



Perovskite Cell Laser Scribe

鈣鈦礦雷射設備大面積升級

Specification



CUSTOMER: 中央研究院

VERSION: V1

[quality x service -> trust]

TeraSolar Energy Materials Corp. (a company of Fair Friend Group)

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1. Description of the propose and machine function

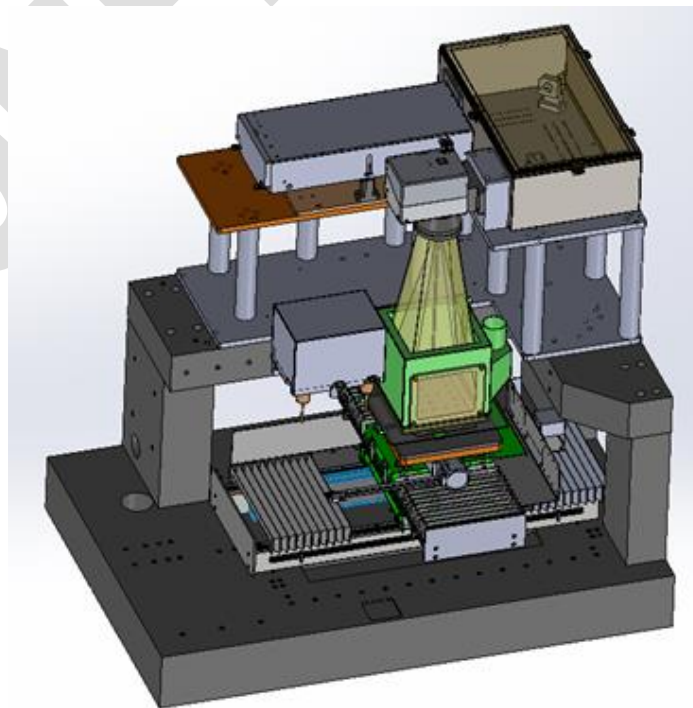
Perovskite Cell Laser Scribe is used in P1/ P2/ P3/ P4 structuring scribing on Perovskite Solar Cell.

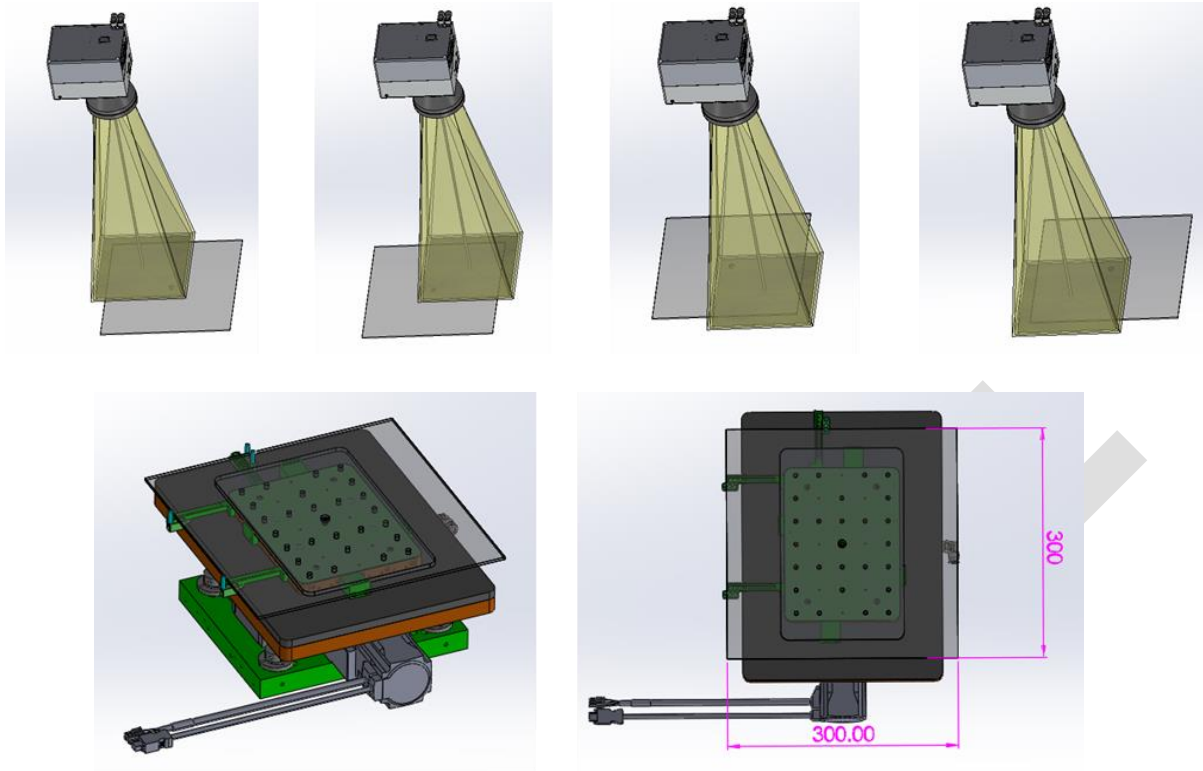
The upgrade include high power and high frequency new ps green laser source, corresponding water chiller, 300x300mm processing area increase, and the mechanical and software upgrade or replacement.

