MicroStep®

Product Catalog

The right machine for every cutting task

Plasma
Laser
Oxyfuel
Waterjet

MicroStep

Your Partner for Cutting and Automation

In our 30+ years of history, MicroStep supplied more than 3,000 cutting machines worldwide in cooperation with long-time channel partners spread over 58 countries. The focus of our company are hi-tech machines that accommodate industry's latest trends – delivery of fully automatic workplaces that combine different cutting, marking and machining technologies with automated material handling, all customizable for a particular manufacturing need. As a company with a background in automation that develops own control systems and software, we are genuinely following the demands for higher level of machinery automation, interconnection of control systems, CAM software and ERP systems. Our in-house developed solutions of machine-to-machine and machine-to-enterprise communication have already been adopted in enterprises throughout Europe, Asia, America and Australia.

Besides flat sheet applications we offer automated processing of pipes, profiles, beams and domes – and all of that often combined in a single multi-functional machine. The domain of MicroStep are precise edge preparations for welds in various types of materials and 3D shapes – we have pioneered the field of bevel cutting with several innovations such as auto-calibration of tool geometry (ACTG® technology), additional beveling of part edges (ABP technology), mapping of true shapes of 3D objects by laser scanning (mScan technology) or advanced bevel corrections (ABC technology). Together with our 2D and 3D CAM software, and the extensive possibilities of our CyberFab® Manager software suite, MiroStep products offer powerful integration into onsite production systems for small and medium-sized enterprises up to large manufacturers.

Our goal is to provide solutions that improve everyday work in factories – to ensure higher precision, minimize downtimes, enable more convenient and efficient operation and easier maintenance. Our priority is to help our customers embrace the newest trends in manufacturing.

Alex Makuch
Managing Director
MicroStep

Eva Stejskalová
Managing Director
MicroStep

Headquarters of MicroStep in Bratislava, Slovakia is also the home of company's extensive R&D teams

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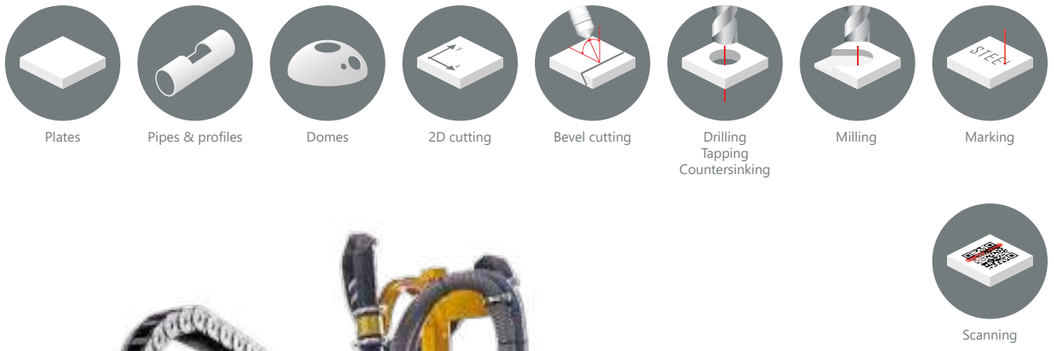
MG series

Multi-functional machine for the most demanding tasks

Plasma **Oxyfuel**



The **MG series** is the top performer among MicroStep cutting machines.

It is built for heavy-duty industrial use to meet the highest demands on precision, performance and ease of operation.

MG machines are suitable for a variety of applications from **straight** and **bevel cutting** with plasma and oxyfuel, **pipe & profile cutting, dome cutting, milling, drilling, tapping** and **countersinking** to **marking** and **additional beveling** with ABP technology.

Smooth and precise positioning

Because a robust machine construction is an important condition for excellent cutting results, the gantry supports have been extended by 35% in longitudinal direction (X axis). Thanks to the greater stability of the positioning system, the machine will operate smoothly also with heavier equipment installed.

Long-lasting,low-maintenance planetary gears

In order to take full advantage of the dynamics and performance of the AC drive system, the MG series uses long-lasting and low-maintenance planetary gears.

Stiff gantry beam design

The MG series has a rigid gantry construction. In comparison to previous generation of the machine, the stiffness of the gantry has been increased threefold. That means even less vibrations, resulting in clean and precise cuts.

Fully automatic drilling, tapping and milling

The fully automatic drilling solution provides a substantial added value for your production. Before the parts are cut, precise holes up to Ø40 mm, threads up to M33 and countersinks can be produced within the same cutting plan. Optionally, its functionality can be extended to marking and a selected range of milling operations. For a smooth and fast tool change, the machine can be equipped with a tool magazine for 6, 8 or 16 tools.

High reliability even in a three-shift operation

Cutting is often the first step in many production processes, so reliability of the cutting machine plays a key role. For this reason, MicroStep machines are equipped exclusively with high-quality components and designed for long-lasting operation.

Rotator technology – the new standard in bevel cutting

The endless rotator enables high-quality weld edge preparation with bevels ranging up to 52° (plasma) or 60° (oxyfuel) on sheets, pipes, profiles as well as domes. The powerful and compact design ensures high precision and dynamics that allows even complex bevel contours to be cut in a reliable manner.

Additional Beveling Process

Parts with thicknesses so big that direct beveling is not possible can still have their edges beveled thanks to MicroStep's Additional Beveling Process (ABP). V-, Y-, X- as well as K-cuts are done via scanning and cutting in a precise and cost-saving way that eliminates the necessity of secondary processing on another machine.

3D pipe & profile processing up to Ø 1,000 mm

The pipe cutting option on MicroStep machines enables weld edge preparation on pipes and hollow sections, with diameters of pipes ranging from 30 to 1,000 mm.

Dome processing

The sturdy machine frame and gantry construction of MG series enables dome processing up to Ø 4,000 mm. Different types of tool stations provide a different extent of reach over the dome surface and thus offer various dome processing options.

Plasma rotator performing bevel cutting on a water table

The powerful drilling head enables drilling, tapping and countersinking, and optionally also milling

Pipe cutting with an MG machine

Dome processing with a multi-functional MG cutting machine

DRM series

Heavy-duty CNC machine for special requirements

Plasma **Oxyfuel** **Drilling**

The **DRM** is a heavy-duty cutting and drilling machine designed for a wide range of **dome, sheet** and **tube** processing applications.

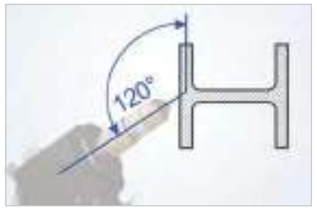
Its robust gantry enables vibration-free operation of heavy equipment such as several automatic oxyfuel triple torches, a **3D rotator** with tilting up to 120° and **Z-axis stroke 1,500 mm** or other custom equipment.

Along with the full range of sheet and pipe cutting options, DRM offers special applications on domes like trimming, separation cuts, cutting of diverse openings and weld edge preparation across the whole surface of domes or dome petals. An advanced 3D scanning process with MicroStep's **mScan technology** allows the machine to achieve excellent spatial precision in **3D cutting**.

A special version of the machine with a **drilling** table and a selection of powerful drilling tool stations **up to 55 kW** allows for heavy-duty drilling of construction sheets, tube sheets for heat exchangers and other demanding drilling jobs as well as a selected range of milling operations.

Flexible means of production for nearly any cutting task

- Broad range of processing possibilities – cutting of plates, pipes, profiles, beams and domes as well as several drilling and marking options
- Extremely robust and heavy gantry for toughest requirements
- Long-term reliability in single- and multi-shift operations



Fast and precise bevel cutting with plasma and oxyfuel

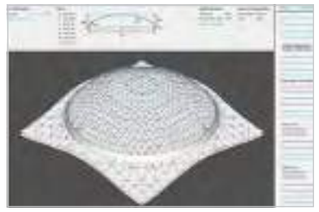
- Fully automatic and highly precise weld edge preparation with rotator and 3D rotator bevel tool stations with auto-calibration feature (ACTG®)
- Bevel cutting on sheets, pipes, profiles, beams and domes
- 3D rotator with a tilt up to 120° for cutting of 3D objects with both plasma and oxyfuel technologies
- Additional Beveling Process (ABP) – simple and reliable subsequent weld edge preparation via a laser scanning process

Fully automatic drilling, tapping and milling

DRM machines can be delivered in a special version with a drilling table and a selection of powerful drilling heads with powers up to 55 kW that allow drilling up to Ø 60 mm and tapping up to M30. Optionally, its functionality can be extended to marking and a selected range of milling operations. The solution can also include a motorized brush and a sideways waste channel for removal of drilling chips. For a smooth and fast tool change, the machine can be equipped with a linear or a rotary tool magazine for up to 16 tools.

Dome processing up to dome height 1,500 mm

- Automatic processing of large tank ends with height up to 1,500 mm
- Trimming of domes, separation cuts, cutting of diverse openings and intersections
- Weld edge preparation across the whole dome surface
- Advanced dome scanning process
- Convenient creation of cutting programs from solid models in MicroStep's 3D CAM software mCAM



Precise dome processing with mScan

MicroStep's mScan technology for precise cutting of domes sets new standards in dome processing. A 3D laser scanning process and a point cloud processing software are used to map the true shape of a particular dome. Advanced algorithms then allow the control system to adjust the movement of tool accordingly and compensate for possible deviations of the real dome from its ideal shape. Thus, contours and openings can be cut with an outstanding precision.

3D pipe & profile processing up to Ø 1,500 mm

- Enhance your production range by adding a pipe and profile cutting option for processing of a wide range of pipe diameters including heavy pipes up to 12 t
- Convenient cutting program creation with MicroStep's 2D and 3D CAM software
- High precision and dimensional accuracy reduce post-processing costs
- If required, the pipe cutting channel can be covered with additional grates and used as extension of the cutting table including sideways fume extraction

Real shape scanning of beams a profiles is crucial for accurate cutting

DRM gantries provide exceptional processing possibilities – all within a single machine

Cutting of pipes up to Ø 3,000 mm

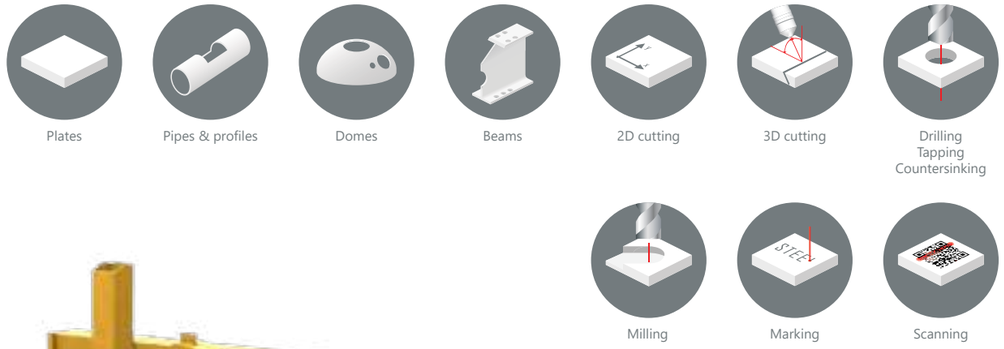
DRM machine with work area 50 x 8 meters and a water table for underwater plasma cutting

Tank end processing on DRM, with a 3D rotator with tilt angle up to 120°

DRM's automatic drilling solution with 55 kW spindle with inner cooling and a dedicated drilling table

DRM Max series

Heavy-duty CNC cutting, drilling and milling



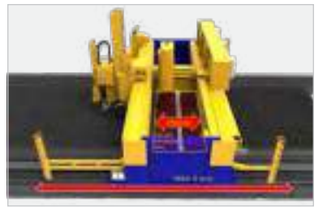
Plasma **Oxyfuel** **Drilling** **Milling**

DRM Max is MicroStep's flagship in **machining** operations – a heavy-duty CNC cutting, drilling and milling machine with key applications in offshore, wind tower, heavy vessels, columns, reactors and other heavy-duty machinery segments.

Its gantry has a rigid double-beam structure with an independent sub-gantry carrying its powerful spindle over a 750 mm wide drilling and milling area. This robust machine design enables **drilling** up to Ø 70 mm and a variety of **milling** operations.

DRM Max can be also equipped with other accessories of the DRM series enabling **plate, pipe, beam** and **dome** cutting applications.

