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Tipo: **Presentazione orale**

Design of a Compact Versatile Testing Rig for Elastomers (TESTOR)

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The following work is focused on the design and construction of an innovative testing ring aimed at performing detailed mechanical characterization of different materials under multiaxial load states. The objective is to overcome the limitations of traditional testing devices, which often fail to accurately replicate the complex stress states to which materials are subjected in real-world applications. This initiative falls within the thematic areas of Spoke 2 of the PNRR (Piano Nazionale di Ripresa e Resilienza), with a particular focus on the development of testing equipment primarily, but not exclusively, for elastomers under variable stress and temperature conditions. The device features unique characteristics, including the limitless rotational capability of the load cell, essential for the complete characterization of materials capable of undergoing large deformations (such as elastomers); the free axial expansion/contraction of the specimen during testing to ensure pure torsion loading throughout the entire deformation range; independent load ramps, to precisely control the imposed stress triaxiality during the test; and the application of synchronized but independent axial and torsional loads, including torsional cyclic loads with efficient and accurate stress reversal at high frequency using a "zero-backlash" system. One of the key features of the developed device is the integration of non-proprietary industrial components, which ensures an open architecture that facilitates future upgrades, improvements, and ease of maintenance.

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