



Navy Infrared Decoy Project

TSE Processing of MTV

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Problem

- Magnesium/Teflon™/Viton™
Composition Production:
 - Coacervation Coating Process (Cowles Mixer)
 - n-Hexane - 1.6 to 2.2 Lb Solvent/Lb Dry Comp
 - Acetone - 0.3 Lb Solvent/Lb Dry Comp
 - Several Recent Incidents in Production Facilities
 - Fatalities and Serious injuries
 - Heavy OSHA Fines



Objectives

- Produce IR Decoy Compositions in a more environmentally conscious manner
- Minimize Personnel Exposure to the Composition through continuous processing
- Lead IR Decoy Industrial Base through process improvements



Approach

- Demonstrate MTV TSE Processing w/Solvent Recovery
- Acquire & Install TSE Capability
- Define and Implement Process Improvements

Demonstrate TSE/Solvent Recovery



- Contract with Thiokol, Brigham City UT
 - Produce Composition with Varying Burn Rates
 - Incorporate Solvent Recovery
 - Share all Production Data/Methods with Govt.
 - 4071 ChE on-site for Project Completion

Demo Contract Accomplishments



- Designed/Fabricated Continuous Acetone Recovery
- Demonstrated:
 - TSE process for MTV utilizing:
 - No n-Hexane (1.6-2.2 lb Solvent/lb dry comp reduction)
 - 50% Acetone (0.2 lb Solvent/lb dry comp reduction)
 - Limited Continuous Solvent Recovery
 - Process flexibility in producing 3 burn rates of composition



Acquire/Install Capability

- Commercial-Off-The-Shelf TSE
 - Model SE-1600 40 mm TSE
 - Co-rotating, vertically aligned
 - Hydraulic Motor
 - 22:1 L/D
- Facility Designed for 50 lbs 1.1
- Construction complete 30 May, Installation to follow

Sensitivity Test Data



	Impact	Friction	Electrostatic	VTS
	50% Fire	Avg Energy (Ft-	Max No-Fire	Outgassing
	Ht. (cm)	lbs), result	Energy (J)	(ml/g)
RDX Standard	66.1	800.2, 20% fired	0.10	NA
Coacervated MTV	>159	423.2, 80% fired	0.08	0.09
High BR TSE MTV	>159	652.3, 60% fired	1.01	0.0
Med BR TSE MTV	>159	267.1, all fire	0.08	0.04
Low BR TSE MTV	>159	246.1, all fire	1.01	0.0

Thiokol Propulsion

Twin Screw Extruder Production Engineering Study

Contract No. N00164-98-C-0085

Presented by:
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Building for the Future



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