

# Target Group Procedure

|                  |  |
|------------------|--|
| Procedure Number | TGT-PROC-17-004  |
| Revision         | 0  |
| Active Date      | 7/27/2017  |
| Expiration Date  | 7/27/2017  |
| Author           | David Meekins  |
| Checked          | Jenord Alston  |
| Approved         | David Meekins  |
| Title            | HATT Tritium Cell Examination, Assembly, and Testing Procedure   |
| Description:     | <p>Procedure for examination, assembly, and testing the tritium cell(s) for PS-TGT-12-001. Results shall be marked on the procedure and filed for each cell assembly. Activities are:</p> <ul style="list-style-type: none"><li>• Receipt Inspection of parts<ul style="list-style-type: none"><li>○ Dimensional inspection</li><li>○ Visual surface inspection</li></ul></li><li>• Thickness measurements</li><li>• Torque record</li><li>• Leak/pressure testing</li></ul> |

## 1. Revision History

| Revision    | Date      | Description |
|-------------|-----------|-------------|
| Revision: 0 | 7/26/2017 | Original    |

## 2. Definitions

- HATT: Hall A Tritium Target

## 3. Purpose and Scope

The purpose of this procedure is to ensure proper cleaning, assembly, testing, and documentation of the HATT cell. The report generated as part of the process steps for this procedure shall serve as the final mechanical examination for the cell. Reference the JLAB drawing TGT-103-1000-0013 and other drawings referenced therein.

## 4. Facility

This procedure shall be performed in the JLAB Target Group Shop area.

## 5. Authority

The following JLAB Target Group members shall have authority to implement this procedure.:

- Chris Keith – Target Group Lead
- David Meekins – Target Group Staff Scientist
- Jenord Alston – JLAB Examiner

Alterations to this procedure shall be approved by David Meekins or Chris Keith.

## 6. Process Steps

The following process steps shall be completed as part of this procedure:

1. All components shall be cleaned using procedure TGT-PROC-17-003 Rev 0.
2. Swagelok MS-TL-SGT anti-seize shall be applied to all fastener threads.
3. Calibrate the MagnaMike to be used in the next step.
4. Use MagnaMike to perform dimensional checks and thicknesses of thin sections and record results on report form.
  - a. Measure main body beam left side wall thickness at using 10 measurements at each location: upstream, mid and downstream as shown in the figure below. Record the average and standard deviation on the report form below.
  - b. Measure main body beam right side wall thickness at using 10 measurements at each location: upstream, mid and downstream as shown in the Figure 1 below. Record the average and standard deviation on the report form below.
  - c. Measure beam exit of main body. Record the average and standard deviation on the report form below.

- d. Measure entrance window thickness (see Figure 2). Record the average and standard deviation on the report form below.
5. Check calibration of the torque wrenches to be used in the assembly of the HATT cell.
6. Check and record assembly torque data and record on report form.
7. Perform reverse He leak tests of cell assembly with 400 psia in cell. Record data on report form.
8. Perform valve leak through test with cell filled at 200 psia helium. Record data on report form.
9. Perform cold leak test using PS-TGT-16-002 Target Group Cryo Test Stand with cell filled to 200 psia helium. Record data on report form.
10. Remove helium pressure on cell. Maintain slight positive pressure  $\sim 1$  psig in cell for shipping to SRS.
11. Procedure complete

