

DURMA

LASER CUTTING MACHINES

HDFL HDF HDL & HD SMART SERIES



BETTER PARTS  BETTER PROFITS

THE COMPANY

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 of technologies.

HEADQUARTERS | BURSA TURKEY



In our three production plants with a total of 1.5 million square feet, 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 the Research & Development Center to the technical support given by our worldwide distributors, we all have one common mission: to be your preferred partner.



R&D CENTER



BASKÖY FACTORY



CHARLOTTE NC

CO₂

LASER TECHNOLOGY

The diffusion cooled laser source provides a high beam quality at laser powers up to 4.5 kW with a minimal running cost compared with other CO₂ laser technologies. The laser is immediately ready for use when powering on the machine and consumes no energy when it is in stand-by.



Maintenance

There are no major parts in the laser that are subject to mechanical wear, there is no electrode erosion inside the vacuum chamber that could contaminate internal optics and there is an absence of brittle glass tubes to contain the laser medium. These unique features allow an extremely low routine maintenance, both in part cost and in down time.



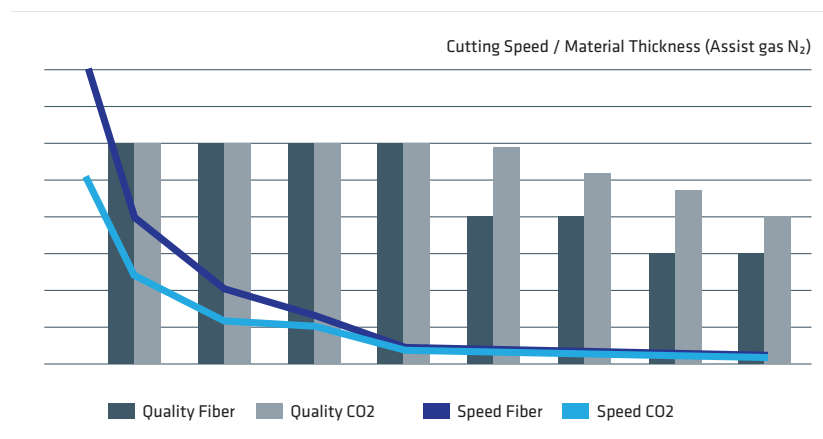
Laser Gas

Since the electrodes that provide the power to the electrical discharge in the laser medium are not in contact with the laser gas, the gas does not get contaminated and allows the laser to operate three days without the need of refreshing it.



Beam Delivery System

The laser beam propagates through a completely closed beam delivery system over-pressurized by clean, dry air. The laser beam preserves its excellent quality and has constant characteristics all over the working area.



FIBER

LASER TECHNOLOGY

The laser power source of the HDF series is an all-solid-state fiber laser. This technology reduces further the maintenance requirements and offers the lowest possible running cost with a wall-plug efficiency of 30% and without the need of any laser gas. When the application requires a broader spectrum of material types to be cut and the maximum thickness range is limited, the fiber laser is the ideal solution. It will cut faster at lower cost than any CO2 laser at the same laser power.



Maintenance

Fiber lasers are all solid state and have no mechanical parts that could suffer from wear or need adjustment. The laser source is therefore truly maintenance free and has an expected lifetime of greater than 100,000 hours.



Laser Gas

Where CO2 lasers are excited by an electrical discharge in a laser gas medium, fiber lasers are powered by diode lasers and require no gas for their operation.



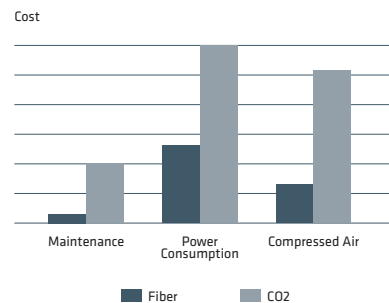
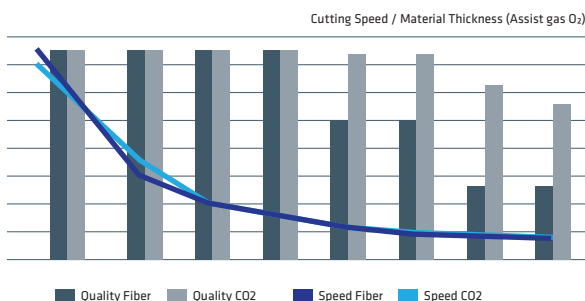
Beam Delivery System

