



Smart Fibre TFC Mini-Tube Laser

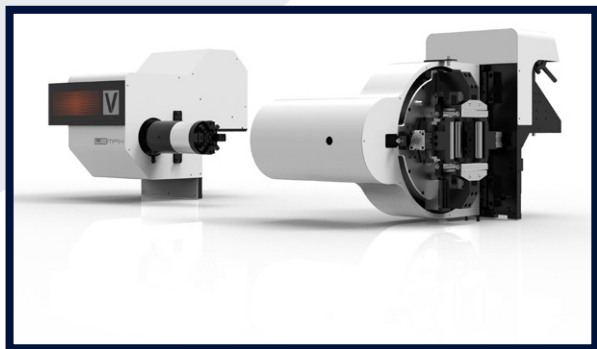
The RVD TFC ultra-mini-tube Fibre laser tube cutting machine integrates intelligent, automated, and multi-functional modular designs. It supports ultra-fast automatic material feeding and offers flexible switching between fully automatic and semi-automatic modes, enabling efficient processing of tubes with diameters ranging from 8mm to 120mm. The machine achieves three major breakthroughs: “zero scrap waste, multi-scenario compatibility, and high-precision ultra-fast production,” redefining the standards for ultra-mini-tube cutting.

It adopts a side-mounted machine bed structure, with the front chuck featuring a retractable function. When combined with a composite dual-function chuck, it enables zero scrap cutting, thereby minimising material waste. Additionally, it is equipped with a high-speed pneumatic chuck specially customized for small tubes. A full-servo floating support system is utilized at both the loading and unloading ends, working in tandem to enhance cutting accuracy and processing efficiency.





SUPERIOR TUBE CUTTING QUALITY



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Machine Features

- High performance Raycus Laser Source
- Fibre optic beam delivery system
- BOCI BLT 310T Autofocus Laser Cutting Head
- High strength, rigid gantry design to ensure high accuracy and allow high acceleration
- German LEITESSEN rack drive motion system
- Applicable tube types : Round tube, square tube, rectangular tube, oval tube, D-shaped steel, T-shaped steel, H-shaped steel, channel steel, angle steel, etc.
- Material Receiving and Collecting System
- CE compliant complete machine enclosure and light barrier system
- FSCUT3000DE Control System
- BOCHU TubePro Tube Cutting Software
- TubesT-Tube Nesting Software
- Semi-Automatic Loading System
- Zero scrap cutting with pneumatic clamping system to avoid final parts being stuck in the chuck.
- Scrap collection draw

Optional Equipment

- 1.5, 2 or 3 kW Laser Source

MAXIMUM ACCELERATION **2.0G**

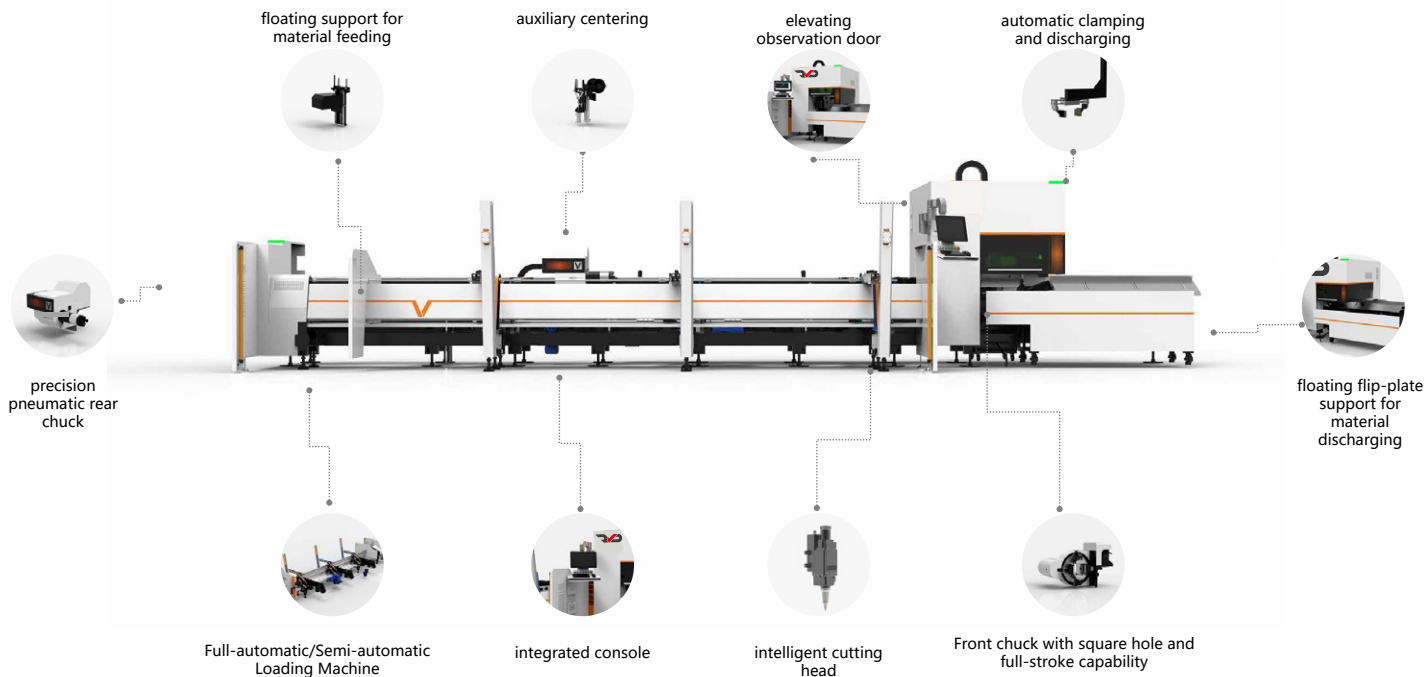
The TFC cutting equipment is equipped with 2.0g acceleration dynamic performance, enabling precise positioning and efficient cutting. This significantly increases the cutting speed and reduces non-cutting (air travel time optimising processing efficiency. Additionally, it effectively avoids laser energy waste caused by inefficiency and material ablation issues during small tube cutting.

