FORZA Crom

Datasheet

V250818

Model CR12024U30P30

FORZA Crom

Laser cutting machine for tubes and profiles

CUTTING / MARKING / PERFORATION

The FORZA CROM laser cutting machine operates at high speed and precision across a wide range of tube profiles, including round, square, rectangular, angles, channels, and more.

It incorporates three clamping chucks along the tube, providing greater stability and accuracy when processing pipes up to 12 meters in length. In addition, it features a protective enclosure for laser cutting.

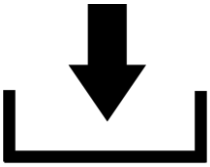
Main Features

FEATURE	DETAIL
Application	Cutting tubes and profiles
Maximum tube length & diameter	L:39.4ft x D:$9^{29}/_{64}$in | L:12000mm x D:240mm
Laser power rating	3000W
Nominal cutting thickness (ASTM A36) (1)	$^{9}/_{16}$in | 14mm
Maximum cutting thickness (ASTM A36) (2)	$^{3}/_{4}$ in | 19mm
Maximum acceleration (3)	19.3ft/s^2 | 0.6G
Maximum rotation speed (3)	60 rev/min
Cutting precision (4)	± 0.1mm

1. *This is the maximum limit at which a burr-free and clean cut can be obtained. Up to this thickness, cutting can be performed continuously.*
2. *The maximum thickness is the greatest thickness that can be cut under certain parameter settings. It is not recommended to size the machine based on the maximum thickness. Working with thicknesses closer to the limit significantly restricts the cutting geometries that can be achieved, due to the high temperatures reached by the material.*
3. *As the tube weight increases, motion parameters may decrease.*
4. *Cutting precision is measured on a 0.027in stainless steel sheet, considering the machine's repeatability and accuracy. A precision of 0.0039in means that when cutting a 3.937in plate, the actual measurement may be 3.941in or 3.937in. If the material thickness increases, the error may become greater due to material properties and cut width.*

Special Features

Unloading System



The chuck movement system allows cut tubes of up to 3 meters to be automatically unloaded once the process is completed, eliminating the need for manual unloading.

Marking Technology

Not only cuts but also performs a marking function, ideal for engraving bending lines for post-bending processes or for marking numbers and letters.

FORZA Play T Software

User-friendly Spanish/English cutting tubes and profiles specialized software with an integrated alarm system and maintenance notice.

Smart Tube Support

The tube support height adjusts automatically based on the diameter and surface, ensuring alignment with the center of the chuck throughout the cutting process.

Automatic loading system (Opcional)

Optionally, an automatic tube storage and loading system can be implemented for cutting, enabling continuous and efficient production.

Three-chuck structure

The three chucks are particularly useful for providing greater stability and precision when working with lengths of up to 12 meters, ensuring accurate cutting and improving material utilization.

General Specifications

SPECIFICATION	DETAIL
Model	**FORZA Crom – CR12024U30P30**
Laser Type/Technology	Fiber Laser 1064nm ± 10nm
Fiber laser diameter	150µm
Nominal fiber laser power	3000W
Fiber laser power range	5 a 100% (±0.5%)
Output power stability	± 1.5W
Laser working frequency	4 a 5000Hz
Laser source protection level	IP54
Laser source model	MFSC-3000W | MAX PHOTONICS
Working modes	CUTTING / MARKING / PERFORATION
Focusing system	SMARTFOCUS TECHNOLOGY [1]
Auxiliar gas type for cutting	O_2, N_2 or Air
Proportional oxygen control	Analog control 145 psi (10 bar) | AIRTAC
Laser head model	RAYTOOLS – BS03K CAT
Focal range	-22mm ~ +22mm
Maximum focusing speed	3.94in/s | 100mm/s
Head protection system	Collision prevention and detection
Pre-loaded cutting profiles	Yes [2]
Laser cutting width	0.004in ~ 0.06in | 0.1mm ~ 1. 5mm [3]
Cutting precision	Thickness - dependent [4]

