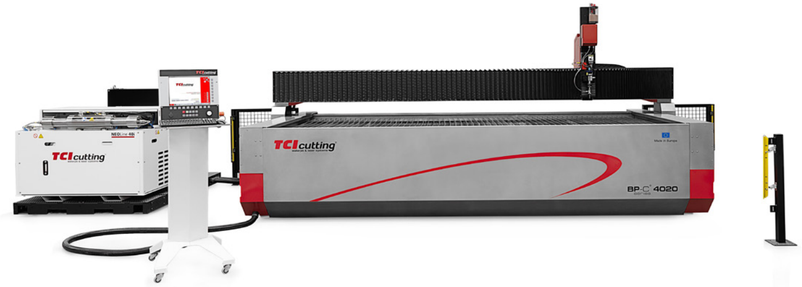
The Y axis gantry drive system allows for fast accelerations and high speeds, thus reducing operating times.

**TCI Cutting** builds three bridge-type machine models:

- BP-C® Series (Compact)
- BP-S® Series (Standard)
- BP-M® Series (Modular)



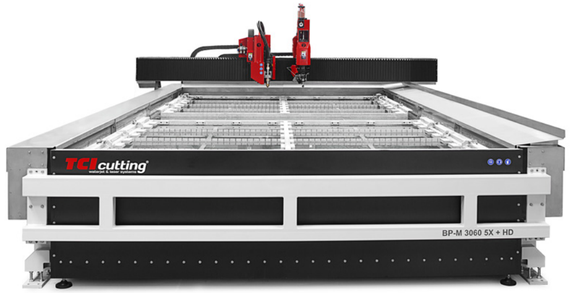





The BP-C series of machines are built entirely from structural aluminium and stainless steel (both the cutting table and machine), which promotes long durability and resistance over time. The sound structure and endurance of this machine makes it ideal for manufacturers with large-scale cutting needs.

| Models BP-C® compact series | Dimensions |
|---|---|
| BP-C 3020 | 3000X2000X200 mm |
| BP-C 4020 | 4000x2000x200 mm |

| Characteristics BP-C® compact serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 - 2 |
| Maximum simultaneous positioning speed | 70 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |




**TCI Cutting**'s BP-S cutting machines offer a functional, precise and profitable installation for all standard applications.

Maximum performance with minimum investment and maintenance.

| Models **BP-S**® standard series | Dimensions |
|---|---|
| BP-S 3015 | 3000X1500X200 mm |
| BP-S 3020 | 3000x2000x200 mm |
| BP-S 2040 | 2000x4000x200 mm |

| Characteristics **BP-S**® standard serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 - 4 |
| Maximum simultaneous positioning speed | 70 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |







Flexibility and adaptablility are the key to being competitive in a market in which new challenges are constantly arising. That is why **TCI Cutting** has developed the BP-M machine.

The modular construction of these machines is beneficial for several reasons. First of all, the construction of these machines makes them easy to transport. The BPM machine also offers a great degree of flexibility for the customer by allowing them to add new modules to meet the needs of future expansion. These modules include adding more cutting heads or a new bridge with more cutting heads. The adaptability of this machine to the changing needs of the customer makes its growth potential endless.

| Models **BP-M**® modular series | Dimensions |
|---|---|
| BP-M 2040 | 2000X4000X200 mm |
| BP-M 3020 | 3000x2000x200 mm |
| BP-M 3060 | 3000x6000x200 mm |
| BP-M 3080 | 3000x8000x200 mm |
| BP-M 30120 | 3000x12000x200 mm |
| BP-M 4060 | 4000x6000x200 mm |
| BP-M 4080 | 4000x8000x200 mm |
| BP-M 40120 | 4000x12000x200 mm |

| Characteristics **BP-M**® modular serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 - 4 |
| Maximum simultaneous positioning speed | 70 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |

# SM Series
## Flexibility and accessibility

In **TCI Cutting**'s SM series, the cutting heads are mounted on a highly stable and robust mechanical arm.

