

# IKON19

## HEAVY SHUTTERS REPORT FOR IKON19

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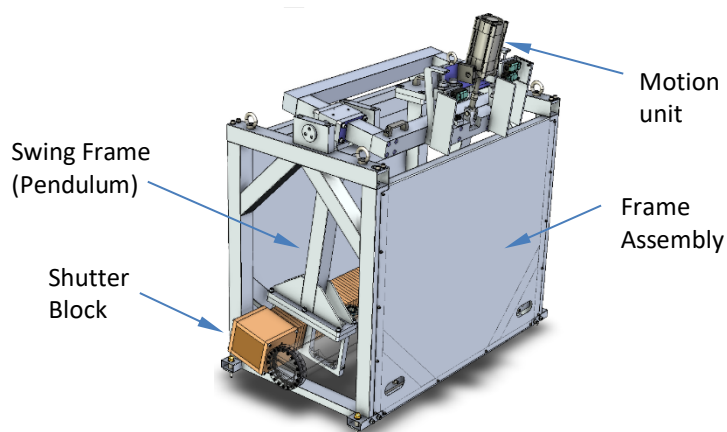
Date/time of session:  
[Monday, 28 September 2020, 14.15-15.00]

### 1. INTRODUCTION

NSS is offering to customize and procure Heavy shutters based on the TBL prototype for the Instrument teams. The preliminary design of the shutter was done by NSS and the detailed design and manufacturing was done by Kinetic.

### 2. STATUS OF THE TBL PROTOYPE

To make the procurement more cost effective, we have broken down the shutter into multiple procurements. Items in bold are included in the scope.



- **Flight tube, including beam windows:** ESS workshop
- **Vacuum test:** ESS vacuum team
  - Test results: ESS-2745863 (Released)
- **CE-Marking:** NSS
  - Hazard Identification and Analysis: ESS-0265769 (Reviewed)
  - Operation and Maintenance Manual: ESS-0265775 (not ready yet)

- Pneumatic components excluding pneumatic cylinder: BIFROST design
- Control: ESS Motion control (Not ready yet)
- **Structural and moving components including the attenuator block and the pneumatic cylinder and switches: Kinetic co.**

We had the FAT (ESS-2821515) of the moving components in March, but the transport was delayed because of the requested modifications and the pandemic. The requested modification was the addition of a counter weight for proper closing.

We have received the prototype in August and the SAT is planned for week 38.



**Figure 1.:** TBL Heavy shutter in E02

### **3. BASIC PARAMETERS OF THE TBL PROTOYPE**

- Attenuator Size: 1600mm x 220mm x180mm (Length x Width x Height).
- Attenuator Weight: 372kg
- Overall length of the flight tube: 1600mm
- No internal optics (neutron guide) in the Flight tube
- Alignment range of the Flight tube:  $\pm 6$ mm vertically and laterally
- Distance between open and closed position:  $\approx 250$ mm
- Closing time:  $< 4$ s

### **4. PROCUREMENTS FOR INSTRUMENT TEAMS**

The ESS call for tender for DREAM and ODIN was published on the first of September and will be closed on the 22th.

After the evaluation of the offers we are going to give a report to the instrument teams that will contain the exact scope and cost of the ESS contribution. If this offer is approved by the instrument team, then we can transfer the scope from the instrument to ESS.

The expected time of TG3 is a month from the kick-off meeting. The expected time of delivery is April 2021.

#### 4.1. Content of the ESS offer

- Customization of the shutter design (based on the scope in 2.)
- Structural verification of the modified shutter
- Manufacturing and testing of the shutter
- Provision of CE-marking documentation

Necessary input from the instrument teams

- Geometry and composition of the shutter block
- Shielding analysis of the shutter block, including the shutter environment
- Interface and dimensions of the optics
- Range of motion

We also offer the design of the TBL shutter support stage.

#### 4.2. DREAM Shutter

- Shutter block Size: 1500mm x 180mm x 180 mm (Length x Width x Height).

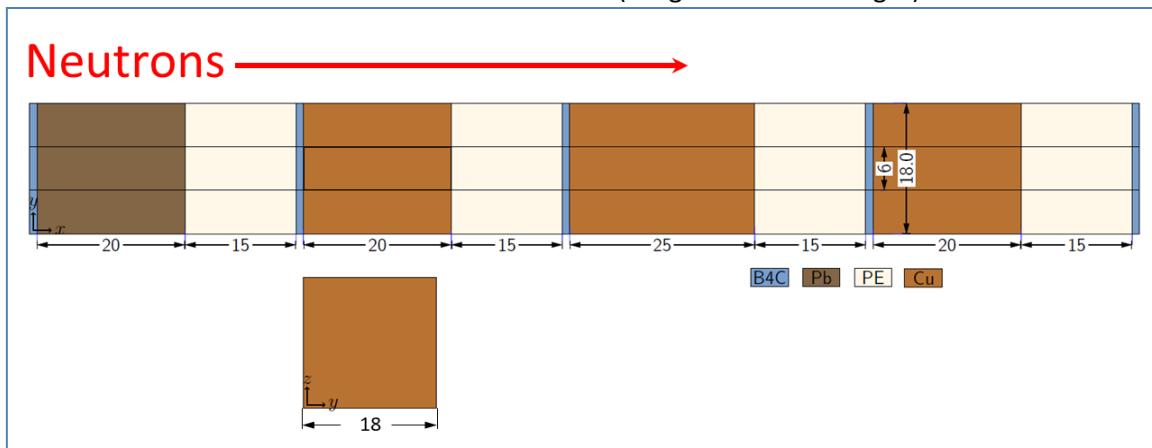


Figure 2: Composition and geometry of Shutter block (dimensions in cm)

- Attenuator Weight: 285kg
- The overall length of the vacuum tube (former flight tube) shall be also reduced to 1500mm. (The design update and model of the Vacuum tube will be provided by ESS. The interfaces will be the same as before.)

#### 4.3. ODIN Shutter

- Shutter block size: 1210mm x 200mm x 200 mm (Length x Width x Height).

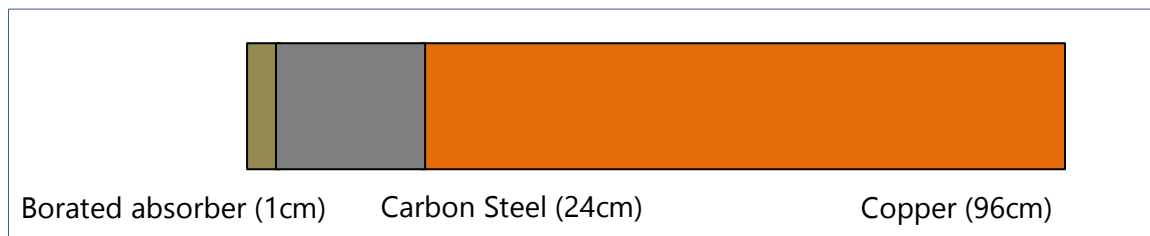


Figure 3: Composition and geometry of shutter block (dimensions in cm)

- Attenuator Weight: 420kg.
- The overall length of the Vacuum tube (former flight tube) will be reduced to 1260mm. (The design update and model of the Vacuum tube will be provided by ESS. The interfaces will be the same as before.)