

“SLIM : A 180 mm IM compliant Min Smoke rocket motor”

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Roxel has developed and partly qualified a 180 mm diameter Minimum Smoke, 1.3 Hazard Class, IM compliant motor suitable for use on, for example, Hellfire and Brimstone missiles.

Based on a similar type of Cast Double Base (CDB) propellant to that used on the current JCM motor, but adding an Elastomer Modified binder, to permit charge to case bonding, plus a Steel Strip Laminate (SSL) case, the motor has been demonstrated to give a very high degree of IM compliance.

After a self funded R&D programme in the 1990's, plus a US DoD FCT sponsored IM Hellfire Qualification programme, in 2005 Roxel completed a MoD sponsored Technical Demonstrator Programme on the SLIM (Smokeless Large Insensitive Munitions) motor. Additional MoD and self-funded work continues in 2006.

Roxel has assessed the thermal loads associated with fixed wing carriage and missile free flight. A higher temperature SSL resin has also been applied to prototype SSL cases, to extend the structural safety margin at elevated temperatures. The stretch potential of the motor has also been demonstrated by a “flameless” option, that maintains full performance.

Significant challenges successfully overcome in this work, in addition to demonstrating IM compliance, include - matching the ballistic performance of the legacy 1.1 HD class motor, with a different type of propellant ; passing a 10 g, + 25 mm displacement vibration trial, unpacked, at 71 °C ; Centrifuge testing, with 53 g acceleration at + 71 & - 46 °C ; Debris free design.