

## **Microstructures Evolution of a Nano/Ultrafine Grained Low Carbon Steel Produced by Martensite Treatment Using Accumulative Roll Bonding**

**Authors :** Mehdi Salari

**Abstract :** This work introduces a new experimental method of martensite treatment contains accumulative roll-bonding used for producing the nano/ultrafine grained structure in low carbon steel. The ARB process up to 4 cycles was performed under unlubricated conditions, while the annealing process was carried out in the temperature range of 450–550°C for 30–100 min. The microstructures of the deformed and annealed specimens were investigated. The results showed that in the annealed specimen at 450°C for 30 or 60 min, recrystallization couldn't be completed. Decrease in time and temperature intensified the volume fraction of the martensite cell blocks. Fully equiaxed nano/ultrafine grained ferrite was developed from the martensite cell blocks during the annealing at temperature around 500°C for 100 min.

**Keywords :** martensite process, accumulative roll bonding, recrystallization, nanostructure, plain carbon steel

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