Analysis Static Loading Variations In Multifunctional Three-Wheeled Electric Vehicle Frame Design Using Software Ansys Workbench* 2024 *R1
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ABSTRACT

By choosing the type of material to be used, strength, durability, and safety can be increased. Current technological developments make and analyze a design easier before the production stage. In this study, an analysis of static loading variations was carried out on the design of a multifunctional three-wheeled electric vehicle frame using ansys workbench 2024 R1 software to produce stress, deflection, and safety factor values. This study aims to determine the strength value of the frame design and analyze the frame design, the materials to be used in this study are Carbon Steel AISI 1020 and Stainless Steel AISI 316 with loading variations of 215 Kg, 265 Kg, and 365 Kg. The test results on the Carbon steel AISI 1020 material with the loading are respectively the maximum stress values of 29.175 MPa, 35.96 MPa, 49.53 MPa. The deflection value is 0.098137 mm, 0.12096 mm, 0.1666 mm. And the safety factor value is 10.06, 8.1619, 5.9257. While for the AISI 316 Stainless steel material with the loading, the maximum stress value is 29.287 MPa, 36.098 MPa, 49.72 MPa. The deflection value is 0.10717 mm, 0.13209 mm, 0.18194 mm. And the safety factor value is 8.6079, 6.9838, 5.0704.

Key words: *Von misses stress, deflection, safety factor*