

## LIONSFORGE PTE LTD

21 Bukit Batok Crescent  
WCEGA Tower, #04-70  
Singapore 658065  
(+65) 98799992



### Product Overview

**Innovative** - LionsForge's **CRAFTLASER** is the world's first portable CLASS 1 CO2 Laser cutter, with a built-in cooling system, air-assist compressor, and exhaust filtration.



**Safe** - The **CRAFTLASER** is the only laser cutter in the world that adopts NFPA 115 Laser Fire Safety standards, has a full-metal enclosure, and meets CLASS 1 LASER Safety rating (tested and validated by a reputable and independent testing agency, UL GmbH), making it the world's safest CO2 LASER cutter in the market.

**Capable** - Packed with a 40W sealed CO2 LASER system, a 16.5" x 11.6" cutting area, an electro-mechanical focusing system, a true boresight high-pressure air assist system, and a rigid alignment system, the **CRAFTLASER** offers superior performance against conventional LASER cutters in

this class.

**Flexible** - Weighing only 25kg, and designed like a rollable suitcase, the **CRAFTLASER** can be moved from classroom to classroom, and even fit in the back of a car boot, thus making it the most portable and flexible CO2 LASER cutter in the market.

**Proven** - The **CRAFTLASER** has transformed today's classrooms into tomorrow's incubator for innovation and learning. Although it is a new product in the market, the **CRAFTLASER** is being deployed across all stages of education - from elementary schools to colleges/vocational training institutes.

**Endless STEM Applications** in the Classroom and Beyond - More schools are incorporating maker education and rapid prototyping into their curriculum to give their students a chance to build things that are meaningful to themselves and to their community. With the **CRAFTLASER**, students are also exposed to powerful digital fabrication tools employed in the industry.

**STE(A)M Applications** includes:

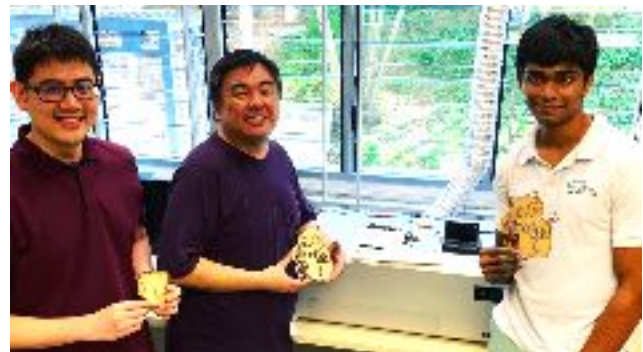
Model Building

Straight-to-Market Product Design

Rapid Prototyping

Educational Games & Toys

Artwork



## Features/Specifications

Features	Specifications
Effective work area	16.5" x 11.6" ( A3 : 420mm x297mm), up to 60mm in height
Machine dimension	800 mm x 520 mm x 260 mm
Machine weight	Estimate 22.6Kg (without filter), 25Kg (with filter) – with handles and wheels for easy transport
Casing	Full metal enclosure using Extruded Aerospace Grade Aluminum
Control and Monitoring Interface	LCD dial knob controls, 2 onboard cameras with RCA output to external monitors
Laser Type	Sealed CO2 Laser Tube Laser Power: 40W
Gross Power	800W
Power Supply	220V / 110V
Air Assist	Built-in air-compressor with Air assist at the laser head
Focusing system	Electro-mechanical focusing system
Requirements for Optics Alignment after relocation	No Optics alignment required after re-location as the machine features a rigid alignment system
Registration System	Boresighted ruler references

<b>Cooling system</b>	Built-in water cooling system - water pump, water tank, radiator, Thermal electric cooler
<b>Smoke/Fumes Management system</b>	Built-in Exhaust Fans with a combined flow rate of 300 CFM, with Exhaust filtration options -  Option 1: HEPA + Activated Carbon Filter cartridge,  Option 2: Standard 4" exhaust port
<b>Software</b>	Not linked to any software - just need any GCODE sender via USB or take GCODE from SD card  Recommended Software: Inkscape 0.91 with laser cutting extensions (Free and Open Source) - Compatible with PC, Linux, Mac OS. Accept AI, .SVG, .PDF, .CDR, .DXF format.
<b>Other Features</b>	Space-saving Stackable design: 2 Laser Cutters stacked together



