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## **EFFECT OF HEAT TREATMENT ON WEAR BEHAVIOUR OF FORGEDSTEEL BALLS**

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**Abstract :** The raw material preparation sector such as cementworks, the steel and mining sector is beginning to pay attention toforged balls as an alternative to the cast balls for their best usecharacteristics. The forging materials are stronger than the asting material because of their fiber structure. The forgingtechnique, in contrast to the casting process, contributes to asignificant improvement of ball wear behavior during the grinding process. The wear behavior depends on several factors including the chemical composition of the alloy, the type of microstructure and the applied heat treatment. In this work we focus on the effect of austenitizing temperature on the type of the produced microstructure. All the heat treatment parameters were fixed for all the samples except the austenitizing temperature. Threeaustenitizing temperatures are selected and a tempering at 250°C with a holding time of one hour followed by cooling has been carried out. The study is carried out on medium micro-alloyed carbon steel intended for heat treatment. To make clear the effect of the temperature on the microstructural transformation, several investigations wereachieved. Optical and SEM microscopy was carried out toqualitatively characterize the phases A microstructural analysisusing the Rietveld method was conducted to access, for eachtemperature, the type and proportion of phases as well as the crystallites size.

Keywords : grinding balls, forging, heat treatment, characterization, XRD analysis, Rietveld refinement