EXTRUDED SCINTILLATOR R&D FOR MINERVA

Anna Pla-Dalmau
Fermilab

Victor Rykalin
NICADD, Northern Illinois University

Minerva Collaboration Meeting
October 7-8, 2005

PROGRESS FROM JULY MEETING

- Underwent First Design and Cost Review
  - Pursue official drawing for ID and OD scintillator shapes – done
  - Extrude at 100 kg/h – done
  - Determine crate sizes for ID and OD scintillator
  - Evaluate shipping
- Placed many P.O.s
  - R&D and production dopants
  - R&D and production PS pellets
  - Dies, TiO_2 pellets, labels

PROGRESS FROM JULY MEETING

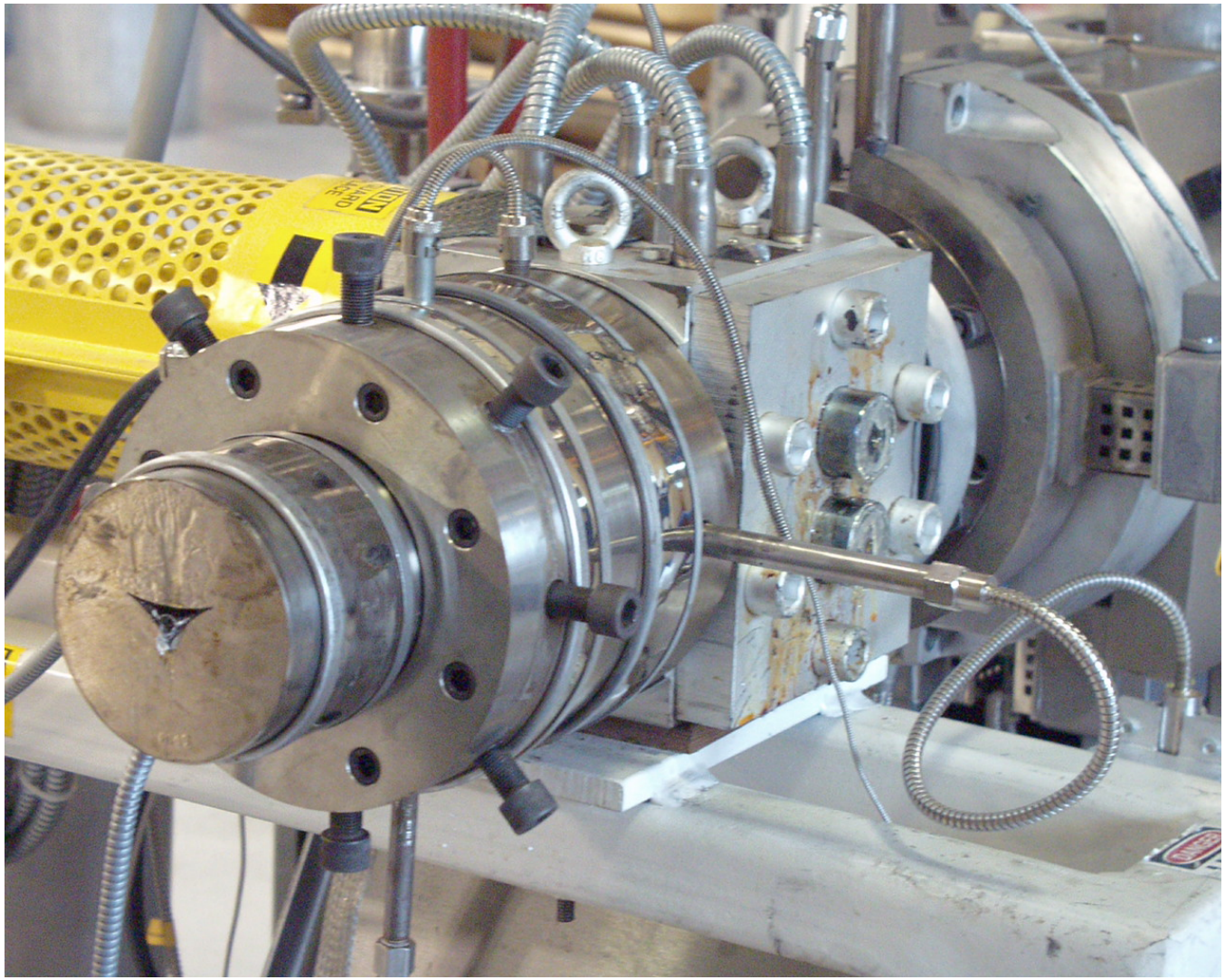
- Extruded at 100 kg/h
  - It is possible
  - Triangle has smaller base
  - Cooling of strip is more difficult
  - Check attenuation length vs rates at 75 and 50 kg/h
    - Residence time (down) vs melt temperature (up)
- Continued to monitor feeder performance
  - Checked fluorescence of strips
- Checked simultaneous extrusion and drying of pellets
  - High nitrogen flow in system seems OK.

