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Special Issue Reprint

Scientific and Engineering Progress on Aluminum-Based Light-Weight Materials: Research Reports from the German Collaborative Research Center 692

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Aluminum-based light-weight materials offer great potential for novel engineering applications, particularly when they are optimized to exhibit high strength and yet provide sufficient reliability. The last decade has thus seen substantial activity in the research fields of high-strength aluminum alloys and aluminum-based composite materials. For twelve years, backed by solid funding from the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG), scientists of the Collaborative Research Center, “High-strength aluminum-based light-weight materials for safety components” (SFB 692) at TU Chemnitz, Germany, have contributed to this research area. Our research efforts have been focused on three main areas: ultrafine-grained aluminum alloys produced by severe plastic deformation; aluminum matrix composites; and aluminum-based composite materials (including material combinations such as magnesium/aluminum or steel/aluminum and the corresponding joining and forming technologies). The framework of SFB 692 has served as a base for numerous scientific collaborations between scientists in the fields of materials science, design engineering, production engineering, mechanics, and even economics—in Chemnitz, and with many well-established international experts around the world. In this Special Issue, we present recent results on high-strength aluminum-based light-weight materials that also provide a broad overview of research activities in SFB 692 and elsewhere.<false,>

