عنوان مقاله:

Cooling Rate Effect on Upsetting Behavior of Hot Rolled Cold-heading Quality Steel Wire Rods

محل انتشار:

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خلاصه مقاله:

Cold heading quality wire rods are one of the primary wrought products which are used in fastener production industry. Hot rolling of steel billets is one of the well-known manufacturing processes for wire rod production. Generally, in finishing mill process, the austenitized wire rod is rolled by high speed rollers, consequently, an air cooling process (STELMOR process) is applied on wire rod coils, which has vital effect on mechanical and metallurgical properties of final products. Upsetting test is one of the test procedures that evaluates aptitude to cold forming of wire rods in cold heading process. In this study, by using experimental approach, effect of cooling rate on upsetting behavior of ۱۰B۲۱ wire rod is investigated. Laying head temperature is set between ۸۴۰-۸۶۰ oC for ۱۰B۲۱ wire rod. Some arrangements of cooling fans with adjustable flow rates are implemented to change the cooling rate after the laying head. Consequently, according to BS-EN ۱۰۲۶۳-۵:۲۰۰۱ prepared test samples, are subjected to compression stress applied by a hydraulic upsetting test machine with different upsetting ratios until the first streak of surface cracks are revealed. Three kind of of cooling rates are implemented and their effect on the upsetting behavior is studied and discussed. It is observed that cooling rate has twofold effect on cold forming behavior of cold heading quality steel wire rods, thus determining an optimum cooling rate for such wire rods is necessary to attain appropriate quality.

کلمات کلیدی:

Wire rod, Hot rolling, Cooling Rate, Upsetting