

## **HD-TC**

Laser Tube Cutting



- Easy To Use
- High Quality Cutting
- Low Energy Consumption
- Faster
- Efficient
- Winning
- Ergonomic



**DURMA** The Winning Force





As a total supplier for sheet metal manufacturing with almost 60 years of experience, Durma understands and recognizes the challenges, requirements and expectations of the industry. We strive to satisfy the ever higher demands of our customers by continuously improving our products and processes while researching and implementing the latest technologies.

In our three production plants with a total of 150.000 m<sup>2</sup>, we dedicate 1,000 employees to delivering high quality manufacturing solutions at the best performance-to-price ratio in the market.

From the innovations developed at our Research & Development Center to the technical support given by our worldwide distributors, we all have one common mission: to be your preferred partner.

Present Durmazlar machines with **DURMA** name to the world.



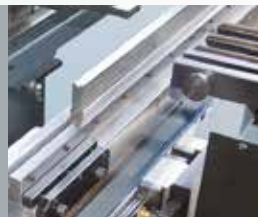
1

High technology,  
modern production  
lines



2

Top quality  
components



3

High quality  
machines designed  
in R&D Centre

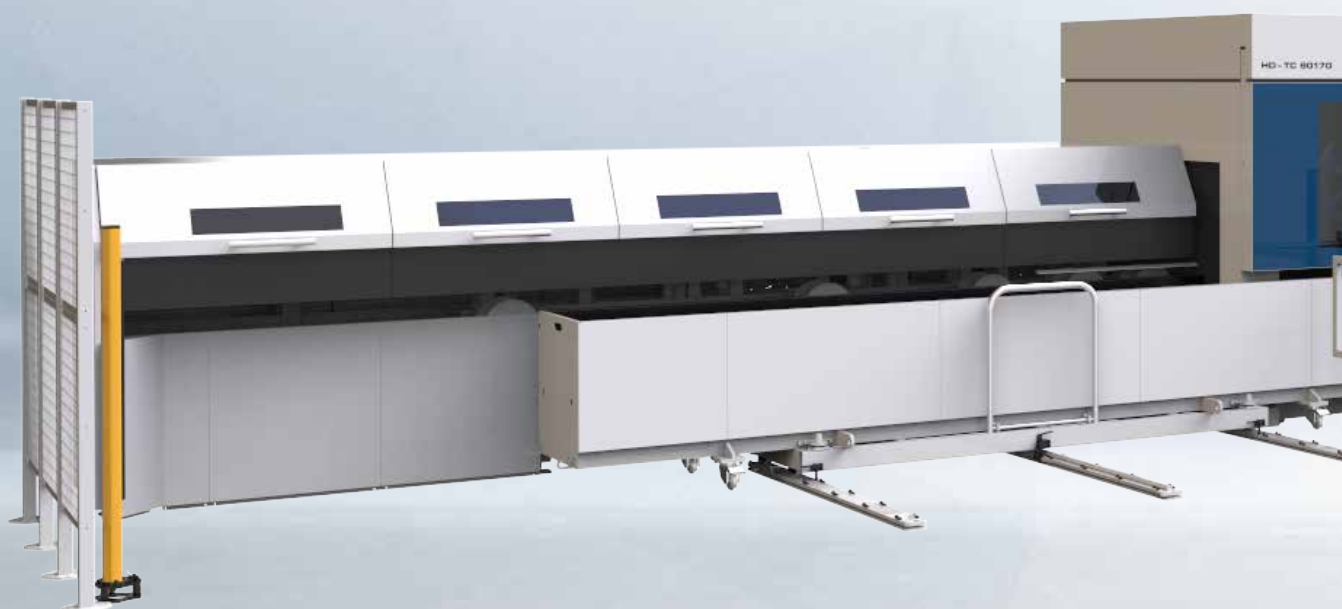
# HD-TC

## LASER TUBE CUTTING

Laser tube cutting is specifically designed for businesses that care about high quality tube (Max. Diameter 220 mm ) and profile (Max. Square 160 mm and Max. Rectangle 200 x 100 mm) 2D and 2.5D cutting. Using a laser cutting power of up to 4 kW, pipes and profile materials of thicknesses from 0.8 mm to 10 mm are cut. Full automatic Loading and Unloading requires less effort and time save for the operator.

