

Radioprotection for the Radiochemist

How shielding and contamination control can
help protect you in the lab

RRMC-Ft. Collins
October 31, 2012
Lawrence Jassin

Eichrom / NPO

- Founded in 1990

– 2008 Eichrom Technologies acquired Nuclear Power Outfitters

– 2009 Eichrom moved entire company into one facility in Lisle, IL just ~30 miles of downtown Chicago

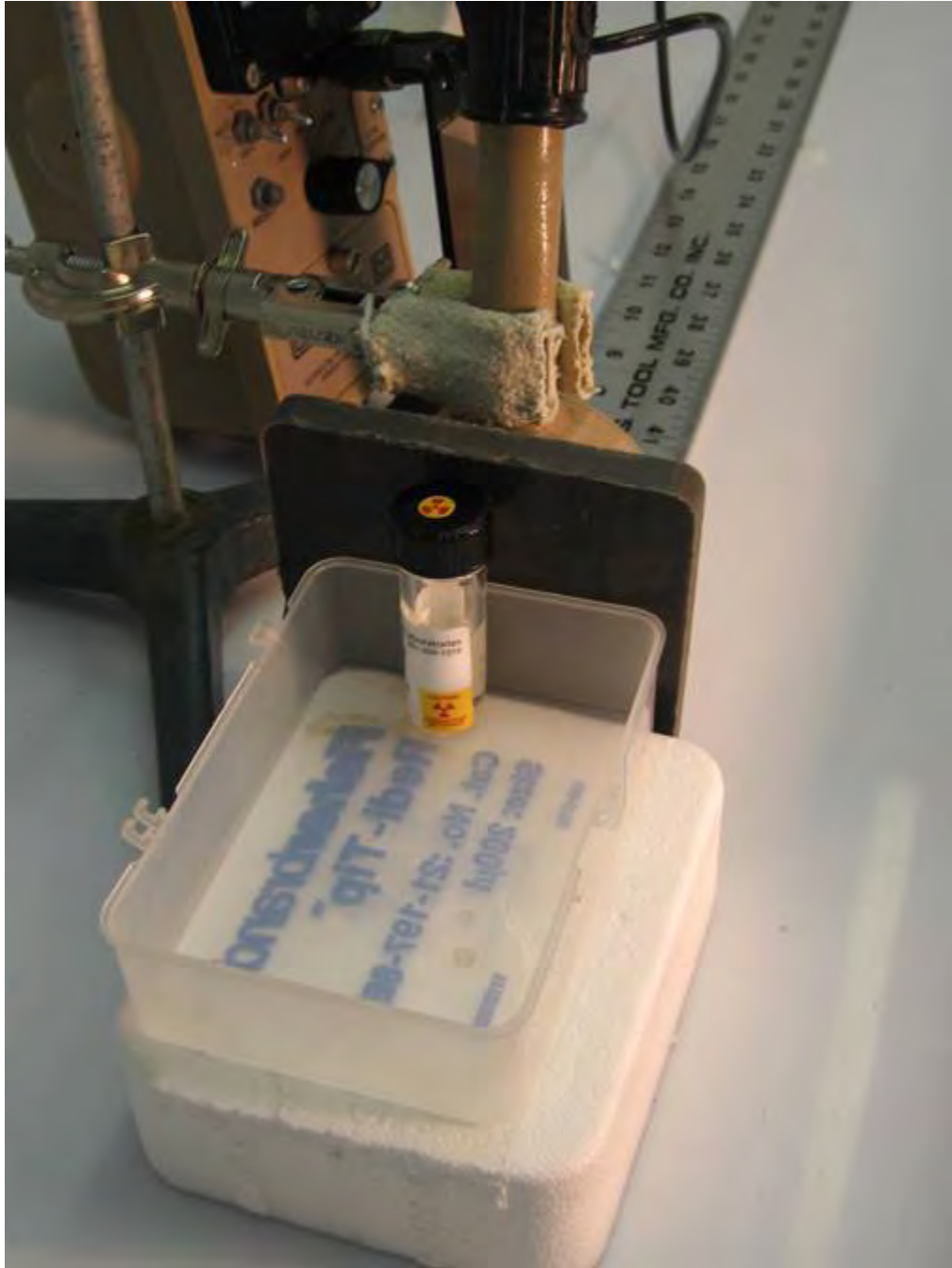
Under head Repair- Kewaunee



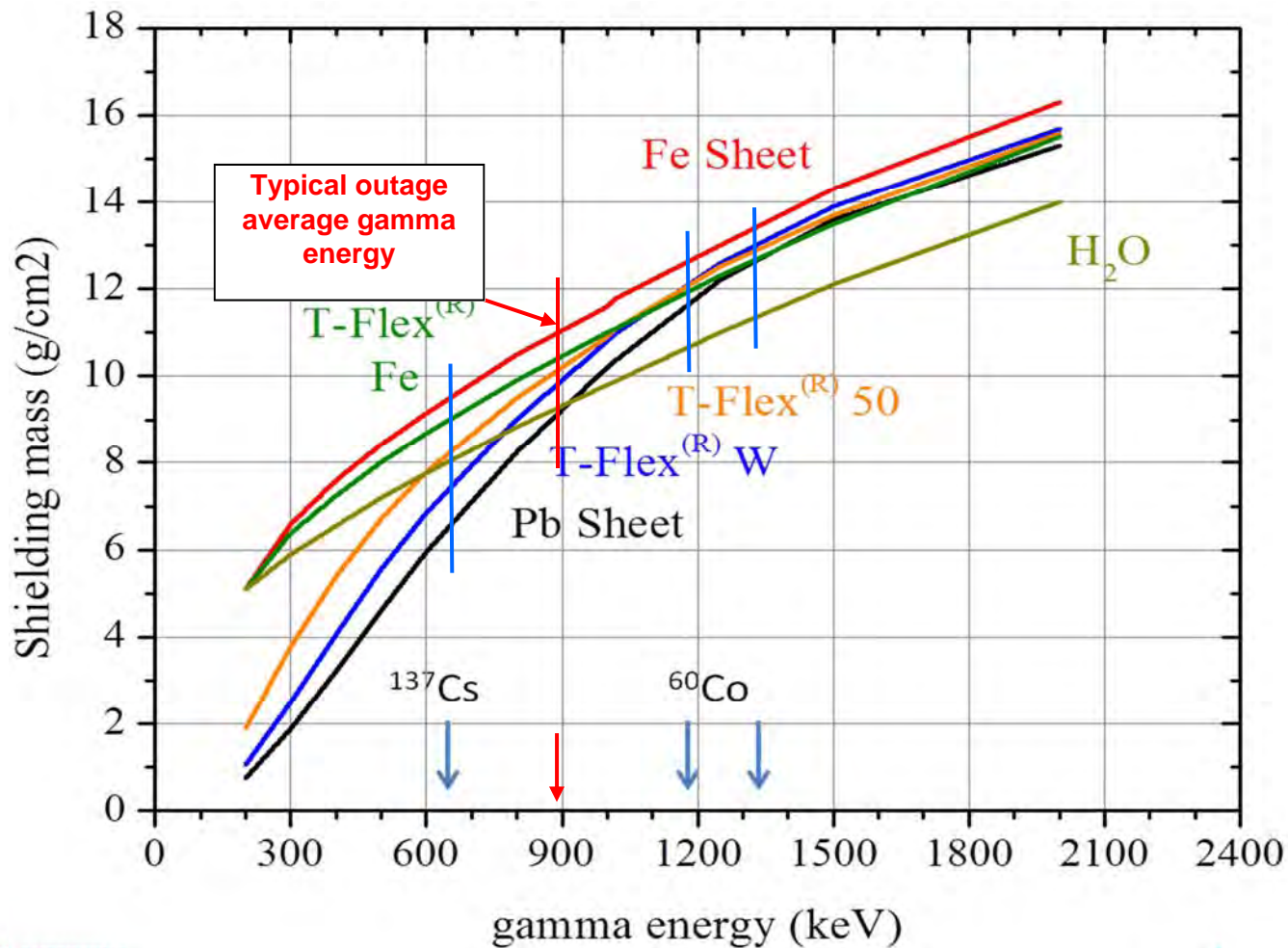


Magnetic T-flex

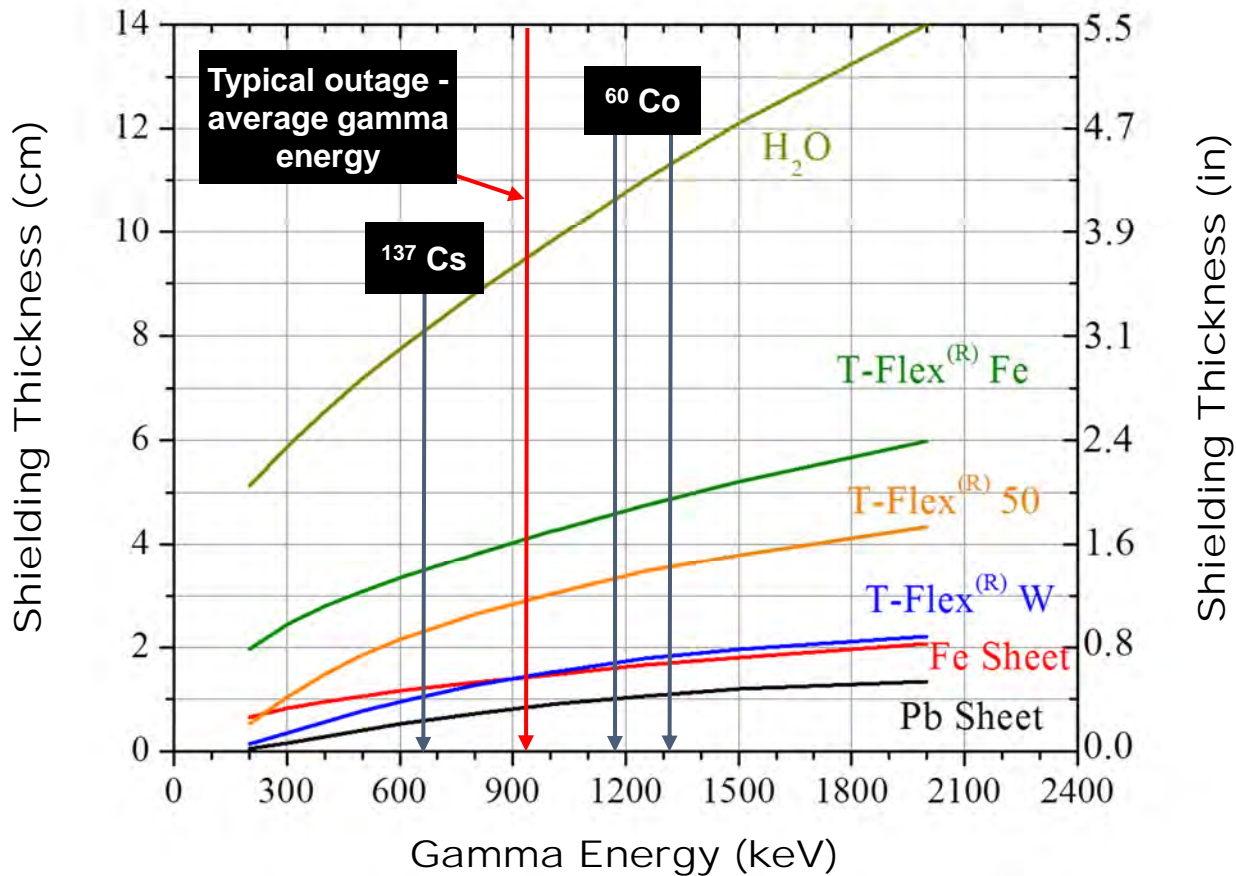
Seabrook
Reactor Head,
August 2012



Mass of Shielding (g/cm²) Required to Achieve 50% Attenuation



Thickness of Shielding Required to Achieve 50% Attenuation (1 hvl)



150 mL T-Flex W
Beaker Shield

½" Thick- 64%
Attenuation at 661 KeV
400 degrees F
Approx. 3 lbs.