THE CO-EXTRUDER IS COMING!!!

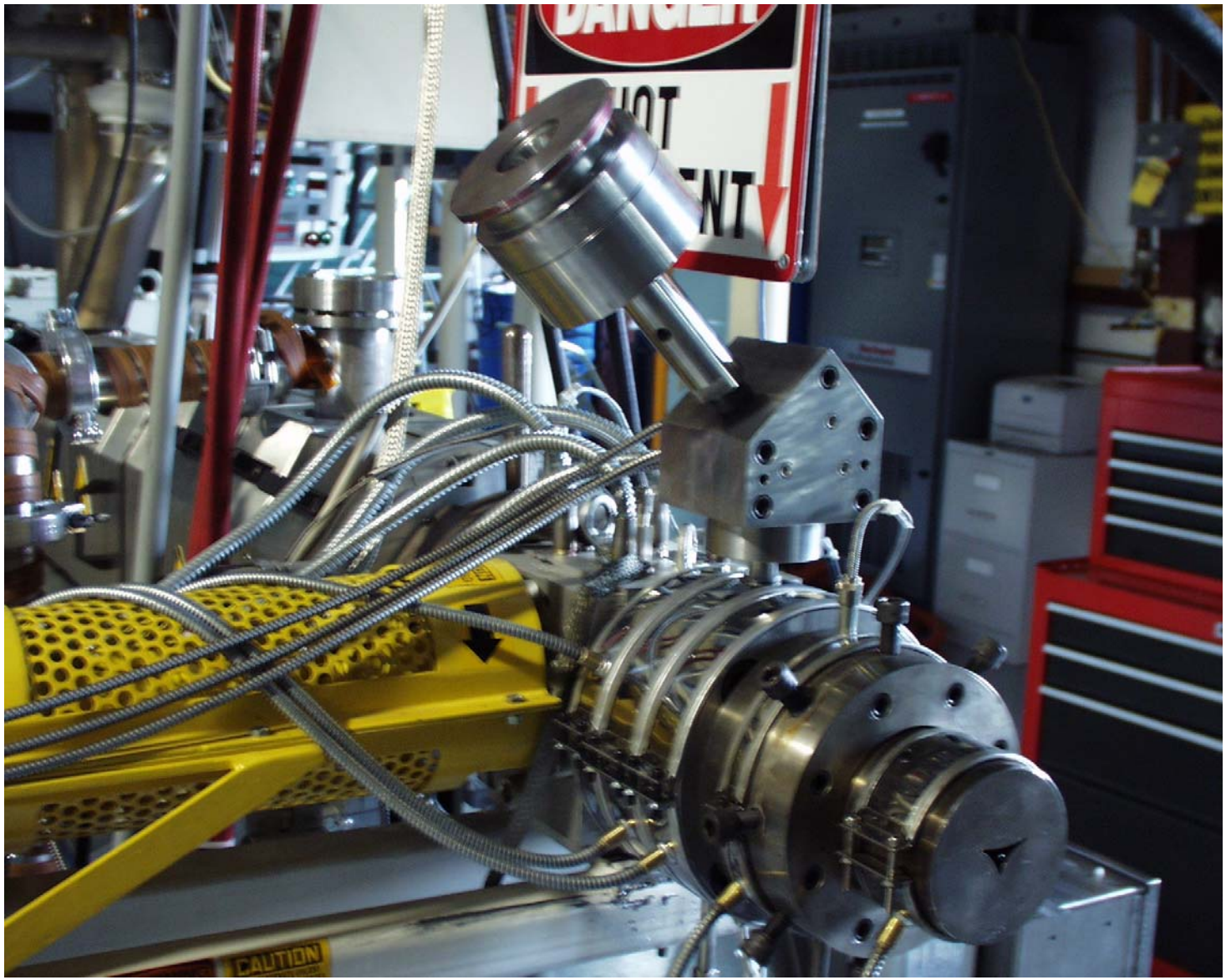
- Delivery **next week**: Monday, Tuesday?
  - Start-up visit: Oct 17

- Electrical work: done
- TiO_2 pellets: here
- Dopants: here
- PS pellets: available
- Co-extrusion die: in place