Double-beam gantry



DRM Max gantry features a rigid double-beam structure with an independent sub-gantry carrying a 55 kW spindle and two powerful retainers that clamp down with 24,000 N each, over a 750 mm wide drilling and milling area.

Drilling & milling

The powerful spindle enables drilling up to Ø 70 mm and a variety of milling operations such as large hole milling, face milling, pocket & slot milling, chamfer milling, thread milling or counter boring.

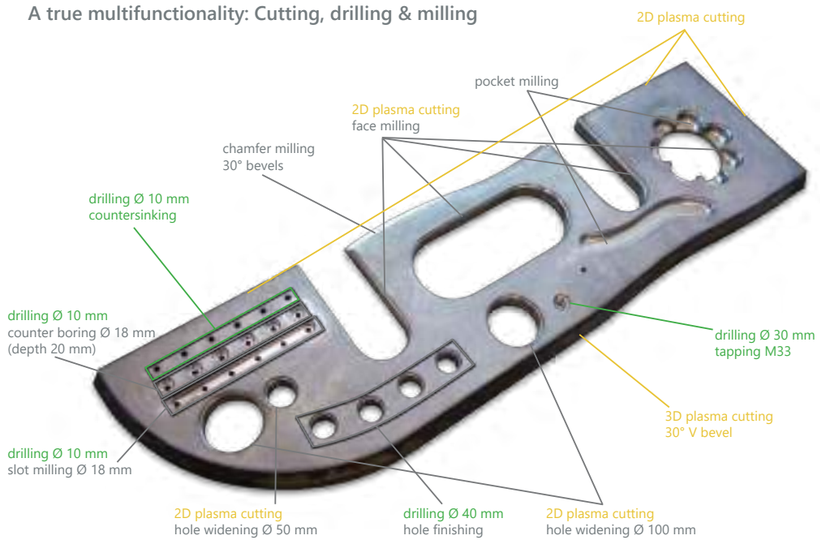
Versatile & multifunctional

DRM Max can handle it all: in addition to its drilling and milling capabilities, the machine provides all the advanced functionalities of other MicroStep cutting machines, such as bevel cutting, tapping, countersinking, marking and scanning.

Dome & petal processing

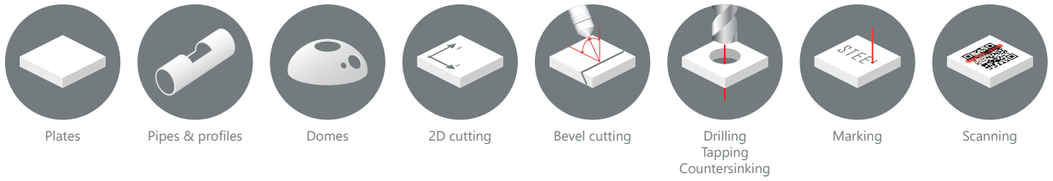
DRM Max can process a whole range of workpieces including domes up to a height of 1,500 mm as well as dome petals. A 3D laser scanner and mScan technology compensate for possible deviations of the real domes for achieving outstanding precision.

A true multifunctionality: Cutting, drilling & milling



CombiCut series

Built for tough environments



Oxyfuel **Plasma**

CombiCut is a robust and high-precision CNC machine designed especially for multiple-shift high-performance plasma and oxyfuel cutting.

It allows cutting of steel up to 300 mm thick, bevel cutting with two rotators or oxyfuel triple torches, parallel cutting with up to 8 torches, drilling up to Ø 40 mm, inkjet, micro-percussion or laser marking, pipe and dome processing as well as additional beveling with ABP technology.

Robust and durable

Extreme conditions present a great challenge to any cutting machine. With CombiCut, MicroStep has come up with a solution that is suitable also for non-standard environments.

- Operating temperatures: -10° to +45°C
- Resistance to dirt, dust and humidity
- Robust machine design for longevity even in heavy-duty cutting operations

Multi-tool cutting with up to 8 oxyfuel torches

- Increase your productivity with parallel cutting operations
- Possibility of parallel bevel cutting with several rotator bevel heads
- Automatic spacing of slave tool stations (option)
- Individual selection of tool parameters to fit your requirements
- All tools controlled automatically from the iMSNC® control system

Fast and precise bevel cutting with plasma and oxyfuel

- Fully automatic and highly precise bevel cutting up to 50° (plasma rotator) or up to 60° (oxyfuel rotator)
- Bevel cutting of plates, pipes, profiles and domes
- Additional Beveling Process (ABP) – simple and reliable subsequent weld seam preparation
- Intuitive and easy programming of bevels with MicroStep's CAM solutions
- Auto-calibration of rotator via ACTG® feature for consistent quality and precision

Cutting with plasma up to 800 A and oxyfuel up to 300 mm

CombiCut machines are designed to withstand high workloads in multiple-shift operations including multi-torch parallel oxyfuel cutting of material thicknesses up to 300 mm. Intelligent temperature management keeps the system from exceeding its limits even in harsh environmental conditions and under intensive cutting load.

Fully automatic drilling up to Ø 40 mm and tapping up to M33

The fully automatic drilling solution provides a substantial added value for your production. Before the parts are cut, precise holes, threads and countersinks can be produced within the same cutting plan, with holes up to Ø 40 mm and threads up to M33. To enable smooth and fast tool change, the machine can be equipped with a tool magazine for 6, 8 or 16 tools.

3D pipe & profile processing up to Ø 1,000 mm

- Enhance your production range by adding pipe and profile cutting option
- Convenient cutting program creation with MicroStep's 2D and 3D CAM software
- High precision and dimensional accuracy reduce post-processing costs
- If required, the pipe cutting channel can be covered with additional grates and used as extension of the cutting table including sideways fume extraction

Automatic production line with several double-gantry CombiCut machines

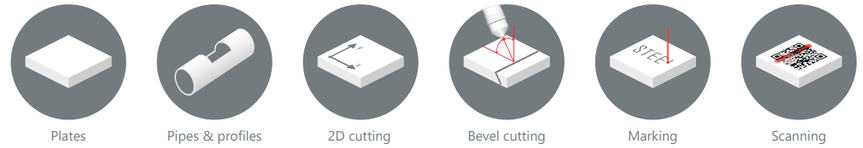
Bevel cutting with oxyfuel rotator

Integration of up to 8 oxyfuel tool stations on one gantry

MasterCut series

Versatile solution for your cutting tasks

Plasma **Oxyfuel**



The **MasterCut series** is a versatile high-precision CNC cutting machine which can be applied throughout the industry reaching from small workshops to big factories.

The application range of the standard version with rails in the X direction dedicated to fully automated oxyfuel cutting or cutting with conventional plasma can be enhanced to a variety of high-precision plasma cutting applications including pipe, profile or elbow cutting and marking.

Adding a plasma bevel head will allow the machine to perform a great portion of common bevel cutting jobs with bevel angles up to 47°. By default, the beveling system comes equipped with the patented auto-calibration system ACTG® that significantly improves precision and dimensional accuracy of the cutting process, eliminates tedious mechanical adjustments, and substantially increases productivity of the machine.

Flexible means of production for nearly any cutting task

- Broad range of processing possibilities – cutting of plates, pipes & profiles with plasma or oxyfuel as well as several marking options
- Generous gantry clearance for processing of higher parts
- Rigid steel gantry to ensure high precision and dimensional accuracy
- Long-term reliability in single- and multi-shift operation

Cutting with plasma up to 440 A and oxyfuel up to 200 mm

The machine offers excellent cutting results by utilizing both high-definition and conventional plasma sources, with an advanced height control based on proprietary adaptive algorithms backed by the ball screw actuated Z axis. A combination of plasma and oxyfuel cutting technologies along with extensive work area configurations make MasterCut a highly versatile production tool with an optimal price/performance ratio.

Bevel cutting up to 47° with the plasma bevel head for MasterCut

- V- and X-cuts as well as complex Y- or K-cuts up to 47°
- Fully-automatic compensation of potential mechanical imprecisions of the bevel head's geometry in the range of hundredths of a mm thanks to MicroStep's patented ACTG® technology
- Automatic compensation of bevel angle with the Adaptive Bevel Compensation feature (ABC)

Multi-tool operation with up to 6 oxyfuel torches

- Increase your productivity with parallel cutting operations
- Automatic spacing of slave tool stations (option)
- Individual selection of tool parameters to fit your requirements
- All tools controlled automatically from the iMSNC® control system

Pipe & profile cutting up to Ø 1,000 mm

- Enhance your production range by adding pipe and profile cutting option
- Convenient cutting program creation with MicroStep's 2D and 3D CAM software
- High precision and dimensional accuracy reduce post-processing costs
- If required, the pipe cutting channel can be covered with additional grates and used as extension of the cutting table including sideways fume extraction

Enhanced machine frame delivers even smoother operation

Because a robust machine construction is an important condition for excellent cutting results, in the latest generation of MasterCut the gantry supports have been extended by more than 60% in longitudinal direction (X axis), along with reinforcement of the gantry beam and redesigning of the drive system. Thanks to these measures, the positioning system is even more stable and lets the machine operate smoothly also with heavier equipment installed.

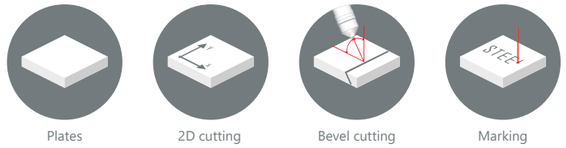
MasterCut with linear guidelines in the X-axis and a channel for pipe processing

Configuration of MasterCut machine with a bevel head, an oxyfuel torch and a punch marker

This pipe cutting device can process pipes up to Ø 300 mm

MasterCut Compact series

Compact, versatile and dynamic



Plasma

Oxyfuel

MasterCut Compact is a dynamic, high precision CNC cutting machine suitable for a variety of plasma and oxyfuel cutting jobs. Thanks to its sophisticated design and high-quality components, the machine smoothly delivers latest features of plasma technology for a decent price – true contours, small holes, sharp corners and efficient operation.

As a fully compact machine it is moveable within the workshop while delivery in a pre-assembled state significantly shortens its start-up time. Work area sizes of MasterCut Compact reach from 2,000 x 1,500 mm to 6,000 x 2,000 mm.

As a bonus, a **bevel cutting** option allows to perform a great portion of common bevel cutting jobs.

6 work area sizes available

In order to optimize your production, you can choose from seven standard work area sizes.

Compact design

Space is costly so we designed MasterCut Compact as a compact stand-alone solution. Less space needed for cabling and media supplies gives you more space for your work.

Excellent cutting quality

Better cutting quality means less post-processing, which helps you to save manufacturing costs. A proper technology is available for each cutting task: in addition to plasma, MasterCut Compact can be equipped also with an oxyfuel cutting head.

Cost-saving operation and maintenance

Cost savings are key – in comparison with laser systems, modern plasma cutting machines impress with their high cutting speeds and excellent cutting quality at substantially lower costs.

Bevel cutting up to 50° with the plasma bevel head for MasterCut Compact

- V- and X-cuts as well as complex Y- or K-cuts
- Fully-automatic compensation of potential mechanical imprecisions of the bevel head's geometry in the range of hundredths of a mm thanks to MicroStep's patented ACTG® technology
- Automatic compensation of bevel angle with the Adaptive Bevel Compensation feature (ABC)

High precision

The machine maintains an uncompromising quality of components – linear guidelines in all axes, helical gears, sturdy gantries and monitoring of all electronic components ensure a seamless operation.

MasterCut Compact machine designed for small and medium-sized businesses

A compact design that provides an uncompromising performance

Active anti-collision protection for high safety standards

EasyCut series

The tough performer

Oxyfuel

Plasma

EasyCut is a robust and precise CNC cutting machine designed for multiple-shift heavy-duty oxyfuel and plasma cutting. It's sturdy construction allows to perform simultaneous cuts with up to 6 cutting tools. Long-term stability and accuracy of the system is ensured by it's dual-side driven gantry, planetary gearboxes and helical racks and pinions. Apart from single oxyfuel torches for cutting of steel up to 300 mm thick, the machine can accommodate also highdefinition plasma technology.