The fiber laser light is brought from the laser source to the cutting head by a flexible glass fiber. There are no mirrors in the beam delivery that require maintenance and adjustment. The light does not travel through air, making a flushing or over-pressurizing with clean air unnecessary.



Reduced Power Consumption

Not only will fiber lasers cut faster than CO2 lasers with a similar output power, their wall-plug efficiency of 30% is more than double. There is no stand-by electrical consumption and also the cooling requirements are only a fraction of that of a CO2 laser.



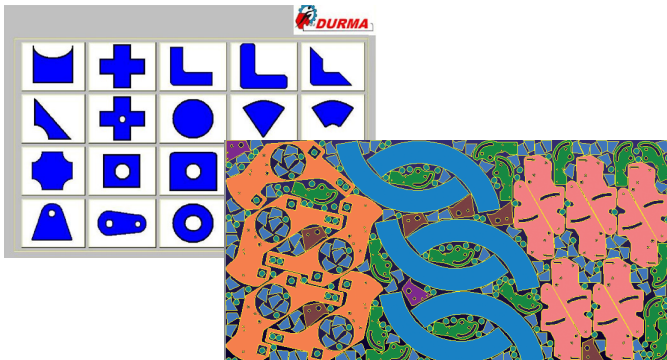
USER FRIENDLY

CONTROL + SOFTWARE



Control Unit

Durma laser machines achieve the highest dynamics and the fastest laser processing cycle times thanks to the combination of rigid mechanics and a state-of-the-art numerical control and drive system. The graphical user interface ensures an easy operation of the machine and the on-board libraries of reference cutting parameters for various materials and thicknesses allow the operator to achieve optimal cutting results in a minimum amount of time. Programs can be loaded easily into the machine with a USB stick or over a fast Ethernet connection with the company network.



CAD/CAM Nesting Software

The CAD/CAM software provided with the machine has all the tools to import or draw parts, prepare and optimize automatically the different geometries for the laser cutting process and make efficient nests.

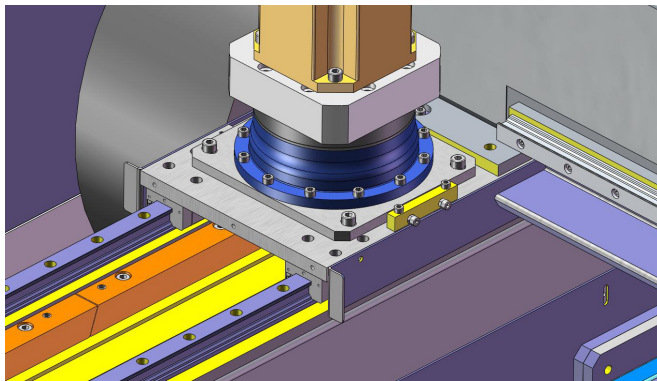
STANDARD

FEATURES



Linear Motion System

State-of-the-art linear motors narrow down further the accuracy of the machine and offer higher dynamics than the rack and pinion system. When the application demands high precision and/or require many positioning movements between complex shaped features, the linear motors will reduce the dead times in the process and increase the productivity.



Direct Drive Rack & Pinion

The stable construction concept allows extremely high acceleration values. The axes are driven by dynamic low moment of inertia and high performance AC servo motors, that require no maintenance. There are no intermediate load transmitting elements between the motor and the pinion, which otherwise could cause loss of precision. High precision two-way, hardened helical racks with low running clearance make it possible to achieve very high acceleration and speeds.



