



MSIAC
Munitions Safety Information Analysis Center



INSENSITIVE MUNITIONS & ENERGETIC MATERIALS TECHNOLOGY SYMPOSIUM (IMEMTS)

October 21 – 24, 2019 | Seville, Spain | NDIA.org\IMEMTS

PROVISIONAL AGENDA

MONDAY 21 OCTOBER 2019

4:00 – 8:00 pm **ON-SITE REGISTRATION**
FOYER

Welcome Pack Sponsored by: RWM Italia SpA

6:00 – 8:00 pm **WELCOME RECEPTION**
PATIO

Sponsored by: NEXTER Munitions & ROXEL France

TUESDAY 22 OCTOBER 2019

7:00 – 8:30 am **CONTINENTAL BREAKFAST**
RESTAURANT

LATE ON-SITE REGISTRATION
FOYER

PLENARY SESSION
MARBELLA ROOM

Chair: Ron Hollands, BAE Land Systems, UK

8:00 – 8:10 am **WELCOME ADDRESS & INTRO TO KEYNOTE (IMEMG PRESIDENT)**

8:10 – 8:40 am **KEYNOTE ADDRESS**
General de Division Manfredo Monforte Moreno. Subdirección
General de Sistemas Terrestres, INTA, Spanish MoD

8:40 – 9:00 am **MUNITION SAFETY AWARDS (MSIAC)**

9:00 – 9:20 am **Highlights and Future Priorities**
Dr. Michael Sharp, MSIAC
22209

9:20 – 9:40 am **Joint Enhanced Munitions Technology Program Changes and Insensitive Munitions**
Anthony Di Stasio, Picatinny Arsenal, USA
22225

9:40 – 10:00 am **Is IM Relevant in an Increasingly Dangerous World?**
Wade Babcock, U.S. Navy
22248

10:00 – 10:30 am **COFFEE BREAK**
FOYER

Sponsored by: AWE Plc

Sessions 2A – Systems I

Phil Cheese, MoD - UK

MARBELLA ROOM

Sessions 2B – Energetic Materials

Mike Ervin, BAE Systems - USA

IBIZA ROOM

10:30 – 10:50 am

IM HE-T® Final Hazard Classification

Jason Sebastian, GD-OTS, USA
22163

DAPO-LLM-105: Improving the Particle Morphology and Thermal Stability

Anne Wuillaume, CEA, France
22157

10:50 – 11:10 am

Reducing HE Response Severity by Varying the Confinement Around an Explosive Charge to Improve IM Signature

Andrew Jones, AWE, UK
22169

GrIMEx (Green IM Explosive): Development of Novel IM Comp B Replacements Based on Green TNT and RDX Replacements

Dr. Jacob Morris, BAE Systems, USA
22217

11:10 – 11:30 am

IM Technologies & Implementation of New Designs

Dr. Brian Fuchs, Picatinny Arsenal, USA
22237

Desensitization of Nitramine Explosives with Reserved High Energy

Dr. Zhijian Yang, CAEP, China
22156

11:30 – 11:50 am

New Generation & General Purpose Mk82 IM Signature

Emmanuel Bacle, Eurenco, France
22206

Manufacturing and Characterization of Insensitive High-Energy Explosives Containing Fluid Energy Milled Nitramine

Virgil Fung, BAE Systems, USA
22238

11:50 am – 12:10 pm

Transition of a System Solution to Mitigating the USMC SOCOM LAW FFE M72E10 Warhead's Violent Response to Cook-Off and Impact Threats

Daniel Pudlak, CCDC-AC, USA
22232

ECH Polymerization – Qualification of a Solvent Compatible with REACH Regulation

Genevieve Eck, Eurenco, France
22199

12:10 – 1:40 pm

SIT-DOWN LUNCH

PATIO

Sponsored by: EXPAL Systems

	Sessions 3A – Testing I James Padfield, RWM - Italia	Sessions 3B – Formulations Ron Hollands, BAE Systems - Land Systems - UK
	MARBELLA ROOM	IBIZA ROOM
1:40 – 2:00 pm	Fragmentation from Detonations and Less Violent Munition Responses Christelle Collet, MSIAC 22197	Cast PBX Energetic Fillers Recycling: Approaches and Results Julie Perouel, Eureenco, France 22210
2:00 – 2:20 pm	Extremely Insensitive Explosive DDT Results during SLSGT Nicholas Albrecht, NAVAIR, USA 22185	Performance and Stability of Explosive Formulations Based on PATO Dr. Philip Leonard, LANL, USA 22219
2:20 – 2:40 pm	Magazine Loading Density Detonation Estimation Dr. Ernest Baker, MSIAC 22194	Further Development of TNBA Melt-Pour Explosive Formulations Virgil Fung BAE Systems, USA 22240
2:40 – 3:00 pm	IM Test on Artillery Ammunition Vulcano 127mm and 155mm Ballistic Extended Range Version Gianluca Bersano, Leonardo, Italy 22266	Investigations on Liquid Carbon-Free Gas Generating Compositions Uwe Schaller, ICT, Germany 22214
3:00 – 3:30 pm	COFFEE BREAK FOYER Sponsored by: THALES LAS France	

