

## Failure Analysis: Solid Rocket Motor Type “Candy” - Explosion in a Static Test

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**Abstract :** The sounding rockets are aerospace vehicles that were developed in the mid-20th century, and Colombia has been involved in research that was carried out with the aim of innovating with this technology. The rockets are university research programs with the collaboration of the local government, with a simple strategy, develop and reduce the greatest costs associated with the production of a kind type of technology. In this way, in this document presents the failure analysis of a solid rocket motor, with the real compatibility to reach the thermosphere with a low-cost fuel. This solid rocket motor is the latest development of the Uniandes Aerospace Project (PUA for its Spanish acronym), an undergraduate and postgraduate research group at Universidad de los Andes (Bogotá, Colombia), dedicated to incurring in this type of technology. This motor has been carried out on Candy-type solid fuel, which is a compound of potassium nitrate and sorbitol, and the investigation has allowed the production of solid motors powerful enough to reach space, and which represents a unique technological advance in Latin America and an important development in experimental rocketry. To outline the main points the explosion in a static test is an important to explore and demonstrate the ways to develop technology, methodologies, production and manufacturing, being a solid rocket motor with 30 kN of thrust. In conclusion, this analysis explores different fields such as: design, manufacture, materials, production, first fire and more, with different engineering tools with principal objective find root failure. Following the engineering analysis methodology, was possible to design a new version of motor, with learned lessons new manufacturing specification, therefore, when publishing this project, it is intended to be a reference for future research in this field and benefit the industry.

**Keywords :** candy propellant, candy rockets, explosion, failure analysis, static test, solid rocket motor

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