FIBERMAK Momentum Gen-3
New Generation Fiber Laser
After half a century, Ermaksan is moving confidently into the future

With 50 years of technological investment and our innovative R&D department, Ermaksan has become one of the world’s leading companies in the sheetmetal fabrication machinery industry.

Ermaksan is a pioneer in the industry with strong R&D department, 80,000 m² modern production facility, highly qualified team of 800 staff dedicated to high quality manufacturing of our machine tools.

Our factory is equipped with the latest industry leading precision CNC machines. Under the supervision of expert engineers, the factory manufactures 3,000+ machines annually. Ermaksan is one of the world’s leading companies in the industry represented by exclusive dealers around the world with strong technical support in 70 countries.

Ermaksan designs and manufactures durable, productive, and value based machinery. We do this by, continuously meeting customer demands and exceeding industry standards towards sustainable growth.

High Tech CNC machines manufactured by Ermaksan:
- New Generation Fiber Lasers
- CO₂ Lasers
- Press Brakes
- Servo Motorized Hybrid Press Brakes
- Plasma Cutting Machines
- Punch Presses
- Shears
- Iron Workers
**FIBERMAK** Momentum Gen-3

New Generation Fiber Laser

**Front Door with safety sensor**
Sliding front door that stops the system in order to ensure operator safety while the door is open.

**Conveyor**
Conveyor system that collects small parts and slag in a collection reservoir after cutting.

**Protection Glass**
Special coated filtering 1070 μm laser wavelength protective windows.

**Shuttle Table**
Pallet change table for improved productivity and precise sheet positioning.

**User Friendly Controller**
Easily trainable 15” color touch-screen control.

**New Safety Standards**
Light barrier protection for working safely according to CE standards.
Micron-rated precision achieved with Travelling Column Duplex Milling Machines

- Drives, encoders, and rails have to be placed on precision surfaces. Even the slightest defects can cause serious damage to drives and encoders. This is why, main body of Fibermak is machined perfectly on Travelling dual Column Soraluce CNC machine towers.
- Encoders, linear motors and rails on linear model machines and rack & pinions and rails on Servo motor machines are machined on CNC machines with micron-rated precision. This is the foundation of the high tolerance processing achieved with the Fibermak.

The Fibermak, built for long-life with precision components and its rigid construction, is able to work continuously and precisely in the most severe conditions.

- 4 Axis (X, Y, U, Z)
- Servo Motor
- Auto - focus cutting head
- Laser Source
- Chiller Unit
- Clean-dry air system
- Safety Cabinet
- Automatic-Dual Shuttle Table
- CAD/CAM Software (Lantek, Metallix, Almacam, Sigmatek, Radan)
- 15” Touchscreen Controller
- Conveyor
- Warning Lamps
- Nozzle Set
- Nozzle Cleaning & height calibration plate

Shuttle table body frame (Optional)
Linear motor technology is used on Fibermak’s U,X,Y movement.

The working principle of the Linear Motor

The working principle of the Linear Motor is based upon the laws of magnetism. One magnet one electromagnetic motor apply force to each other when placed face to face.

The principle of movement

The moving part of a linear motor is directly coupled to the machine load, saving space, simplifying machine design, eliminating backlash, and removing potential failure sources: Ballscrew systems, couplings, belts, or other mechanical transmissions. Linear motor gives better positional repeatability and accuracy over unlimited travel at higher speeds.

Main Advantages of Servo Motor Systems

- Fibermak has 4 servo motors for all axial movements. These are the latest technology single cable servo motors.
- Power and process data are transmitted in one standard cable, significantly reducing costs.
- This technology also gives more accurate positioning and more geometrically accurate parts.

Servo Motor Fibermak: is a unique machine having ultra low energy consumption and very fast cutting capability with minimum maintenance cost.

Linear motor technology is used on Fibermak’s U,X,Y movement.

Main Advantages of Servo Motor Systems

- Low investment cost for a high performance machine
- Low energy consumption
- Easy repair and maintenance
- Low repair needs
- High linear rigidity

Power and process data are transmitted in one standard cable, significantly reducing costs.

On Linear Motors, position information is read from linear encoders by an optical receiver.

Linear motors are working in a frictionless environment.

- Rapid speed and acceleration.
- Maintenance-free.
LASER SOURCE
- The Ytterbium solid state laser beam is created inside the laser unit. Excitation is performed by laser diodes enabling high efficiency with low costs. Laser beam created at the resonator is transferred to the cutting head by a fiber-optic cable without loss of power or quality. This provides a high beam quality appropriate for metal cutting.
- The Power range of resonator source is between 500W and 6 kW. As the power increases so does the cutting speed and capacity respectively.
- Fiber Lasers are inherently made for maintenance-free production. The importance is sustainable diode life lasting approximately 100,000 hours.
- In any defective situation, part changing is easy because modules are designed for plug-n-play.

CHILLER UNIT
- The chiller unit cools down the laser source, the linear motors, and collimation unit inside the cutting head.