Rigid Frame & Gantry

The foundation for all Durma laser machines is a rigid stress-relieved welded steel frame construction upon which a stiff gantry axis system moves the cutting head. The design guarantees accurate parts even when cutting with the fastest speeds and under the highest accelerations.



Shuttle Table

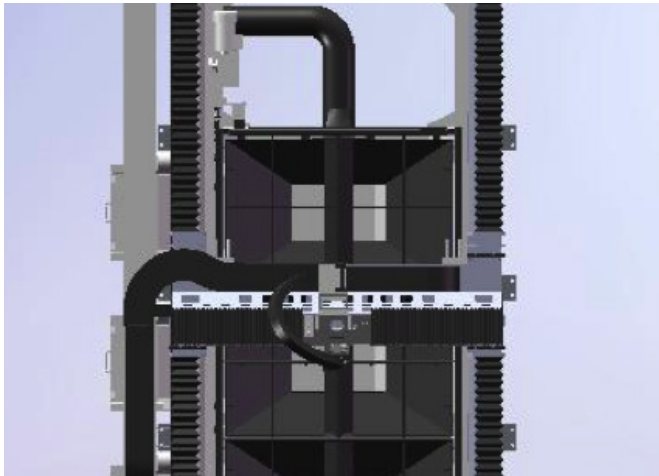
Not available on Smart Series Integrated shuttle tables are incorporated on the laser machine to maximize productivity and minimize material handling times. The shuttle table and pallet change system allows convenient loading of new sheets or unloading of finished parts while the machine is cutting another sheet inside the working area. The tables are fully electric and maintenance free. There are no hydraulic oils to handle and the table changes take place fast, smooth and energy efficient.

STANDARD FEATURES



Scrap Removal

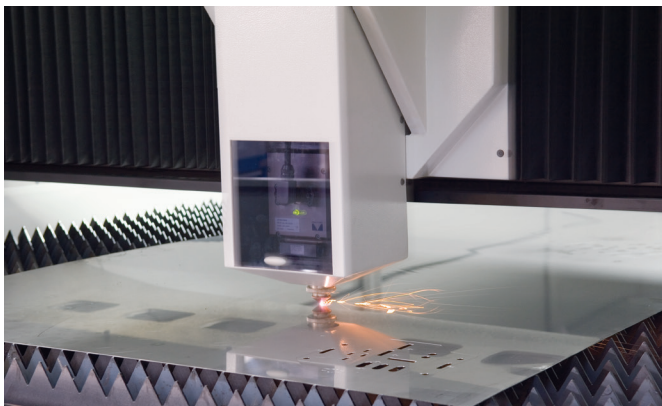
The standard lateral scrap drawers allow the removal of scrap pieces from the working area without the need to interrupt the cutting process. The sideways operation of the short conveyors allow for easy maintenance and trouble-free operation. Motorized conveyors are available as an option.



Fume Extraction System

Efficient fume extraction by means of shutters which are controlled in accordance with cutting head position results in more efficient use of the filtration system. Therefore a smaller lower cost system can be used. The system consists of six fume extraction zones (as seen below). The improved suction flow design results in:

- Smaller air flow from the dust collector
- Low electrical consumption
- Smoke and dust free machining area



Intelligent Auto Focus Capacitance Cutting Head

In the high-pressure auto-focus cutting head for fiber lasers, the cutting lens is shielded from the laser process by an exchangeable low-cost protection window. The $1\mu\text{m}$ wavelength light of fiber lasers is very sensitive to dust or other contamination produced in the cutting or piercing process, therefore the cutting head is being well protected in an additional cover to ensure that all critical parts remain as clean as possible. The integrated capacitive distance sensor is capable of having the head follow height differences in the sheet even at the extreme high cutting speeds that can be achieved with the fiber laser technology.