The moving axes operate via maintenance-free, dynamic and high-performance AC servo motors. Suction system is used to vacuum the dust generated during laser cutting to the dust collection filter. Automatic pipe and profile loading system is designed in accordance with the principle of reducing the material preparation time and automatic pipe and profile unloading system to collect the cut materials without stopping the machine. Thanks to the compact layout of the machine, all pipe and profile loading / cutting / unloading actions are performed with less space and less processing.

HD-TC Lasers make differences with speed, high quality components, efficiency and industrial design.



User  
Friendly

Ergonomic

Efficient

Fast

Reliable  
Brand



# HD-TC 60170 Compact LASER TUBE CUTTING



You can use Durma HD-TC Compact Profile Cutting Laser for processing pipes or profiles produced in different materials and shapes in many sectors such as construction equipment, defense industry, automotive sector, agricultural machinery, furniture and industrial shelf sector.

Precise and fast profile and pipe cuts are guaranteed with easy manual loading, hydraulic drive chuck, pneumatic center chuck, support arms.

Thanks to our Durma Pipe Cutting Laser Machine with continuous improvement that will ensure you to increase profitability by creating new applications or improving your existing jobs and even you may enter new industrial sectors.

Durma HD-TC Compact Profile Cutting Laser ;

- Save time, reduce the number of components
- Cut profiles with more precision and faster and easier assembly
- Complete your part in one "COMPACT" machine with one program, one process step

| Technical Data                            |                                      |       |
|-------------------------------------------|--------------------------------------|-------|
| <b>Capacity</b>                           |                                      |       |
| Max. Pipe Diameter                        | Ø170                                 | mm    |
| Max. Square Profile Dimension             | 120 x 120                            | mm    |
| Max. Rectangular Profile Dimension        | 150 x 100                            | mm    |
| Min. Pipe Diameter                        | 20 (12 Manual)                       | mm    |
| Max. Material Length                      | 6500                                 | mm    |
| Min. Length of Remaining Material         | 145                                  | mm    |
| Unloading Length                          | 4500 / 6000                          | mm    |
| Max. Material Weight                      | 37.5                                 | kg/m  |
| Max. Total Workpiece Weight               | 210                                  | kg    |
| Profile Types Can Be Cut                  | Round, square, rectangular, elliptic | kg    |
| Height of Chuck Center                    | 1150                                 | mm    |
| <b>Dynamics</b>                           |                                      |       |
| X Axis                                    | 60                                   | m/min |
| Y Axis                                    | 60                                   | m/min |
| Z Axis                                    | 30                                   | m/min |
| A Axis                                    | 840                                  | °/s   |
| <b>Accuracy*</b>                          |                                      |       |
| Positioning Accuracy                      | ±0.02                                | mm    |
| Cutting Accuracy                          | ±0.20                                | mm    |
| Tube Center Search with Capacitive Sensor | Yes                                  |       |
| <b>Control Unit</b>                       |                                      |       |
| CNC                                       | SINUMERIK; 840D SL; NCU 720.3PN      |       |
| PC: PCU50.3                               | 19" Touch panel                      |       |

\*The maximum possible precision on the workpiece depends factors on the type of workpiece, its pretreatment.

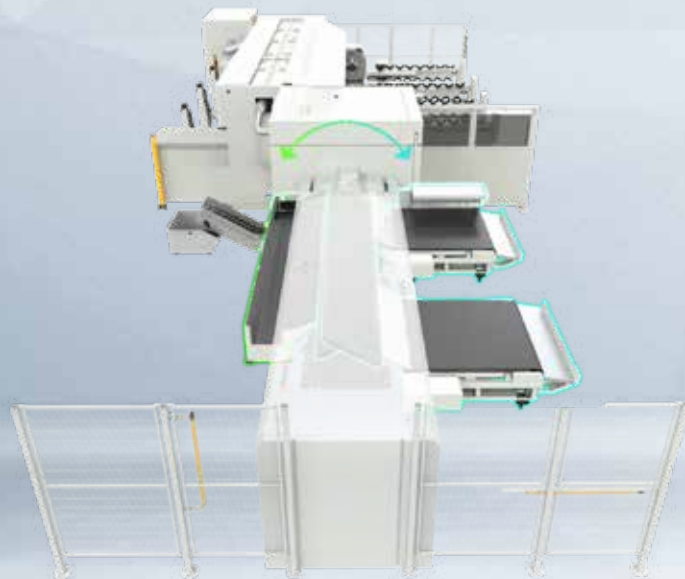
Measurement length is 1 m.

