

Resodyn Acoustic Mixers: Shared Innovation

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Director of Marketing
and Business Development




Early RAM Development

- Technology developed in the 1990s for energetics
- Harnessed resonance, ideal for a great many industries




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More Than A Mixer




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RAM Processing Throughout The World



- HYUNDAI
- EDISON INDUSTRIES
- janssen
- Honeywell
- abbvie
- GILEAD
- Hewlett Packard Enterprise
- MERCK
- IPK
- TESLA

BAE SYSTEMS RAM ENERGETICS CASE STUDY

- Using RAM since 2014
- Multiple RAM 5 H, LabRAM II H
- At production facilities in the UK
- Industry: Energetics, Defense
- Expressed interested in expanding RAM capabilities

BAE SYSTEMS RAM ENERGETICS CASE STUDY



BAE SYSTEMS RAM ENERGETICS CASE STUDY

- Mix advanced energetic product with 20% increase in performance
- Enables the manufacture of advanced formulations that are unmixable by state-of-the-art available processing technologies
- Mix faster – what took days now takes hours
- Enables Mix-in-Case
- Mix without impellers
- 90% reduction in waste



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BAE SYSTEMS RAM ENERGETICS CASE STUDY

"Our engineers have achieved a 20 percent increase in munition explosive power by mixing polymer bonded explosives using the Resodyn Acoustic Mixer."

BAE Systems, Inc.

Richard Brown Head of Technology Communications



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Resodyn Acoustic Energetic Materials Clients

- United States DoD Applications
 - U.S. Navy
 - U.S. Army
 - U.S. Air Force
- United States Other than DoD
 - Los Alamos National Laboratories
 - Lawrence Livermore National Laboratories
 - Rocky Mountain Scientific Laboratories
 - Innovative Materials Processing
 - Purdue University
 - FBI
 - Los Alamos
 - Sandia National Laboratories
- United Kingdom
 - Ministry of Defense
 - BAE Systems
 - The Falcon Group
 - Roxel UK
 - DSTL
- France
 - Roxel
- Canada
 - Ministry of Defense
- Australia
 - DSTG
 - Thales
- Singapore
 - AME/STE
 - ATREC
- Brazil
 - CBC Defense
- Türkiye
 - Aselsan
- Poland
 - IPO



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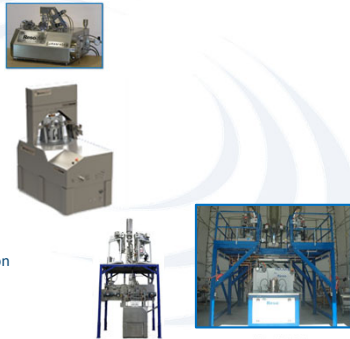
Batch RAM Energetic Systems

- LabRAM II H
 - 81 Systems Installed
 - 2 Sold and are in Manufacturing
- OmniRAM H
 - 14 Systems Installed
 - 2 Sold and are in Manufacturing
- RAM5 H
 - 20 Systems Installed
 - 3 Sold and are in Manufacturing
 - 9 Systems in Negotiation for 2025 and 2026 Procurement
- RAM55 H
 - 1 System Installed
 - 1 System Quote out for 2026 Procurement
 - 3 Systems in Negotiation for 2025, 2026 2027 Procurement



Automated & Continuous Energetic Systems

- Automated
 - LabRAM II H
 - 1 System Installed
 - OmniRAM H
 - 1 System Installed
- Continuous
 - OmniRAM CAM-CIP
 - 1 System in Fabrication
 - RAM5 CAM-CIP
 - 1 System Installed



Results Driven Innovation

- Faster processing
- Greater Homogeneity
- Easier, safer cleanup
- Dramatic waste reduction
- No cross-contamination
- Scale
 - Consistent, up or down
 - Milligrams ↔ kilograms
 - Batch and continuous

The Most Researched Mixing Technology

- Over 800 research papers feature RAM technology
- 158 patents list RAM technology as the preferred embodiment

“The acoustic mixing approach represents a potential **time savings of two orders of magnitude**”

improved mixing of suspensions
formulations

Dennis H. Leung, David J. Lamberto, Lina Liu,
Elizabeth Kwong, Todd Nelson, Timothy
Rhodes, Annette Bak



Resonant Acoustic Mixing: Your Story

What will you do with RAM?



Thank you for your time
and attention.