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STUDY ON THE 15TH CENTURY KOREAN ROCKET, DAE-SIN-GI-JEON

Abstract

Based on the documents written in the 15th century, we restored and tested the Dae-Sin-Gi-Jeon, the 15th Century Korean rocket and gunpowder weapons that were developed in 1448. The propellant case is made of Korean traditional paper, length 695mm, thickness 17.8 mm, internal diameter 63.1 mm, the diameter in the bottom is 37.5 mm. The shaft is made of bamboo stick, 5.31 m long. The tail fins are made of feathers, 31.28 mm wide, 843.48 mm long. The length from the end of the bamboo stick to the fins is 843.48 mm. The propellant case was charged with black powder. To restore Dae-Sin-Gi-Jeon (large-magical-machine-arrow), we performed experiments including but not limited to the followings; 1) Tensile strength tests - analysis of strength and structure of Korean traditional paper 2) Internal pressure tests of the propellant case, 3) Ground firing test and thrust measurements, 4) Flight tests. Average thrust is 242.94 Newton, total impulse is 925.60 Newton-sec during the boosting 4 seconds after ignition. Flight distance of the Dae-Sin-Gi-Jeon is approximately 900 meters.