MAXIMUM POSITIONING SPEED **120M/MIN**

The TFC significantly boosts cutting efficiency with a maximum positioning speed of up to 120m/min. Its rapid positioning and path switching capabilities drastically reduce non-cutting time such as material feeding and air travel, comprehensively optimising overall processing efficiency.

MAXIMUM ROTATION SPEED **200RPM**

With a maximum rotational speed of 200r/min, the laser cutting head achieves rapid and flexible movement. This is particularly evident in tasks such as rotational air travel, tube truncation, and complex corner cutting, where it demonstrates exceptional dynamic response and efficient processing capabilities.



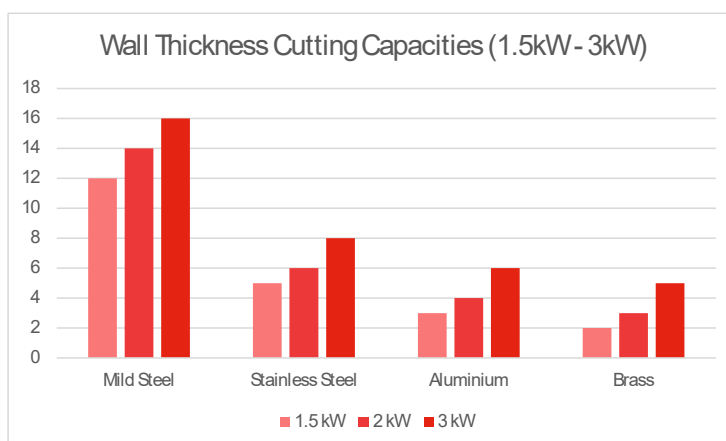
TECHNICAL SPECIFICATIONS

TFC6312		
Laser Power	kW	1.5, 2 or 3
Max. Tube Length	mm	6,300
Tube Diameter	mm	Round: Ø8 - 120 Square: 8 x 8 - 120 x 120
Suitable for Cutting		Mild Steel, Stainless Steel, Galvanised Steel, Aluminium, Brass and Copper
Cutting Profiles		Round, Square, D-Shaped, Rectangular, Special Shaped, Angle, Triangular, Elliptical, Waisted Round, Channel, Strip and I-Beam
Weight of Single Tube	kg	70
Positioning Speed	m/min	120
Chuck Rotation Speed	rpm	200
Axis Acceleration	G	2.0
Positioning Accuracy	mm	0.05
Repeat Positioning Accuracy	mm	0.03

KEY COMPONENTS

COMPONENT	BRAND
Fibre Laser Source	Raycus
Controller	BOCHU
CAM/CAD software	FSCUT3000DE
Servo motor and driver	HCFA
Rack and Pinion	LEITESEN
Guide Rail	SMAGIC
Laser Head	BOCI
Gas Proportional Valve	SMC
Rotate Chuck System	RVD
Automatic Support	RVD
Automatic Bundle Loader	RVD
Automatic Unloading	RVD

LASER SOURCE	kW	1.5	2	3
Cutting Capacity - Mild Steel	mm	12	14	16
Cutting Capacity - Stainless Steel	mm	5	6	8
Cutting Capacity - Aluminium	mm	3	4	6
Cutting Capacity - Brass	mm	2	3	5



DUAL FULLY-AUTOMATIC / SEMI-AUTOMATIC LOADING SYSTEMS

The TFC is equipped with an innovative hybrid system that combines fully-automatic and semi-automatic loading for small tubes. This system is meticulously designed to meet the processing needs of various types of tubular materials in bulk, including round tubes, square tubes, rectangular tubes, and oval tubes.

It seamlessly integrates every link in the tube processing workflow, from automatically loading the tubes, precisely conveying them, to efficiently performing cutting operations, and finally organizing the collection of the processed tubes, thus establishing a one-stop closed-loop processing process.