1. *The focusing system incorporates an internal servo motor that moves the lens, along with a capacitive sensor that maintains the distance between the laser head and the plate during cutting.*
2. *Cutting parameters are available on the library.forzalaser.com platform, where customers can download them for free. A local backup is also stored on the machine for quick access.*
3. *The cutting width is directly proportional to the material thickness; as thickness increases, so does the cutting width. The type of assist gas also plays a role, with oxygen producing a wider cut line.*
4. *Cutting precision is 0.0039mm for thicknesses up to 0.027mm. As material thickness increases, precision may be affected due to the widening of the cut line, reaching up to 0.019mm on ½in plates.*

Cutting angle	<2° [5]
XY movement repeatability	±0.02mm
XY movement accuracy	±0.05mm
Tube working length	1.6ft to 40ft | 500mm a 12000mm
Tube working diameter	0.8in to 9.4in | 20mm a 240mm
Minimum tube thickness	$^{3}/_{64}$in | 1mm [6]
Maximum cutting speed	1.6ft/s | 30m/min
Maximum travel speed	3.3ft/s | 60m/min
Maximum rotation speed	60rev/min
Maximum XY acceleration	19.3ft/s^2 | 0.6G
XY motion system	Rack and pinion
Z motion system	Ball screw
Servo motors brand	INOVANCE
Lubrication system	Automatic by working path
Wireless control	Wi-Fi enabled remote control
Fume extraction system	Extraction by external motor
Maximum plate load capacity	2.2klb | 1000kg [7]
Laser source power	10kW
Chiller power	3.8kW
Fume extractor power	1.5kW
Motion & control system power	41.8kW
Power of the loading and unloading system (optional)	3kW
Peak machine power	57.1kW

5. *The cut angle depends on the material thickness and the type of assist gas used. Thicker materials can result in greater cut angles, and oxygen may increase the cut angle.*
6. *Thin-walled tubes are susceptible to deformation or crushing during chuck clamping. Do not work with tubes thinner than this value to ensure a safe and precise process.*
7. *Although the structure can support thick-walled tubes, the cutting thickness specified for this laser power must not be exceeded.*

Minimum power for electrical system design [8]	35.45kW
Average energy consumption [9]	34.26kWh
Operating voltage	220V/250V/380V/440V/480V 3ph 50Hz-60Hz
Minimum line current	104A @220VAC 3ph
	91.0A @250VAC 3ph
	59.9A @380VAC 3ph
	51.7A @440VAC 3ph
	47.4A @480VAC 3ph

Conductor wire gauge to the thermal-magnetic circuit breaker (MCCB) [10]	Up to 140°F | 60°C (TW, UF)	Up to 194°F | 90°C (THHW, THHN)	Voltage
	3 x 1AWG	3 x 3AWG	220VAC 3ph
	3 x 3AWG	3 x 4AWG	250VAC 3ph
	3 x 4AWG	3 x 6AWG	380VAC 3ph
	3 x 6AWG	3 x 8AWG	440VAC 3ph
	3 x 6AWG	3 x 8AWG	480VAC 3ph

Recommended MCCB and grounding conductor	MCCB	PE Conductor (Copper)	Voltage
	110A	6AWG	220VAC 3ph
	100A	8AWG	250VAC 3ph
	60A	10AWG	380VAC 3ph
	60A	10AWG	440VAC 3ph
	50A	10AWG	480VAC 3ph