STANDARD FEATURES



Dust Collection & Filtration

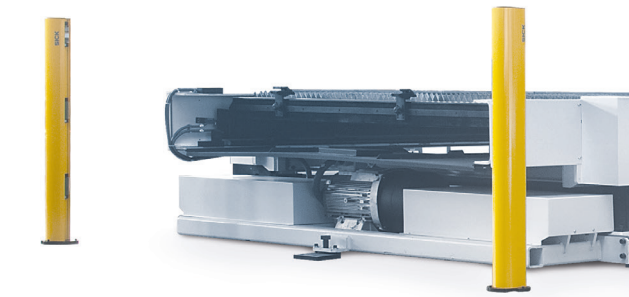
Elimination of dust, particles and harmful fumes generated during cutting:

- Intelligent control by Siemens
- Self cleaning and Easy Disposal
- Free contacts for external control
- Integrated fan
- Dust load dependent automatic filter cleaning
- Siemens CPU and PTFE membrane filter cartridges

Safety & Protective Measures

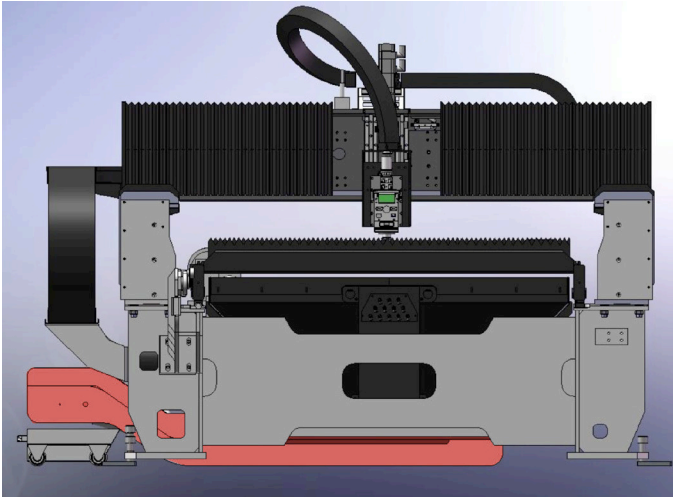
The laser cutting system, machine and CNC controller are equipped with safety devices. These switches and sensors protect the operator from hazards and counteract damage to the system. For example, incorrect path measurement programming or collision between the work piece and the machine. A diagnosis system keeps the operator informed about the current status of the system and allows him to intervene in the dialogue to make corrections that remedy these faults. The steps required for the solution appear as plain text on the controller screen.

The working area of the machine is guarded light guards. These guards can be interrupted to gain free access to insert a new sheet, lens and nozzle replacement, general maintenance and for other special purposes. During the laser cutting operation the safety devices are electromagnetically locked in order to prevent an accidental triggering of the machine's EMERGENCY STOP function. The machine's safety equipment corresponds to the CE guidelines currently in force. The laser head is guarded along the Y axis by flexiglass material which allows clear vision of the cutting area.



