

Laser based Micro-Nano- manufacturing and surface processing capability at IIT Indore

Keywords: alloyed Nano particle generation, Micro-pillars, micro/Nano texture, micro-channels

Write-up: The Mechatronics and Instrumentation lab at IIT Indore is equipped with a Nd:YAG laser having a capability generating beam with three different wavelength(355 nm, 532 nm and 1064 nm). This system is used for material deposition and material removal for different applications. The details of the activities are listed below

- a) Generation of Alloyed micro-Nano particle for demonstrating surface plasmonics effect using under water laser assisted technique
- b) Laser assisted micro-forming has been performed on sheet metals to demonstrate different prototypes
- c) Laser induced shock peening of gears and cutting tools for improving the life and wear resistance
- d) Laser induced forward transfer of micro-particles to generate micro-pillars and other functional device
- e) Laser induced multiple micro hole drilling on metal sheets using laser based interference technique
- f) Generating random and period textured surface using laser for improving the efficiency of the solar cell
- g) Laser based surface processing of additive manufactured samples including laser based annealing form improving the performance
- h) Laser based micro-channel generation on metals, glasses and silicon wafers for micro-fluidics and heat transfer based applications



