

# High Power 450nm Blue Laser

## 1. STN Series Blue Lasers

Our industrial high power blue lasers leverage fundamental physics and their high-brightness, high-power design to produce the fastest, highest quality laser materials processing, including laser welding and additive manufacturing of copper, gold, aluminum and other industrially important metals.

The high power blue laser welds copper faster and better than any alternative solution. This advantage springs from fundamental physics: copper absorbs blue light better than it absorbs infrared radiation or other colors of light. Aluminum, gold and other important industrial metals also absorb more blue than they do other wavelengths of light. That basic fundamental physical advantage leads to performance advantages for welding copper, welding aluminum, 3D printing, and other materials processing applications.



### Qualitatively

- High quality low to spatter-free welding
- Dramatically improves process performance and process window
- Enables welding processes not possible or with low yields with IR

### Quantitatively

- 2x to 10x metal processing performance of IR fiber lasers that are industry-standard
- Blue wavelength offers superior performance over green as well

### Advantages of Blue Laser Processing:

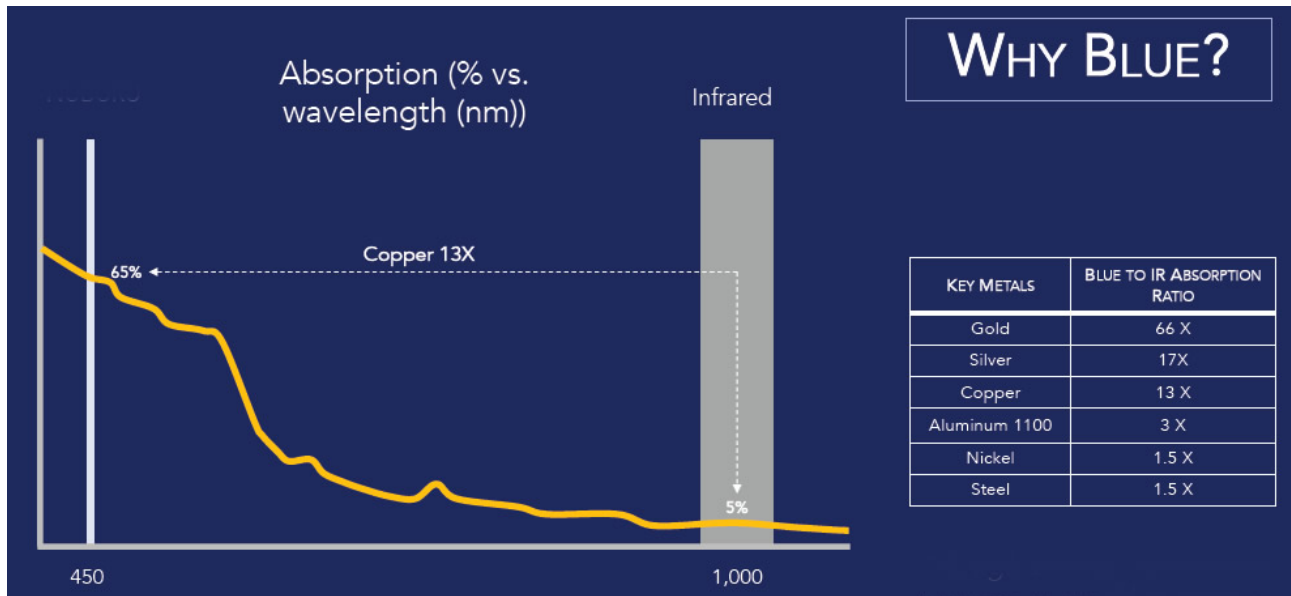
IR lasers have always had difficulty welding copper due to low absorptivity (~5%) (need high peak power) and high thermal diffusivity. As a result, IR lasers can only operate in keyhole mode generating and there are following limits:

- High spatter
- High porosity and defects
- Poor mechanical & electrical variability
- Poor yields
- High difficulties to weld dissimilar metals (Cu/Al & Cu/SS)

	STN-AO	STN-AI	IR Laser	Competitive Blue Laser	Ultrasonic Welding	Resistance Welding
<b>Welding</b>						
Spatter	★	★	-	★	-	-
Defect	★	★	-	★	-	-
Process Window	★★★	★★★	-	★★	-	-
Process Speed	★★★	★★★	★★	★★	★	★
Scanning	-	★	★	-	N/A	N/A
<b>Laser Performance</b>						
Brightness	★★	★★★	★★★	★	N/A	N/A

### Absorption Is Everything

Blue laser has superior efficiency. Physics dictates the efficiency of energy absorption. Compared to industry-standard IR wavelength, blue absorption is maximum 66x better and blue laser enable process speed gains of 2-10x.