# HD-TC 60220 & HD-TC 80220

## LASER TUBE CUTTING



- Both – sides ( front & back ) unloading system
- Semi automatic loading system (upto Ø220 mm), automatic loading system (upto Ø170 mm)
- Ø220 mm profile diameter,
- 160x160 mm square tube dimension,
- 200x100 mm rectangular tube dimension, maximum cutting sizes.



The automatic unloading system is designed in accordance with the principles of separate training stacking according to the cut parts. The automatic unloading system is a two-directions system, which has the conveyor on the front and the unloading bucket on the back. Up to costumer request, it is possible to unload on both side.

The automatic loading system was designed in accordance with the principle of bringing materials which were loaded as bundles, to the line after measuring one by one. During cutting, the next material is taken to ready position to load cutting line.

Automatic loading is used for profile sup to Ø170. Semi automatic loading system is suitable for profile between Ø12-220 mm. Profiles is loaded manually to 8 pcs. carrying grippers. And system makes loading process to the machine automatically.

## Technical Data

|                                            |                                      |      |
|--------------------------------------------|--------------------------------------|------|
| Max. Pipe Diameter                         | Ø220                                 | mm   |
| Max. Square Profile Dimension              | 160 x 160                            | mm   |
| Max. Rectangular Profile Dimension         | 200 x 100                            | mm   |
| Min. Pipe Diameter                         | 20 (12 manual loading)               | mm   |
| Max. Pipe Diameter For Automatic Loading   | Ø170                                 | mm   |
| Max. Tube Size For Automatic Loading       | 150 x 100 , 120 x 120                | mm   |
| Max. Material Length                       | 6500 / 8500                          | mm   |
| Min. Material Length For Automatic Loading | 3000                                 | mm   |
| Min. Length of Remaining Material          | 150                                  | mm   |
| Unloading Length                           | 4500 / 6000                          | mm   |
| Max. Material Weight (kg/m)                | 52                                   | kg/m |
| Max. Total Workpiece Weight                | 310                                  | kg   |
| Max. Bundle Weight                         | 3000                                 | kg   |
| Profile Types Can Be Cut                   | Round, Square, Rectangular, Elliptic |      |
| Open Profile Types Can Be Cut              | C,L,U                                |      |



### Front Chain Loader - Semi Automatic ( For Tubes > Ø170)

- 8 tubes can be loaded to chain loader at once.
- Different types of tubes can be loaded at once. (In the order in the part program list)
- Ø12 - Ø220 tubes can be loaded.
- After loading to cutting line, the tube length is measured automatically by measuring system

### Driver Chuck

- It can hold variety of profiles by 4 clamps working independently as 2+2.
- Adjust pressure automatically according to profile material thickness.
- Fast and reliable clamping process with measuring position of jaws.
- Clamping range: Ø20-Ø220 (Ø12 optional)



## Control Panel

The Sinumerik 840DSL CNC controller is an efficient 64-bit microprocessor system with an integrated PC. The controller has a Durma operator interface and a complete cutting database for all standard pipe cutting applications.

The database includes the cutting parameters for standard tubes and profiles (steel, stainless steel, aluminium) for common thickness ranges. Based on these reference values the operator can easily improve the cutting quality for different types of materials.



## Rack and Pinion Motion System (HD-F Series)

Axes motions achieved by rack and pinion design. There are low backlash gears between the motor and the pinion which otherwise could cause precision losses. High precision two-day, hardened helical racks with low clearance make it possible to achieved very high acceleration ( $10 \text{ m/s}^2$ ), speed (100 m/min.) and accuracy (0,05 mm) values.