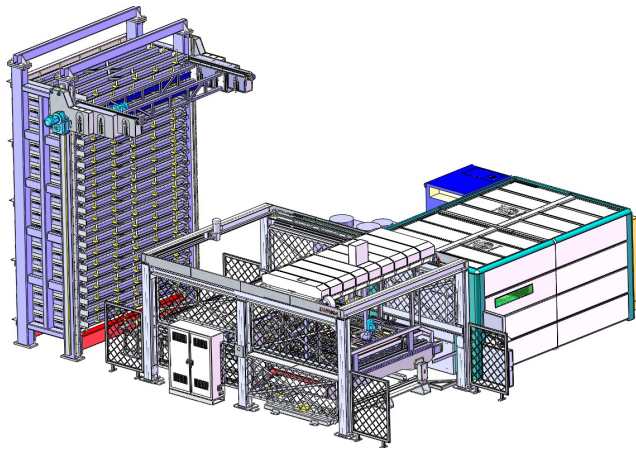
OPTIONAL

FEATURES



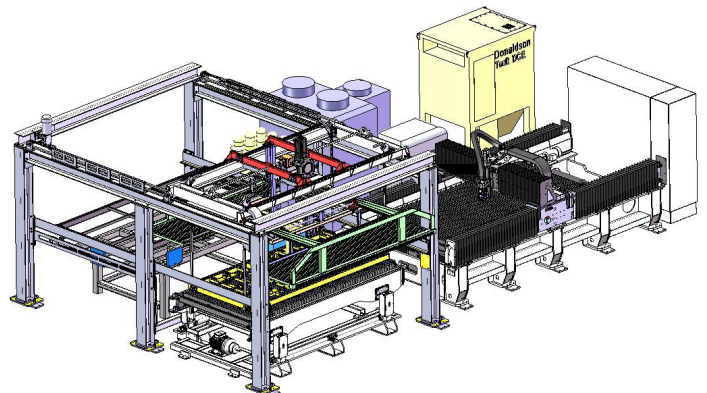
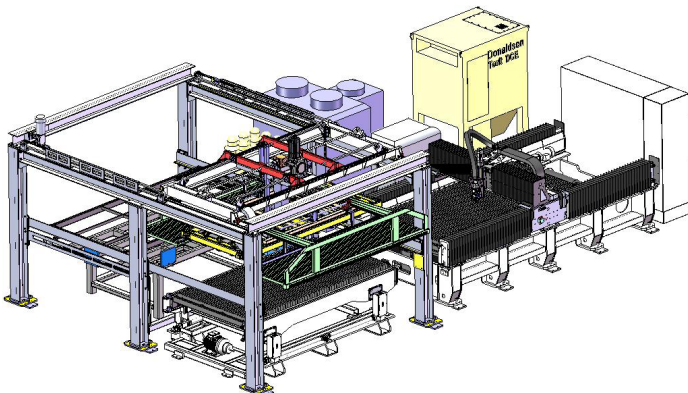
Motorized Lateral Scrap Conveyors

Three optional lateral scrap conveyors offer easy access, easy maintenance and low electrical consumption.



Compact Automation

Durma's automation has been designed with maximum flexibility and allows for upgrading as your production needs grow. Its compact footprint reduces floor space requirements, thereby lowering production costs.



NEW GENERATION

HDF SMART LASER

Accurate and fast cuts; No mirrors or adjustment requirement; Low energy costs; No maintenance; Reflective parts cutting (copper, brass); Produced by the world's largest manufacturer of sheet metal fabrication



Technologies - Laser sources	0.5kW	1kW	2kW
Wavelength (nm)	1070 - 1080	1070 - 1080	1070 - 1080
Power output range	0.05 - 0.5 kW	0.1 - 1kW	0.2 - 2 kW
Polarization	Random	Random	Random
Max. pulse frequency	5kHz	5kHz	5kHz
Gas consumption	-	-	-
Max. power consumption	2kW	4kW	8kW

Application Range	0.5kW	1kW	2kW
Mild steel max thickness	0.16	0.31	0.59
Stainless steel max thickness	0.06	0.12	0.24
Aluminum max thickness	0.06	0.10	0.20
Copper max thickness	0.06	0.10	0.20
Brass max thickness	0.06	0.12	0.24

Dimensions	
Layout area	413in x 275.5in
Machine height (in)	95.3
Machine width (in)	159.4
Machine length (in)	360.2
Machine weight (lb)	19,841.6

Working Range	
X-axis (in)	120.5
Y-axis (in)	61
Z-axis (in)	7.9
Max sheet size (in)	118 x 59
Max sheet weight (lb)	1,102.3

Dynamics	
Max speed X-axis	3375 in/min
Max speed Y-axis	3970 in/min
Max speed simultaneous	5200 in/min
Max acceleration X-axis	397 in/s ²
Max acceleration Y-axis	397 in/s ²
Max acceleration simultaneous	556 in/s ²
Positional accuracy (in)	0.002
Repeatability (in)	0.002

NEW GENERATION

LASER CUTTING

Durma lasers are a modular product family of state-of-the-art flying optics laser cutting machines for the sheet metal industry. We are proud to offer solutions for all budgets and expectations, covering a wide range of different sheet sizes. From a small cost-effective and manually but easily operated simple laser cutting machine to a full-automatic high-power linear-drive manufacturing cell with integrated loading and unloading, Durma laser systems can be equipped with the optimal laser technology for every range of material and thickness, and all are driven by high-performance and maintenance-free motion systems.



