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The present research focuses on the characterization of microstructural and mechanical properties of real castings produced by HPDC using EN AC 46000 alloy. The Cu content of the alloy was varied inside the limits prescribed by the standard for EN AC 46000 alloy to investigate the influence of Cu on the material performance and to provide results useful for industrial applications. Castings with Cu content of 2 wt.% and 4 wt.% were industrially produced using a 2500-ton HPDC machine. Two areas of the casting with different cooling rates were selected to obtain samples for microstructural and mechanical characterization. In particular, area fraction, number density and equivalent diameter of intermetallic compounds were investigated, and the size distribution of these particles were statistically evaluated. Finally, hardness measurements and tensile tests were performed and the results were correlated to microstructural features and solidification conditions to deeply understand the alloy behavior.

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