Delivered to Savannah
River Site



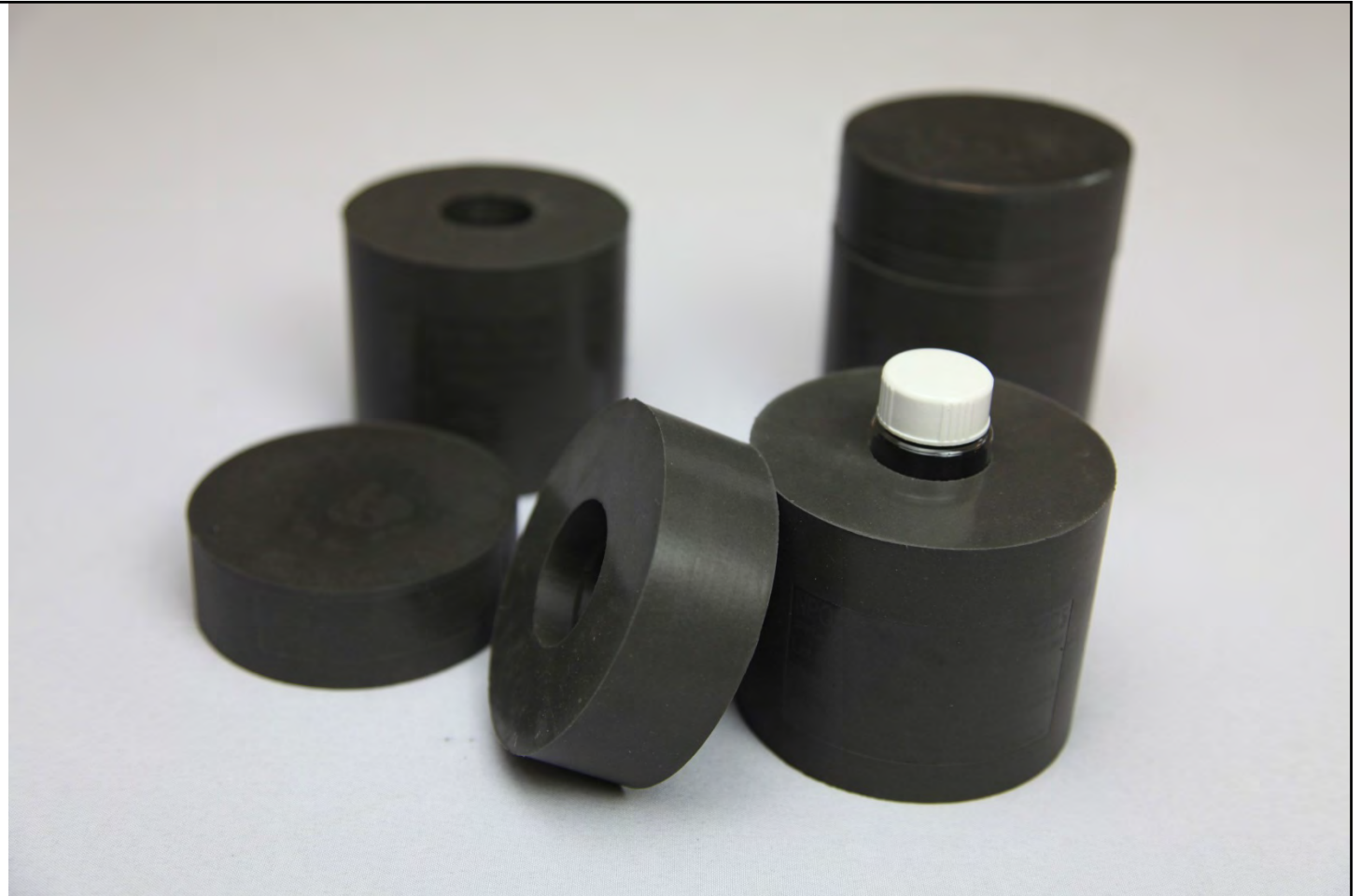
Vial Shield

1" Thick
T-Flex W

90%
Attenuation
at 661 KeV

Flexible

6 lbs.



Developed as a Necessary Tool for RH (Remote Handle)
TRU Waste Characterization (>200mR/Hr)

Preliminary Measurements on Higher Contact Dose Rate Laboratory Samples



RH Sample



Shielding Container Lid

Sample: High Cs-137 and Sr-90 requiring TRU analysis

Instrument: Thermo Eberline model RO20 ion chamber

With or Without Shield	Contact Open Window	Contact Closed Window	30 Centimeters Open Window	30 Centimeters Closed Window
Without Shield	8,000 mR/hour	250 mR/hour	120 mR/hour	10 mR/hour
With Shield	80 mR/hour	50 mR/hour	10 mR/hour	2mR/hour

