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Analysis of dynamic deformation behavior of AZ31 using Taylor Rod on Anvil Impact Tests. MARUWADA SUKANYA SHARMA, DANIEL KIRTLEY, ARUN GOKHALE, NARESH THADHANI, Georgia Inst of Tech — The dynamic behavior and detailed microstructural characterization of rolled magnesium alloy AZ31 is described in this work. Magnesium alloys have gained considerable importance as they possess a high strength-to-weight ratio. The goal of the current work is to provide an insight on the dynamic deformation of AZ31 magnesium alloys.Taylor rod-on-anvil impact tests have been conducted at different velocities, on rods machined along the rolling and transverse directions of the as-rolled AZ31 plate, in order to capture the effects of anisotropy on the dynamic deformation behavior. The experiments used laser beam interruption to measure the impact velocity of the samples and high-speed digital imaging to capture transient deformation states. The impacted samples showed anisotropic deformation resulting in an elliptical impact surface foot print. Additionally, detailed orientation maps and micrographs revealed extensive twinning along with some cracks on the impact faces of the samples. Quantitative microscopy revealed that the surface area per unit volume of twins *at least* tripled under all impact conditions. In this presentation evolution of microstructure and anisotropy in rolled AZ31 samples subjected to Taylor rod-on-anvil impact tests will be discussed.

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