This cutting system offers maximum accessibilty to the work area and requires very little space for installation.

**TCI Cutting** builds three SM machine models:

- SM-C® Series (Compact)
- SM-S® Series (Standard)
- SM-M® Series (Modular)



The SM-C waterjet cutting series is designed as a machine very versatile, easy to install and transport aimed to cover the most demanding needs of waterjet cutting systems with an unbeatable ratio quality investment and the best price and quality.

The product range of SM-C series in waterjet cutting machines provides to the customer the possibility the auto installation, without technical equipment or technician.

The main advantage of the SM–C SERIES in waterjet cutting machine: provide the auto installation easy and rapidity.




| Models SM-C® compact series | Dimensions |
|---|---|
| SM-C 3015 | 3000X1500X200 mm |

| Characteristics SM-C® compact serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 |
| Maximum simultaneous positioning speed | 70 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |




Profitability and accessibility are the main characteristics of these machines, which are capable of meeting the needs of most kinds of cutting.

| Models SM-S® standard series | Dimensions |
|---|---|
| SM-S 3015 | 3000X1500X200 mm |
| SM-S 3020 | 3000x2000x200 mm |
| SM-S 4020 | 4000X2000X200 mm |
| SM-S 6020 | 6000x2000x200 mm |

| Characteristics SM-S® standard serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 |
| Maximum simultaneous positioning speed | 60 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |








**TCI Cutting**'s SM-M machines allow both the installation of a second separate table, as well as the extension of the cutting table, thus maximising performance.

The SM-M series can be fully enclosed, allowing for clean and quiet work conditions while occupying a minimum amount of space.

| Models SM-M® modular series | Dimensions |
|---|---|
| SM-M 3015 | 3000X1500X200 mm |
| SM-M 3020 | 3000x2000x200 mm |
| SM-M 4020 | 4000X2000X200 mm |
| SM-M 6020 | 6000x2000x200 mm |

| Characteristics SM-M® modular serie | Technical Specifications |
|---|---|
| Maximum part thickness | 200 mm |
| Maximum allowable part load | 790 kg/m$^2$ |
| Number of cutting heads | 1 - 2 |
| Maximum simultaneous positioning speed | 60 m/min |
| Maximum cutting speed | 20 m/min |
| Machine tolerance according to VDI/DGQ 3441 | ± 0.05 mm/m |
| Repeatability | ± 0.025 mm/m |

# SL-V PLUS 4136

The latest generation of SL-V Plus pumps offers cutting-edge water jet technology with work pressures of up to 4,150 bars, which allow for faster cutting and cleaner cuts.




## Characteristics:

- Pumps for all kinds of cutting and installation.
- Suitable for both pure water as well as abrasive cutting.
- The innovative design of our hard seal end cap intensifier range reduces operating costs and wear.
- The larger accumulator can maintain constant pressure even when work levels are high.
- Power of up to 200 HP

| TCI Cutting Streamline Plus 4136 | | | | | | | | | | Maximum number of nozzles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOMINAL POWER (cv) | WORK PRESSURE (bar) | MAXIMUM FLOW (l/m) | ACCUM. CAPACITY (l) | TANK CAPACITY (l) | HYDRAUL. PUMP FLOW | LENGHT (mm) | WIDHT (mm) | HEIGHT (mm) | WEIGHT (Kg) | 0,17 mm | 0,23 mm | 0,33 mm | 0,40 mm |
| 30 | up to 4136 | 2,1 | 2 | 106 | 66 | 1.721 | 914 | 1.453 | 953 | 2 | 1 | - | - |
| 50 | up to 4136 | 3,6 | 2 | 106 | 101 | 1.721 | 914 | 1.453 | 1.315 | 3 | 2 | 1 | - |
| 60 | up to 4136 | 3,7 | 2 | 182 | 101 | 1.975 | 914 | 1.453 | 1.542 | 3 | 2 | 1 | - |
| 75 | up to 4136 | 5,4 | 3 | 182 | 202 | 1.975 | 914 | 1.453 | 1.724 | 5 | 3 | 1 | 1 |
| 100 | up to 4136 | 7,2 | 3 | 182 | 202 | 1.975 | 914 | 1.453 | 1.905 | 6 | 4 | 2 | 1 |
| 150 | up to 4136 | 11 | 4 | 473 | 2 x 129 | 2.310 | 1.700 | 1.700 | 3.855 | 9 | 5 | 2 | 1 |
| 200 | up to 4136 | 14 | 4 | 473 | 2 x 174 | 2.310 | 1.700 | 1.700 | 4.082 | 13 | 8 | 4 | 2 |





