



Optimization of CO₂ Laser Cutting of Stainless Steel Sheet for Curved Profile

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Abstract

Laser cutting is one of the most widely used thermal energy based non-contact type advance machining process. In recent years, considerable experimental investigations have been carried out aiming at improving laser cutting process performance. In this work CO₂ laser cutting parameters on stainless steel 304 width 2.5 mm thickness were studied. The cut quality achieved minimum kerf width to cut stainless steel sheet depends on appropriate selection process parameters was investigated. The parameters consider to include laser output power, cutting speed, gas pressure. The effect of cutting parameter on the cut quality was further investigated by monitoring top kerf width, and bottom kerf width using box – behnken designing the response surface methodology. And finally optimized best CO₂ laser cutting parameters are selected by using genetic algorithm approach.

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2021, Infrared Physics and Technology

Citation Excerpt :

...They revealed that the effect of laser power on the cutting speed and gas pressure was significant. Parthiban et al. [23] also used CO2 laser cutting to cut 304 stainless steel parts. All parameters affecting laser cutting were carefully analyzed....

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...Similarly, the higher taper angle and higher dimensional deviation are observed when the electrical discharge machining process on superalloys [2]. Higher heat-affected zone, higher taper angle and higher power consumption are produced using laser beam machining on superalloys [3]. Striation formation, wear track and pits formation are observed through abrasive water jet machining on superalloys [4]....

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