It can process the larger area of the PSC module and also improve the processing speed, lower thermal damage scribing and to achieve higher efficiency of PSC module.

2. Main equipment composition and schematic diagram:

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No.	Item	Q'ty	Unit
1	ps green laser source	1	Set
2	Chiller for laser source	1	Set
3	300mmx300mm processing system	1	Set
4	Mechanical parts and modules	1	Set
5	300mmx300mm software program	1	Set





Schematic diagram (adjustable according to actual needs)

Technical spec table

Items	Criteria	Agreed [Y/N]	TSEMC's feedback
Basic information			
ps geen laser source	>25W	Y	
Chiller			
Temperature control	0.1°C	Y	
300mmx300mm processing system			
Laser scribing line width for P1 or P2 or P3	<50um	Y	
P4 layer (edge cleaning)			
Resistance	>10 Mohm	Y	

Line width measurement above not include HAZ, heat affected zone

3. General function description

Item	Sub-item	Description	Remark
Glass substrate	Glass size	300mm*300mm (max)	
	Glass thickness	Designed for 1-4mm	
Machine	Size (LxWxH)	~1500mm x 1400mm x 2000mm	Follow the original specs of the present machine
	Weight	~1800Kg	
	Machine body structure	Aluminum extrusion model, metal square tubes, granite, etc.	
	Frame	Sealed metal sheet with powder coating	
	Laser scribing process	X-Y-Z movement system, laser scanning module, optical alignment module	
	Warning light	Included	
Laser source	Laser type	>25W, picosecond (ps) green laser, 532nm	
	Chiller	Able to control laser temperature at target temperature $\pm 0.1^{\circ}\text{C}$	
	Scanner	Optical scanner x 1	Follow the original specs of the present machine
	Accuracy of repeatability	$\leq \pm 20\mu\text{m}$	
	Lens	f-theta lens	
Control system	Operating system	Upgrade to 300x300mm software and laser scanning calibration and pattern stitching PC-Based Control, Windows	
	Operating interface	Monitor/ KB/ Mouse/ Buttons/ HMI	Follow the original specs of the present machine
	Pattern format	DXF file	
Safety design	Regulation	Machine design based on standard safety requirement	Follow the original specs of the present machine
	Safety device and interlock	a. EMO switch b. Interlock device while door open	
	Laser protection design	a. Low power mode for calculation/ adjustment b. Dust collection system	

4. Software function

Function of pattern adding	Scanning route pattern created from external, and pattern format: *.dxf file
Data storage	Folder for data storage: recipe and record data
Recipe management	User can create up to 20 recipes
Production monitoring	Automatic record production data; In-line monitoring production data; Alarm record display & check, etc.
Priority management	Different user priority can be set
Error message	Message appears when an error occurs, and will be recorded

5. Facility

Item	Description	Spec	Remark
Facility	Power	220VAC, 3 phases 4 cores, 60Hz, 32KW	Adjustable according to actual needs
	CDA	4~6kg/cm ² ; Max. 100lpm, Min. 50lpm; 1/2" quick connector	Adjustable according to actual needs
	Exhaust	Negative pressure, Flow rate 50 CMM, dia. 5"	Adjustable according to actual needs

6. Acceptance

Based on FAT (Final acceptance test) signed by both parties

7. Documents

Operation manual: 2 copies

8. Warranty

The equipment is guaranteed for one year after shipment. Not including consumable spare parts.

The equipment is not guaranteed while damaged by natural accidents or improper operation.

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