# STREAMLINE 6500

**TCI CUTTING** STREAMLINE PRO 6500 offers a new range of products that provide a breakthrough in the world of water jet cutting. The innovative high pressure pumps have been specifically designed for abrasive waterjet cutting at operating pressures of up to 6,200 bar.

Depending on the material and its thickness, cutting with 6,500 bar allows operators to increase the cutting speed by up to 50%. In many applications, the increase is even considerably higher.




## Characteristics:

- High cutting speeds.
- Better quality of the cut edge.
- Reduced abrasive consumption.

| TCI Cutting Streamline Plus 4136 | | | | | | | | | | Maximum number of nozzles | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOMINAL POWER (cv) | WORK PRESSURE (bar) | MAXIMUM FLOW (l/m) | ACCUM. CAPACITY (l) | TANK CAPACITY (l) | HYDRAUL. PUMP FLOW | LENGHT (mm) | WIDHT (mm) | HEIGHT (mm) | WEIGHT (Kg) | 0,17 mm | 0,20 mm | 0,28 mm | 0,35 mm | 0,40 mm |
| 60 | up to 6500 | 2,8 | 1,6 | 182 | 242 | 198 | 91 | 145 | 1.565 | 2 | 2 | 1 | - | - |
| 125 | up to 6500 | 5,4 | 1,6 | 182 | 242 | 223 | 150 | 155 | 1.565 | 4 | 2 | 1 | 1 | 1 |



# TCI CUTTING KIT 5XDD V4.0

## 5 axis-cutting head

Cutting head allows cutting at an angle of 90 degrees.

It allows 3-dimensional cutting.

Patented design.

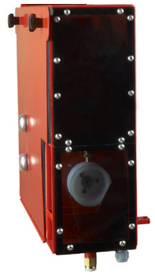
It allows infinite rotation, which saves time and optimises machine performance.



Accesories

### TCI ABRASIVE 3.0
Abrasive regulation

Automatic abrasive control system that incorporates a constantly regulated motor to automatically deliver the amount of abrasive at all times to the cutting head; the exact amount can be varied each time (eliminating traditional manual adjustment). It is controlled by the machine interface and halts if it detects that the abrasive has run out. Ideal for cutting brittle and composite materials.



### TCI CUT CONTROL 2.0
Self-cutting system

Abrasive anti-return system that allows the machine to function autonomously. If a jam occurs in the cutting process, it prevents the water and abrasive from rising and eventually wetting the hopper dispenser. It also incorporates the new CUT CONTROL 2.0 system that allows the cutting process to resume should jams occur by automatically restarting the cutting process on the last hole and automatically unclogging the nozzle.



### TCI COLLISION PROTECTION 2.0
Anti-collision system

Electronic cutting head collision monitoring system, with the option of regulating the electronic detection sensitivity for each cutting head. It is a unique system in the market because it is completely independent from the regulatory system and ensures safe detection of any nozzle impacts caused by the material lifting and contingencies, and halting the machine before any damage is done.