| Resonator                 | 1.0 kW                                                                                                                       | 2.0 kW       | 3.0 kW       | 4.0 kW       |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|
| Product designation       | YLR/YLS-1000                                                                                                                 | YLR/YLS-2000 | YLR/YLS-3000 | YLR/YLS-4000 |
| Available operation modes | CW, QCW, SM                                                                                                                  |              |              |              |
| Polarization              | Random                                                                                                                       |              |              |              |
| Available output power    | 100-1000 w                                                                                                                   | 200-2000 w   | 300-3000 w   | 400-4000 w   |
| Emission wavelength       | 1070 -1080nm                                                                                                                 |              |              |              |
| Feed fiber diameter       | Available in single mode, 50,100, 200, 300µm                                                                                 |              |              |              |
| Ancillary Options         | Options Available: Internal coupler, Internal 1x2 beam switch, Internal 50:50 beam splitter, External 1x4 or 1x6 beam switch |              |              |              |
| Interface                 | Standard: LaserNet, Digital I/O, Analog Control Additional Options: DeviceNet or Profibus                                    |              |              |              |

| Material (Cutting Capacity)* | 1.0 kW | 2.0 kW | 3.0 kW | 4.0 kW |
|------------------------------|--------|--------|--------|--------|
| Mild Steel                   | 4 mm   | 8 mm   | 10 mm  | 10 mm  |
| Stainless Steel              | 2 mm   | 5 mm   | 6 mm   | 6 mm   |
| Aluminium (AlMg3)            | 3 mm   | 6 mm   | 8 mm   | 8 mm   |

\* Standard cutting parameters

## Low Operating Costs

- Low energy consumption
- Low cost per component
- Optimised focal distance for all thickness values
- Maintenance free operation
- Compact design, fast installation
- Rigid body structure, high durability

- The laser power is controlled as a function of the path, velocity, time and travel.
- Close-loop working.
- Optional functions.
- 6 MB expanded user memory, external memory option.
- Advanced optimisation: tools optimisation.
- Fast tool way collision protection. Toolway optimisation to prevent damage from possible deformed material.
- Writings supported by your operating system can be applied directly on the material to be cut.
- Cutting direction, clockwise or opposite is supported.
- Advanced corner applications provide perfect corners and soft cutting.
- Fillets, cooling, slowing down, circulation.
- Shared Cuttings: This function is especially useful for thick plates and reduces the need of marking holes during cutting.
- Automatic entry point
- Fully automatic cutting
- Z-Axis control

## Chiller

The cooler is a device that provides cooling of the laser power source, optics in the cutting head. It has a water based cooling system.

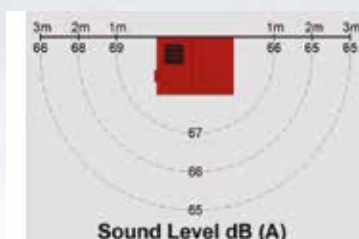
Thanks to the dual circuit system, cooling water is sent at different temperatures, which are needed for optics and laser power supply.



## Filter

It provides a healthy working environment by absorbing smoke, dust and small particles formed during cutting. The vibrating dust collection filter is fully automatic. It runs automatically when cutting is started.

Filter cartridges are a compact unit with integrated fan motor assembly and jet-pulse (back blow) cleaning system.



Low noise level



Easy access to filters and dust bins

# 2D & 2.5D CUTTING HEAD

## THE NEW GENERATION OF EFFICIENT CUTTING HEADS

For flatbed cutting systems : The cutting head LightCutter 2.0 is the perfect solution for efficient and cost-effective laser cutting .The new generation of our Light Cutter family is designedfor cutting applicationsin the medium power range up to 4 kW and is characterized by a high cutting quality for all metalls – especially mild steel, stainless steel and aluminum.

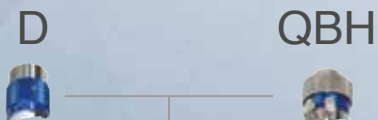
Thanks to an automated motor – driven adjustment ofthe axial focus position, the cutting head Works precise and stable at all times, even at accelerations of up to 3G. The display of the set focus position on the front of the cutting head makes commissioning much easier. The LightCutter 2.0 Motorized covers a large focus position range of 23 mm.

The flexible cutting head is available in 2D & 2.5D versions: While the 2D version is suitable for integration in flatbed and simple tube and profile cutting systems, the 2.5D version ia ideal for use in professional tube and profile cutting systems as well as in demanding free-form applications. The narrow contour of the 2.5D cutting head's lower sectionenables even complex cuts on tubes, profiles and free-form parts withan inclination angle of up to 45 degrees.

