

# Electron Backscatter Diffraction (EBSD) Analysis of Machinable Lead-Free Brass Alloys: Connecting Texture with Fracture

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**Abstract:** The current paper is related to the study of the microstructure and texture of two machinable lead-free brass alloys, namely CuZn42 (CW510L) and CuZn38As (CW511L), which were evaluated in the as-drawn and post heat treated condition. Electron backscatter diffraction (EBSD) was employed for the examination of the brass rods' crystallographic properties in order to correlate the effect of post processing heat treatment on the evolution of phase structure and texture towards the interpretation of dynamic (impact) fracture properties. It is shown that  $\alpha$ - and  $\beta$ -phase volume fractions, mean grain size, and grain boundary misorientation are the most influential factors altering the fracture resistance of single- and dual-phase brass alloy rods. The role of grain boundary engineering, through the formation of coincidence site lattice (CSL) boundaries and their evolution during thermomechanical processing, is of major importance for the design of the mechanical behaviour of new eco-friendly machinable brass alloys.