

Correlation between grain size and Barkhausen noise on ground surface

M. Vashista^{1*}, S. Paul²

¹*Department of Mechanical Engineering
Indian Institute of Technology (BHU)
Varanasi 221005, U.P., India*

**Corresponding author*

²*Department of Mechanical Engineering
Indian Institute of Technology Kharagpur
Kharagpur 721 302, West Bengal, India*

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*e-mail: mvashista.mec@iitbhu.ac.in

Grain size is used to characterize different material properties and surface integrity features. However, there is no literature available that discusses the nature of the correlation between the grain size with Barkhausen Noise upon grinding with simultaneous occurrence of plastic deformation, formation of white layer, grain elongation, change in microhardness, etc. AISI 1060 steel samples were ground under different grinding domains, i.e. conventional abusive grinding, conventional grinding, cBN grinding and high speed grinding with

moderately deep cut. Induction of tensile and compressive residual stress, microstructural changes, white layer formation, grain refinement, plastic deformation, grain elongation and change in microhardness were observed upon grinding AISI 1060 steel. A correlation was established between the grain size and Barkhausen Noise when simultaneous changes in microhardness and microstructure, grain elongation, plastic deformation and formation of white layer take place due to grinding.