Multi-tool cutting with up to 6 oxyfuel torches

- Increase your productivity with parallel cutting operations
- Automatic spacing of slave tool stations (option)
- Individual selection of tools parameters to fit your requirements
- All tools controlled automatically from the iMSNC® control system

Processing of material thicknesses up to 300 mm

EasyCut machines are designed to withstand high workloads in multiple-shift operations including multi-torch parallel oxyfuel cutting of material thicknesses up to 300 mm. Intelligent temperature management keeps the system from exceeding its limits even in harsh environmental conditions and under intensive cutting load.

Robust and durable

Extreme conditions present a great challenge to any cutting machine. With EasyCut, MicroStep has come up with a solution that is suitable also for non-standard environments.

- Operating temperatures: -10 °C to +45 °C
- Resistance to dirt, dust and humidity
- Robust machine design for longevity even in heavy-duty cutting operations

Innovative software solutions

So that you can fully concentrate on your production, our innovative software solutions help you intuitively transform drawings and cutting plans into inished parts.

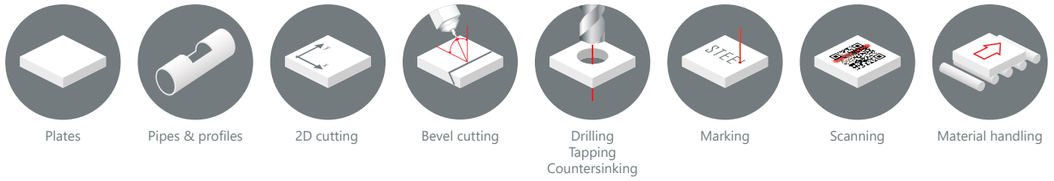
The iMSNC® control system

A standalone, ergonomic MMI console provides the operator with an overview of all cutting processes, machine related information as well as extensive multi-tasking features. Additionaly, a handy operational panel on the gantry allows the operator to perform basic tasks suc as interrupt a cutting program, initialize or move the machine or perform a manual cut.

MSF Pro series

Powerful solution for fiber laser cutting

Laser



MicroStep's precise **laser all-rounder MSF Pro** allows for multi-functional processing of materials: 2D and 3D cutting of sheets with bevels up to 45°, drilling, tapping, countersinking and marking. The machine can be equipped with a turret drilling head for 6 tools that allows **drilling up to Ø 15 mm** and **tapping up to M16**. Optionally, the cutting area can be extended by a pipe & profile cutting zone for processing of **pipes up to Ø 500 mm** and a length up to 12 m, or **hollow sections** up to the size 350 x 350 mm.

Thanks to the patented ACTG® technology, MSF Pro machines deliver consistent, highly precise bevel cutting results in a reliable process with minimum downtimes for maintenance. Another innovative technology – ABP – offers the option of adding bevels to already cut parts, for example to thicker workpieces that were cut with plasma or oxyfuel in advance. By default, MSF Pro machines are equipped with automatic shuttle tables, whereas **automated material handling** and **sorting** options for sheets, pipes and profiles are likewise available.

MSF Pro machines are designed for production of highly accurate parts at high cutting speeds, with surprisingly low maintenance and operational costs. Their outstanding dynamics is achieved thanks to their rigid welded gantries, high-torque digital AC drives, precision planetary gears and the sophisticated tool motion control by MicroStep. The machine includes several advanced functions by default, such as automatic nozzle cleaning, nozzle check by camera, predictive collision prevention, auto-monitoring of protection glass, Smart Z Movement and DynaFly features. The machines are equipped with state-of-the-art fiber laser sources with powers up to 20 kW, including sources with beam shaping technology.

Robust, dynamic, and long-lasting machine design

- Gantries with extremely high torsion resistance enable high traverse speeds of up to 180 m/min with steel gantry and 200 m/min with carbon gantry
- Bellows on all axes protect the guidelines from contamination
- Automatic lubrication of linear guidelines and carriages with auto-control of its frequency and duration
- Possibility of parallel cutting with two cutting heads
- Smart Z Movement (SZM) and DynaFly features for smoother and faster operation

Extensive automation features and options

- Shuttle table with fast table changeover reduces costly downtimes
- Automatic focus position and diameter adjustment according to the cut material
- Automatic cutting height sensor calibration and nozzle cleaning cycle
- Automatic nozzle change option
- Possibility of complete automation of loading and unloading including tower storage and part sorting

Carbon gantry for highly dynamic 2D cutting

For straight cutting with a single head up to an effective width 2 m, a carbon gantry option provides significant advantages:

- higher traverse speed (200 m/min) and acceleration result in productivity gain up to 15 – 25% (for medium-sized parts with medium complexity)
- vibration dampening properties of carbon allow for more rapid changes of direction which translates to faster cutting of complex contours
- up to 40% weight decrease of gantry results in slower wear of load bearing components

Pipe and profile cutting

- Supplementary pipe and profile cutting as add-on to sheet processing
- Cutting of pipes up to Ø 500 mm and a length up to 12 m, and hollow sections up to the size 350 x 350 mm
- Motorized and synchronized pipe supports positioned according to the cutting program
- Automatic pipe loading, feeding and unloading system as option
- Convenient cutting program creation in MicroStep's 3D CAM software mCAM

Laser bevel head for bevel cuts up to 45°

- V- and X-bevels as well as complex Y- or K-bevels up to 45° with micro joints
- Auto-calibration of tool geometry (ACTG®) feature ensures high precision and reliability of bevel cutting with minimum downtimes for maintenance
- Additional Beveling Process (ABP) – simple and reliable subsequent weld edge preparation via a laser scanning process
- Auto-calibrated height sensor for correct height control in all cutting angles

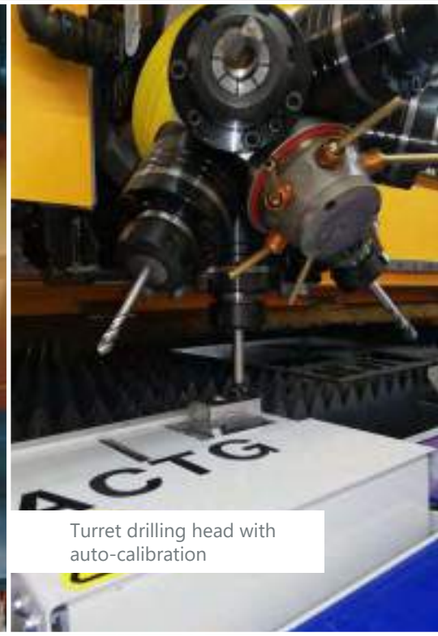
Fully automatic drilling up to Ø 15 mm and tapping up to M16

- Fully automatic drilling solution for laser machines
- Drilling up to Ø 15 mm, tapping up to M16 and countersinking
- Turret head with tool magazine for 6 tools
- Auto-calibration of drill bits (ACDB) feature
- Pneumatic retainer close to the drill tool ensures accuracy of the drilling process

MSF Pro machines can be fully automated via material handling and sorting systems and CyberFab® Manager software

Pipe and profile cutting option

Bevel cutting up to 45°



Turret drilling head with auto-calibration

Multi-functional machine with additional beveling and inkjet marking

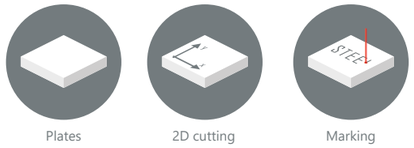
A combined machine with automated pipe cutting

NEW

MSF Cut

Reliable 2D performer for fiber laser cutting

Laser

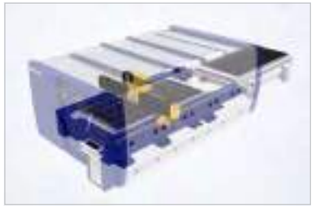


The state-of-the-art fiber laser machine **MSF Cut** is an ideal production tool for straight cutting of mild steel, stainless steel, aluminum, copper or brass. The series is available in three sizes with work areas of 3,000 x 1,500 mm, 4,000 x 2,000 mm and 6,000 x 2,000 mm. Laser sources with powers of up to 15 kW are available.

MSF Cut machines achieve excellent dynamics thanks to a rigid welded gantry, high-torque digital AC drives, precision planetary gears and a sophisticated tool motion control by MicroStep. Despite its attractive pricing with comparatively low investment and operating costs, the machine includes several advanced functions such as automatic nozzle cleaning, nozzle check by camera, predictive collision prevention, automatic monitoring of protection glass, Smart Z Movement or DynaFly features.

MSF Cut machines can be integrated with all MicroStep automatic material handling systems.

High-quality, efficient 2D laser cutting



MSF Cut is an efficient fiber laser cutting system that combines reliability, precision and economy. The machine is available in different configurations:

- Three available sizes with work areas of 3,000 x 1,500 mm, 4,000 x 2,000 mm and 6,000 x 2,000 mm enable processing of sheets from standard to large
- Laser sources ranging from 1 to 15 kW allow fast and efficient laser cutting of thin and medium material thicknesses

High-quality components from renowned brands

High-quality components combined with MicroStep's dynamic motion control ensure excellent quality and long-term reliability of the cutting results. Here is a short excerpt:

- Laser sources: IPG YLS/YLR (Germany) or nLight CFX (USA)
- Cutting heads: THERMACUT EX-TRABEAM® ECO or HP (Germany)
- Servo drives: Panasonic (Japan)
- Gearboxes: Stöber (Germany)
- Racks: ATLANTA (Germany)
- Linear guides: BOSCH Rexroth (Germany)

Automatic shuttle table with sectional fume extraction

By default, the machine is equipped with an automatic, hydraulically lifted shuttle table that enables simultaneous cutting and unloading of parts/loading of new material in two working positions. Electronic control of the table's suction zones ensures high suction efficiency and an environmentally safe operation.

Outstanding cutting quality - whatever the cutting job

MSF Cut machines achieve outstanding cut quality – regardless of the material type and contour shape. Thanks to the highly dynamic tool motion control and an advanced process control system integrated in the cutting head, the machines deliver smooth cut edges even in small details.
The fiber laser series enables 2D processing of mild steel, stainless steel, aluminum, brass and copper, among other materials. For thin parts with grid-like contours such as grids, arcs, circles or polygons, **DynaFly** feature provides fast and highly efficient results.

Automation & Digitalization

MSF Cut series can be used with the majority of MicroStep´s automated sheet handling options: a combination of the machine with MSLoad, MSTower and MSSort systems ensures the highest possible optimization of material flow. In connection with advanced order and production management provided by MicroStep´s **CyberFab Manager**, the cutting machine can turn into a fully connected production cell within the framework of Smart Factory and Industry 4.0 methodologies.

Efficient operation with a high degree of automation

MSF Cut series includes many advanced control and processing features by default, such as:

- Automatic material edge detection
- Dynamic piercing
- DynaFly cutting and marking
- Smart Z Movement – optimized tool path control
- Predictive collision prevention
- Automatic nozzle cleaning + nozzle check by camera
- Automatic height sensor calibration
- Auto-monitoring of protection glass
- Zonal cutting

MSF Compact series

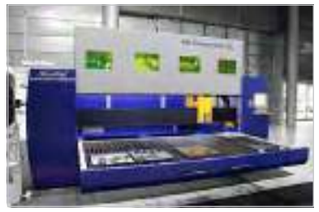
Compact, fast, precise

Laser

MSF Compact combines precise 2D laser cutting with a compact design. This space-saving version of MicroStep's fiber laser machine is available in **work areas** of **1,000 x 2,000 mm**, **1,250 x 2,500 mm** and **1,500 x 3,000 mm** and is particularly attractive thanks to its small footprint in combination with the genuinely high cutting quality. A manually extractable cutting table enables easy and straightforward loading.

MSF Compact machines are available with state-of-the-art fiber laser sources with a power range **1 – 8 kW**. The machines are perfect for production of highly accurate parts at high cutting speeds, with a small footprint and low maintenance and operational costs. Their high dynamics is achieved by a low-seated gantry, digital AC drives and precise planetary gears.