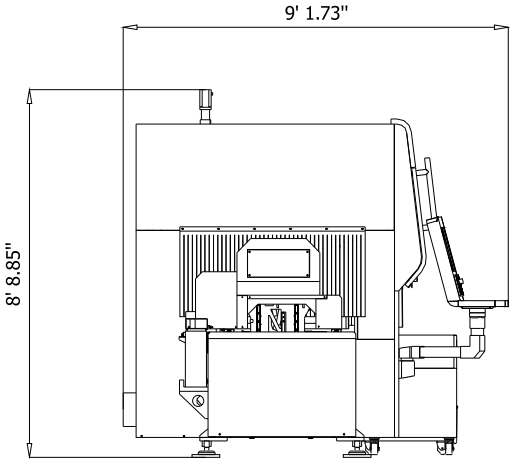
Power cable length [11]	32.8ft | 10m

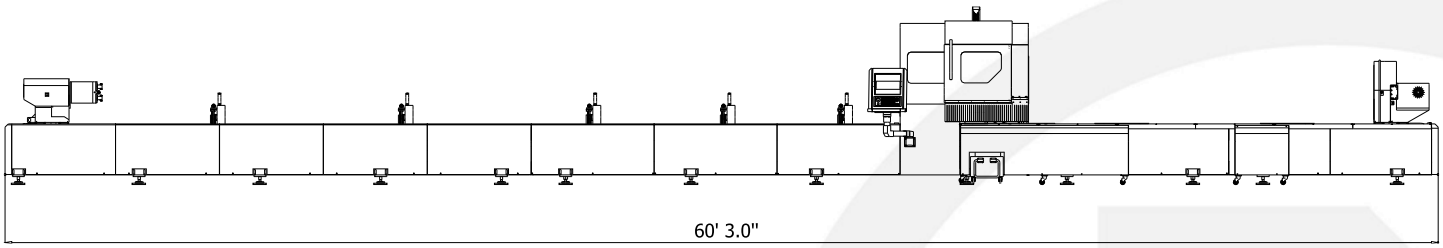
8. *The minimum power sizing for electrical design is calculated based on typical power consumption of the laser source and chiller, along with half the power of the fume extractor and machine actuators.*
9. *Average power consumption is estimated at 60% of the measure peak power. Not all components operate simultaneously; the intermittent activation of systems such as the chiller, motors, and laser source results in lower actual consumption. To estimate hourly power consumption, use the average consumption.*
10. *The cable gauge sizing was done based on NEC 310-16 for maximum conductor temperatures of 140°F and 194°F, considering conduit installation. If installing cables in open air, a smaller gauge may be used upon consultation with FORZA Laser's technical department.*
11. *The maximum length of the power cable is 32.8ft (10m) to prevent voltage drops and ensure optimal system performance.*

Pneumatic supply for actuators	43.5 to 101.5psi | 3 to 7bar		
Communication Interface	RJ45, WIFI, USB 3.0		
Compatible design formats	IGS, IGES, STP, STEP		
Software	FORZA Play T		
Software language	Spanish and English		
PC control interface	By screen and by manual control		
Cooling method	Water-cooled		
Chiller tank capacity [12]	TFLW	CWFL	HL
	7.9gal | 30L	5.8gal | 22L	5.6gal | 21L
Gas connection diameter	O_2 and N_2 8mm ($^5/_{16}$in) hose (Nylon)		
Maximum gas pressure at laser head	362.59psi | 25bar		
Maximum Air/N_2 input pressure	290psi | 20bar		
Maximum O_2 input pressure	145psi | 10bar		
Recommended N_2 input pressure	≤232psi | ≤16bar		
Recommended O_2 input pressure	87psi | 6bar [13]		
Machine weight	~10.1ton		
Machine shipping weight	~10.5ton		
Machine dimensions	9.2 x 61.2 x 8.8 ft | 2786 x 18632 x 2663 mm		
Required floor resistance	92.45psi | 6.5Kgf/cm^2		
Relative humidity	< 85%		
Operating temperature	35.6 – 95 °F | 2 - 35 °C		
Storage temperature	46.4 – 86 °F | 8 - 30 °C		
Certifications	CE, RoHS		