Session 4A – Modelling I

Didier Picart, CEA - France

MARBELLA ROOM

Session 4B – Processing I

Steve Nicolich, Picatinny Arsenal - USA

IBIZA ROOM

3:30 – 3:50 pm

An Improved Shock Model for Covered Explosives Taking into Account Projectile and Barrier Material Variations

Gert Scholtes, TNO, Netherlands

22190

ResonantAcoustic® Mixing: Qualification Challenges

Dr. Matthew Andrews, MSIAC

22189

3:50 – 4:10 pm

Modeling Effect of Small Fragment Impact Angles and Spherical Fragment on the Explosive Response to the Fragment Impact Test

Ryan Conner, CS Squared LLC, USA

22173

Processing Studies of Energetic Materials using Resonant Acoustic Technology

Rosie Davey, BAE Systems–Land Systems, UK

22259

4:10 – 4:30 pm

Probabilistic Modeling of Initiation Due to Fragment Impact

Dr. Ernest Baker, MSIAC

22192

Processing of Energetic Materials with New Mixing Technologies

Peter Gerber, ICT, Germany

22180

4:30 – 4:50 pm

IM Hazards Modeling & Simulation: an International Collaboration

Tom Swierk, Hart Technologies, USA

22170

Resonant Acoustic Mixing (RAM) Technology for Coated Explosive Material Manufacturing

Brian Alexander, BAE Systems, USA

22241

4:50 – 5:10 pm

Modelling Tool for Industrial Application

Teddy Gilloux, Thalès, France

22252

The Application of Resonant Acoustic Technology to the Manufacture of a Polymer-Bonded, Explosive-Shaped Charge

Rosie Davey, BAE Systems–Land Systems, UK

22260

5:10 pm

SESSIONS ADJOURN

6:30 – 7:30 pm

EVENT RECEPTION

GARDEN AREA OR PATIO

Sponsored by: BAE Systems

WEDNESDAY 23 OCTOBER 2019

Session 5A – Thermal Testing I

Tom Swierk, Hart Technologies - USA

MARBELLA ROOM

Session 5B – Gun Propulsion

Christelle Collet, MSIAC

IBIZA ROOM

8:30 – 8:50 am

Results and Analysis of Slow Cook-Off Testing Performed at 15°C/hr

Dr. David Hubble, NSWC, USA

22202

IM and Ballistic Assessment of 105-mm Cartridges with Foamed Celluloid Combustible Case

Adriana Eng, Picatinny Arsenal, USA

22165

8:50 – 9:10 am

Slow Heating Test Thermal Equilibrium and Maximum Reaction Temperature

Dr. Ernest Baker, MSIAC

22203

Innovative Thermoplastic Propellants for Gun Ammunition Applications

Dr Amar Bouchama, DGA Tt, France

22211

9:10 – 9:30 am

A Heat Flux Calibration Tool for Fast Heating Tests

Marie De Bats, IMEMG

22244

Gun Launch Explosive Setback Survey

Dr. Ernest Baker, MSIAC

22193

9:30 – 9:50 am

Harmonizing FCO and UN-6(c) with Propane Burners

Dr. Jon Yagla, Bowhead Tech. Services, USA

22171

Energetics and Munitions Suitability for Gun Launch

Sean Swaszek, Picatinny Arsenal, USA

22229

9:50 – 10:10 am

Continued Development and Results of Fast Cook-Off Testing Using Propane Burner

Jon Toreheim, Bofors Test Center, Sweden

22162

Defense Logistics Agency – Strategic Materials (DLA-SM): Efforts Towards Mitigating the Risk of Energetics Shortfall

Braden Harker, Defense Logistics Agency - Strategic Materials, USA

22212

10:10 – 10:40 am

COFFEE BREAK

FOYER

Sponsored by: SAAB Dynamics

Session 6A – IM Requirements

Melissa Hobbs-Hendrickson, NGC - USA

MARBELLA ROOM

Session 6B – Synthesis

Hervé Bénard, MoD Test Centre - France

IBIZA ROOM

10:40 – 11:00 am

NATO AC326 Subgroup B Ammunition Systems Design and Assessment – Insensitive Munitions Test STANAG Updates

