

# IKON 2016

## Shielding Parallel Session Closeout

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# Main Points

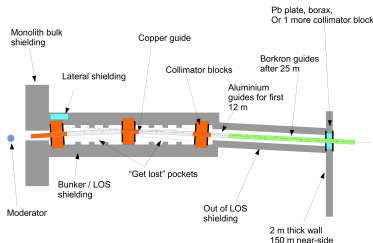
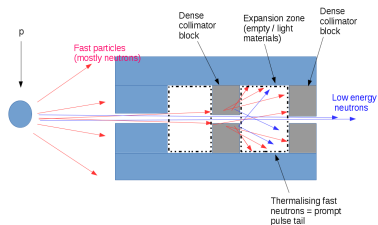
- Need standard shielding solutions
- Where to put copper guides?
- Rad hard plastics?
- Pinholes / eye of needle?
- Chopper housings made of stainless steel?
- What about activation in general?
- Where to put boron to prevent activation in the bunker?

# Standards for Shielding

- This was of course one of the main goals for NOSG
- Politics shifted 2-3 years ago, now sits with partners and individual instrument projects
- We are of course eager to assist in this area as much as we can
- Follow up meeting with management (Phil et al)
- Possible workshop following after scope setting meetings and reviews

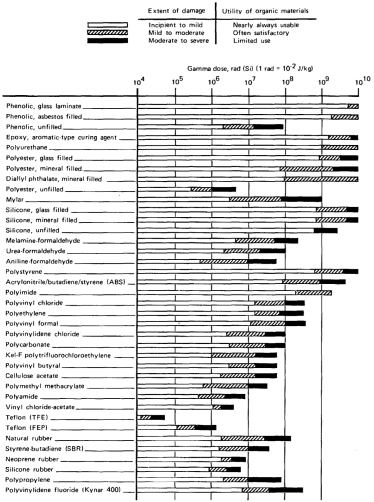
# Beamline Concept

- Needs updating in handbook (old bunker)
- Dense collimation blocks for scattering (Cu based in handbook)
- Escape areas after collimation
- Detailed neutronics design in phase 2



# Rad-Hard Plastics

■ NOSG handbook page 73-74



# Pinholes / Eye of the needle

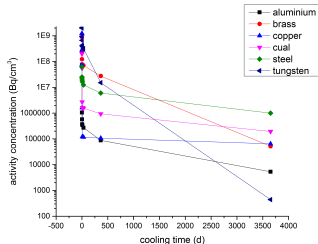
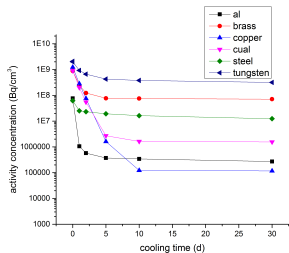
- These are useful even on straight beamlines
- Put one in even if the guide is large
- These are some of the “collimator block” positions and part of the solution to lower backgrounds, dose rate and cost.

# Stainless Steel Chopper Housings

- Please try to find alternatives to stainless steel everywhere you can

# Radiation Safety Engineering for Servicing

- During phase 2 — activation engineering needs to be done
- Assess access areas / maintenance planning
- Swap out active components (Steels) for superior materials (Al, Cu) where feasible
- Affects operations budget and uptime significantly!
- Not discussed, but...  
Don't forget wood for structures, if it can take the load



Many thanks to Zsafia Kokai, ESS Target Div.



# Air Activation in Bunker

- All guides wrapped in absorbing material
- Boron sheets probably the best solution
- Current recommendation:
  - Put boron around *outside* of aluminium vacuum housings
  - Put boron around guides on the *inside* of steel vacuum housings (to reduce activation in bunker, and allow earlier maintenance access)
- Instruments should propose best cost/benefit of these two options, evaluating also outgassing etc.