Your solution for fast and precise cutting



- A powerful, compact laser cutting machine for cutting a wide variety of materials
- High precision and accuracy of parts and contours
- Excellent dynamics thanks to a robust machine design, low-seated gantry, digital AC drives and precise planetary gears

Robust, dynamic, and long-lasting machine design

- Gantries with extremely high torsion resistance enable high traverse speeds
- Compact, manually extractable cutting table for convenient loading of sheets up to 15 mm thick
- Bellows on all axes protect the guidelines from contamination (optional)

Advanced control features

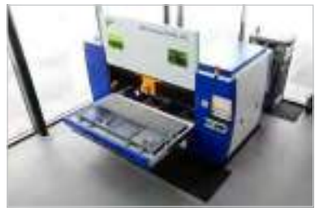
MSF Compact machines include several advanced control and processing features by default, such as:

- Automatic material edge detection
- Dynamic piercing
- DynaFly cutting and marking
- Smart Z Movement – optimized tool path control
- Predictive collision prevention
- Automatic nozzle cleaning
- Automatic height sensor calibration
- Auto-monitoring of protection glass
- Zonal cutting

High economic efficiency

- 2/3 lower power consumption and higher cutting speeds (compared to CO_2 laser of the same power)
- Easy maintenance
- No gases required for generating the fiber laser beam
- Extremely small footprint
- No warm-up time, after switching on immediately ready to work
- Fast commissioning thanks to its compact design (Plug & Produce)

Compact machine with manual loading and unloading



The MSF Compact is available with work areas of 1,000 x 2,000 mm, 1,250 x 2,500 mm and 1,500 x 3,000 mm and is particularly attractive thanks to its small footprint in combination with the genuinely high cutting quality. A manually extractable cutting table enables easy and straightforward loading.

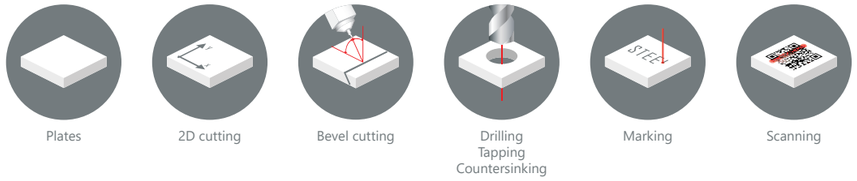
High-quality components from renowned brands

High-quality components combined with MicroStep's dynamic motion control ensure excellent quality and long-term reliability of the cutting results.

- Laser sources: IPG YLS/YLR (Germany)
- Cutting heads: THERMACUT EX-TRABEAM® ECO or HP (Germany)
- Servo drives: Panasonic (Japan)
- Gearboxes: Stöber (Germany)
- Racks: ATLANTA (Germany)
- Linear guides: BOSCH Rexroth (Germany)

MSF Max series

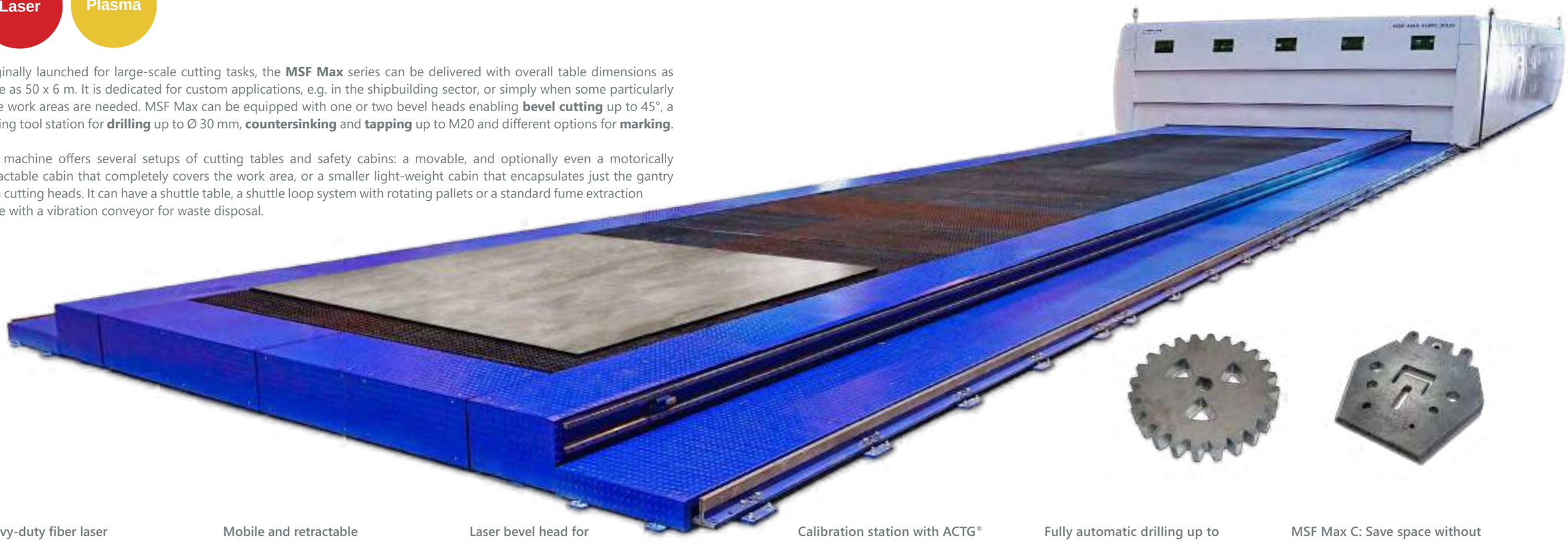
3D fiber laser machine for large-scale applications



Laser **Plasma**

Originally launched for large-scale cutting tasks, the **MSF Max** series can be delivered with overall table dimensions as large as 50 x 6 m. It is dedicated for custom applications, e.g. in the shipbuilding sector, or simply when some particularly wide work areas are needed. MSF Max can be equipped with one or two bevel heads enabling **bevel cutting** up to 45°, a drilling tool station for **drilling** up to Ø 30 mm, **countersinking** and **tapping** up to M20 and different options for **marking**.

The machine offers several setups of cutting tables and safety cabins: a movable, and optionally even a motorically retractable cabin that completely covers the work area, or a smaller light-weight cabin that encapsulates just the gantry with cutting heads. It can have a shuttle table, a shuttle loop system with rotating pallets or a standard fume extraction table with a vibration conveyor for waste disposal.



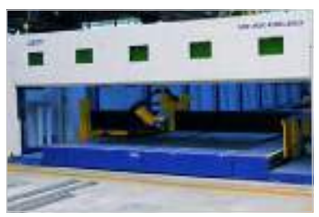
Heavy-duty fiber laser cutting machine

The MSF Max, with its maximum work length of up to 50,000 mm and width of up to 6,000 mm, is an excellent laser cutting solution for large-scale applications. The fiber laser cutting machine developed originally for the shipbuilding industry is designed for reliable and precise processing of large components. The design makes MSF Max a heavy-duty fiber laser cutting machine for complex and extraordinary cutting tasks.

Mobile and retractable safety cabin

To accommodate its unconventional work areas while maintaining high safety standards, MSF Max uses a mobile safety cabin to shield against laser beam reflection. The mobile cabin moves on its own guidelines and can reach the entire work area of the machine. Optionally, a retractable version of the mobile cabin allows to choose different work area sizes and thus enables and unmatched flexibility of operation.

Laser bevel head for bevel cutting up to 45°



- V- and X-cuts as well as complex Y- or K-cuts up to 45° with micro joints
- Additional Beveling Process (ABP) – simple and reliable subsequent weld edge preparation via a laser scanning process
- Easy programming thanks to intuitive software tools
- Auto-calibrated height sensor for correct height control in all cutting angles

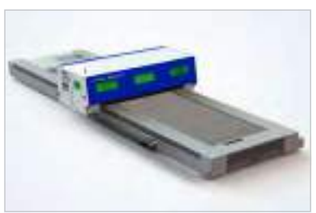
Calibration station with ACTG® unit integrated into the gantry

In case MSF Max is equipped with a laser bevel head, the system comes with the ACTG® unit and auto-calibration feature by default. Unlike in other MicroStep machines, the unit is integrated directly into the gantry in a combined calibration station that is ejected during the calibration process. The station contains also a pad for calibration of the capacitive height sensor in the cutting head and a nozzle cleaning system consisting of a camera and a wiping brush.

Fully automatic drilling up to Ø 30 mm and tapping up to M20

- Fully automatic drilling solution for the MSF Max machine
- Drilling up to Ø 30 mm, tapping up to M20 and countersinking
- Automatic tool exchange with a tool magazine for up to 8 tools mounted on the gantry
- Auto-calibration of drill bits (ACDB) feature
- Pneumatic retainer close to the drill tool ensures accuracy of the drilling process

MSF Max C: Save space without compromising the performance

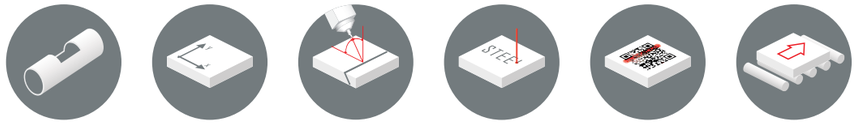


MSF Max is also available in a version with a compact safety cabin that encapsulates just the gantry instead of the whole work area. MSF Max C has the same configuration possibilities as standard MSF Max but requires significantly less installation space, so it is ideal for customers with limited workshop area.

NEW

MSF Pipe series

Fiber laser tube cutting solutions



Laser

MSF Pipe machines provide precise and reliable fiber laser cutting of **pipes** and **profiles** with a variety of cross-section types – round, rectangular and custom shaped. The machines come in two basic versions – **manual** or fully **automated** – and allow to process pipes of up to 500 mm in diameter and 12 meters in length, depending on the configuration.

The machines accommodate advanced features and options such as **bevel cutting** with auto-calibration feature ACTG®, motorized pipe supports with compensation of torsional stiffness of pipes and profiles, automated unloading support platforms and more. A **3D laser scanner** is used to determine the real shape of tubes along the cut trajectories in order to map and compensate for real workpiece imprecisions – and thus deliver the most accurate cutting results.

MSF Pipe with manual loading

For applications with less workload or a tight floor plan, a version of MSF Pipe with manual loading and unloading is available. The machine features motorized pipe supports that enable convenient positioning and a smooth, efficient cutting process. Torsional stiffness compensation is provided for pipes with smaller diameters.

Pipes and profiles of different cross-sections

MSF Pipe can process pipes and profiles with different cross-sections: from common round and elliptical pipes through square and rectangular hollow profiles to special shaped profiles.

Automated material handling

The machines can be fully automated via handling systems and production management software:

- Loading of material
- Detection of shape deviations via a laser scanner
- Loading and execution of cutting programs
- Unloading of finished parts
- Updating of the warehouse database, exchanging information with ERP system

Laser scanner for measuring the true profile shape

MSF Pipe machines are equipped with a 3D laser scanner that scans the exact shape of the workpiece in the place of cutting. Advanced algorithms then allow the control system to adjust the movement of cutting tool and pipe supports accordingly and compensate for possible inaccuracies of the particular pipe or profile.

Custom laser tube applications

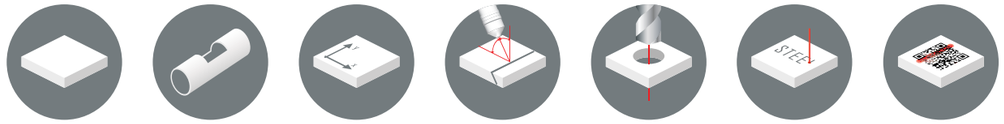
Complex production challenges sometimes require unorthodox solutions. If even the rich customization options do not go far enough, thanks to in-house developed hardware and software MicroStep is ready to offer fully tailored solutions with special functionalities such as robotic manipulators, multiple work positions and more.

Advanced safety features

Each version of MSF Pipe is delivered with safety elements that ensure safe operation in production environment. A safety cabin completely encloses the area of the machine where the actual cutting takes place while lockable fences make sure no one is harmed by the outside moving parts.

AquaCut series

Multi-functional waterjet cutting machine



Waterjet **Plasma**

The **AquaCut** is a highly precise CNC waterjet cutting machine designed to process a wide variety of materials including those that cannot be subject to thermal or mechanical stresses.

Pure water or abrasive cutting can be applied, among others, to metal, stone, marble, armored glass, ceramics, plastics, wood, thick corrugated cardboard, foam materials and sandwich materials.

The machine can be equipped with a 5-axis waterjet rotator with ACTG® for **bevel cutting**, as well as combined with plasma, **pipe** and **profile** cutting or **tapping**. Other features include Additional Beveling Process (ABP) and **taper compensation** (ABC).

