

**STRUCTURAL IMPROVEMENT & MATERIAL COST  
REDUCTION ON WASHING MACHINE BASKET  
ASSEMBLY**

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**KEYWORDS**

Structural analysis, benchmark, reliability, stress measurement, validation test.

**ABSTRACT**

New project consider renovating the current washer machine platform for Latin America markets focusing on reliability, quality and product cost.

Through a benchmark study basket assembly was identified as one of the components with major opportunity to positively impact on the objective of material cost reduction. Basket assembly contains stainless steel, aluminium and plastic polypropylene parts, besides appearance and clothes care, one of its critical functions is withstand inertial loads generated by the laundry load during spin condition.

By means of Design Failure Mode Analysis exercise, components fracture and excessive deflection were identified as a critical failure modes, because of that, as a preventive action, a structural comparison of different basket assembly design concepts was carried out by means of finite element analysis simulations, this, under design for six sigma methodology.

Centripetal force, balance ring force, and unbalance mass located at different position into the basket assembly was considered as external forces acting over the component. In addition, using strain gages, stress measurement in base line and competitor components were performed, furthermore, material mechanical properties characterization and high stressed test was made.

A correlation between experimental data and finite element simulations data were obtained and after several design iterations a final design concept that meet structural and cost requirements were released.

Finally after a prototypes building, in order to validate the design concept, a set of reliability test were completed without structural failures interruptions. As a result, an optimized basket assembly design was achieved.

As a conclusion, in early development stages, structural finite element simulations allowed a quick and effective design concept iteration process, additionally when a correlation with experimental data was achieved, design team had major certainty of successful validation test.