

This special issue of the *Journal of Engineering Materials and Technology* (JEMT) contains selected papers from the first symposium organized on shear; SHEAR07 in Nancy, France, 4–7 September, 2007. All papers have successfully gone through the regular peer-review process of JEMT.

Shear deformation is one of the basic deformation modes in testing and metal forming. It usually permits to reach much larger strains than in other deformation modes. The main objective of this issue is to provide an insight into the large variety of topics that are related to shear and to publish new advances in testing, material behavior and modelling.

Although the selected papers cannot cover all topics related to shear, the present collection represents a good discussion about effects related to large strain shear (torsion), hardening behavior, adiabatic shear bands at high strain rates, specific rules for dynamic recrystallization in shear, advanced crystal plasticity analyses, texture development and testing of polymers. One can present the essential of the contributions as follows:

- After an analysis of the shear process and grain refinement in Equal Channel Angular Extrusion, the paper entitled “Plastic Behavior of Metals at Large Strains: Experimental Studies Involving Simple Shear” presents a new model on Stage IV strain hardening.
- There are two papers on high strain torsion of an intermetallic alloy, the NiAl: “Texture Formation and Swift Effect in High Strain Torsion of NiAl” and “Microstructure Development During High Strain Torsion of NiAl.” They present original experimental data on texture and microstructure at large strains and varying temperatures together with good simulation results concerning the Swift effect. The latter is always important in free-end torsion and is shown to be related to the evolution of the crystallographic texture.
- The contribution entitled “Analysis of Large Strain Hot Torsion Textures Associated With ‘Continuous’ Dynamic Recrystallization” presents new principles and successful modelling for the dynamic recrystallization process that changes the texture at higher temperatures during shear.
- The torsion of non-axisymmetric initial textures is analyzed in the paper “Texture and Mechanical Behavior of Magnesium During Free-End Torsion” including polycrystal plasticity modelling of the texture development and new ideas about dynamic recrystallization in hexagonal materials.
- There are two theoretical papers that give insight into the shear process in metal forming and the selection of slip systems: “Identification of Simple Shear in Plane Strain Deformation” and “Shear on the Flow Surface of Metallic Crystals.”
- A complex shock-related problem is addressed in the paper “Numerical Study of Impact Penetration Shearing Employing Finite Strain Viscoplasticity Model Incorporating Adiabatic Shear Banding” for the case of dynamic plasticity of high-strength metallic materials.
- The hardening characteristics of polymers strongly depends on the crystalline phase which deforms mainly by simple shear as shown in the paper “Determination of Critical Strains in Isotactic Polypropylene by Cyclic Loading-Unloading.”

Finally, I thank gratefully all the authors for their excellent contributions to this special issue and the Editors of JEMT, Professors Hussein Zbib and Huseyin Sehitoglu for giving the opportunity to publish the most relevant contributions of the SHEAR07 symposium. Special thanks to Professor Christian Gsell, the Chairman of SHEAR07 for bringing the scientific community together on shear processes and related phenomena.

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