Fine contours and highly precise cuts up to 150 mm

- No thermal stress on the cut part
- Cutting of the finest contours
- Precision to the degree of hundredths of a millimeter
- Cutting of all materials (stone, steel, glass, rubber, wood, sandwich materials)
- High-pressure technology up to 6,200 bar

Intelligent taper compensation for true contour edges

In order to meet the requirements for high precision and/or perpendicularity of the cut parts, MicroStep's Adaptive Bevel Compensation (ABC) technology enables taper compensation in a range of ± 7°. The technology adjusts the bevel angles with speed to compensate the natural stream lag and taper of a water jet. The system also allows custom adjustment of the compensation values.

Bevel cutting up to 45° with ACTG®

- Fully automatic and highly precise bevel cutting up to 45°
- Auto-calibration of tool geometry (ACTG®) feature ensures high precision and reliability of bevel cutting with minimum downtimes for maintenance
- Smooth, yet dynamic operation thanks to AC drives
- Intuitive and simple programming of bevels including the ABP technology

Abrasive removal system for cleaning the water tank

Boost the efficiency of your waterjet cutting machine with water tank cleaning equipment:

- automatic cleaning of the water tank through continuous removal of used abrasive and cut material particles
- minimizing downtime required for tank cleaning
- time saving through automation

Durable high-precision components

Rustproof chrome plating of linear guidelines helps to protect them against wear caused by abrasive and corrosion. In addition, bellows on all axes seal the guidelines against dust and humidity, substantially increasing their lifespan.

Optional water table designs

Depending on your requirements, different cutting table designs are available for the AquaCut series:

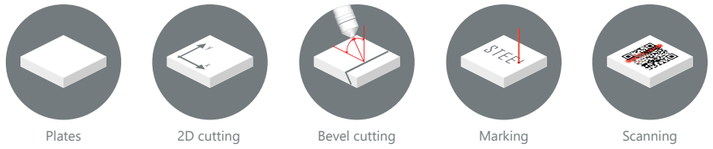
- Galvanized or stainless steel tanks
- Separate water tanks for pipe and profile cutting
- Custom designs for special requirements

NEW

WaterCut series

Compact 2D & 3D waterjet cutting machine

Waterjet



The **WaterCut series** offers highly precise and reliable **waterjet cutting** machines designed for 2D & 3D waterjet cutting. Besides a single tool station, WaterCut can be equipped with a multi-tool station with outer span 1200 mm, carrying up to **4 water jets on a single Z axis**, or a small drilling unit for **piercing of sandwich materials**.

The machine is equipped with MicroStep's efficient and user-friendly CNC control system iMSNC®, which, by default, supports 5 waterjet cut quality settings for different edge finishing. It can be chosen between the highest speed or the best edge quality whereby other customization of tool parameters is also available: for example, adjustment of cutting speed in the corners of parts. Thus, the machine is perfect for achieving an optimal balance between quality, performance and cutting costs.

Fine contours and highly precise cuts up to 150 mm

- No thermal stress on the cut part
- Cutting of the finest contours
- Precision to the degree of hundredths of a millimeter
- Cutting of all materials (stone, steel, glass, rubber, wood, sandwich materials)
- High-pressure technology up to 6,200 bar

Durable high-precision components

Rustproof chrome plating of linear guidelines helps to protect them against wear caused by abrasive and corrosion. In addition, bellows on all axes seal the guidelines against dust and humidity, substantially increasing their lifespan.

Bevel cutting up to 45° with ACTG®

WaterCut can be equipped with a bevel cutting head up to 45° with auto-calibration feature ACTG®, or with up to two straight cutting tool stations. Optionally, the machine can be fitted with a multi-tool station with outer span 1200 mm, carrying up to 4 water jets on a single Z axis, or a small drilling unit for piercing of sandwich materials.

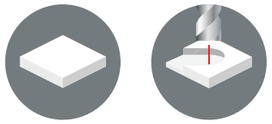
Abrasive removal system for cleaning of the water tank

Boost the efficiency of your waterjet cutting machine with water tank cleaning equipment:

- automatic cleaning of the water tank through continuous removal of used abrasive and cut material particles
- minimizing downtime required for tank cleaning
- time saving through automation

MicroMill series

Premium CNC routing solution



Routing

The **MicroMill series** is designed for CNC **routing** of mild metals, plastics and wood by means of high-revolution spindles. Mechanical construction makes the machine suitable for shape machining of flat parts including parts with bigger dimensions.

Utilizing MicroMill's rugged frame, dual-side driven gantry and linear guideline system, the machine proves its excellent dynamic properties in various shaping jobs. The material can be fixed on the table with mechanical clamps, or conveniently locked in position on MDF pad through a **vacuum clamping** system.

Fine contour routing and shaping for a variety of materials

- Routing of softer materials such as mild metals, plastics, Teflon or wood
- Suitable for shape machining of flat parts including parts with bigger dimensions
- Precision to the degree of hundredths of a millimeter
- Automatic tool exchange with a tool magazine for 8 tools

Excellent dynamics with poitioning speeds up to 56 m/min

Robust machine frame coupled with a powerful drive system of digital AC drives, planetary gears and high-precision linear guidelines in all axes result in excellent dynamical properties and high positioning speeds. The machine can be equipped with a selection of high-revolution spindles up to 24,000 rpm.

Material clamping options for convenient usage

The material can be either fixed on the table with mechanical clamps, or, optionally, locked in position on MDF pad through a vacuum clamping system. Optimal solution is using of one vacuum pump for each 2 m^2 of clamping area. Efficient and safe overhead extraction of dust and small chips from routing is offered as a recommended option.

Vertical design saves workshop area

Organize your production efficiently with a floor space saving solution - the vertical router MicroMill-V. While preserving the dynamics of a standard MicroMill machine, the easily accessible work area of MicroMill-V enables convenient loading and unloading of material.

PipeCut series

Weld edge preparation on pipes and profiles

Plasma Oxyfuel

The **PipeCut series** offers a wide range of pipe and profile cutting possibilities for various industrial applications in offshore, lifting and agricultural equipment, pipelines, power plant and steel constructions or shipbuilding.

Modular design of the machine allows to meet unique pipe fabrication needs and thus become a valid part of your production facility.

PipeCut machines enable a wide range of pipe-based applications including **trimming**, **cutting** of various openings for multiple **pipe** and **profile** intersections or connections, weld edge preparation as well as **marking**.

The machine can be supplied as a fully automated workplace with **automatic loading**, feeding, unloading and **sorting** of pipes and profiles. Optionally, PipeCut can also be fitted with an additional cutting area for smaller domes.

3D pipe and profile cutting up to Ø 800 mm

PipeCut's cantilever design with open loading area enables processing of pipes and profiles up to Ø 800 mm.

- 3D plasma for fast and efficient cutting
- 3D oxyfuel for thick-walled workpieces

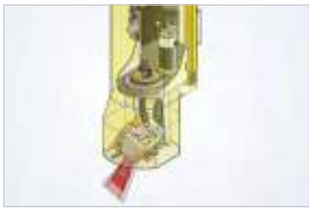
Efficient suction through chuck and the overhead extraction system

MicroStep's proven suction design for pipe cutting includes direct fume extraction from inside of the pipe through chuck as well as suction from the overhead cover around the cutting head.

Advantages:

- Reduced dust pollution of workpieces
- Prolonged lifetime of components
- Minimized fume exposure of the workshop staff

Laser scanner for measuring of profile position



For cutting of hollow sections, the PipeCut machine can be equipped with a laser scanner that will measure the deviation of profile's position in the place of cutting to ensure precise positions of cut-outs and openings.

ElbowCut: Weld edge preparation on pipe elbows

ElbowCut, a special version of the PipeCut machine, was designed for trimming of pipe elbows with preparation of trimmed edges for subsequent welding. The machine can process elbows in the range Ø 80 – 400 mm while ensuring high environmental safety and suction efficiency thanks to housing in a noise reducing cabin*.

*cabin not included in photo

Automatic loading, feeding and unloading

The PipeCut series can be fully automated via handling systems and CyberFab® Manager software, including:

- Loading of pipes and profiles
- Detection of shape deviations via a laser scanner (applicable for hollow sections)
- Loading and execution of cutting programs
- Unloading of finished parts
- Updating of warehouse database, exchanging information with ERP system

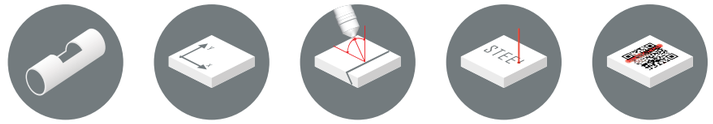
Automatic sorting

NEW

Boost your productivity: The modular design of the PipeCut series allows to extend the machine with a customized pipe and profile sorting system tailored to your production layout. Fully automated pipe sorting is integrated with the pipe unloading area of the machine and configured with respect to the length of cut pipes and layout of the unloading positions to ensure the best sorting efficiency.

CPCut series

Solutions for large pipes and profiles



Plasma **Oxyfuel**

The **CPCut series** offers robust pipe and profile cutting machines designed for processing of a great range of pipe diameters and lengths.

The machine's modular design enables a wide range of pipe-based applications including **trimming**, **cutting** of various openings for multiple **pipe** and **profile** intersections or connections, weld edge preparation as well as pipe **marking**.

The application field of CPCut is in tank, pipeline and power plant constructions.

3D pipe and profile cutting up to Ø 2,000 mm

CPCut's cantilever design with open loading area and a powerful chuck enables clamping and processing of pipes and profiles up to Ø 2,000 mm.

- 3D plasma for fast and efficient cutting
- 3D oxyfuel for thick-walled workpieces

Pipes and profiles up to 12 t

Depending on the type of pipe cutting device and pipe supports, the CPCut series can cut round pipes as well as hollow profiles with different cross-sections in the range Ø 100 – 2000 mm up to a weight of 12 tons. Modular design of the machine provides possibilities of different machine configurations as well as further customized expansion of the system.

Easy loading and unloading

Thanks to the open machine area with low-positioned guidelines in the longitudinal axis and the mobile cantilever gantry construction, the gantry can be parked aside to ensure convenient and safe loading and unloading even for large pipes and profiles.

Powerful suction through chuck and the overhead extraction system

MicroStep's proven suction design for pipe cutting includes direct fume extraction from inside of the pipe through chuck as well as suction from the overhead cover around the cutting head.

Advantages:

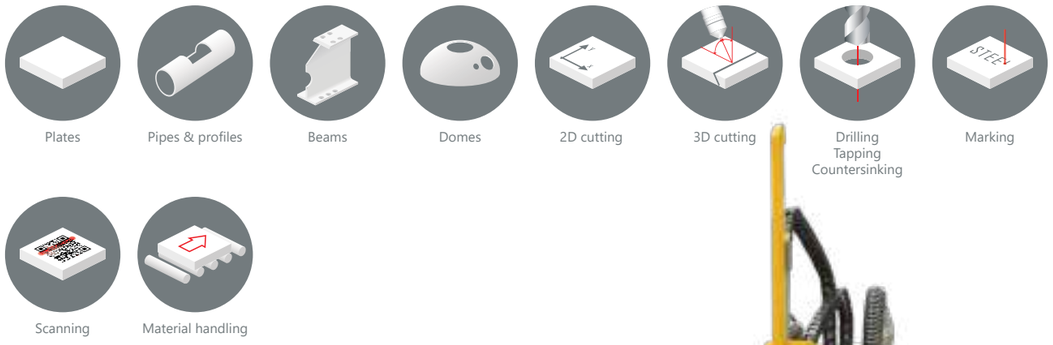
- Reduced dust pollution of workpieces
- Prolonged lifetime of components
- Minimized fume exposure of the workshop staff

Operator terminal on the gantry

A control unit with touchscreen mounted on the gantry provides all positioning and technology control functions and thus ensures convenient operation of the machine along its whole length.

ProfileCut series

Designed for efficient beam, pipe and dome processing



Plasma **Oxyfuel**

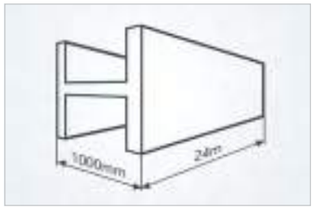
The **ProfileCut series** is dedicated for production of **steel structures**. It provides efficient and cost-effective cutting and marking of commonly used types of beams and profiles.