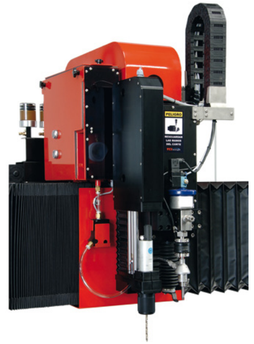
## TCI ABRALINE 1.0
Abrasive self-feeder

Automatic feeding of the abrasive in the cutting process. It pneumatically feeds the abrasive at low pressure to the automatic control system built into the hopper of the cutting head. It also incorporates warning sensors if the abrasive level is low and can be refilled without interrupting the cutting process. It is fully accessible by the user and has a 200 l. capacity.




## TCI DRILL 2.0
Drilling System

Equipment developed to carry out mechanical pre-cutting on brittle materials and composite plywood materials that come out with the usual water-jet drilling perforation. Capacity for the assembly of different bit sizes.



## TCI EXTRACTION SYSTEM 2.0
Sludge cleaning

The fully automatic and maintenance-free sludge removal system is the only one of its kind on the market. It collects the sludge deposited in the cutting tank, separating it from the water and recirculating it to the tank to maintain a constant level. It allows for on-going operations and prevents the machine downtime needed to clean the tank. This ensures perfect extraction without moving parts inside the tank. It includes:

- The extraction system.
- A collection container.






Accesories

## TCI BULK TANK 2.0
2,000-kg. capacity hooper

2,000 kg hopper capacity for high production machines. Allows TCI ABRALINE 1.0 a continuous feed system to avoid unnecessary downtime, especially for the autonomous operation of the machine during long cutting processes.




## TCI CHILLER 50HP
Water cooling system

The intensifier pumps' hydraulic oil cooling system with closed circuit water is ideal for warmer regions, since it allows the proper operating temperatures to be maintained even in summer. It also eliminates the cost of cooling water, since the closed circuit cools the water with a gas and recirculates it constantly.




## TCI HIDRO SYSTEM 2.0
Water Treatment Equipment

In order to extend the life of high pressure components, the water treatment system conditions the water for its entry into the intensifier, eliminating limescale and ensuring constant pressure. The equipment consists of a water softener, salt deposit and a stainless steel pressure pump. It is especially useful in areas where the water contains high levels of limescale.



# TCI EXPERT HMI V 5.0.

## Machine/operator interface

A new, very intuitive operator/machine interface offers the potential for machine operation, since it incorporates the possibility of regulating cutting parameters and controlling the status of the extraction system, consumables, etc., at all times.

It also allows the status of the cutting program to be displayed at all times, since the colour of the parts change and offers the possibility of moving parts, editing them, etc.



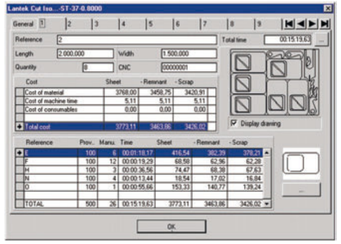

# TCI EXPERT CUT 2D

## Machine/operator interface

Expert Cut is a CAD/CAM system especially designed for automating water jet cutting machine programming. This system allows for our cutting technology to meet the specific programming and management needs of the customer.

### Technology.

Expert Cut configures and manages the types of pitch for each contour. Common line cutting can be performed between several parts or can be limited to only to pairs of parts with notches and pre-cuts. It detects design and machining errors. It offers automated pitches, manual and automatic cutting, mechanised copying, customised configuration of machines and postprocessors. It has technology tables for machine-specific water jet cutting, slowdowns in corners and special and multicutting head penetrations.



### Technical characteristics..

Integration of all Expert Cut options into one program, thus designing a part, importing, (automatic or manual) nesting, generating the cut, generating the CNC, seeing sheet metal storage etc., is carried out by one single program without having to leave it.