Cap removes and holds vial lid



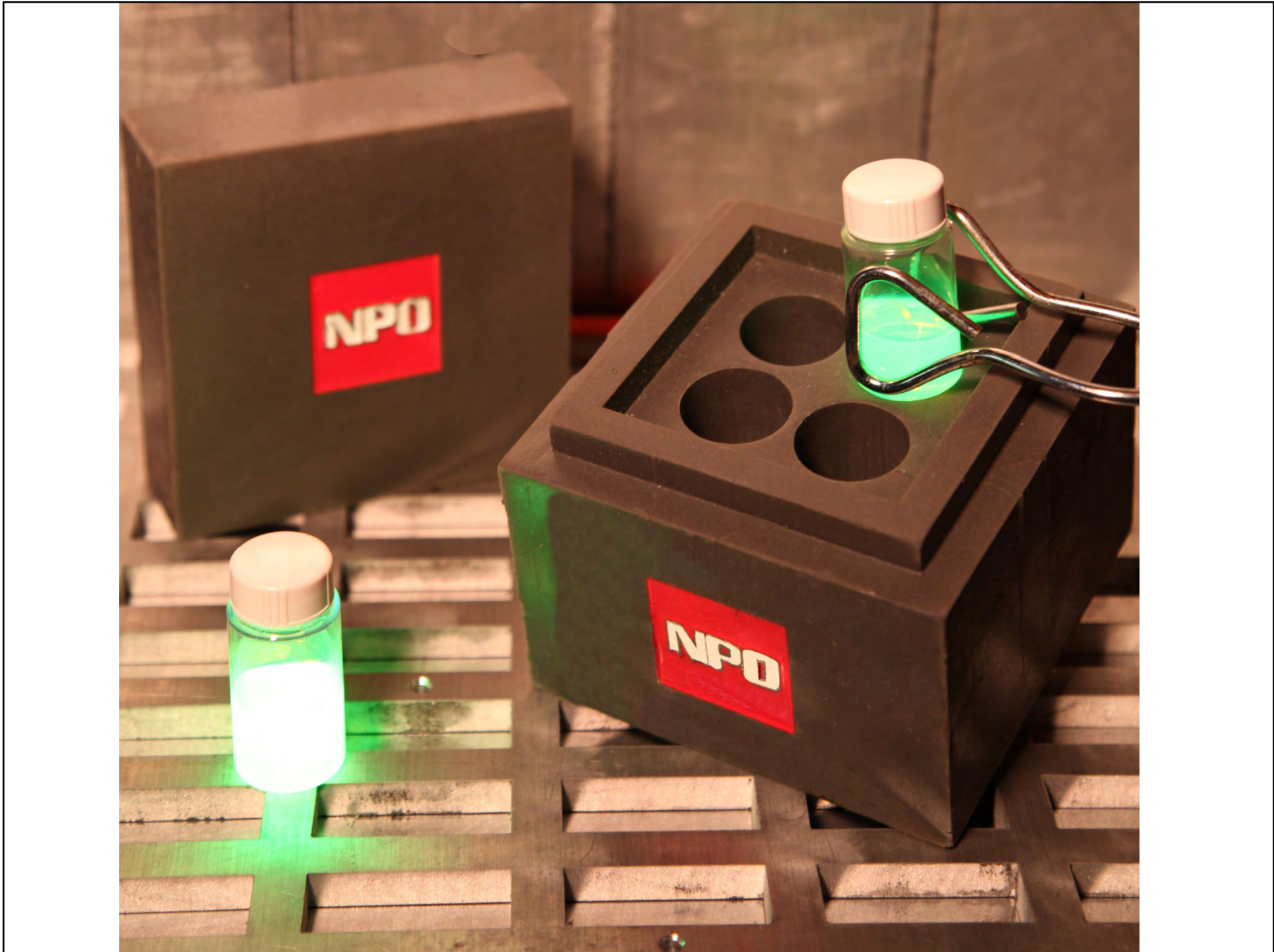
Samples can stay in the shield while sampling



Sub-Sampling Completed and TRU analysis using Eichrom Resins can begin



**Thanks to Patty Tullock, Richard Wells, Rob Alley, Ben Young and Jamie Stuart
At the Advance Mixed Waste Treatment Project, Idaho Treatment Group
For sharing their data**