Besides optional **tube** and **plate** cutting areas, the machine has a dedicated area for cutting of **beams** such as **I, H, U** or **L**. To enable precise processing of beams in the required spots, ProfileCut machines are equipped with a laser scanner that measures the exact shape of beam in the place of cutting. That allows the control system to adjust the movement of tool according to the true shape of the particular beam.

In addition, ProfileCut machines offer **automation possibilities** with automatic loading, feeding, sorting and unloading of beams via feeding and conveyor systems and a dedicated production management software.

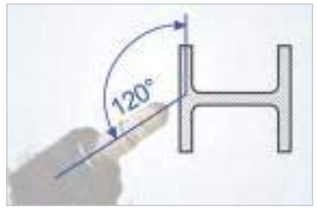
Extension of the machine with a **dome** cutting area for processing of dished ends turns ProfileCut into a true all-rounder in processing of 3D materials.

Processing of beams and profiles up to HEB 1000 and length 24 m



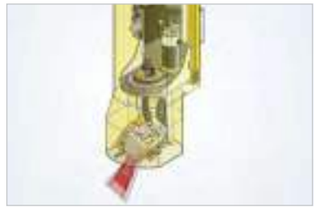
Thanks to its generous work areas, the machine can process beams up to HEB 1000 and a length of 24,000 mm. In addition to the common beam types such as I, H, U or L, round pipes, hollow sections and even domes and plates can be cut as well.

Great production flexibility thanks to the 120° bevel cutting head



MicroStep's 3D rotator with a torch tilt of up to 120° provides full beam processing functionality including dividing of beams and cutting of commonly required contours and openings. The advanced auto-calibration feature (ACTG®) guarantees long-term accuracy, easy setup and minimum maintenance downtimes of the bevel cutting equipment.

Laser scanner for measuring of the true beam shape



ProfileCut machines are equipped with a 3D laser scanner that measures the exact shape of beam in the place of cutting. Advanced algorithms then allow the control system to adjust the movement of tool accordingly and compensate for possible inaccuracies of the particular beam.

Convenient loading of profiles

Thanks to the large, open loading area, even heavy beams can be easily and safely slid over the supporting rollers into the work zone. This saves time as the beams do not have to be clamped or otherwise prepared for processing.

Extensive configuration possibilities

ProfileCut is one of MicroStep's most versatile machines. Besides processing of beams and tubes, the machine can be extended by a plate or dome cutting area and by integrating a variety of technologies such as triple-torch oxyfuel cutting, drilling, tapping, countersinking or marking – turning the machine into a universal production tool for structural steel jobs.

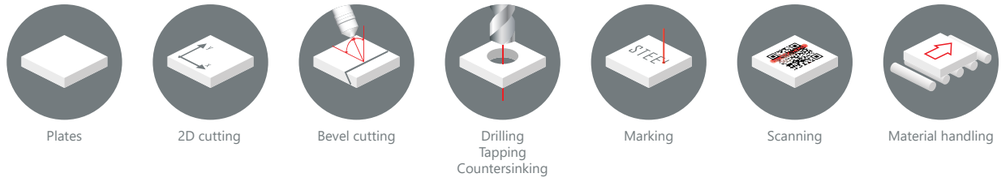
Beam processing automation

The machine can be fully automated via handling systems and CyberFab® Manager software, including:

- Loading of beams
- Detection of shape deviations via a laser scanner
- Loading and execution of cutting programs
- Unloading of finished parts
- Updating of warehouse database, exchanging information with ERP system

DS series

Plate processing line for structural steel applications



Drilling **Plasma** **Oxyfuel**

The automated **plate processing line DS** was designed for high-efficiency drilling and cutting with the possibilities of automatic plate feeding and automatic part sorting on output. The machine is dedicated to heavy-duty structural steel applications such as production of high-precision **fittings, gussets** and **end plates**.

The **DS series** was designed for a high level of **automation** within the factory workflow as a time- and cost-effective production solution for certain types of flanged parts.

A special version of the machine – **DS-B** – is dedicated to **automatic dual drilling**, **tapping** and **marking** of **hollow profiles** with square or rectangular cross-sections. The work area of the machine consists of a rotary drilling support with two turret drilling heads, each having 6 tool positions. The DS-B machine can process hollow sections up to 300 x 300 mm with a length of up to 12 m.

Automated processing of flat materials for steel structures

The DS series offers a variety of automated processing options for flat materials. Besides drilling, straight cutting and bevel cutting for weld edge preparation up to 50°, oxyfuel cutting, tapping, countersinking as well as scanning and marking are possible. The standard work area size is up to 6,000 x 2,000 mm.

DS-B: Automated drilling and marking of hollow profiles

The DS-B series, a special version of the DS machine, was designed for automatic dual drilling, tapping and micro-percussion marking of hollow profiles with square or rectangular cross-sections. The work area of the machine consists of a rotary drilling support with two turret heads for drilling up to Ø 24 mm and tapping up to M12, each having 6 tool positions. The machine can process hollow sections up to 300 x 300 mm with a length of up to 12 m. Material loading, feeding and unloading are fully automated.

High degree of automation

As a time- and cost-efficient production solution, the DS series has a high degree of automation. Loading of plates into the cutting zone, unloading of processed parts as well as separation of residual material are fully automated. The modular design of the machine allows to customize the unloading process incl. sorting by robots. Moreover, the machine is operated by MicroStep's production management software CyberFab® Manager that can be interconnected with local ERP system.

MSLoad / MSTower / MSSort

Solutions for automated material handling

Plates

Material handling

Plasma

Laser

Bring your production automation one level up: the modular system **MSLoad** provides automatic loading of workpieces and unloading of cut parts for MicroStep laser and plasma cutting machines. Combined with optional storage and part sorting systems, material handling solutions can be as simple or as comprehensive as desired.

MSTower is an in-house developed extension to MSLoad, providing buffer storage close at hand for raw material and cut material alike.

Unloading a cut plate from the machine is not the end of the task. To separate cut parts from waste material and sort them according to a customer-defined sorting plan, MicroStep offers **MSSort** with a customized set of clamping heads, tailored to each type of part and stored in a magazine for automatic exchange based on the sorting plan.

MSLoad: Flexible material handling

The variable and modular structure of the material handling system MSLoad allows it to fit different requirements and production setups. Loading and unloading can take place on the same or opposite sides, or on both sides at once.

MSTower: Customized storage solution

Standard MSTower comes in sizes from 3 x 1.5 m to 6 x 2 m and accommodates up to 10 loading palettes. However, MicroStep's offer does not end there. We offer custom solutions in terms of palette size and number, as well as integration with supplementary technology.

MSSort: Sorting tailored for your needs

MicroStep´s integrated CAM software pack allows to generate sorting plans along with cutting plans with ease. The rotary sorting tool station features automatic exchange of clamping tools that are designed for various shapes and sizes of parts.

Work safety

Safety is paramount in material handling. The loading system is secured by lockable fences and optical barriers that stop all movement when entry into the work area is detected.

Ever higher efficiency with automatic nozzle changer

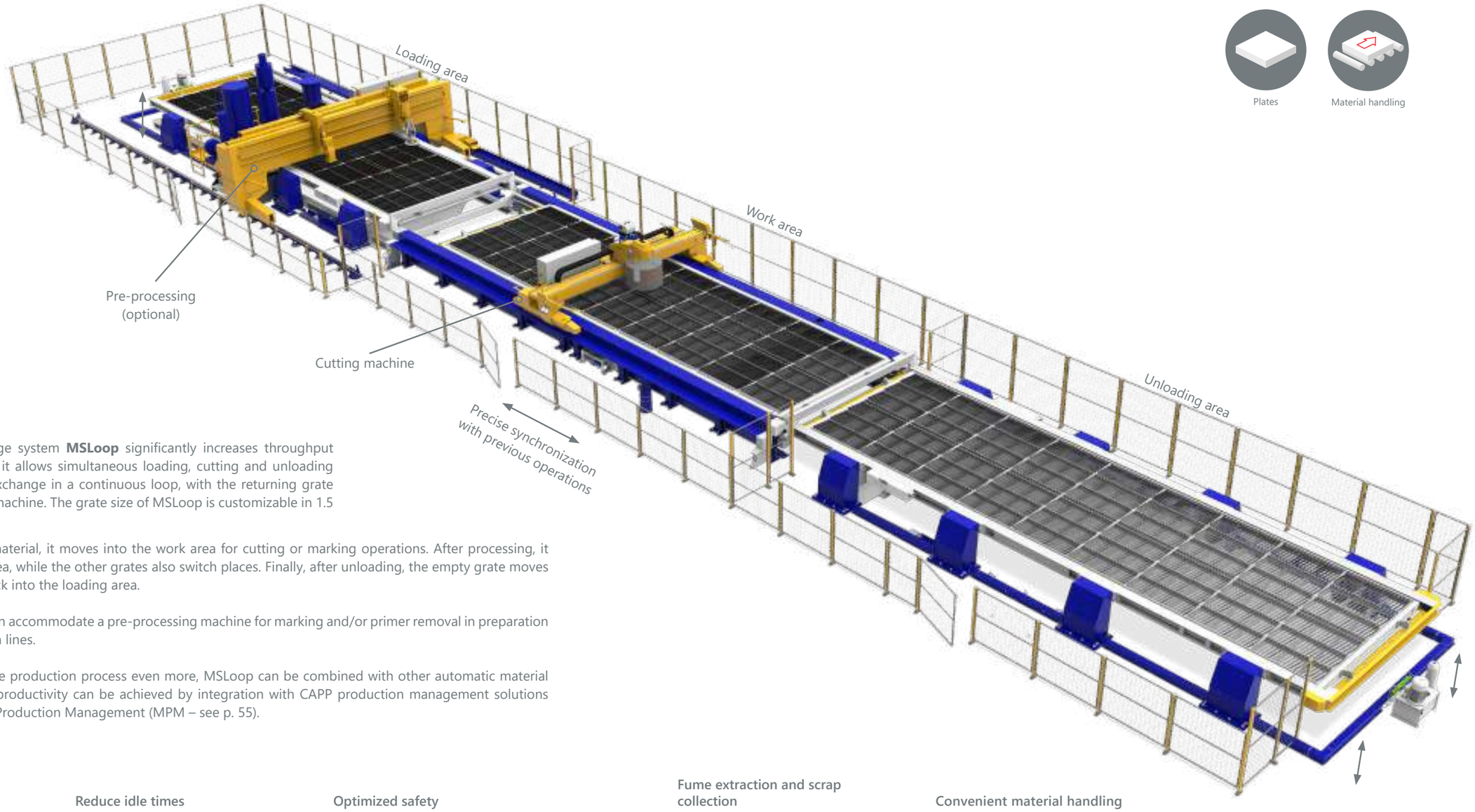
Apart from auto-calibration features of laser heads, MicroStep's fiber laser systems can be equipped with automatic nozzle exchange units that reduce operation times and further increase productivity.

MSLoop

Productivity multiplier

Plasma

Laser



The automated table exchange system **MSLoop** significantly increases throughput of a CNC cutting machine as it allows simultaneous loading, cutting and unloading of material. Its three grates exchange in a continuous loop, with the returning grate moving underneath the CNC machine. The grate size of MSLoop is customizable in 1.5 m length modules.

After a grate is loaded with material, it moves into the work area for cutting or marking operations. After processing, it continues to the unloading area, while the other grates also switch places. Finally, after unloading, the empty grate moves underneath the work zone back into the loading area.

Optionally, the loading area can accommodate a pre-processing machine for marking and/or primer removal in preparation for marking of synchronization lines.

To automate and speed up the production process even more, MSLoop can be combined with other automatic material handling systems. Maximum productivity can be achieved by integration with CAPP production management solutions such as MicroStep´s Machine Production Management (MPM – see p. 55).

Universal and versatile

MSLoop can be combined with any freestanding MicroStep machine equipped with plasma or laser cutting technologies. Loading and unloading can be automated via in-house or third-party loading and sorting solutions – the vast customization possibilities make MSLoop a perfect solution for boosting of production efficiency.

Reduce idle times

The system consists of 3 separate working zones that allow simultaneous operations of loading/unloading and work-piece machining, e.g. cutting, marking, primer removal... Table exchange between zones is synchronized to enable highest possible efficiency of production.