### SPATTER-FREE™ Copper Conduction & Keyhole Welding Modes

- Our blue laser enables conduction welding mode currently not possible with infra-red lasers at thin and mid-size thicknesses and up to 25m/min
- Our blue laser enables keyhole welding at power starting at 150W
- Both modes operate SPATTER-FREE™

### Technical Specifications:

Model	STN-AO-200	STN-AO-650	STN-AI-1500
Wavelength	450nm	450nm	450nm
Band width	10nm	10nm	10nm
Laser power	200W	650W	1500W
Power adjustment	0-100%	0-100%	0-100%
Power stability (8 hours)	3% at full power	3% at full power	3% at full power
Fiber core diameter	200um	400um	125um
Fiber numerical aperture	0.22	0.22	0.22
Beam production parameter	<15	<30	<11
Standard fiber length	5m, QBH connector	5m, QBH connector	5m, QBH connector
Power input	220VAC/50/60Hz,	220VAC/50/60Hz,	380VAC/50/60Hz,

	<6A	<20A	<19A
Dimension (DxWxH)	643x443x133mm	975x610x600mm	643x483x355mm
Weight	28kg	150kg	55kg

**Typical Applications:**
**Energy Storage**

- Cu conduction welding
- Cu and Al foils welding
- Cu/Al welding
- Tab welding

**Consumer Electronics**

- Cu conduction welding
- Cu/Al and Cu/SS welding
- Al welding

**Automotive**

- Welding & braising
- Cutting
- Laser metal deposition
- 3D printing

**Aerospace**

- Laser metal deposition
- 3D printing
- General welding & cutting

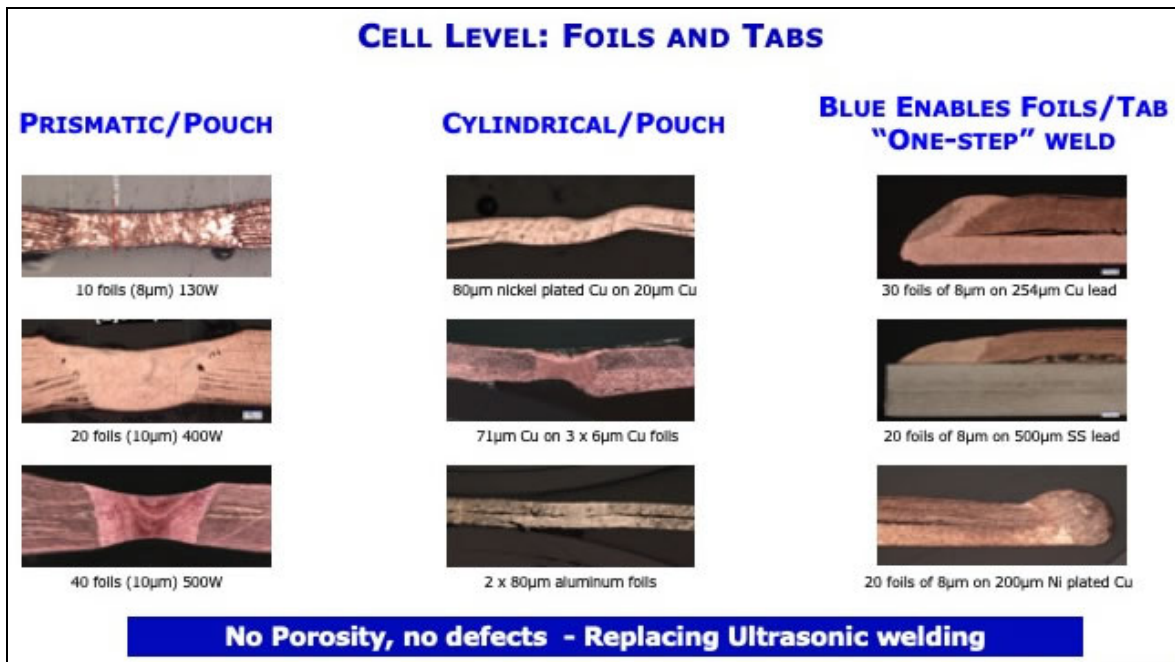
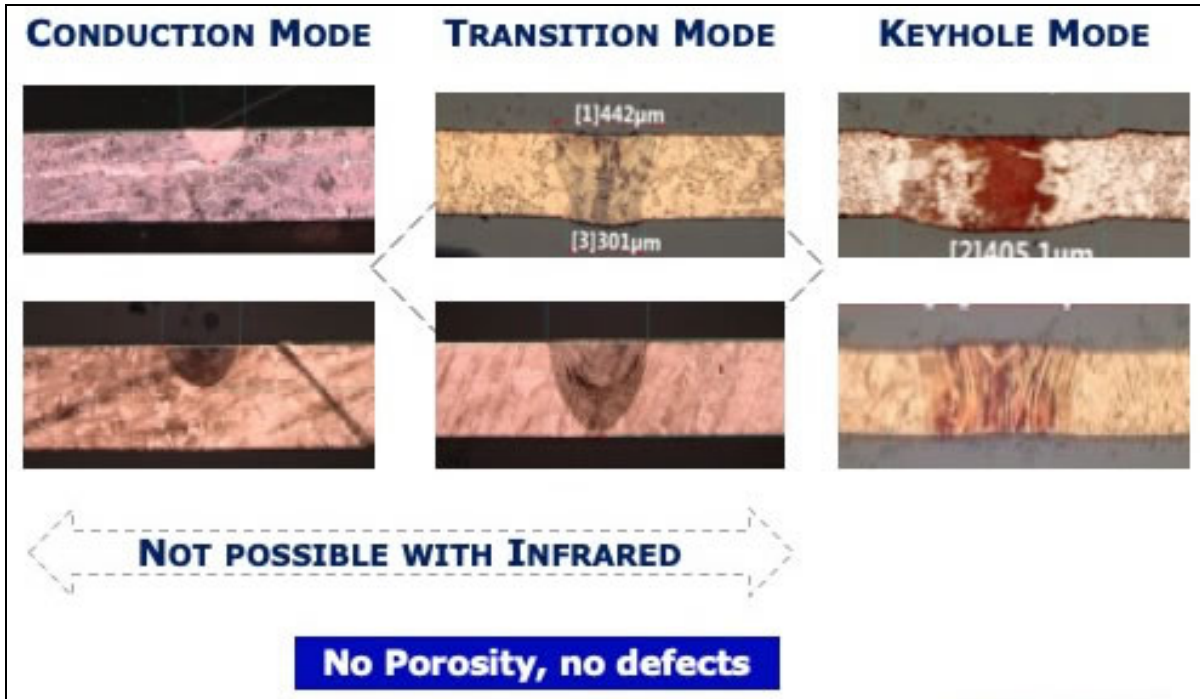
**Healthcare**