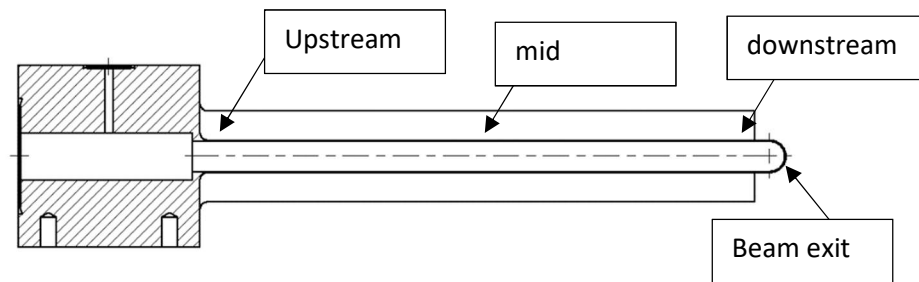


Figure 1: Main body measurement locations

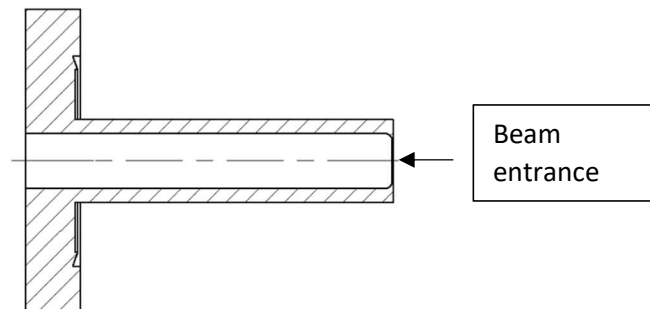


Figure 2: Entrance window measurement location

## HATT Assembly, Testing, and Examination Report

|  |  |
|--|--|
| General  |  |
| Examiner   |  |
| Date   |  |
| Cell assembly number                                 |  |
| Assembly Tech  |  |
| Entrance window number                               |  |
| Main body number                                     |  |
| Surface finish                                       |  |
| Parameter  | Data   |
| General condition free of nicks scratches dents etc. | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Components cleaned per procedure TGT-PROC-0017-003   | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Are external dimensions within tolerance             | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Tapped holes run free                                | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| MagnaMike Calibrated Prior to start                  | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Beam left upstream thickness (mm)                    |  |
| Beam left upstream thickness (mm)                    |  |
| Beam left upstream thickness (mm)                    |  |
| Beam right upstream thickness (mm)                   |  |
| Beam right upstream thickness (mm)                   |  |
| Beam right upstream thickness (mm)                   |  |
| Beam exit thickness (mm)                             |  |
| Entrance window thickness (mm)                       |  |
| Heat/lot cell main body                              |  |
| Heat/lot cell entrance window                        |  |
| Heat/lot ¼-28 hardware                               |  |
| Heat/lot 8-32 screws                                 |  |
| Heat/lot 4-40 screws                                 |  |
| Weld exam performed                                  | <input type="checkbox"/> VT <input type="checkbox"/> RT  |
| Continue to leak testing section                     |  |

| Pressure and Leak Testing   |                     |  |                                      |
|---|---------------------|--|--------------------------------------|
| Leak Test (ASME B31.3 (2014) 345.5)   |                     |  |                                      |
| Test date:  | Start time:         | Actual gauge pressure:                                   |                                      |
| Required Duration:<br>15 min  | Finnish time:       |  |                                      |
| <b>TEST EQUIPMENT</b>   |                     |  |                                      |
| Gauge Type/Number:  | Range:              | Cal date:  | Cal due date (attach cert if needed) |
|   |                     |  |                                      |
| <i>Helium Leak Testing:</i><br><i>Note maximum leak rate warm is <math>10^{-9}</math> mbar l/s. Required leak rate cold is <math>10^{-7}</math> mbar l/s.</i> |                     |  |                                      |
| Helium leak detector calibrated   |                     | <input type="checkbox"/> Yes <input type="checkbox"/> No |                                      |
| Valve assembly capped or connected to hose  | Cell pressure:      | Leak Rate  |                                      |
| Valve closed with VCR cap removed   | Cell pressure:      | Leak Rate  |                                      |
| Cold leak test with VCR cap installed   | Cell pressure warm: | Leak Rate  |                                      |
| Signature Block   |                     |  |                                      |
| Examiner:   |                     |  |                                      |
| Design Authority:   |                     |  |                                      |
| Pressure Test Technician  |                     |  |                                      |
| Examination Result (pass/fail)  |                     |  |                                      |