### Flat Cutting (2D)

applications

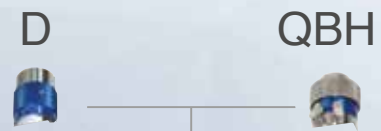
### Bevel Cutting (2.5D)



LightCutter 2.0  
Motorized



fiber socket



| Tube-Cutting Technical Specifications            |                                      |
|--------------------------------------------------|--------------------------------------|
| Max Diameter (mm)                                | Ø220                                 |
| Max Square Tube Dimension(mm)                    | 160x160                              |
| Max Rectangular Tube Dimension (mm)              | 200x100                              |
| Min. Diameter (mm)                               | Ø20 (Ø12 Option)                     |
| Max. Tube Length (mm)                            | 6500 / 8500                          |
| Min. Tube Length (for automatic loading)         | 3000                                 |
| Max. Tube Weight (kg/m)                          | 37,5                                 |
| Max. Material Thickness (mm) (for 2 kW )         | 8                                    |
| Min. Material Thickness(mm)                      | 0,8                                  |
| Automatic Loading                                | Yes                                  |
| Automatic Unloading                              | Yes                                  |
| Cutting Head                                     | 2D (Option 2.5D)                     |
| Amount of Chuck                                  | 1                                    |
| Centering Chuck                                  | Yes                                  |
| Last Cut Tube Length (mm)                        | 145                                  |
| Velocity of Driver Chuck (m/dk.)                 | 60                                   |
| Acceleration of Driver Chuck (m/s <sup>2</sup> ) | 10                                   |
| Cutting Accuracy (mm)                            | ±0,20                                |
| Positioning Accuracy (mm)                        | ±0,05                                |
| Tube Types                                       | Round, Square, Rectangular, Elliptic |
| Beam Types                                       | C, U, L                              |



Tubes up to 6 m of length are removed by automatic unloading system with conveyor.



### Auto Loading System

Profiles taken from bundle one by one to the chain, system moves the profile up and grippers clamp the profile and move it to the chuck axis and chuck holds the profile.



### Tube Transfer System

Tube transfer system ensures that tubes are taken to cutting line with right position.



### Chain Transfer System

Chain transfer system is used with the principle of loading stainless steel aluminium brass etc. tubes without stretching.



### Automatic Loading Gripper System

Tubes which come from loading unit are transferred to cutting zone and centered automatically.



### Measuring Profile Length

With servo motor on it measures profile length and send the data to the system.



### Hydraulic Profile Holder

It can hold variety of profiles by 4 clamps working independently as 2+2. Adjust hydraulic pressure automatically according to profile material thickness.



### Z Axis

Z axis allows faster cutting process with its high dynamic performance. Laser head with automatic focusing eliminates time loss in the preparation phase before cutting.



### Profile Support system

4 pieces support arms with servo motors obtain the loading to be the same level with hydraulic chuck. As hydraulic chuck move forward the profile at X1 axis, supports arms close down one by one to open the front of hydraulic chuck.



### Centering Chuck Tube

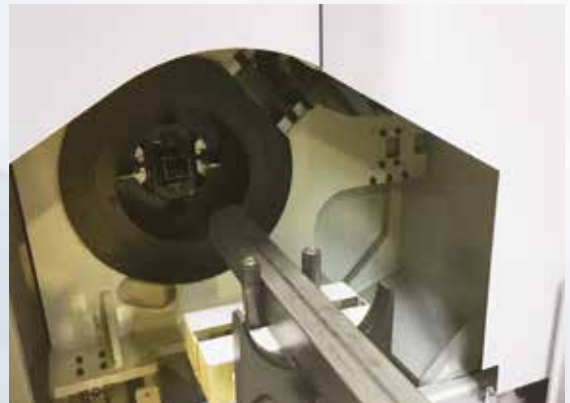
To get cutting precision, centers the profile as close as possible to cutting head. Driver turn synchronized with chuck.

4 independent clamps come to position automatically before profile comes.



### Tube Centering Mechanism

Tubes centering mechanism which is on the first support takes tubes to the chuck axis.



### Seam Detection Sensor

The Seam Detection sensor attached to the HDTC machines detects the stitched surface when the pipe is loaded on the machine and provides the ability to rotate the operator's cut holes at any angle.



### Centering System with Laser Sensors

With the newly added laser sensor centering option added to the HDTC machines, it is possible to control the size and irregular structure of the profile during cutting or before cutting with the help of sensors to ensure that the internal contours to be cut are at the right point.



### Spatter Protection System

The Spatter Protection system is used to prevent the slag coming out at the cutting edge from sticking to the opposite surface of the profile. The burrs adhering to the inner surface of the profile disrupt both the cutting quality and cause some cleaning of the inner surface of the work pieces. All these problems can be prevented by Spatter Protection system.