Ken Tomasello, NOSSA, USA

22116

Development of Continuous Nitrato-nitramine Synthesis via Advanced Flow Reactor

Dr. Bradley Sleadd, NSWC, USA

22164

11:00 – 11:20 am

Review and Update of Insensitive Munitions Test Procedures

Christophe Jacq, DGA-EM, France

22160

Synthesis, Formulation, and Testing of 3,4-DNP

Dr. Jacob Morris, BAE Systems, USA

22236

11:20 – 11:40 am

A Review of the Test Item Configuration for Conducting a Sympathetic Reaction Test in Accordance with AOP-4396

Daniel Pudlak, CCDC-AC, USA

22183

Holston AAP Modernization: New Explosive Synthesis and Expanded Production Capability

Andrew Wilson, BAE Systems OSI, USA

22263

11:40 – 12:00 am

A Better Use of Insensitive Munition and Hazard Classification Test Results

Christelle Collet, MSIAC

22205

12:00 pm

SESSIONS ADJOURN

12:10 – 1:20 pm

SIT-DOWN LUNCH

PATIO

Sponsored by: HIRTENBERGER Defence Systems

THURSDAY 24 OCTOBER 2019

Session 7A – Testing II

Ken Graham, Aerojet Rocketdyne - USA

MARBELLA ROOM

Session 7B – Rocket Propulsion

Jamie Neidert, Redstone Arsenal - USA

IBIZA ROOM

8:00 – 8:20 am

An Investigation into Unknown-to-Detonation (XDT) Thresholds Using Charge Scale Testing

Benjamin Keefe, UK MOD, UK

22181

Advanced Technology Demonstration Motor: Case-Bonding Propellant Grains

Joseph Hong, BAE Systems, USA

22176

8:20 – 8:40 am

Fragment Impact Modeling and Experimental Results for a 120mm Warhead

Kevin Miers, CCDC-AC, USA

22187

Development of Extruded Double Base Rocket Propellants - Alternative Ballistic Modifiers

Erik Tunestål, Eurenco Bofors, Sweden

22201

8:40 – 9:00 am

Instrumented Fragment Impact Testing for Reactive Burn Model Validation

Dr. Magnus Bergh, FOI, Sweden

22188

Development of an IM Minimum Smoke Double Base Rocket Motor Containing Propellant Refractories

Daniel Turner, Roxel, UK

22218

9:00 – 9:20 am

Solving a Tricky Heavy Fragment Effect: Approach and Corrective Solutions

Emmanuel Bacle, Eurenco, France

22207

Nitrocellulose Fiber Quality Comparative Characterization of Nitrocellulose Manufactured via Two Industrial Processes

Dr. Lee Goetz, BAE Systems, USA

22224

9:20 – 9:40 am

Characterization of Shear Ignition Threshold of Energetic Materials Using Hybrid Drop Weight-Hopkinson Bar

Dr. Vasant Joshi, NSWCC, USA

22208

Predicting the Fate and Transport of Insensitive High Explosives Constituents in the Environment: A Proposed Approach

Encina Gutierrez Carazo, Cranfield University, UK

22264

9:40 – 10:10 am

COFFEE BREAK

FOYER

Sponsored by: TDW

Session 8A – Int'l IM Policy

Michael Sharp, MSIAC

MARBELLA ROOM

Session 8B – Systems II

Gareth Flegg, AWE - UK

IBIZA ROOM

10:10 – 10:30 am

Review of Hazard Classification at Elbit Systems Land and IMI Division (former IMI Systems)

Dr. Gila Strul-Yudkiewicz, Elbit Systems, Israel

22161

IM Warheads and Rocket Motors for Tactical Missiles: Progress to Date, Future Opportunities and Challenges

Jim Fleming, FCIT2, UK

22168

10:30 – 10:50 am

Results of the Improved Explosives and Munitions Risk Management Workshop

Christelle Collet, MSIAC

22200

Explosive Characterization for Improved Impact Response

Nausheen Al-Shehab, US Army, USA

22213

10:50 – 11:10 am

French MURAT Assessment Panel: From Expert Analysis to IM/MURAT Signature Score

Dr. Fabien Chassagne, DGA-EM, France

22233

PBX Sensitivity: Ageing Trends

Aubrey Farmer, NAWCWD, USA

22231

11:10 – 11:30 am

Insensitive Munitions Industry Contribution for the New STANAG - AOP 4396 Ed. of Sympathetic Reaction