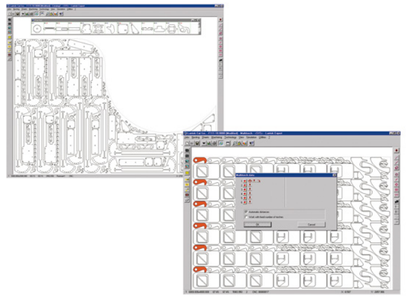
Expert Cut includes:

- Production and teamwork management.
- Parts management, 2D design and extensive library of parametric parts.
- Plate storage via open databases.
- Calculation of real costs and times.
- Smart Importer / Exporter (links to major CAD systems on the market: DXF, DWG, IGES, etc.)

### Nesting.

Manual and automatic nesting offers a perfect combination with powerful manual nesting functions, such as copying, moving, rotating, etc.

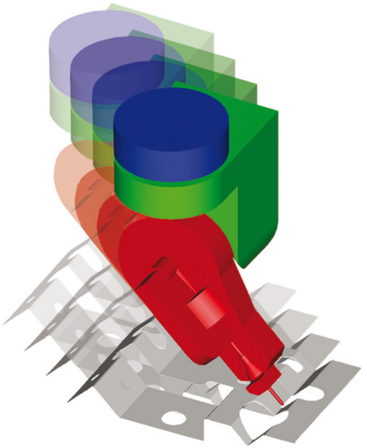
Automatic nesting optimises the arrangement of parts on the sheet and also makes use of remnants.



## TCI CUTTING FLEX3D 5X

### Introducción.

Flex3D 5X is a specific application for automating the programming of water jet cutting machines that have five-axis cutting heads. It is the ideal complement to the Expert Cut 2D cutting module. Fully compatible with the leading 2D design systems used in the field of sheet metal. Enables parts to be imported in almost all the formats to apply the desired technology to them and subsequently generate the cut. Designed so that the user has only to follow the steps indicated by the software.

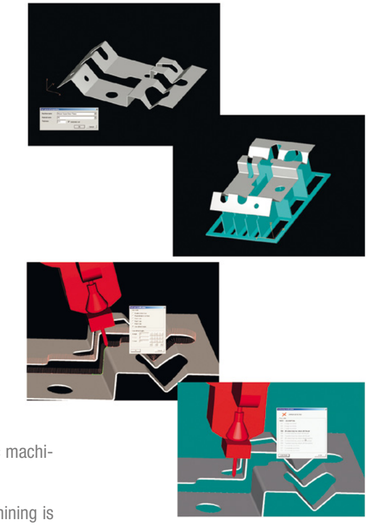


# Software

## Technical characteristics.

Flex3D 5X includes:

- 3D, SAT, IGES, VDA, etc., surface and solids importers.
- Databases on machines and materials in common with Expert Cut.
- Detection of the geometry, cut contours and thickness of the solid.
- Manual modification of the cutting vectors and cutting head in each point and part on the table.
- Simulated collision checking.
- Independent quality by contour.
- Automatic passage to Expert Cut for the machining of the calculated supports, which are automatically generated in order to place the part on the cutting table
- Simulation of the complete work environment: parts, supports, cutting head, etc.



## Machining.

Flex3D 5X automatically detects all the cutting contours of the part and allows semiautomatic machining of those selected in the part or automatically of all contours.

Additionally it allows the qualities to be applied in each contour to be chosen. Once the machining is done, the system allows simulation and automatically detects collisions that may occur between the cutting head and other elements involved in cutting. Issuing a collision warning also allows the cutting direction to be changed and manually modifies any cutting vector at any point of the contour and the cutting head.

# TCI Cutting delegations

- Switzeland
- Holland
- Belgium
- England
- France
- Czech epublic
- Denmark
- Austria
- Germany
- Hungary
- Poland
- Russia
- Italy
- South Africa
- Middle East
- EEUU
- Taiwan
- China
- India
- Australia
- Turkey
- Venezuela
- Finland
- Sweden
- Spain
- Portugal
- Romenia
- Morocco
- Algerie
- Jordan
- Egypt



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