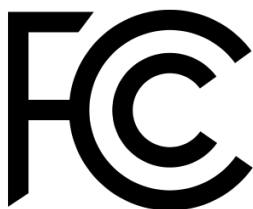
## Laser Safety - UL Certified

UL certified Class I Laser



## Fire Safety - NFPA

NFPA 115



## FCC compliant

Preferred STEM Education Tools by:



Ministry of Education  
SINGAPORE



Singapore Institute of Technology (SIT)	Fuhua Secondary School
Singapore University of Technology Design (SUTD)	Holy Innocents High School
	Monfort Secondary School
	Northbrooks Secondary School
Nanyang Polytechnic	NUS High
Ngee Ann Polytechnic	Pasir Ris Secondary School
	Pei Hwa Secondary School
ITE College Central	Raffles Institution (RI)
ITE College West	St Joseph's Institution (SJI)
ITE College East	Tampines Secondary School
	Whitley Secondary School
Anderson Serangoon Junior College	Yusof Ishak Secondary School
National Junior College (NJC)	
Temasek Junior College (TJC)	Mee Toh School
	Monfort Junior School
Beatty Secondary School	
Bowen Secondary School	Anglo Chinese School Independent
Bukit Batok Secondary School	Canadian International School
Chung Cheng High	International Community School
Commonwealth Secondary School	
Crest Secondary School	Ministry Of Education

## Risk Assessment Matrix Comparison against Conventional CO2 Laser Cutters

Operating a laser-cutter requires careful consideration for safety and understanding of the risks involved. Therefore, LionsForge placed great emphasis on integrating safety features to offer all-round passive protection to our operators, allowing for superior safety performance over conventional laser cutters. The following is the Risk Assessment Matrix derived based on United States OSHA 30 years records of Laser cutter related injuries/deaths (Table 1).

Severity	Consequences	Increasing Likelihood				
	People	A	B	C	D	E
		(Rare) Never Heard of in the industry	(Possible) Heard of in the Industry	(Likely) Has Happened more than once a year in the industry	(Often) Has Happened more than once a month in the industry	(Frequent) Has Happened daily
1	No or Slight Injury/health impact	Low	Low	Low	Medium	High
2	Minor Injury or health impact (medical attention)	Low	Low	Medium	Medium	High
3	Major Injury or health impact (hospitalization)	Low	Low	Medium	High	Extreme
4	Permanent Total Disability	Low	Medium	High	High	Extreme
5	Fatalities	Medium	Medium	High	Extreme	Extreme

Table 1: Risk Assessment Matrix

Using the Risk Assessment Matrix in Table 1, CraftLaser's superior safety performance is clearly seen in the Risk Assessment Comparison (Table 2) against conventional laser cutters commonly found in the market.

S/N	Risk Assessments	CO2 Laser Cutter (Class 4)		CraftLaser		Remarks	Mitigations Features
1	Laser hazards	3	C	1	A	Full metal enclosure, no Line-of-sight to laser pathways, employ Safety Interlock no user maintenance	Tested with IEC-60825-1-2014 safety standards as Class 1 Laser System
2	Fire hazards	3	C	1	B	CraftLaser is full metal enclosure with fire protection	Bimetallic Thermostat power cut-off (4 total) 65 degree C (self-reset) x 2 75 degree C (manual reset) x 2 FV-0 internal housing material for fire retardant performance Adopt NFPA115 laser fire safety design standards

3	Electrocution /shock	3	C	1	A	Electrically Grounded with no access to High Voltage parts	
4	Smoke/Fumes	3	C	1	B	Equipped with HEPA plus Activated Carbon Filter or ducting	Use with Air Quality Indicators to monitor
							Built-in 300CFM Exhaust fans
5	Mechanical Hazards	3	A	2	A	Full enclosure, and no access to mechanical moving parts	
6	Temperature Hazards	1	A	1	A	Full Aluminium enclosure, heat transfer to casing not enough to cause injury	
7	Ergonomic Hazards from moving the equipment	3	C	1	C	Portable design, with handles and wheels. Below 50Lbs i.a.w OSHA manual lifting recommendation	Adopt OSHA safe manual lifting limits recommendation

Table 2: Risk Assessment Comparison