### 2.5 D Bevel Cutting (Option)

Perfect integration of the 2.5D bevel cutting option in HD-TC machines to obtain the required angular surfaces of the welded joints of pipes and profiles. High-speed and quality angle cutting between 0 - 45 ° angles in pipes and profiles up to 12 - 170 mm in diameter and 8 mm in thickness.



### Automatic Unloading System



For smaller parts than 800 mm, unloading table stays in outside and another small unloading system unloads the parts.



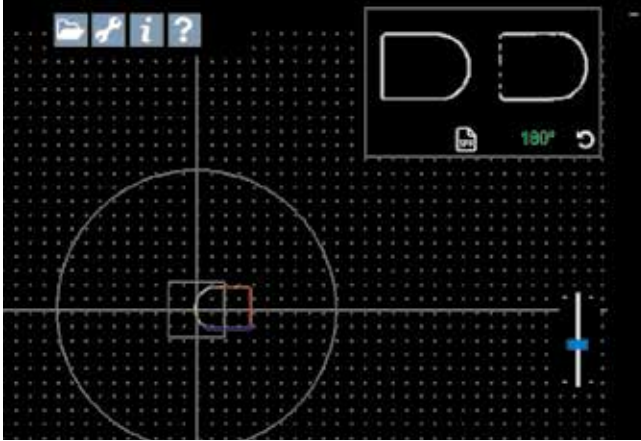
For longer parts than 800 mm, unloading table enters the cabin and unloads the parts.



# AKILLI PROFİL ŞEKİL ALGILAMA

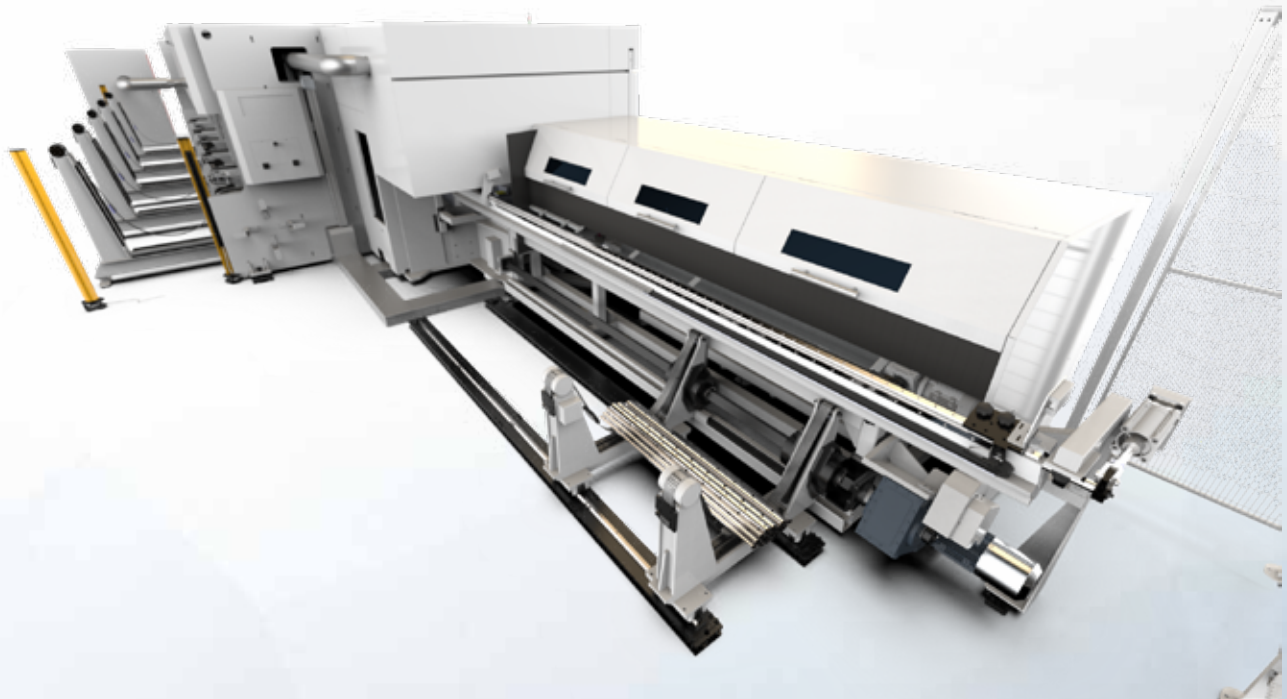
Simetrik olmayan özel profilleri otomatik olarak yükleme bir çok kullanıcının ortak sorunudur. Bu sorunu Durma Akıllı Profil Şekil Algılama Sistemi ile ortadan kaldırdık. Tüm profilleri otomatik yüklemek artık çok daha kolay ve sorunsuz. Durma profil kesim fiber lazeri, tam otomatik profil kesimini basitleştirir.

