

## **Burr Formation Mechanisms During Drilling Operations Of Low Carbon And Stainless Steels**

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**Received on:7/9/2015   &   Accepted on:20/1/2016**

### **ABSTRACT**

In drilling operations, burrs cause many problems for product quality and functionality. Therefore, understanding of burr formation mechanism is essential in order to reduce the deburring cost by reducing burr formation. Also, to avoid or minimize the burr formation during drilling, it is necessary to realize the relationship between the burr formation mechanism and the cutting parameters involved in the machining operations. Therefore, this research is an attempt to investigate experimentally the influence of using a wide range of cutting speeds, feed rates, and depth of cuts on the burr formation mechanism in drilling operations of low carbon and stainless steels plates using HSS cutting tools and cutting fluids. Additionally, this study was focused on the effect of these cutting parameters on the burr size and type. Thus, the average heights of exit formed burrs were measured at different machining conditions. Two types of burr mainly formed and observed (transient and uniform burrs) during drilling both steels. Accordingly, two types of burr formation mechanism related to these observed types of burr were explained. It was found that the average burr height for both steels generally reduced with increasing cutting speeds and feeds due to the change of burr type from a transient burr at lower cutting speeds and feeds to a uniform burr with and without a drill cap at higher speeds and feeds. Finally, no crown burr type formed and observed during drilling both steels in comparison with previous works.

**Keywords:** Drilling Operation, Burr Height, Burr Formation Mechanism, Low Carbon steel, Stainless Steel