

Deformation solar container and grain refinement

<div class="df_qntext">Do grain refinement and low temperature affect deformation mechanisms of stainless steel?

The synergistic effects of grain refinement and low temperature on the deformation mechanisms of Cr-Mn-N austenitic stainless steels (ASSs) were systematically investigated.

<div class="df_qntext">Can severe plastic deformation refine the grain of metallic materials?

Severe plastic deformation can refine the grain of metallic materials[,,,,,]. Especially, grain refinement is more pronounced at high strain rates [2,5,,].

<div class="df_qntext">Can grain refinement improve the ability to store energy during plastic deformation?

Rittel et al. stated that DRX results from the finite capacity of a material to store dynamic plastic deformation energy. In other words, grain refinement can improve the ability to store energy during plastic deformation.

<div class="df_qntext">Does grain refinement influence the strain-hardening effect of metals under dynamic deformation?

Consequently, grain refinement inevitably influences the strain-hardening effect of metals under dynamic deformation at multiple levels, which will be discussed in detail in the following section.

<div class="df_qntext">Do precipitates progress grain refinement during deformation?

Precipitates will progress grain refinement during deformation, there is a mass of nanoscale grains around the precipitates. The mechanical behaviors and deformation mechanisms of Chinese low activation martensitic (CLAM) steel under extreme loading conditions were systematically studied.

<div class="df_qntext">How does shear plastic deformation affect grain refinement?

Shear plastic deformation induced by external forces triggers grain refinement, resulting in finer grain structures with more grain boundaries. Double-billet forming yields better joint surface areas than single-billet forming, reducing the likelihood of crack propagation, a desirable outcome for many manufacturers.

Refining grains of metals and alloys is an effective approach to tailor their properties and performance. Plastic deformation is routinely used for structure refinement, with which microstructures down to the ...

This study focused on the significance of crystal structure on the grain refinement occurring during severe plastic deformation without considering the activation of softening ...

The mechanism of grain refinement was supposed to be the compressive strain-induced deformation twinning, dislocation slip systems movement, the refinement effect of subgrain ...

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Surface Mechanical Attrition Treatment (SMAT) has emerged as a promising technique to enhance the corrosion resistance and fatigue performance of metals by inducing plastic ...

To investigate the influence of stress state on the hot deformation behavior of AA2195, the plane strain compression (PSC), uniaxial compression (UC) and torsion (TR) tests were ...

Grain refinement of Zr-containing Al alloys has attracted extensive attention for many years in both industry and academia, since "Zr-poisoning" phenomenon always happens when ...

Numerous nano-sized equiaxed grains were induced by dynamic recrystallization (DRX), as a result of severe shear plastic deformation on the machined surface. As the cutting speed increases, the grain ...

In fact, only Ahn et al. [22] performed channel die compression experiment to activate deformation twins and annealing experiment to induce SRX for achieving homogeneous grains with ...

Grain refinement is also obtained during extreme deformation in metal processing by high-energy ball milling (Zhou et al., 2004) and severe plastic deformation (Beyerlein et al., 2014, ...

Grain refinement can mitigate severe localized deformation during quasi-static deformation of HEAs with BCC structure, enhance the strain hardening capacity, and facilitate the ...

Combined with microstructural observations, it was determined that grain refinement primarily occurred through the dynamic recrystallisation mechanism and the deformation induced ...

This study investigates an approach to simulating grain refinement during macroscopic deformation considering microstructural evolution in each constituent phase within the steel using a ...

Effective grain size control is a fundamental property of Zn-based alloys that has a significant impact on their mechanical properties and degradation rate through various methodical ...

Grain refinement is a pivotal technique for enhancing the mechanical attributes of magnesium alloys, offering improvements in strength, ductility, and fatigue resistance. Among the ...

The objective of this overview is to elucidate the grain evolution mechanism during the superplastic deformation and manufacturing process. Particular emphasis is placed on the ...

Moreover, primary zinc grain refinement has been shown to decrease the fraction of coarse deformation twins that serve as undesirable sites of micro-cracking. In particular, both ...

Synchrotron measurements revealed the temporal evolution of the grain refinement mechanism in terms of the

initiation and rate of refinement throughout the loading test. A multiscale ...

The evolution process of grain size, texture and microhardness with various rolling deformation was measured and analyzed. Nd-enriched phase may play an important role in activation ...

Thank deformation energy storage and grain refinement - the unsung heroes of materials engineering. These processes are like the Avengers of metallurgy, quietly strengthening ...

The microstructure characterization results indicate that grain refinement during deformation and the positive strain rate effect on elongation are primarily governed by changes in ...

Abstract This study investigates an approach to simulating grain refinement during macroscopic deformation considering microstructural evolution in each constituent phase within the ...

The deformation role of each constituent phase and the scientific origin of outstanding mechanical properties achieved by the grain refinement in the DP steel are discussed based on ...

A review made in the present study highlights the important methods of grain refinement for ferrous casting alloys. It has been shown that the processes used for the grain refinement of ferrous alloys ...

The synergistic effects of grain refinement and low temperature on the deformation mechanisms of Cr-Mn-N austenitic stainless steels (ASSs) were systematically investigated.

Thermal mechanisms of microstructural refinement in steels were reviewed. These include thermal cycling, martensite process, and static recrystallization (SRX), in which the dominant ...

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