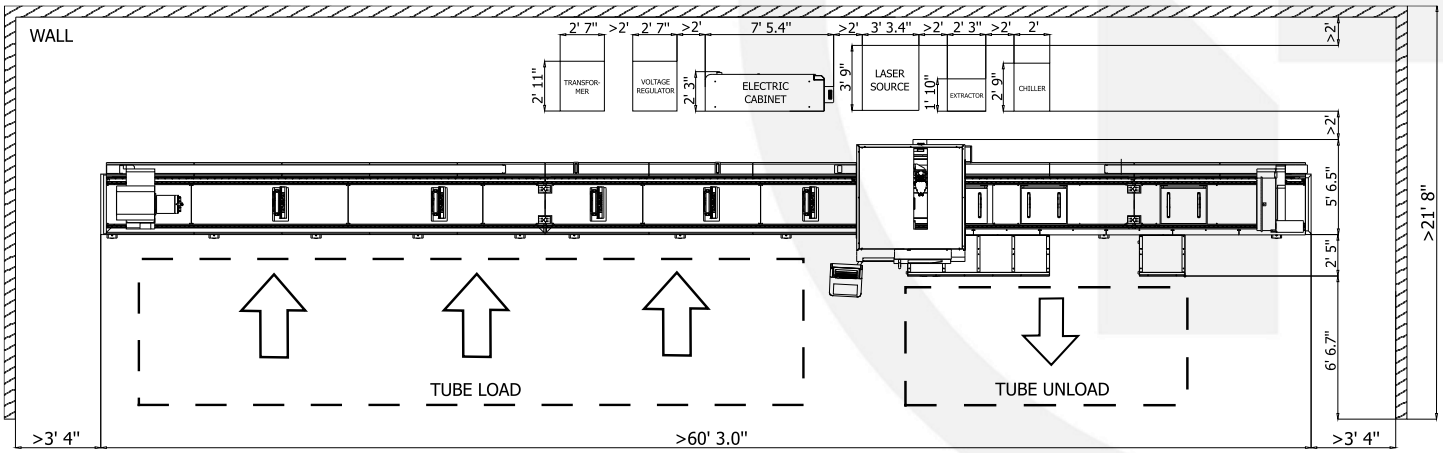
12. *The tank size depends on the cooler model equipped in the laser machine. At the time of installation, at least 1.1 gallons (4 liters) of additional distilled water beyond the tank capacity must be available to fill the water circuits between the chiller, the power supply, and the laser head.*
13. *The specified pressure is measured at the tank pressure indicator output; from this pressure, the valves are calibrated.*

Machine Dimensions



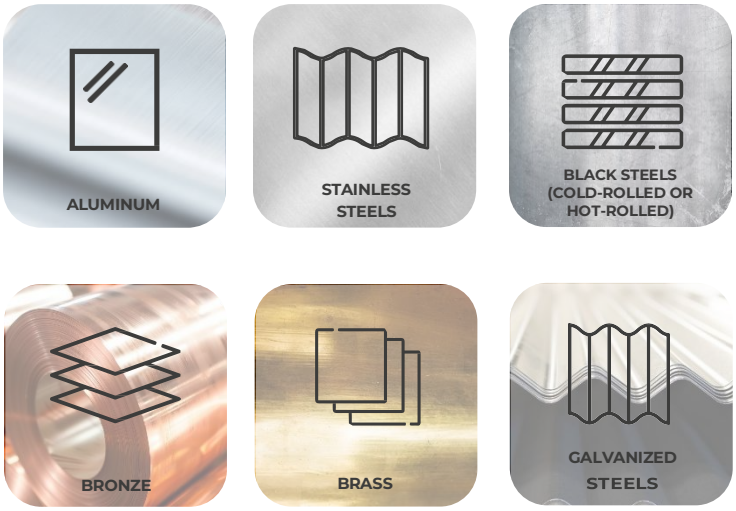


Required Space

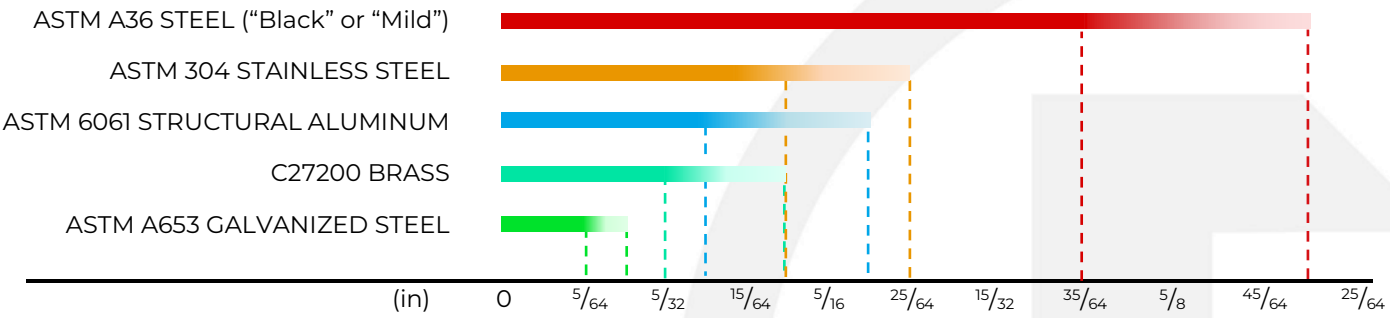


* Peripheral dimensions may vary depending on the machine model.