Artık özel şekilli profilleri otomatik olarak kolaylıkla yükleyebilirsiniz ki bu önceden profillerin özel geometrileri nedeniyle mümkün değildi.

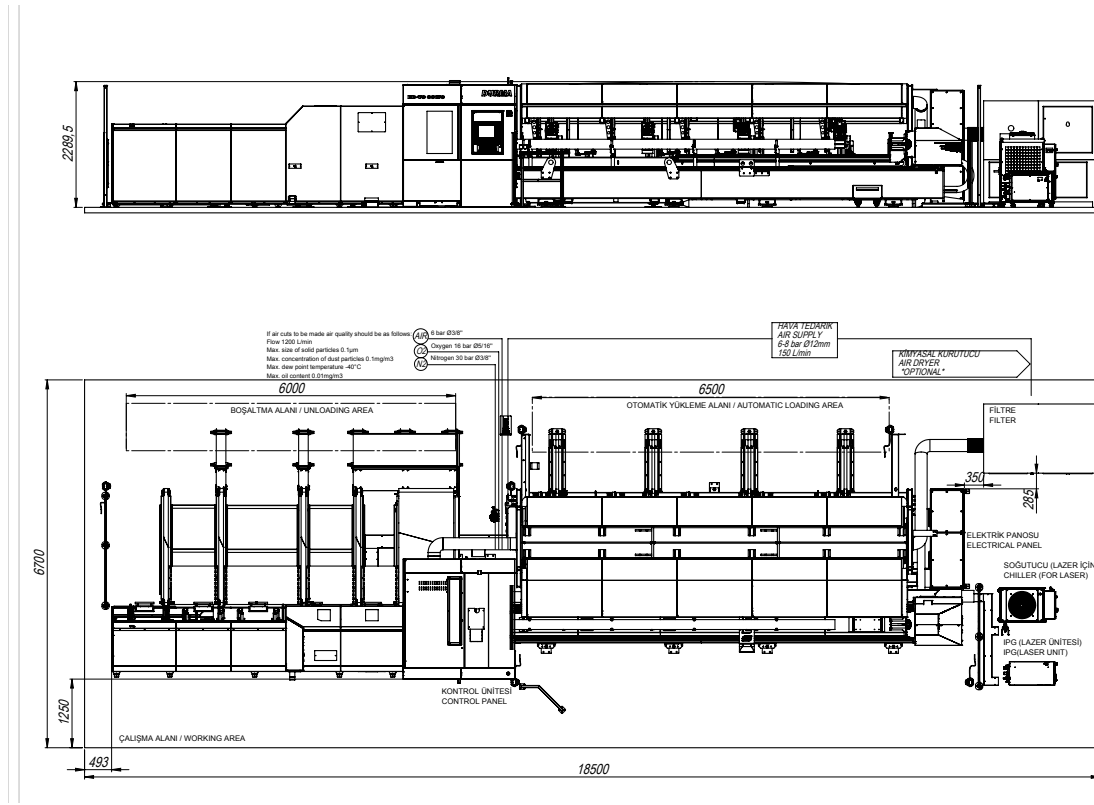


## Tam Otomatik Yükleme & İstifleme

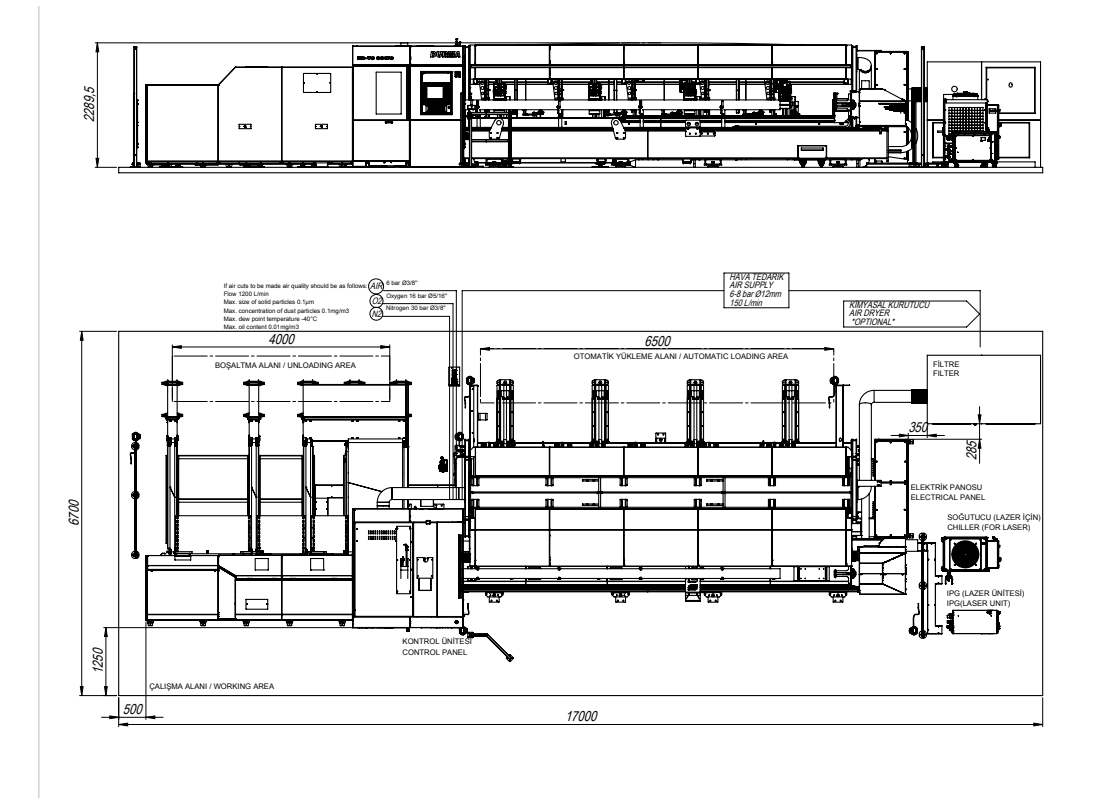
Profillerinizi kesim işlemlerinden sonra paketlemeye hazır. Durma, geliştirdiği otomatik Boşaltma ve İstifleme Sistemi sayesinde, makinada kestiğiniz profillerin ebatlarına bağlı olarak bir araya istiflenmesini sağlayarak oluşabilecek zaman kayıplarının ve fazladan işçilik masraflarının önüne geçer.



## Layout (6 m Unloading System With Conveyor)



## Layout(4 m Unloading System)



# SPECIAL APPLICATIONS



Industrial Machines



Steel Service Center



Damper Trailer



Lighting and Energy Poles

# Fast on Service and Spare Parts

DURMA provides the best level of service and spare parts with qualified personnel and spare parts in stock. Our