PTFE Laminate Alpha Air Monitoring Filters



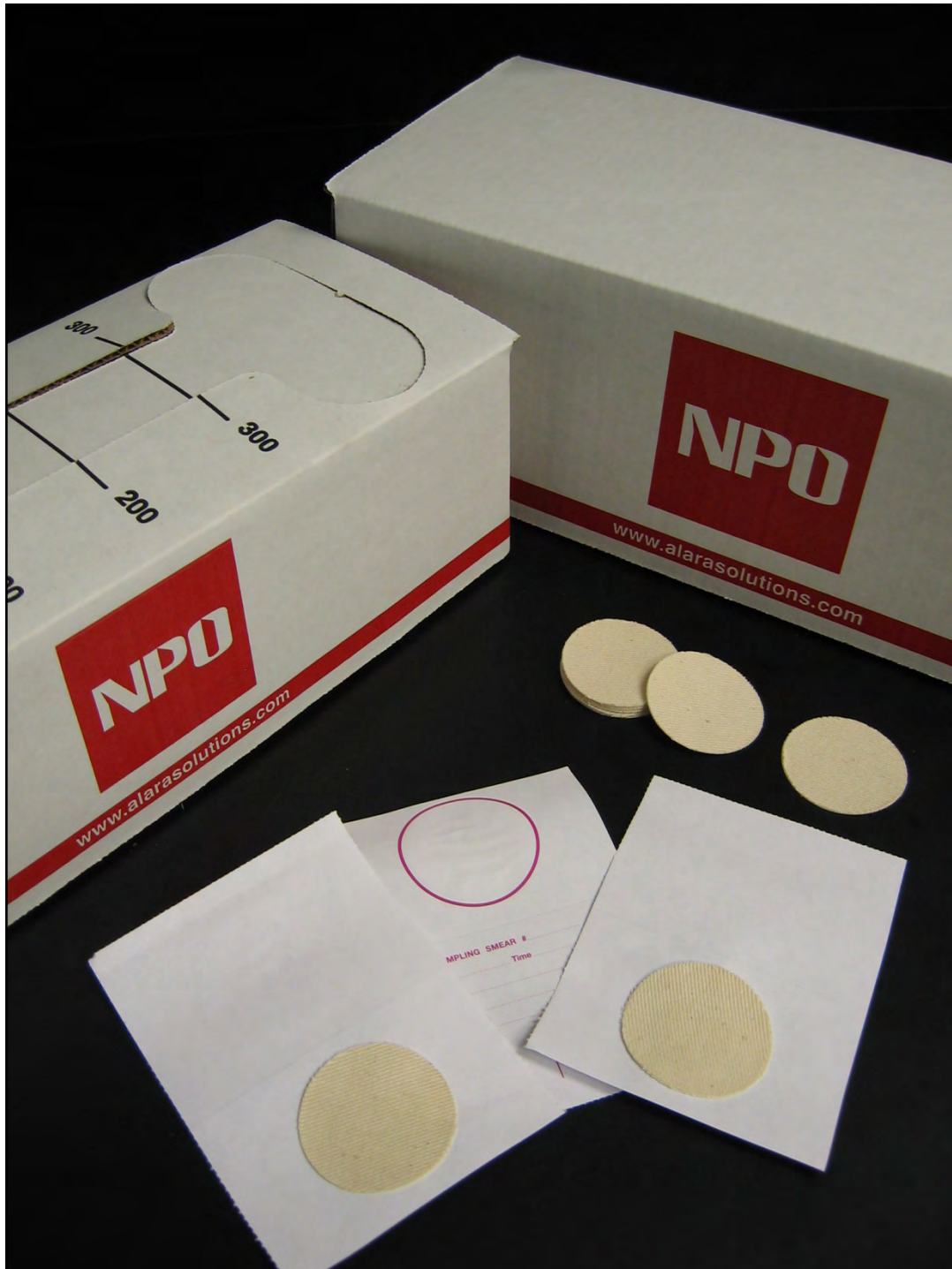
- Quality Control Specification:
 - Background < MDA for α & β
 - Resolution verified <60 KeV FWHM
 - Minimal curling <4.0 mm deflection
- The filters have a easy to determine orientation:

“Grid side down, Opposite Air flow”

Eichrom's Resolve® PTFE Laminate Filters

- Volumetric Flow
 - Resolve 47mm PTFE Filters have maintained a DOP 99.99% efficiency testing rating up to 9 CFM = 254 LPM
 - PTFE Filters maintain integrity even with mg of material loaded on the filter for your harshest applications.





Health Physics Sampling Smears


Swipe/Smears for
contamination
monitoring.

Two Formats:

- Paper Backed with
recorder paper
- Bulk Packaged

Features of Swipe / Smears

- 44.4mm (1 ¾ inch) in Diameter Cloth Smear
- Pressure Sensitive adhesive backing/support
 - Allows for easy reattachment to support or planchet
- Backing and Smear can be removed together from support for analysis



SAMPLING SMEAR #

Date Time

Location

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Technician

COUNT	TYPE
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NPO I85SS2005

Eichrom And NPO

- The Right Tools for the Right Project
- A Multidisciplinary Approach to Your Challenges
- A Transparent Relationship based on Science
- A Reliable Partner