Configuration	3015					4020				6020		8020	
	Fiber		CO ₂			CO ₂		Fiber		Fiber		Fiber	
	Rack & Pinion		Linear			Rack & Pinion		Linear		Rack & Pinion		Linear	
	HDF Smart	HDF 3015	HDFL 3015	HD 3015	HDL 3015	HD 4020	HDL 4020	HDF 4020	HDFL 4020	HDF 6020	HDFL 6020	HDF 8020	HDFL 8020
1kW	S	-	-	-	-	-	-	O	-	-	-	O	-
2kW	O	S	S	-	-	-	-	S	S	-	-	S	S
2.5kW	-	-	-	O	O	O	O	-	-	O	O	-	-
3kW	O	O	O	-	-	-	-	O	O	-	-	O	O
3.5kW	-	-	-	S	S	S	S	-	-	S	S	-	-
4kW	O	O	O	-	-	-	-	O	O	-	-	O	O
6kW	-	O	O	O	O	O	O	O	O	O	O	O	O
Conveyors	-	O	O	O	O	O	O	O	O	O	O	O	O
Shuttle Table	-	S	S	S	S	S	S	S	S	S	S	S	S
Auto-focus Head	O	S	S	S	S	S	S	S	S	S	S	S	S
Tube Cutting	O	O	O	O	O	-	-	-	-	-	-	-	-
CELL	-	O	O	O	O	O	O	O	O	-	-	-	-

(S) STANDARD (O) OPTIONAL (-) NOT AVAILABLE

NEW GENERATION

FIBER LASER

The laser power source of the HDF series is an all-solid-state fiber laser. This technology reduces further the maintenance requirements, and offers the lowest possible running cost with a wall-plug efficiency of 30% and without the need of any laser gas. When the application requires a broader spectrum of material types to be cut and the maximum thickness range is limited, the fiber laser is the ideal solution: it will cut faster at lower cost than any CO2 laser at the same laser power.



HDF HDFL 3015 + 4020

Technologies - Laser sources	HDF	HDF / HDFL			
	1kW	2kW	3kW	4kW	6kW
Wavelength (nm)	1070 - 1080	1070 - 1080	1070 - 1080	1070 - 1080	1070 - 1080
Power output range	0.05 - 0.5 kW	0.2 - 2 kW	0.3 - 3 kW	0.4 - 4 kW	0.6 - 6 kW
Polarization	Random	Random	Random	Random	Random
Max. pulse frequency	5kHz	5kHz	5kHz	5kHz	5kHz
Gas consumption	-	-	-	-	-
Max. power consumption	4 kW	8 kW	12 kW	16 kW	24 kW

Application Range					
Mild steel max thickness	0.24	0.59	0.79	0.98	1.0
Stainless steel max thickness	0.12	0.24	0.39	0.47	0.5
Aluminum max thickness	0.10	0.20	0.31	0.39	0.5
Copper max thickness	0.10	0.20	0.31	0.39	
Brass max thickness	0.12	0.24	0.31	0.39	

Dimensions	3015	4020
	HDF / HDFL	HDF / HDFL
Machine height (in)	96	98
Machine width (in)	160	189
Machine length (in)	400	496
Machine weight (lb)	26,456	37,975