Carole Fournier, IMEMG

22245

IM Multi Effect Warhead for Brimstone 3

Dr.-Ing. Reiner Gleichmar, TDW, Germany

22253

11:30 – 11:50 am

MSIAC Workshop 2020: Defects – Causes, Classification and Criticality

Dr. Michael Sharp, MSIAC

22256

The Effects of Explosives Ageing on Munition IM Response

Dr Gaynor Olliver, IMEMG

22257

11:50 am – 1:20 pm

SIT-DOWN LUNCH

PATIO

Session 9A: Thermal Testing II

Gard Ødegårdstuen, NAMMO - Norway

MARBELLA ROOM

Session 9B: Modelling II

Christophe Coulouarn, Thalès - France

IBIZA ROOM

1:20 – 1:40 pm

Kinetics of Thermo-Chemical Decomposition of RDX in Cyclohexa-none and Gamma-butyrolactone Determined with ARC and Heat Flow Microcalorimetry

Manfred Bohn, ICT, Germany

22154

High Velocity Fragment Launcher and Impact Initiation of Munitions - A Numerical & Experimental Study

Akhilesh Sharma, TBRL, DRDO, India

22267

1:40 – 2:00 pm

Novel Slow Cook-off Test Method to Replicate Worst Case for Munitions Containing Internal Fuel

Benjamin Blazek, NAWCWD, USA

22167

Modelling Cook-Off

David Leipold, IMEMG

22178

2:00 – 2:20 pm

Extended Multi-physics Model for Slow-Cook-Off Events of Warheads

Dr. Markus Graswald, TDW GmbH, Germany

22172

Multiphysics Simulation of Fuze Slow Cook-Off

Raphael Gutser, TDW GmbH, Germany

22179

2:20 – 2:40 pm

Heating of HMX-Based PBXs During Low-Velocity Impact

David Drouet, CEA, France

22174

Developing an Understanding of Variables that Impact on Unknown-to-Detonation Transitions (XDT) in GAP/Nitramine Propellants

Benjamin Keefe, UK MoD, UK

22182

2:40 – 3:00 pm

Non-HERO Microwave Hazards to Munitions

Christelle Collet, MSIAC

22204

Assessment of the Transference of Energy from a Projectile to a Target During a Supersonic Impact on the Metallic Lining of an Explosive with a 1000000 fps High Speed Camera

Juan José Navlet, ISDEFE, Spain

22196

3:00 – 3:30 pm

COFFEE BREAK

FOYER

Sponsored by: HIRTENBERGER Defence Systems

Session 10A: Testing III

Paul Braithwaite, NGC - USA

MARBELLA ROOM

Session 10B: Processing II

Andrew Wilson, ExplorInsights - USA

IBIZA ROOM

3:30 – 3:50 pm

Slow Heating Oven Construction Analysis

Daniel Pudlak, CCDC-AC, USA

22184

High-Yielding and Continuous Fabrication of Nano-Sized Explosive Crystal via Electrospraying Deposition

Dr. Chuan Huang, Institute of Chemical Materials, CAEP, China

22158

3:50 – 4:10 pm

Test Development for Characterizing Electrically Controlled Energetic Materials

Dr. Kimberly Chung, CCDC-AC, USA

22215

Large Caliber Projectile Fill Adherence

Dr. Ernest Baker, MSIAC

22191

4:10 – 4:30 pm

Study on Cylinder Test and JWL Equation of State of Detonation Product for GOL-823 Insensitive Aluminum Explosive

Yu Chuan, Fluid Physics, CAEP, China

22220

Advanced Coatings of Explosives

Helen Stenmark, Eurenco Bofors, Sweden

22198

4:30 – 4:50 pm

Small Scale Evaluation of Energetic Materials: Shock Sensitivity Characterization at the Early Stage of Synthesis

Julien Moriceau, ArianeGroup, France

22222

Isostatic Pressing of PAX-3 High Explosive

Sean Swaszek, CCDC-AC, USA

22228

4:50 – 5:10 pm

Small-Scale Tests to Determine Divergence and Spreading of Explosive Booster Materials

Elizabeth Francois, LANL, USA

22223

Continuous Flow Synthesis of High Explosives at Lawrence Livermore National Laboratory: Benefits, Challenges, and Compromise

LLNL, USA

22121

5:10 pm

SESSIONS ADJOURN

5:30 – 6:30 pm

FAREWELL DRINKS & AWARD PRESENTATION FOR BEST IM & EM PAPERS

PATIO

Goodbye Gift Sponsored by: Northrop Grumman

6:30 pm

CONFERENCE ADJOURNS