

"Development of 20 kN hybrid rocket booster "

Alberto Bettella¹, Federico Moretto², Enrico Geremia³, Nicolas Bellomo⁴, Daniele Pavarin⁵ and Dino Petronio⁶
DII University of Padova, Padova, Italy – HIT09 s.r.l., Padova, Italy

A hybrid rocket booster was developed by CISAS “G.Colombo” . The activity started from small-scale testing of lab motors and culminated on a successful testing of a demonstrator. The hybrid motor is propelled by nitrous oxide (N₂O) as oxidizer and paraffin wax as solid fuel. It is ignited by three solid charges that also command the opening of the oxidizer valve. The peak thrust is 20 kN, the total impulse 50 kNs and the N₂O liquid phase burn time 3.5 seconds. The paper presents the design and development strategy applied.

¹ Mechanical Engineer, Ph.D., HIT09 s.r.l., a.bettella@hit09.com.

² Aerospace Engineer, Ph.D., Department of Industrial Engineering, University of Padua, federico.moretto@unipd.it

³ Aerospace Engineer, HIT09 s.r.l., e.geremia@hit09.com

⁴ Aerospace Engineer, Ph.D., Department of Industrial Engineering, University of Padua, nicolas.bellomo@unipd.it

⁵ Mechanical Engineer, Ph.D., Department of Industrial Engineering, University of Padua, daniele.pavarin@unipd.it

⁶ Aerospace Engineer, HIT09 s.r.l., d.petronio@hit09.com