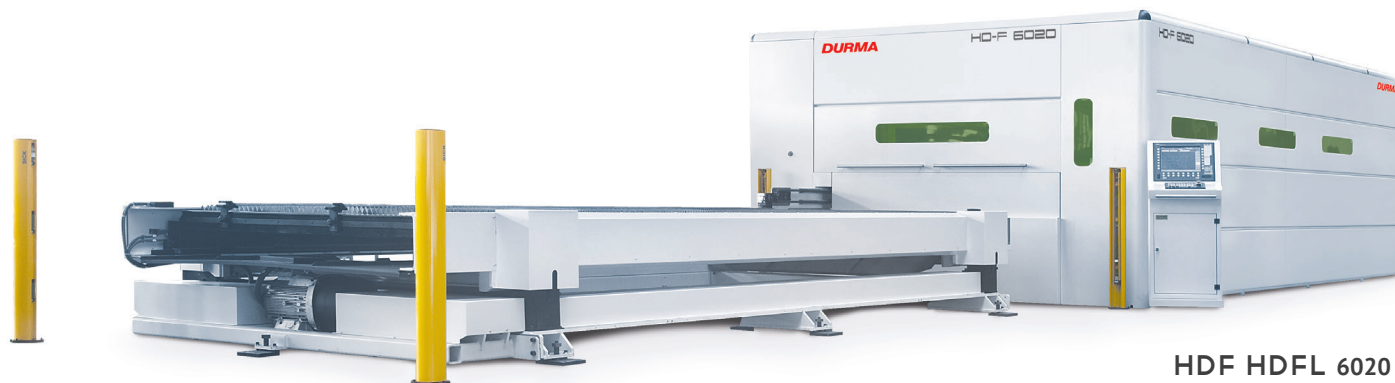
Working Range		
X-axis (in)	120.5	120.5
Y-axis (in)	61.0	61.0
Z-axis (in)	7.9	7.9
Max sheet size (in)	118 x 59	118 x 59
Max sheet weight (lb)	2204.6	2204.6

Dynamics		
Max speed X-axis (ipm)	3,375 / 7,940	3,325 / 7,940
Max speed Y-axis (ipm)	3,970 / 7,940	3,970 / 7,940
Max speed simultaneous (ipm)	5,200 / 11,116	5,200 / 11,116
Max acceleration X-axis in/s ²	397 / 1,794	397 / 794
Max acceleration Y-axis in/s ²	397 / 1,794	397 / 794
Max acceleration simultaneous in/s ²	556 / 11,112	556 / 1,112
Positional accuracy (in)	0.002	0.002 / 0.0008
Repeatability (in)	0.002	0.002 / 0.0008

NEW GENERATION

LASER CUTTING

The laser power source of the HDF series is an all-solid-state fiber laser. This technology reduces further the maintenance requirements, offers the lowest possible running cost with a wall-plug efficiency of 30% and has no need for laser gas. Durma lasers are available in large envelope sheet sizes. Due to the modular construction, the sheet size capacity is larger than most competitors' solutions.



HDF HDFL 6020

HDF / HDFL				
Technologies - Laser sources	2kW	3kW	4kW	6kW
Wavelength (nm)	1070 - 1080	1070 - 1080	1070 - 1080	1070 - 1080
Power output range	0.2 - 2 kW	0.3 - 3 kW	0.4 - 4 kW	0.6 - 6 kW
Polarization	Random	Random	Random	Random
Max. pulse frequency	5kHz	5kHz	5kHz	5kHz
Gas consumption	-	-	-	-
Max. power consumption	8 kW	12 kW	16 kW	24 kW
Application Range				
Mild steel max thickness	0.250	0.500	0.750	1.0
Stainless steel max thickness	0.375	0.750	0.314	0.5
Aluminum max thickness	0.375	0.750	0.375	0.5
Copper max thickness	0.375	0.750	0.375	
Brass max thickness	0.375	0.750	0.375	
Dimensions	HDF		HDFL	
Machine height (in)	100		100	
Machine width (in)	189		189	
Machine length (in)	680		680	
Machine weight (lb)	58,423		58,423	
Working Range				
X-axis (in)	242.1		242.1	
Y-axis (in)	82.7		82.7	
Z-axis (in)	7.9		7.9	
Max sheet size (in)	236 x 78		236 x 78	
Max sheet weight (lb)	5,952		5,512	
Dynamics				
Max speed X-axis	3,375 in/min		7,940 in/min	
Max speed Y-axis	3,970 in/min		7,940 in/min	
Max speed simultaneous	5,200 in/min		11,116 in/min	
Max acceleration X-axis	397 in/s ²		794 in/s ²	
Max acceleration Y-axis	397 in/s ²		794 in/s ²	
Max acceleration simultaneous	556 in/s ²		1,112 in/s ²	
Positional accuracy (in)	0.002		0.0008	
Repeatability (in)	0.002		0.0008	

