

Annexure – II

Technology of packaged fiber laser

i) 100 W Continuous wave (CW) Ytterbium fiber laser at 1 μm

ii) 20 W Pulsed Ytterbium fiber laser at 1 μm

- Type 1 (Pulse Energy 0.5 mJ, Pulse width within 90-120 ns)
- Type 2 (Pulse Energy 1 mJ, Pulse width within 80-110 ns)

iii) 30 W Continuous wave (CW) Thulium fiber laser at 1.94 μm and 2 μm

Description of Technology:

The offer comprises of three technologies consisting of fabrication and packaging technique of i) 100 W CW Ytterbium laser for stent cutting, marking on plastic and PCB surface, ii) 20 W Pulsed Ytterbium laser for marking and engraving applications and iii) 30 W CW Thulium laser for surgical application in medicine.

ABSTRACT

CGCRI has developed technology for packaged fiber lasers for material processing applications such as metal cutting, marking and surgical applications. The developed 100 W CW fiber laser at 1 μm delivers a good quality beam at a wall plug efficiency of > 30%. The laser can be used for cutting coronary stent and micro welding. For annealing or ablation types marking pulsed fiber lasers are used with varying peak power, energy and repetition rate. The 20 W pulsed laser at 1 μm comprises of two different technologies, one delivering 0.5 mJ pulse energy with superior beam quality ($M^2 < 1.3$), another delivering 1 mJ pulse energy with good beam quality ($M^2 < 1.8$), both at a wall plug efficiency of > 18%. The pulsed fiber laser can be used for marking/engraving on metal surface (anodized alumina, stainless steel).

The 2 μm 30 W Thulium laser can be used for precise incision of soft tissues which is applicable in the surgical sector of medicine. It is far more efficient than their crystal based Holmium laser counterpart due to smaller size, high wall plug efficiency and rugged nature.