FNAL/NICADD EXTRUSION FACILITY

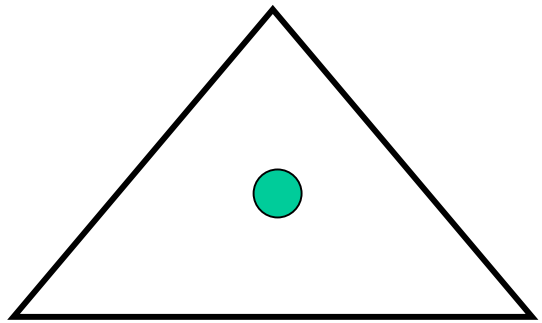


FNAL/NICADD EXTRUSION FACILITY



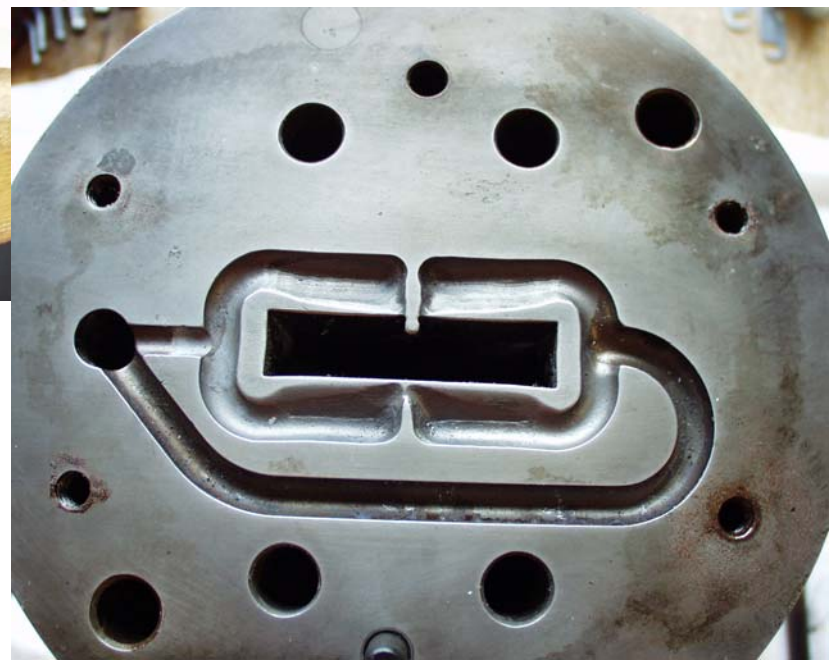
THE CO-EXTRUDER CHALLENGE

- How will the capstocking look at the tips?
  - Bottom corners – too thin?
  - Top corner – too thick?

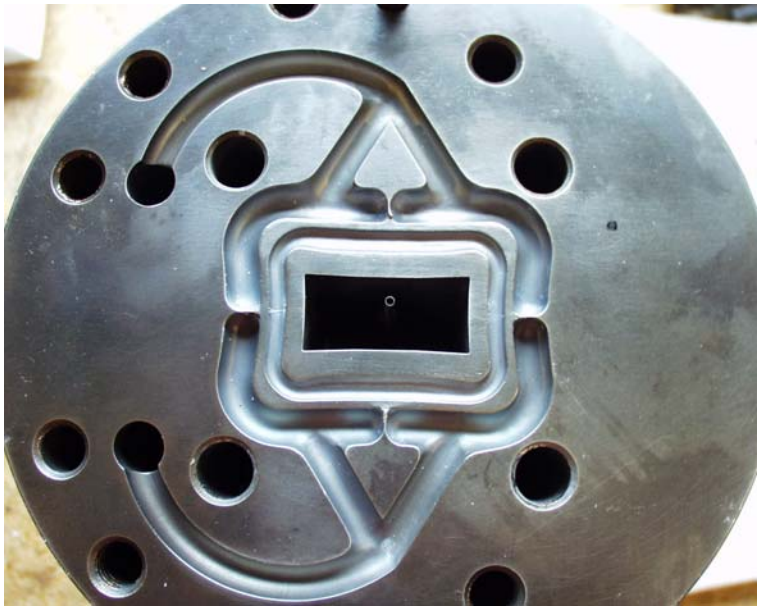


- No mixing with core material
- TiO2 concentrate WHC – 26311-A
  - 60% TiO2
  - 40% PS, waxes, dispersants
  - PS is not Styron 663, but MIPS
  - Used in MINOS, K2K, up to 2005

CO-EXTRUDER DIES: MINOS



CO-EXTRUDER DIES: K2K, ADAPTER



← K2K

ADAPTER →

NEXT STEPS

- Co-extruder R&D (installation)
  - 1 month – **October – November 2005**
  - Run triangle die with capstocking
- ID tuning and prototyping
  - 2 months – **November** and **December 2005**
- OD tuning and prototyping
  - 2 months – **January** and **February 2006**
  - Final size – TBD