Applicable Materials



Cutting Thicknesses by Material



MATERIAL	IDEAL THICKNESS (1)			MAXIMUM THICKNESS (2)		
	mm	in	gauge	mm	in	gauge
ASTM A36 STEEL (“Black or Mild”)	14	9/16	-	19	3/4	-
ASTM 304 STAINLESS STEEL	7	9/32	2	10	3/8	-
ASTM 6061 STRUCTURAL ALUMINUM	5	3/16	6	9	11/32	-
C27200 BRASS	4	5/32	9	7	9/32	2
ASTM A653 GALVANIZED STEEL	2	5/64	14	3	1/8	11

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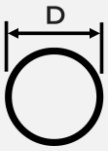
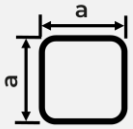
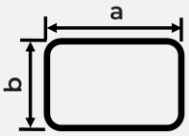
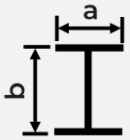
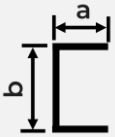
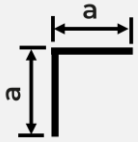
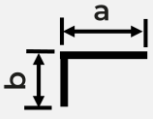
Supported dimensions per profile

PROFILE TYPE	SHAPE	DIMENSIONS (in)
ROUND		$^{25}/_{32}$ < D < $9^{29}/_{64}$
SQUARE		$^{25}/_{32}$ < a < $9^{29}/_{64}$
RECTANGULAR		$^{25}/_{32}$ < a y b < $9^{29}/_{64}$
H/I BEAM		a < $5^{29}/_{32}$ b < $5^{29}/_{32}$
CHANNEL		a < $6^{19}/_{64}$ b < $6^{19}/_{64}$
SYMMETRIC ANGLE		a < $5^{33}/_{64}$
ASYMMETRIC ANGLE		a < $6^{19}/_{64}$ b < $3^{15}/_{16}$

Packing List:

- [ ] 1 x FORZA Crom 3000W Machine
- [ ] 1 x LC80 Head
- [ ] 1 x Wireless remote control
- [ ] 1 x Wireless keyboard and mouse
- [ ] 1 x Laser safety glasses with case
- [ ] 1 x Waste collection carts
- [ ] 20 x Machine leveling feet
- [ ] 1 x Cable tray and drag chain assembly kit
- [ ] 1 x Monitor screen
- [ ] 1 x Industrial CPU

- TOOLBOX -

- [ ] 1 x Plastic toolbox
- [ ] 1 x Scotch tape
- [ ] 1 x Masking tape
- [ ] 1 x Metric Allen key set
- [ ] 1 x screwdriver set (4 pieces)
- [ ] 1 x Door and switch key set
- [ ] 1 x Adjustable wrench
- [ ] 1 x Cotton swabs and cleaners
- [ ] 1 x 6 mm (15/64in) bolts and anchors bag
- [ ] 1 x Wi-Fi module
- [ ] 1 x Electrical terminal set
- [ ] 1 x Service terminal block set
- [ ] 1 x QBH protector
- [ ] 2 x 10” extraction duct clamps

- LICENSES -

- [ ] 1 x FORZA Play T license – lifetime
- [ ] 1 x FORZA Vectors license – 1 year
- [ ] 1 x FORZA Academy full license – 1 year
- [ ] 1 x Super 7 SUPPORT license – 4 years

- PERIPHERALS -

- [ ] Electrical cabinet
- [ ] 1 x 380V 3ph / 70 KVA Voltage Stabilizer
- [ ] 1 x Automatic 3kW Chiller
- [ ] 1 x MFSC Power Supply – 3000W Max Photonics
- [ ] 1 x 1.5 kW Industrial fume extractor
- [ ] 1 x 70 KVA Transformer [220V - 380V] @220v3ph
- [ ] 1 x 70 KVA Transformer [250V - 380V] @250v3ph
- [ ] 1 x 70 KVA Transformer [440V - 380V] @440v3ph
- [ ] 1 x 70 KVA Transformer [250V - 380V] @480v3ph

- CONSUMABLES -

- [ ] 1 x Top protective lens
- [ ] 9 x Bottom protective lenses
- [ ] 20 x Cutting nozzles, multiple sizes
- [ ] 1 x Ceramic base for capacitive sensor
- [ ] 1 x 1 liter (0.26gal) ISO 68 oil