- Welding
- Laser metal deposition
- 3D printing

**Research**

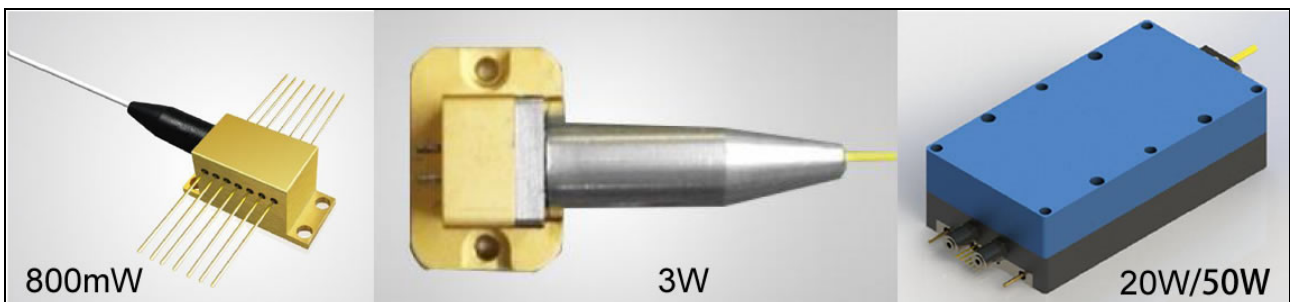
- General welding & cutting
- Laser metal deposition
- 3D printing





**2. STK Series Fiber-coupled Blue Lasers**

The STK series fiber-coupled blue lasers are manufactured by adopting specialized fiber-coupling techniques, resulting in high efficiency, stability and superior beam quality. The asymmetric radiation from the laser diode chips are coupled into an output fiber with small core diameter by using special micro optics. Their prices are reasonable and cheaper in the market.



Part Number		STK450FFB FN-0.8W	STK445F0 3N-3W	STK445FTR FN-20W	STK445FTR FN-50W	STK445FG RFN-200W
Optical Parameter	Laser power(W)	0.8	3	20	50	200
	Wavelength(nm)	450	445	445	445	445
	Tolerance(nm)	±10	±10	±10	±10	±10
	Spectral width(nm)	<6	<6	<6	<6	<8
	Temperature drift (nm/K)	0.3	0.1	0.1	0.1	0.1
Fiber Data	Core dia.(um)	105	105	105	200	200
	NA	0.22	0.22	0.22	0.22	0.22
	Fiber Length (m)	1.0	1.0	3.5	3.5	2.0
	Connector	NIL	SMA905	SMA905	SMA905	SMA905
Thermistor	K Ohm		option	10	10	10
Electrical Parameter	Operation(A)	1.0	3.0	2.5	2.8	2.5
	Threshold current(A)	0.25	0.3	0.3	0.3	0.3
	Operation voltage(V)	4.8	5.2	41	81	220
Others	Operation temp.(°C)	15-35	15-35	15-35	15-35	15-35
	Store temp.(°C)	-20-+70	-20-+70	-20-+70	-20-+70	-20-+70
	Dimension(mm)	30x12.7x14. 8	20x13.6x1 6	143x68x37	143x68x37	246x204x47
Pilot			option			