

The effect of machining parameters on 0.8 mm brass using plasma arc (PA) technique for optimizing cutting quality

Abstract:

This study aims to investigate the effect of machining parameters on 0.8 mm thickness brass sheets using the plasma Arc (PA) technique to optimize cutting quality. It uses the experimental approach to machine 24 specimens. It concluded that: using a higher ampere led to more heat input to the material. Improving the cutting quality requires using higher cutting speeds with lower amperes. Increasing the heat input increases the kerf width of the cutting path. The use of low cutting speeds with high amperes resulted in higher heat energy at the surface of the specimen. This increases the molten areas. The higher thermal concentration at the acute angles has also resulted in the widest kerf width at all the amperes used. The cutting quality of the corners and angles is worse than the cutting of the straight lines. The cut at the obtuse angles is slightly better than the cut at acute angles due to heat concentration. Surface roughness increases as the cutting speed increases. The amount of dross resulting from cutting has been reduced, using moderate amperes and higher cutting speeds. Using a capacity of 30 amperes with a speed of 1500 cm/min is the optimum value to obtain the best quality cut.