NEW GENERATION

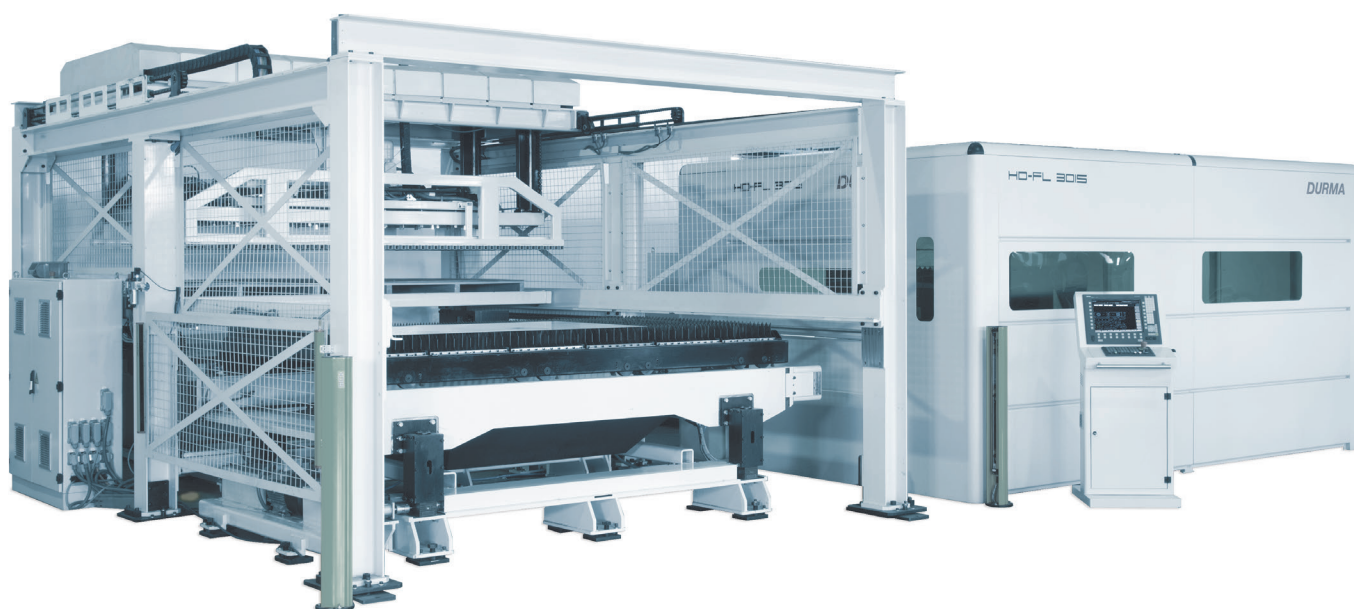
CELL

The Durma laser CELL for automatic loading and unloading of sheets is probably the most compact solution in the industry, offering a maximum of flexibility on a minimum of required floor space.



Two different layouts are possible, and the system can be adapted for integration to automatic storages. The CELL is a full-functional system expansion of the laser cutting machine: work queues of several sheets are activated by pressing one single button and there is no separate control panel for the loading/unloading unit.

When the productivity of a laser machine needs to be increased or when the material handling and flow in a factory needs to be optimized, the Durma Laser CELL will be the most efficient and most economic solution.



Dimensions

Layout area	472.4 in x 295.3 in
Machine height (in)	250
Machine width (in)	159
Machine length (in)	138
Machine weight (lb)	17,637

Working Range

Max sheet dimension	120
Min sheet dimension	60
Max sheet thickness	1
Min sheet thickness	0.020
Max sheet weight	2205
Max height on unloading table (incl. pallet)	11.8
Max weight on unloading table	6614
Max height on loading table (incl. pallet)	11.8
Max weight on loading table	6614