experienced and professional service personnel are always ready at your service. Our professional training and application enriched courses will give you an advantage to use our machinery.



Consultancy



Spare Parts



R&D Center



After Sales  
Service

**DURMA**

Solution Center



Service  
Agreements



Software



Training



Flexible Solution

**DURMA**



PANEL BENDER



PUNCH



PLASMA



L ANGLE PROCESSING CENTER



IRON WORKER



POWER OPERATED SHEAR

**DURMA**



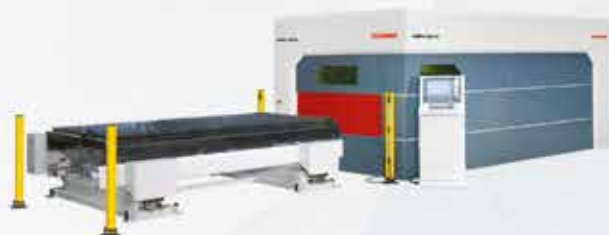
PRESS BRAKE



VARIABLE RAKE SHEAR



TUBE LASER CUTTING



FIBER LASER



ROLL BENDING



PROFILE BENDING



CORNER NOTCHER

# DURMA

## HD-TC SERIES Laser Tube Cutting

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Durmazlar Makina San. Tic. A.Ş. has right to change catalogue values and machine technical details without notice.



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