This innovative design significantly enhances production efficiency while granting greater flexibility to the manufacturing process, making tube processing more convenient, efficient, and intelligent.



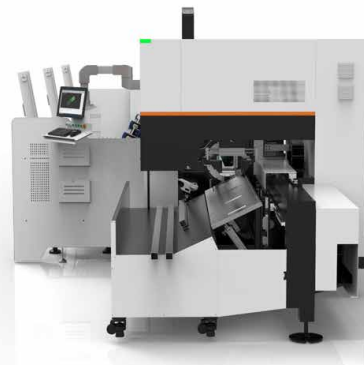
HIGH SEALING PERFORMANCE	STRONG CLAMPING FORCE	WEAR-RESISTANT AND DURABLE
The chuck adopts an advanced fully enclosed structural design, significantly reducing the risk of dust generated during cutting entering the interior of the chuck. This effectively avoids issues such as unstable clamping or jamming caused by dust accumulation. Additionally, its routine maintenance is extremely simple, greatly reducing downtime and maintenance costs, and improving overall work efficiency.	The chuck possesses excellent clamping performance, fully ensuring stable clamping of the tubing. At the same time, the clamping force supports visual adjustment, allowing users to easily adjust the clamping force to ensure that thin-walled small tubes are both stable and do not deform during clamping. This provides a safe and reliable clamping solution for various types of tubing.	The chuck is made of high-quality wear-resistant materials, which allows the equipment to maintain excellent performance even under long-term, high-intensity working conditions. Additionally, the core components have undergone careful hardness modulation treatment, not only improving the durability of the parts but also ensuring that the chuck remains stable and reliable under high-speed, high-precision working conditions.

INTEGRATED MATERIAL RECEIVING AND DISCHARGING FOR SEAMLESS CONNECTION



Material Receiving

The material discharging support system features adaptive adjustment capabilities, capable of flexibly accommodating workpieces of different lengths and achieving precise lifting support. After the cutting operation is completed, the support wheels automatically descend, and the workpiece slides smoothly and slowly down the inclined surface design into the material receiving area, effectively avoiding scattering and damage caused by direct impact on the ground or the receiving frame. Compared to processing scenarios without material receiving and discharging functions, this ensures the safety and integrity of the workpiece.



Material Collection

The material receiving area is designed with efficient storage and buffering capabilities, aiming to reduce manual intervention and enhance the automation level of the production process. This area can safely and orderly store a certain number of workpieces, thereby avoiding the cumbersome process of operators needing to frequently and individually pick up workpieces from the discharging area and manually place them in the designated location. By accumulating a certain number of workpieces, the material receiving area achieves the effect of "batch processing," enabling unified and less frequent material picking and handling operations when the workpieces accumulate to a certain amount. This optimization not only significantly reduces manual labor intensity but also improves production efficiency.

ZERO SCRAP CUTTING

The front chuck of the TFC, through its ground-breaking and innovative design, seamlessly integrates automatic avoidance cutting technology with a composite dual-clamping function, bringing about a revolutionary transformation in the field of pipe cutting. It can effortlessly achieve a zero scrap/offcut cutting effect, comprehensively enhancing cutting efficiency and material utilisation. As the processing workflow nears its end, the front chuck of the TFC demonstrates exceptional intelligent characteristics by automatically initiating an avoidance program. This allows the cutting head to move freely and flexibly within the space between the front and rear chucks.



Subsequently, the clamping jaws of the front chuck quickly and securely grip the pipe, while the rear chuck automatically releases and retracts to its initial position. At this point, relying solely on the single-chuck clamping state of the front chuck, the cutting head can smoothly complete the remaining cutting tasks. This exquisite design ensures that there are no blind spots in the cutting process. The cutting head can precisely reach any position at the end of the pipe for cutting, truly achieving the goal of zero scrap/offcut cutting. In comparison to the traditional double-chuck pipe cutting method, which can result in up to 220mm of scrap waste, the front chuck of the TFC significantly reduces this figure to 0mm, achieving the ultimate optimisation of material utilization. Moreover, while minimizing scrap waste, this design also ensures the cutting precision of the last work piece, providing a strong guarantee for processing quality.

OBSTACLE-FREE INTELLIGENT BLANKING WITH CHUCK AVOIDANCE DURING CUTTING

In traditional pipe cutting, when using the chuck avoidance function to cut the last workpiece, a common issue arises where the workpiece gets stuck inside the front chuck after cutting and cannot automatically dislodge, requiring manual removal. This leads to equipment downtime and hinders full-process automation.

The TFC features an innovatively designed intelligent automatic clamping and blanking system. After chuck avoidance cutting, this system automatically activates a pneumatic clamping mechanism to grip the tail end of the workpiece. The front and rear chucks then retract, releasing the workpiece from its constraints. Subsequently, the clamping mechanism releases, allowing the workpiece to freely fall onto a flip-up support and gently slide into the discharge frame, achieving obstacle-free, flexible blanking.

This ensures the full automation and continuity of the pipe processing workflow, enhancing efficiency and reducing costs.