- POWER CABLES AND TRAYS -

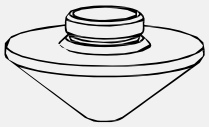
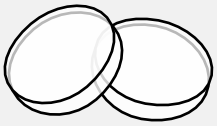
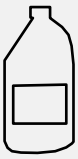
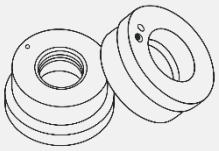
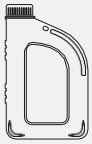
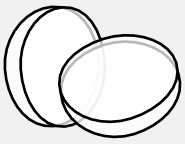
- [ ] 1 x Gas extraction tube/hose, 4.8m (15.75ft) x 10”
- [ ] 1 x Monitor power cable
- [ ] 2 x PU hoses for C-H cooling, 10mx8mm (32.81ftx5/16in)
- [ ] 2 x PU hoses for C-F cooling, 10mx19mm (32.81ftx3/4in)
- [ ] 1 x Voltage stabilizer for monitor
- [ ] 5m (16.4ft) x Cable 3x1AWG + 1x6AWG, B-T (T: Ring-Spade) @220v3ph
- [ ] 5m (16.4ft) x Cable 3x3AWG + 1x8AWG, B-T (T: Ring-Spade) @250v3ph
- [ ] 5m (16.4ft) x Cable 3x4AWG + 1x10AWG, B-E (T: Ring-Spade) @380v3ph
- [ ] 5m (16.4ft) x Cable 3x6AWG + 1x10AWG, B-T (T: Ring-Spade) @440v3ph
- [ ] 5m (16.4ft) x Cable 3x6AWG + 1x10AWG, B-T (T: Ring-Spade) @480v3ph
- [ ] 2m (6.56ft) x Cable 4x4AWG + 1x10AWG, T-E (T: Ring-Ring) @220/250/440/480v3ph
- [ ] 10m (32.81ft) x Cable 3x4AWG + 1x10AWG, E-M (T: Ring-Spade)
- [ ] 15m (49.2ft) x Cable 4x12AWG, M-X (T: Ring-Spade)

T: Transformer, B: MCCB, E: Stabilizer, M: Machine, F: Laser source, C: Chiller, H: Head, X: Extractor, G: Ground.
* Reference cables are coated with TW-type insulation

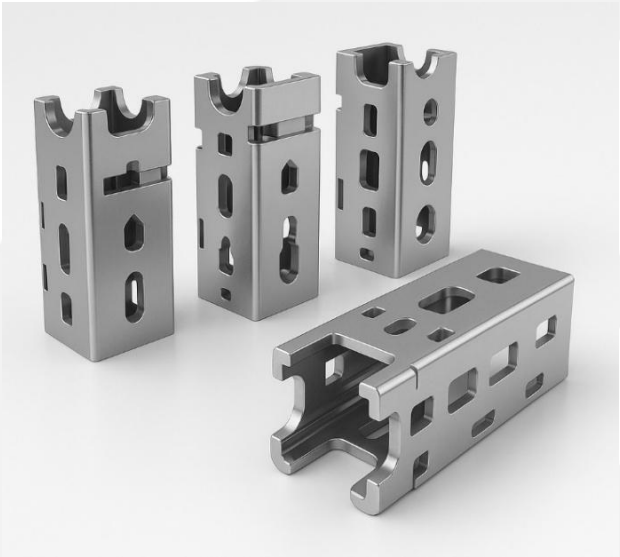
Transportation symbols: (package), (inside the package), (installed on the machine).

