

## **The impact of tube diameter and thickness on laser tube bending process**

### **ABSTRACT**

Laser forming has offered a high promised potential for fabrication, particular laser tube bending because of its important in a different artificial application such as heat exchangers, aerospace, automotive, and air-condition. A high power pulsed Nd-Yag laser JK300HPS of Maximum Average Power Laser 300 (W) emitting at 1064 nm and fiber coupled has been used to irradiate stainless steel 304 (SS304) tubes of diameters (12.7 x 0.6 mm, 12.7 x 0.7 mm, 15.9 x 0.6 mm thickness) and 60 mm in length. In this paper, the effect of tube diameter and thickness have been carried out analytically and validated by experiment. The analytical model utilized in this approach is relatively in the same trend of experiment results and become close in small diameter. The bending angle increases as the diameter and thickness decreasing; the thickness is an effect on the thermal part only meanwhile the diameter is more effective due to the obvious impact on thermal and mechanical aspects of the process.

**Keyword:** Laser tube bending; Bending angle; Tube diameter; Tube thickness