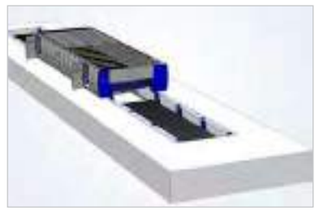
Optimized safety

Each zone has its own entrance into the fenced-off area that unlocks from the outside only after all the machinery in the zone finishes its movement and is switched to a manual slow-moving mode. The other, locked, zones continue working but cannot send a table to the unlocked zone. From the inside the doors are always unlocked to provide free escape routes.

Fume extraction and scrap collection

A fume extraction and scrap collection wagon moves under the gantry between the upper and the lower bed to collect remains from cutting and provide sectional fume extraction via sideways channels. Furthermore, each bed is equipped with a pair of sweeping collectors on the front and the rear side that push the residual scrap into waste containers under the floor level.

Convenient material handling



To fit seamlessly into any production facility, MSLoop does not have to stand on the floor. The embedded version with tables returning underground brings considerable benefits, especially loading and unloading at the floor level, and a more efficient fume extraction and scrap removal.

iMSNC®

Smart solution for multi-technology work

iMSNC® from MicroStep is one of the most advanced control systems for CNC cutting machines. It was developed to easily, reliably, and efficiently turn cutting plans into finished parts with the help of a clear and modern user interface. The system's hardware consists of a stand-alone control console with a TFT touchscreen and a control panel with an LCD display mounted on the gantry. In order to achieve maximum utilization and flexibility of our machines, the ergonomic control console offers the opportunity to nest new cutting programs and generate new CNC codes during an ongoing cutting process. As the iMSNC® control system and all CAM software solutions come from our company, the software with its versatile modules can be individually customized for your production. Parameter databases for individual technologies enable consistently high quality under various circumstances. iMSNC® comes with multiple efficient evaluation tools for production process optimization. These provide you with the much-needed overview of current cutting orders, cutting times, cost calculations and machine utilization in day-to-day production.

- 17'' touchscreen (optionally 24'')
- Efficient management of tool data
- Very short programming times
- Fast data transfer
- Flexible and easy to use
- Advanced cutting simulation for more work safety
- Convenient contextual help via pop-up bubbles

Transparent and easy-to-use user interface

Besides standard features (test run, mirroring, scaling, rotation of cutting plans and many more), the iMSNC® control system incorporates advanced functions such as preparation of cutting plans during machine operation, jog mode, reverse motion, global marking, parametrical dynamic piercing, kerf compensation, automatic plate alignment, restart of cutting from point of interruption after voltage breakdown, virtual tool magazine – a customized database of parameters for all technologies.

The optional 24" monitor displays all data for preparation of cutting in a single screen and thus provides an even clearer overview of the cutting process. Additionally, its configurable right part contains shortcuts to up to 5 custom applications in each screen.

Monitoring of consumables

For all businesses, continuous cost monitoring is one of the most important tools. iMSNC® offers useful commercial support with monitoring of consumables. At the touch of a button you can evaluate the states of your consumables and the probable number of remaining piercing cycles.

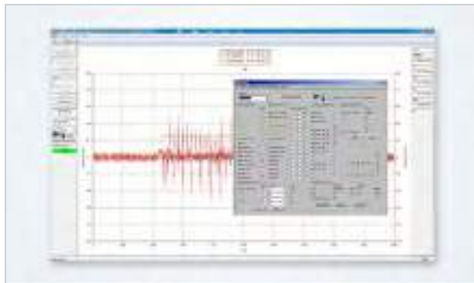
Monitoring and evaluation of production

iMSNC® includes a novel web-based interface for accessing each machine from the company intranet via a web browser. Each machine has its own home page which serves as a gateway for intranet applications.

Management of Cutting Programs (MCP) – remote management of cutting programs allows to define priorities and relations between cutting programs and materials, and to distribute the cutting tasks to several machines

EkoInfo – evaluation of machine operation costs for a particular cutting program

Machine Info – monitoring of machine and operator activities that enables to assign performance information to work shifts and to create specific technological records



Remote diagnostics

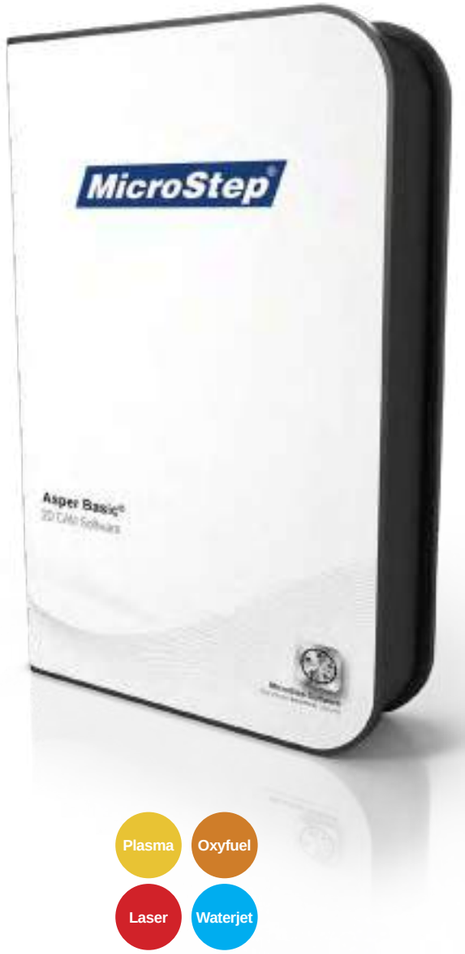
With iMSNC® and numerous remote maintenance modules, MicroStep offers the best foundation for fast and competent help via remote dial-in. Nearly all electronic components can be evaluated and diagnosed using MicroStep's software. Thus, in more than 90 percent of all cases, machine downtime can be remedied quickly and easily without the need of a service technician on site.

Asper® Basic

2D CAM software for intuitive and efficient manufacturing

MicroStep's 2D CAM software Asper® is the ideal tool for easy and fast creation of CNC programs for vari- ous cutting, marking and machining technologies. In its basic version, Asper® offers powerful straight cutting features that can be further extended by specialized modules for bevel cutting, pipe cutting, multi-torch cutting and more, and even customized for special requirements.

The **intuitive structure** and **smart features** make Asper® a modern and powerful tool for CNC programming.



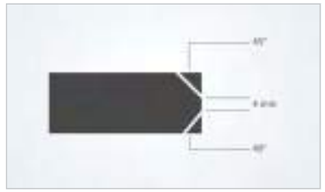
Cutting process simulation

Asper® provides a powerful simulation for both straight and bevel cutting tasks. It verifies in ad- vance whether the part shape can be cut with a particular machine, and also if a machine's movement is to be optimized for better process efficiency.

Additional beveling process (ABP)

For MicroStep machines with a laser scanner and ABP feature, Asper® allows to generate the tool movement for adding bevels to already straight-cut parts. The complete process (stra- ight cutting and subsequent beveling) takes place on the same machine – this saves space in production and significantly reduces the time for part handling.

Easy programming of bevel cuts



With just a few simple steps, you can add **weld seam preparations** to your cutting plans. Just choose the bevel type, angle, and land height.

Multi-technology work processes

Asper® is designed to take full advantage of all technologies on your MicroStep machine. For example, multiple technologies can be used within a single cutting program.

HeatControl® for lower thermal impact

To avoid local overheating of the plate during cutting, the HeatControl® functionality ensures dynamic distribution of the cutting path over the entire plate. This minimizes local heat deformation and protects consumables.

SpeedControl® for higher precision of corners, arcs, and holes

The SpeedControl® functionality regulates the cutting speed on all MicroStep machines to optimize the cutting quality in tight corners and arcs.

Easy & fast creation of CNC programs

To allow you to fully concentrate on your products, our innovative software solutions help you to intuitively translate drawings and cutting plans into finished components.

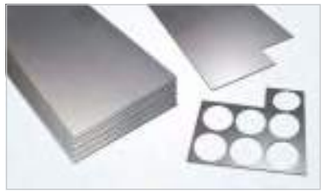
Import all common CAD formats

With Asper®, you can load your parts in various formats (DXF, ESSI, CNC, DC2, IGES...) from the Machine Manager app, from a network location or a USB drive and quickly convert them into a CNC program.

Numerous macro libraries

Choose from a large selection of standardized parts and adapt them to your requirements with just a few clicks, saving time on recurring parts.

Management of plates and remnants

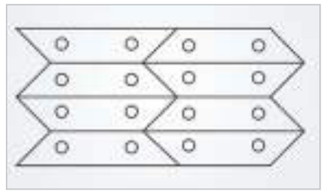


Make the most of your plates by generating the rest plate shapes in Asper®, including the residual material, and using it later for nesting and cutting.

Semi-automatic nesting

The convenient semi-automatic nesting function in Asper® Basic places parts on a plate in different directions within rectangular shapes. For fully automatic nesting, the optional module Asper® Nesting is the optimal choice.

Common-cut contours



If desired, the parts can be nested in a way that allows some of their contours to be cut at once, minimizing the number of lead-ins and lead-outs. This has a positive influence on consumable life, saves cutting time and material.

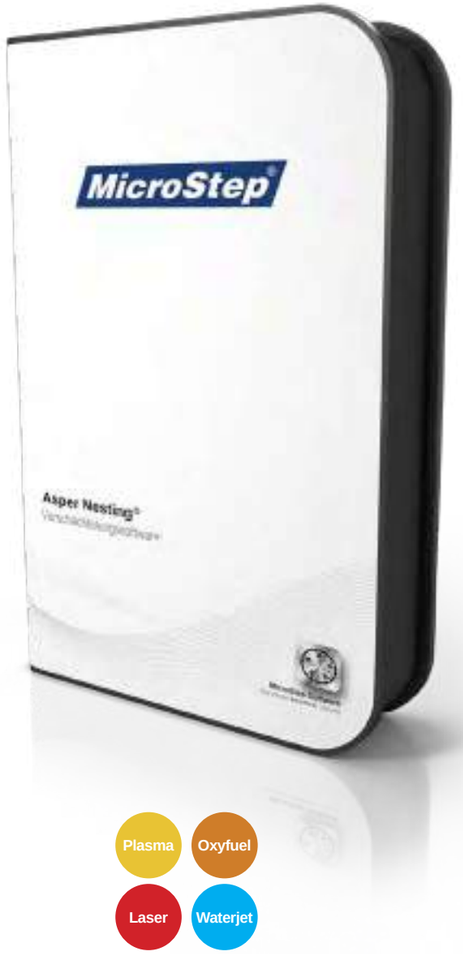
Asper® Nesting

The tool for efficient automatic nesting

Nest your parts efficiently in an uncomplicated and intuitive manner, even in large quantities and across several sheets. Whether it is about manufacturing according to order priority, reducing the heat input into material or simply working as material-saving as possible – Asper® Nesting makes the job easy! The suite also offers numerous other options: from quickly determining how many plates are required or nesting for multiple heads cutting simultaneously, to integration into production management systems for fully automated cutting lines.

Asper® Nesting automatically recognizes information such as markings, part quantities, bevels and drilling information (for the PLA & DSTV file formats). Optionally it also allows to import 3D models in STEP format.

The software can be expanded to include an expert menu for fine-tuning of the nesting settings (Optimizer feature).



Optimal material utilization

Asper® nests the parts fully automatically to achieve optimal utilization of material. The user gets to choose from different nesting criteria: maximum material utilization, order priority, shortest cut time or others. For fine-tuning of material utilization results, an optional Optimizer feature can be included.

Nesting by material type and thickness

Asper® Nesting takes into account the type and thickness of the plate to ensure that the parts are always cut from the correct material.

Sorting by orders

In conjunction with the MicroStep production management solution CyberFab® Manager, individual parts can be sorted according to various criteria, such as the order number, customer number, material thickness, or material type, allowing them to be more easily managed. Plate and residual material management is also included.

CyberFab® Manager NEW

The ultimate CAPP solution for automating your production

CyberFab® Manager provides production management for MicroStep based manufacturing systems. In combination with the CAM software Asper® or mCAM it allows to automatically nest complex cutting orders and projects on assigned stock material and distribute the cutting tasks to assigned cutting machines for processing. After completion, it automatically updates order progress and stock statuses.

The suite also provides tools to control the complete process of manufacturing parts and assemblies in a single integrated system, by managing next operations such as bending, deburring, welding or others that are required within the same project. It helps to reduce the need for operator input, reduce work-in-progress and save material.