EXTRACTION UNIT
- It provides a convenient working area by absorbing little particles and smoke occurs while in production. It automatically works once the cutting starts.
- The suction cells open actively according to the cutting head’s position. This provides accurate absorption.

COMPACT AUTOMATION BOARD
- Fibermark’s automation equipment modules consist of drivers, IO units, height sensor, focal unit, shutter table equipment etc. and their connections.
- The automation board enables the correct connection and cabling in the system resulting in a less defective ratio.
- This will provide easy servicing.

CONVEYOR
- The conveyor is situated under the cutting area where small parts and scraps drop to a wheeled container.

SHUTTLE TABLE
- It has two hydraulic and dynamic tables allowing continuously production while processing goes on. The operator collects cut parts and loads the next material for processing.

Two Hydraulic & Dynamic Tables for Continuous Cutting

ErCut 7 Control Panel
User Friendly Interface
- Simple and easy interface thanks to provide a convenient and reliable user experience to the user.
- Error and warning messages which are indicated by the pop-ups, will give the best user experience to the users.
- High gloss & resolution, coloured, 7” touch screen.
- Touch screen lifespan : 1.000.000 touch
The laser beam is delivered to the cutting head by fiber optic cable with QBH connector.

The laser is delivered to the focusing lens after being collimated by collimation lens.

Laser beam is set to desired focus point by automatic focusing unit.

The protection glass protects the optics from the particles which are caused by the cutting operation.

The sensor insert is the unit of height control system and helps to adjust the distance between material and cutting head.

Height of the cutting head is controled with the most precise sensors in the market. This helps to produce better cuts.

The nozzle is used to control the assist gases. It is also a part of the capacitive sensor of height control system.

Cutting head has three protective glasses, so optics are isolated from outside factors.

Cutting head has bluetooth connection ability to give details about the cutting head without stopping cutting processes.

Decreased weight of the cutting head gives ability to move easily between parts.
POWER IS UNDER YOUR CONTROL

USER FRIENDLY BUTTONS

- Provide automatic shuttle table control, conveyor, extraction unit, laser unit control, focus reference, HSU calibration, shutdown and service positions, etc.
- Specific functions are easily reached with user friendly buttons, instead of surfing through the pages in HMI monitor.

CONTROLLER

- The controller lets the operator command the machine.
- The controller is durable to all environmental effects.
- Active touch screen and functional keyboard.
- Short cut buttons provide ease-of-use. You can access the desired functions faster and easier.
- Speed adjustment potentiometer allows you to adjust the axes velocities even during the cutting operation.
- NC graphic shows online nesting.
TECHNICAL FEATURES

- All the options of CAD/CAM software are fully integrated in one single program; designing a part, importing, nesting (automatic or manual) will be achieved from the same program without switching.

- Production Management Processes: CAD/CAM software is ready for connection to production management systems (ERP) by means of automatic processes.

- Teamwork: Available for operation as a standalone productivity cell, or as part of a network system.

- Part Management and sheet store with open databases: All part info is saved and organized in databases so that users can easily locate the part and sheet required.

- Large library of parametric parts in 2D with advanced options for geometry and editing.

- Calculation of real time and cost: CAD/CAM software calculates cutting time and cost of the entire sheet. Taking into account the number of piercings, the cut length, the mark length, the material costs, the hourly machine rate, the cost of consumables are based on the machine data.

AUTOMATIC NESTING

- Manual and automatic nesting with great flexibility and maximum performance.

- The perfect combination of automatic and semi-automatic nesting along with powerful manual nesting functions like: copying, moving, rotating, adjoining, etc.

- CAD/CAM softwares’ automatic nesting optimises to the maximum arrangement of parts on the sheet.

- CAD/CAM software generates remnants on nestings. Just like for sheets, margins can be defined for remnants.

TECHNOLOGY

- CAD/CAM software cut allows to configure and manage the type and value of lead-in/lead outs for different types of contours.

- Common line cutting can be achieved on several parts or just limit to pairs of parts.

- It detects errors in the design and machining.

- With the help of the microjoints, parts will stay attached to the material which helps to collect parts easily.

FIBERMAK Momentum Gen-3 is designed to cut different thicknesses and types of materials such as steel, stainless steel, aluminum, brass, copper and galvanized steel.

- Higher cut quality is achieved by precise cutting parameters prepared by Ermaksan engineers. When necessary, the operator can also change the parameters.

- Laser unit can be selected between 500 W to 6 kW. Selection of the laser cutting unit power, directly relates to the thickness and cutting speeds of the machine. The following table shows a list of the materials that can be cut by the FIBERMAK.

