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Advancements in Low Z Materials: Comprehensive Characterization and Applications by the Mechanical and Materials Engineering Group at CERN #102

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The Mechanical and Materials Engineering group of the Engineering Department at CERN has gained in the last decade important experience in the comprehensive characterization of low Z materials, offering valuable insights into their properties and field of application. We focus on elucidating the unique challenges associated with low Z materials, encompassing their processing, welding techniques, and fabrication methods. Our expertise covers advanced non-destructive testing (NDT) methods as part of quality control to ensure the integrity of the materials, such as Computed Tomography (CT), High-Resolution X-Ray Diffraction (HR-XRD) or specially adapted Scanning Electron Microscopy (SEM) techniques for the investigation of light materials. We are also equipped with Focused Ion Beam (FIB)-SEM and instrumented nanoindentation as destructive techniques used during the post-mortem evaluations of for example HiRadMat specimens, fixed targets or beam instrumentation devices. By leveraging our state-of-the-art facilities, we provide essential support for an advanced understanding and application of low Z materials in a wide variety of projects at CERN.

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