Management of the complete process

The module **Workstation Manager** provides tools to control the complete process of manufacturing parts and assemblies:

- operators on workstations downstream of the cutting process (a press brake, a saw, a deburring machine...) receive task lists with processing instructions and information on parts flow
- tasks are either displayed on a screen, or can be directly interfaced to other smart equipment
- completed operations are logged to ensure the production database is up-to-date at all times

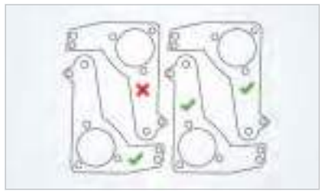
Administration of cutting orders and stock supplies

CyberFab® Manager greatly automates the processing of cutting orders. Even complex orders or projects can be executed automatically based on priority, material type and thickness. The process will flexibly adjust according to availability of material – CyberFab® Manager can be directly interfaced to existing stock management system. If there is not enough material available for a particular order, the system will notify the responsible person to order the required amount.

Fully automatic nesting and processing of cutting plans

For cutting machines equipped with MicroStep´s control system and CAM software Asper® or mCAM, individual parts of a cutting order are automatically nested on their assigned material blanks. Depending on priority and availability of material, orders with more pressing deadlines are processed first. The generated cutting plans are distributed automatically – the operator on a cutting machine will see only the orders that are assigned to the particular machine.

Feedback on finished and defective parts



After finished cutting, the operator or quality controller checks the cutting results and has the option to mark any imperfect part as defective. CyberFab® Manager will then automatically include this part into the next nesting with the highest priority so that the order can be completed at the nearest opportunity.

Order evaluation and reporting

CyberFab® Manager provides an overview of all orders and stores all relevant production information such as material utilization, cutting data and order completion. These data can be compiled into custom reports, displayed in dashboards or interfaced to any upper-level system via CyberFab® Connect.

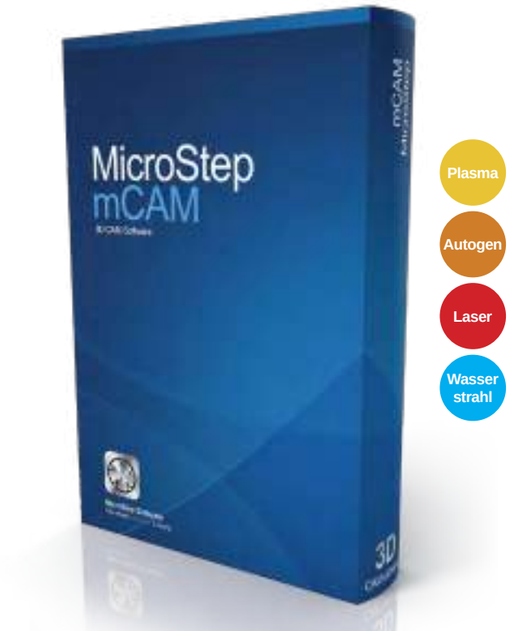
CyberFab® Manager Lite – ideal for smaller businesses

The majority of CyberFab® Manager's benefits at a reduced rate: the "Lite" version is a powerful option especially for businesses with smaller production setups who look for smart cutting automation. It provides all functions of the full version like stock management, order management, automated nesting from multiple orders, operation history and reporting, with a few trade-offs: after cutting, the order and stock statuses need to be updated manually by the machine operator, and there is no interfacing to customer's ERP system available.

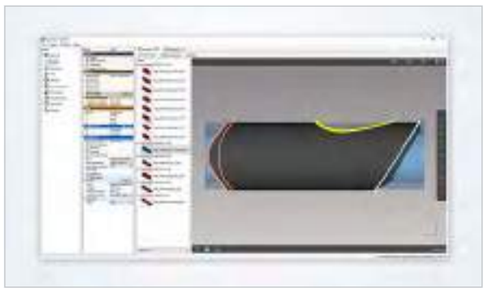
mCAM

Powerful 3D CAM software for parts and assemblies

mCAM is an efficient programming tool for automated 3D cutting of pipes, profiles, beams, domes and plates with cutting machines equipped with various technologies (plasma, oxyfuel, waterjet and laser). mCAM can directly import 3D models (created in e.g. SolidWorks or Inventor), organize them into individual libraries and process them. The software analyzes the shape of the entire model and automatically detects all cutting paths. Thanks to integrated nesting, all individual components can be subsequently nested on material templates. In addition to many supported shapes, mCAM also provides the option to unfold circular pipes to be cut from plates.

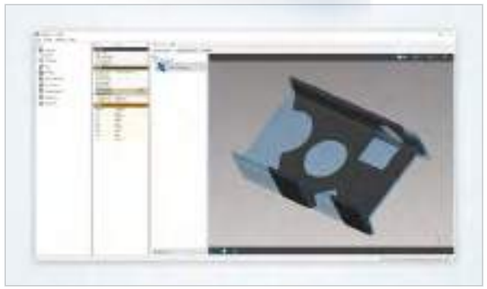


Integrated part libraries ensure efficiency for repeated cutting jobs



Whole assemblies and individual components can be easily imported from 3D models, nested and cut. mCAM stores all imported parts in internal part libraries for later re-use and parameter adjustment.

Processing of pipes, profiles, domes and plates



mCAM automatically detects both simple and complex 3D shapes: plates, circular pipes, rectangular profiles, elliptical, torispherical and semi-elliptical domes, cones, arched, dished, flat and inverted domes, sphere-caps, extruded and bent U- and L-beams and H- and I-beams with parallel and non-parallel flanges.

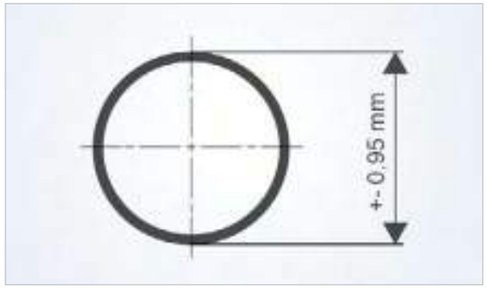
Built-in CAD design tools

Integrating CAD and CAM functionalities within a single software creates a seamless workflow. Users can design their parts from pre-defined shapes and immediately proceed to CAM processing without the need to export or import files.

Automatic nesting of complex 3D models

1. Import of a 3D model into mCAM
2. Automatic detection of cutting paths
3. The model is split into individual components
4. Automatic nesting on a material template
5. Complete compensation of cutting kerfs
6. Simulation of the cutting process for increased process reliability
7. Cutting of nested components

Compensation of geometric deviations

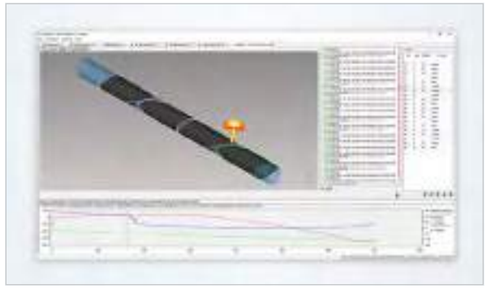


MicroStep uses 3D laser scanning or other detection methods to measure the semi-products for any production-related imprecisions. After detection, mCAM is used to automatically re-calculate cut paths to compensate for material inaccuracies during the cutting process.

Automatic nesting and integration with CyberFab® Manager

mCAM's nesting algorithm intelligently nests the parts on stock material with minimal gaps, so that maximum material utilization and most efficient cutting paths are achieved. Further automation can be provided by integrating mCAM with CyberFab® Manager and connecting it to an ERP system.

Simulation of the cutting process



With cutting simulation in mCAM, cutting plans can be checked for possible errors before the actual cutting, saving time and resources through less waste, and generally ensuring higher process reliability.

Automatic placement of micro-joints

mCAM can add micro-joints to the finished cutting plan to minimize the risk of thermal deformation and to keep the individual components together right up to the end.

MicroStep | 30+ years of cutting and automation

The company MicroStep was established in 1991 by members of the Department of Automation and Regulation, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology in Bratislava, Slovakia with the aim to develop and deliver microprocessor-based control technology to various branches of industry. Over the years, the company has become one of the leading suppliers of cutting equipment that supplied more than 3,000 cutting machines worldwide in cooperation with strong channel partners spread over 58 countries.

MicroStep is offering the full range of contemporary cutting technologies – plasma, laser, oxyfuel and waterjet – along with a great variety of supplemental equipment and software for milling, drilling, tapping, countersinking, marking, process synchronization, automated material handling and robotic solutions. As a producer of not only the machines themselves but also of control systems and CAM software the company delivers solutions that fit custom demands and are future-proof with respect to machine extensions in size and additional technologies.

MicroStep's machines can process different types of materials including plates, pipes, profiles, beams, domes and elbows while implementing advanced automation processes. All of MicroStep's machines are controlled by a multi-tasking PC-based control system developed and produced in-house. The focus of the company are hi-tech machines that accommodate industry's latest trends – delivery of fully automatic workplaces, which integrate different cutting/drilling/marking technologies in combination with automatic loading and unloading systems, following demands for higher level of machinery automation and interconnection of control systems, CAM software and ERP systems.

MicroStep's rapid growth in its 30+ years' history resulted in founding of several subsidiaries, most notable of which are MicroStep Europa GmbH in Germany, MicroStep USA and MicroStep China. Together with subsidiaries, the company has a total of over 500 employees, out of which more than 10 % are working in the field of integrated development of mechanical and electronic nodes of CNC machines and control system software. The company operates two production sites in Slovakia in the towns of Partizánske and Hriňová. In addition to its own R&D base, MicroStep works closely with departments of the Slovak University of Technology in Bratislava and the Institute of Materials & Machine Mechanics of the Slovak Academy of Sciences on utilization of latest achievements in design and control of machinery.

Thanks to its innovation driven production, MicroStep has become a valued partner for industry´s leading manufacturers: Hypertherm, Kjellberg, IPG, nLight, II-VI, Precitec, KMT, BFT, GCE, Harris in the field of cutting technology; Bosch Rexroth, THK, HIWIN in the field of linear motion components; Festo, Asco Joucomatic in the field of pneumatic components; Donaldson, Kemper and Teka in the field of filtration systems, Panasonic and Schneider Electric in the field of motor controls and ABB, Fanuc, Mitsubishi and Stäubli in the field of robotics.

Multi-functional CNC cutting machines

PLASMA – LASER – OXYFUEL – WATERJET – MILLING – DRILLING – TAPPING – COUNTERSINKING – MARKING

- Processing of plates, pipes, profiles, beams and domes
- Multiple technologies in a single machine
- A wide range of processes & accessories
- 2D CAM, 3D CAM & CAPP production management software
- Automation & digitalization solutions
- Robotic solutions

The MicroStep World

Covering more than 50 countries worldwide

MicroStep | Your Partner for Cutting and Automation

Through a network of authorized representatives, MicroStep is present in 58 countries. More than 90% of our production is destined for export. Apart from our home market – Slovakia – and almost all European countries, MicroStep cutting machines also operate in the USA, Canada, China, Russia, South Africa, the Middle East, India and Australia. In the field of plasma cutting, the company belongs among the world's largest producers.

Contact the MicroStep representative in your area to discover the variety of MicroStep's products and features!

MicroStep spol. s r.o.

Alex Makuch
Managing Director
MicroStep

„Our success would not be possible without strong partnerships with our suppliers and, most importantly, without the profound commercial and technical abilities of our sales partners. Together we make it happen."

Our customers | Strong partnerships at a global level

The technology of MicroStep and our long-term experience in the cutting and automation fields have helped us to build a user base spread across many different industries, from schools and small workshops to big multinational enterprises. The know-how of our employees helped realize more than 3,000 cutting machines worldwide. We appreciate the trust of each of our customers, among others:

MicroStep®

Your Partner for Cutting and Automation

Complex & Multi-functional

There is hardly any other CNC system with such a variety of technologies provided by a single machine for such a variety of materials: sheets, pipes, profiles, beams as well as domes. MicroStep is offering such versatile and efficient solutions by nature.

See the cut sample above – bevel cutting of contours and openings, drilling, tapping, countersinking, punch marking and contour marking, all delivered in a fully automatic mode by our multi-functional plasma all-rounder MG.

Contact the MicroStep representative in your area!

For more information visit:
www.microstep.eu/dealers

Selected References

Information on all MicroStep cutting systems can be found in our current reference brochure.

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