Radiation Processing

*Industry Direction and NIST Opportunities*

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Services Offered By NIST

• Research, Data, and Publications
• Laboratories
  ➢ Engineering
  ➢ Material & Physical Measurement

• Technology Partnerships Office
• User Facilities
  ➢ NIST Center for Neutron Research
  ➢ Center for Nanoscale Science & Technology

• Standards & Measurements
  ➢ Variety of areas including ionizing radiation applications
Ionizing Radiation Services Offered By NIST

• Radioactivity & Neutron Sources

• Dosimetry Services
  ➢ Neutron, X-Ray, Gamma, Electron, High Dose Applications
  ➢ Certified Dose Rate
  ➢ Dosimeter Measurement & Calibrations

• Calibrations
  ➢ Spectrophotometric Filters
  ➢ Personal Protection Instrumentation
Challenges – Current State

- Turn-around Times
- Cost
- User-friendly Website

Who to contact?
- To receive a status update on current order
- Modification to an existing request
- A specific technical question
- To discuss a collaborative effort
Path Forward

MEASURE. INNOVATE. LEAD.
Working with industry and science to advance innovation and improve quality of life.

• Think outside the research box
  ➢ Understand industry needs
  ➢ Provide technical support in a format for practical application

“Information is a source of learning. But unless it is organized, processed, and available to the right people in a format for decision making, it is a burden, not a benefit.”

-William Pollard
Future State – Services & Information

- Enhanced Services
  - Expedited irradiation & calibration services

- Visibility to Critical Information Through Web Portal
  - Access current order status
  - Communicate changes to an existing request
  - Current projects
  - NIST offering page – simple/user friendly
  - Ability to request special R&D projects – submit via web portal to initiate the process
Future State – Resources

• Consulting
  ➢ Biographies or similar web page
    • Know where to direct specific technical questions
    • Know that NIST might have the expert that can help

• Materials Expert / Support
  ➢ Dosimeter and dosimeter packaging testing
  ➢ Dosimeter formulation

• Industry Liaison
  ➢ Customer-facing support role

• Project Manager

• Equipment
  ➢ Dosimeter packaging equipment
  ➢ Underutilized equipment lent by industry partners
  ➢ Collaborative studies conducted off-site at industry partner facility on their equipment
Practical Applications - Potential Customer Needs

Dosimetry

• Performance characterization of dosimetry systems
  
  ➢ CTA – defining suitable routine practices and operational controls
  
  ➢ Radiochromics – identifying and quantifying influence factors
  
  ➢ Alanine – experimental and alternative applications
Practical Applications - Potential Customer Needs

• Alanine pellet formulation for improved functionality

• Improve packaging
  ➢ Alanine tapetab, temperature & humidity considerations
  ➢ Functional traceability – barcoding

• Development of alanine film &/or pellet technology to improve utility in electron beam processing

• Advance polyethylene FTIR dosimetry (well suited for low energy e-beam) by establishing reference material formulations and enhancing practicality of measurement
Where do we go from here?

• Collaboration
  ➢ Forum for current NIST projects
    - Industry could provide feedback for practical use, existing info, peer review
  ➢ Academic student/internships to work on R&D projects
  ➢ Between and within academic & industry organizations

• Develop New Technology & Support Innovation
“Learning and innovation go hand in hand. The arrogance of success is to think that what you did yesterday will be sufficient for tomorrow.”

-William Pollard
Questions