

NTS SERVICE SPOTLIGHT

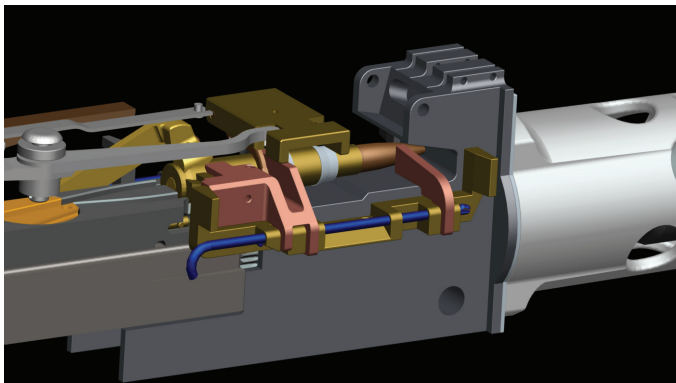
ORDNANCE SCIENCES

OVER THIRTY YEARS OF EXPERIENCE

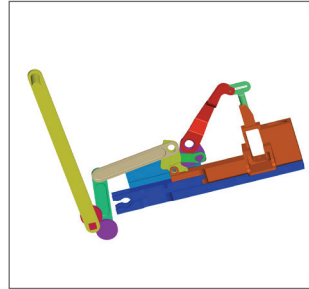
NTS engineers provide ordnance engineering and test services with expertise in the development of detailed test plans and procedures to high level program requirements, failure investigation and analysis, ordnance product design and analysis, reverse engineering, and the design and development of custom test apparatus.

3D CAD MODELING AND TDP DEVELOPMENT

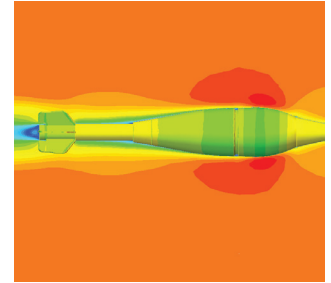
- Creo Parametric and SolidWorks Software
 - » Parametric Solid Modeling
 - » Detailed Documentation w/2D and 3D Drawings
 - » Assembly Modeling/Rendering
- Import/Export of Model Geometry
 - » Kernel Support for ACIS, Parasolid, and Granite
 - » Direct translators for CADDs and AutoCAD DWG
 - » Translators for AutoCAD DXF, IGES, STEP, SET, VDA, ECAD, CGM
- Mechanism Dynamics Analysis Using MSC ADAMS and CREO MDO
 - » Analyze Reaction of Design to Dynamic Forces/Gravity/Friction
 - » Modeling of Springs, Dampers, Motors, Friction, Gravity, Dynamic Loads
 - » Fuze Mechanical S&A Analysis, Gun System Ammunition Handling



CAD Model of M2 HB Gun System



M777 Primer Loading Mechanism



CFD Analysis of 81 mm Mortar

FINITE ELEMENT STRUCTURAL & THERMAL ANALYSIS

Creo Simulate, LS-Dyna, ALE-3D, NASTRAN, and ANSYS Software

- Structural Analysis
 - » Static Stress and Displacement and Buckling Factors of Safety
 - » Evaluate Natural Frequencies (normal modes)
 - » Nonlinear Structural Analysis: Large Deformation, Hyper-elastic Materials, and Material Plasticity
 - » Dynamic Analysis for: Time Response, Frequency Response, Random Response, and Shock
 - » Modeling of Laminate Materials
 - » Explicit (Hydrocode) solvers for highly transient and non-linear phenomena
- Steady State and Transient Thermal Analysis
 - » Applied Heat Loads, Prescribed Temperatures, and Convection Coefficients
 - » Combined Structural/Thermal Analysis