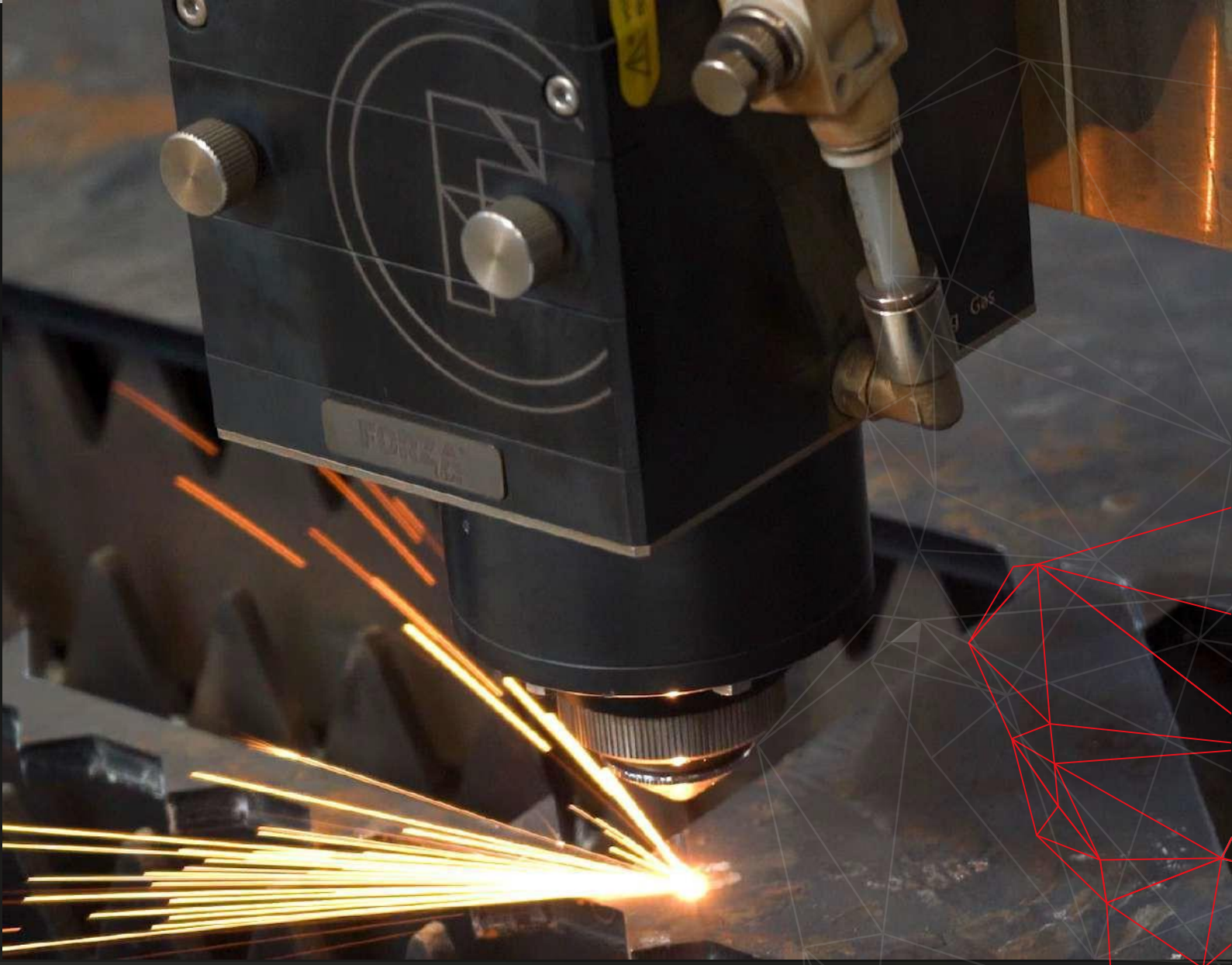
FORZA® Laser

Consumables:

IMAGE	ITEM	MODEL	DIMENSIONS	LIFETIME
	Cutting nozzle:	xxxx	D:28mm M11x0.75 H:15mm	200 hours
	Bottom protective lens	CF-L27.9x4.1-4K	D:27.9mm T:4.1mm	200 hours
	Distilled water	xxxx	7.9gal | 5.8gal | 5.6gal 30L| 22L | 21L	2 months
	Ceramic base for capacitive sensor	CF-BDC28M11L12	D_e:28mm D_i:24.5mm M11x0.75 H:12mm	1000 hours
	ISOVG68 lubricating oil	xxxx	0.26gal 1L	31.09 miles 50 000 meters
	Blue grease for pinions	xxxx	Lithium grease	6.21 miles 10 000 meters
	Top protective lens	CF-L24.9x1.5-4K	D:24.9mm T: 1.5mm	Not specified

Manufactured Parts:





At FORZA Laser, laser specialists, our team has everything you need to take your business to the next level.

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forzalaser.com

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