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<td>Mild Steel</td>
<td>5 mm</td>
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<td>16 mm</td>
<td>18 mm</td>
<td>20 mm</td>
<td>25 mm</td>
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<td>Stainless steel</td>
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<td>8 mm</td>
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<td>Aluminum</td>
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<td>2 mm</td>
<td>6 mm</td>
<td>6 mm</td>
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<td>8 mm</td>
</tr>
<tr>
<td>Galvanized</td>
<td>1 mm</td>
<td>2 mm</td>
<td>4 mm</td>
<td>4 mm</td>
<td>4 mm</td>
<td>5 mm</td>
</tr>
</tbody>
</table>

- Sheet metal cutting thicknesses and speeds varies when the factors such as material quality, assist gas purity, environment conditions, parameter setting, original spare part usage, periodic maintenances, cleanliness of optics are not proper.

- Cutting surface roughness increases at bigger thicknesses by fiber laser technology.
Powerful motors provide high acceleration and speed

The most time loss is during the cutting and movement between the parts. Here, the acceleration of the axes is very important. Fibermak servo motor machines run, 1.5 G acceleration and 2.4 m/sec speed, linear motor machines run 2.5 G acceleration and 2.8 m/sec speed. This provides a serious time advantage passing through the parts.

Lift type transition enables high-speed movement between parts

Velocity and acceleration speed is important while moving between the parts. Fibermak Momentum Gen-3 uses part and aperture avoidance, raising the cutting head in the cycle, which allows you to reach maximum speed.

Ultra fast communication with EtherCAT

Using EtherCAT connections allows for ultrafast communication resulting in faster control. Increasing the speed of control, ie Laser on/off speed, gas on/off speed etc. increases cutting capacities.

Fly-CUT feature

Both circular and equilateral parts can be cut with Fly-Cut feature of Fibermak Momentum Gen-3.

Cutting with dry air

Together with additional equipment (compressor, booster, filter, tank etc.) materials can be cut by dry air. Machine is pre-prepared for this choice.

Cutting process is performed with active G code structure within minimum duration

G code flow is important when performing any action on the Fibermak with a CNC controller. G code flow on the Fibermak is designed to achieve the desired result using the shortest route. The time loss is minimized during operational transitions.

You can prevent time and energy loss while cutting thin materials by using No Pierce and No Lead In features.

Fibermak Momentum Gen-3 incorporates fast part processing techniques allowing you to save time and reduce energy waste during production.

- Cutting with No Pierce
  - Cutting thin sheet metal without piercing gives a significant economic advantage.

- Cutting with No Lead In
  - No Lead In is cutting without passing, providing much faster cutting speeds.
**User Friendly Interface**

- **Job List**
  Used for continuing work automatically by the next program even for different material types and thicknesses by automatic parameter selecting.

- **Manual Remnant**
  A cutting function used for removing the part from scrap plate after cutting process of material.

- **Job repeat and sheet angle detection**
  Starting point and sheet angle detection are all features of the Fibermak.

- **Only pierce feature**
  Achieve high-quality cuts while cutting thick sheets.

- **Online parameter changing**
  Operator can make changes to the parameters during the cutting process.

- **Graphical chase with NC Graphic**
  Watching the real-time cutting process graphically with NC Graphics.

- **Practical solutions**
  Axes move to the start point with pressing just one button.

- **Film Burning**
  You can use various film burning options.

- **Work report at PDF format**
  You can keep detailed work report as PDF of the cutting process.

- **Feedrate changing during the cut**
  You can reduce or increase the speed during the cutting process.

- **Inch-Meter conversion**
  Fiermak can work in both imperial and metric systems.

- **Languages**
  As standard includes English, Russian, Italian, Spanish and Polish. Other languages are possible on request.

- **Check part**
  After cutting first part with this option feature you can check the parameters and cutting quality.

- **Gas control with PID**
  Faster, better and more precise gas control with PID.

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**Optional Equipment**

- Air conditioner for electrical panel.
- 0.5 kW, 1 kW, 2 kW, 3 kW, 4 kW and 6 kW laser source options.
- Extraction unit.
- Light safety barrier.
- Loading table with pneumatic ball transfers

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**Full Automatic Sheet Metal Loading & Unloading System**

- Linear motor technology.
- High acceleration of 2.5 G on Servo Motorized models by Momentum Gen3 G Force version is available as an option.
- The productivity is increased average 15% per hour by higher acceleration and consequently the speed and gaining in time is higher.

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**Easy Interface Design**

- User friendly
- Control from single-point
- Practical solutions

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### TECHNICAL FEATURES

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<th>SM 1100.3x1.5</th>
<th>SM 2000.3x1.5</th>
<th>SM 3000.3x1.5</th>
<th>SM 4000.3x1.5</th>
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<tbody>
<tr>
<td><strong>POSITIONING ACCURACY</strong></td>
<td>mm ± 0,015</td>
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<tr>
<td><strong>REPETITION ACCURACY</strong></td>
<td>mm ± 0,025</td>
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<tr>
<td><strong>WAVE LENGTH</strong></td>
<td>mm 1070 ± 5</td>
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<td><strong>OUTPUT FIBER CORE DIAMETER</strong></td>
<td>µm 100</td>
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