FINITE ELEMENT FLUID/THERMAL ANALYSIS

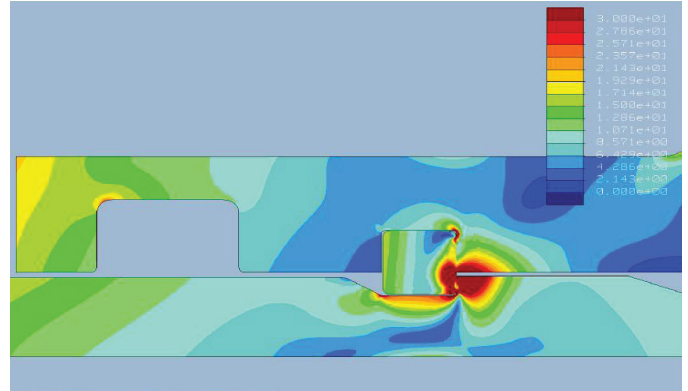
- Autodesk Simulation CFD and FloTHERM
 - » Internal/External Flows
 - » Prediction of Body Forces, Drag/Lift
 - » Convection, Conduction, and Radiation Heat Transfer
 - » Compressible, Transient, and Two-Phase Flows
 - » Cavitation

FINITE ELEMENT FLUID/THERMAL ANALYSIS CONTINUED

- » Fluid/Structure Interaction (e.g. Spinning Projectiles)
- » Electronics Thermal Modeling

PROJECTILE AND ROCKET MOTOR ANALYSIS

- PRODAS Projectile Modeling
- Mass Properties Analysis
- Aerodynamic Analysis
 - » Spin, Fin, or Drag Stabilized Shapes
 - » Attack Angle and Roll Induced Coefficients
 - » Dynamic and Gyroscopic Stability
 - » Aerodynamic Characteristics up to Mach 8
- Trajectory Simulation
 - » 4 or 6 Degree of Freedom Simulation
 - » Muzzle Exit Analysis
- Interior Ballistics Modeling
 - » Tradeoff of:
 - Propellant Weight vs Projectile Weight
 - Barrel Twist
 - Propellant Blending
 - » Computation of:
 - Velocity
 - Breech and Base Pressure
 - Linear and Angular Acceleration vs Distance Along Barrel



Rocket Motor Structural Analysis

PROJECTILE AND ROCKET MOTOR ANALYSIS CONTINUED

- Rocket Motor Performance Modeling
 - » Tradeoff Nozzle Geometry, Grain Geometry, Propellant Burn Rate, Propellant Thermochemical Properties, Igniter Properties, and Booster Properties

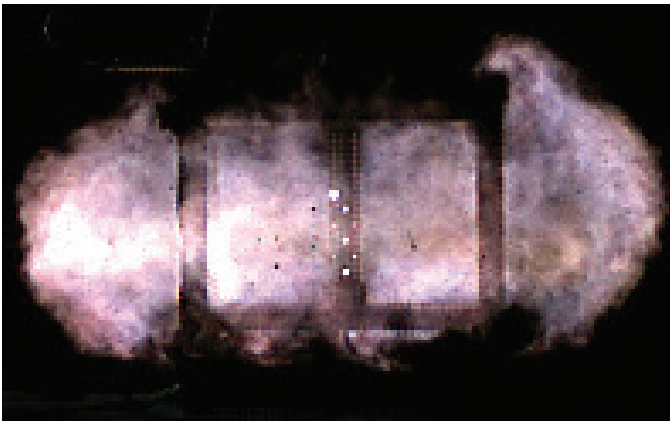
ENGINEERING TEST SERVICES

- Development of Detailed Test Plans and Procedures to High Level Program Requirements
 - » Project Engineering
- Design and Development of Custom Test Apparatus
- Failure Investigation and Analysis
- Product Design
- Reverse Engineering

ABOUT NTS

NTS is fully invested in helping you build better, stronger, safer, more reliable products, and bring those products to market quickly and efficiently. Since conducting our first rounds of tests in 1961, NTS has become one of the largest commercial test laboratory networks in North America.

Our services cover environmental, dynamics, materials, ballistics and much more. NTS engineers have exceptional knowledge of test and conformity requirements in both domestic and international arenas. Client partners in Aerospace, Defense, Telecom and Energy rely on NTS to make sure they're putting their best products forward, and so can you.



M299 Ignition Cartridge Test

