

LASER AN APPLICATION FOR MICRO-NANOFABRICATION

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ABSTRACT: This paper has presented some aspects about laser and its application in micro-nanofabrication. The mechanism used for removal material by used laser technique is name ablation. The applications of laser in micro-nanomanufacturing are diversely, such as micro-drilling metals and non-metals, cutting off, treat of surface material, lexcimer process and welding.

1. INTRODUCTION

The laser represents today a source of innovation for a large manufacturing process, as accuracy, efficiency and productivity. For machine tools field, the laser beam is a novel of applications, which became flexible machine tools [1]. Its light can be controlled and focused to a small spot, getting an intense source of energy required of penetration material, or spread in a diffuse pattern to treat surfaces. In addition, laser can be a novel in material processing.

For example, the laser used to cut sheets materials can be place of machine tools, in some months would recouped because of its productivity and quality process. Laser is used in higher processes, as rapid manufacturing assured production of parts that by classical techniques didn't work. All of that makes the laser a source of constant demand of enhancing the competitiveness in machining industry [1-3].

The machining operations realized by electron beam, laser beam and plasma beam machining processes have some limitations for the most cutting parts, in cut-off and slitting operations and for drilling and holes trepanning. Laser has a good life expectancy due to absence of dynamic forces and metal-to-metal contact during cutting process. This property makes possible the machine construction lighter as classical machines, by reducing the static and dynamic loading during positioning.

The laser used in material processing presents some characteristics [1]:

- are used different type of laser, their active medium, wavelength, energy, power and operation mode (pulse or continuous),
- large materials treated, as metals and alloys, polymers, composites, ceramics, glasses,
- interaction mode of beam-material, by thermal (heat transfer) and athermal (change on atomic scale),
- thermal processing mechanisms: heating, melting and vaporization,
- athermal processing mechanisms: making and breaking chemical bonds.

This paper has the goal to presents certain implication of laser in micro and nanofabrication processes.

5. SELECTIVE REFERENCES

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