

## Optimization of Element Type for FE Model and Verification of Analyses with Physical Tests

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**Abstract :** In Automotive Industry, sliding door systems that are also used as body closures, are safety members. Extreme product tests are realized to prevent failures in a design process, but these tests realized experimentally result in high costs. Finite element analysis is an effective tool used for the design process. These analyses are used before production of a prototype for validation of design according to customer requirement. In result of this, the substantial amount of time and cost is saved. Finite element model is created for geometries that are designed in 3D CAD programs. Different element types as bar, shell and solid, can be used for creating mesh model. The cheaper model can be created by the selection of element type, but combination of element type that was used in model, number and geometry of element and degrees of freedom affects the analysis result. Sliding door system is a good example which used these methods for this study. Structural analysis was realized for sliding door mechanism by using FE models. As well, physical tests that have same boundary conditions with FE models were realized. Comparison study for these element types, were done regarding test and analyses results then the optimum combination was achieved.

**Keywords :** finite element analysis, sliding door mechanism, element type, structural analysis

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