


# Target Group Procedure

Procedure Number	TGT-PROC-17-004
Revision	1
Active Date	7/27/2017
Expiration Date	7/27/2020
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
Revision: 1	8/3/2017	Added torque requirements, adjusted the report, changed test pressure.

## 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.
    - a. Attach torque calibration data for form.
  7. Perform reverse He leak tests of cell assembly with 300 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. Attach material certifications and welding examination reports to form.
  12. Procedure complete

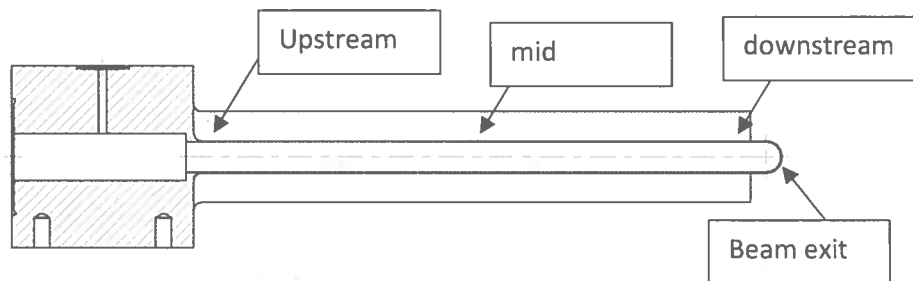


Figure 1: Main body measurement locations

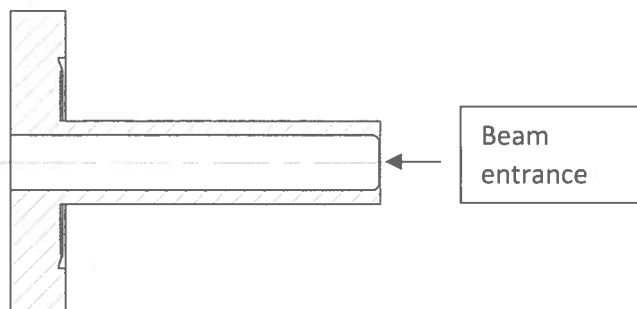


Figure 2: Entrance window measurement location




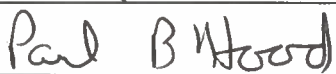
## HATT Assembly, Testing, and Examination Report

General	
Examiner	Jenord Alston
Date	8/3/2017
Cell assembly number	#1
Assembly Tech	David Meekins
Entrance window number	T2-2-ENT
Main body number	T2-2-M
Surface finish	Acceptable
Parameter	Data
General condition free of nicks scratches dents etc.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Components cleaned per procedure TGT-PROC-0017-003	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Are external dimensions within tolerance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Tapped holes run free	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Valve assembly data	
Weld exam performed	<input checked="" type="checkbox"/> VT <input checked="" type="checkbox"/> RT
Heat/lot CF to ¼ tube adapter	E160561
Valve Certifications Attached	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
VCR Certifications Attached	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Cell component data	
Heat/lot cell main body	107954B0
Heat/lot cell entrance window	107954B0
Heat/lot entrance window cover/stay	107954B0
Heat/lot side covers	107954B0
Heat/lot ¼-28 x 1 hardware	50163-052610
Heat/lot ¼-28 x 2 hardware	COC
Heat/lot 8-32 screws	51257
Heat/lot 4-40 screws	107108
Continue to assembly section	

Assembly Section	
Parameter	Data
MagnaMike Calibrated Prior to start	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Beam left upstream thickness (mm)	0.473 ± 0.001
Beam left mid thickness (mm)	0.435 ± 0.001
Beam left down thickness (mm)	0.379 ± 0.002
Beam right upstream thickness (mm)	0.425 ± 0.001
Beam right mid thickness (mm)	0.447 ± 0.001
Beam right down thickness (mm)	0.406 ± 0.001
Beam exit thickness (mm)	0.343 ± 0.012
Entrance window thickness (mm)	0.253 ± 0.004
Torque Data	
Torque ¼-28 x 1 (200 in-lbf)      CF	Torque 200 in-lbf DM
Torque ¼-28 x 2 (100 in-lbf)      Cover	Torque 100 in-lbf DM
Torque 8-32 x 5/8 (50 in-lbf)      Covers	Torque 50 in-lbf DM
Torque 8-32 x ½ (50 in-lbf)      CF	Torque 50 in-lbf DM
Torque 4-40 x ½ (10 in-lbf)      Exit Cover	Torque to 10 in-lbf DM
Continue to leak testing section	

NOT EXP. INSURE  
 CWM 08/18/17  
 JENNIFER ALBERT



Pressure and Leak Testing			
Leak Test (ASME B31.3 (2014) 345.5)			
Test date: 8/3/2017	Start time: 2:17 PM.	Actual gauge pressure: 301 psig	
Required Duration: 15 min	Finnish time: 2:51 PM		
TEST EQUIPMENT			
Gauge Type/Number:	Range:	Cal date:	Cal due date (attach cert if needed)
Ashcroft E058261	0-1000 psi	2/27/2017	2/27/2018
Helium Leak Testing:			
Note maximum leak rate warm is $10^{-9}$ mbar l/s. Required leak rate cold is $10^{-7}$ mbar l/s.			
Helium leak detector calibrated 8/3/17		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Valve assembly capped or connected to hose	Cell pressure: 301 psig	Leak Rate $5.5 \times 10^{-10}$ ATMcc/sec	
Valve closed with VCR cap removed 20 in-lbf on Valve Nut	Cell pressure: 202 PSEG	Leak Rate $1.9 \times 10^{-9}$ ATMcc/sec Falling	
Cold leak test with VCR cap installed	Cell pressure warm: cold: 55 psia	Leak Rate $1.8 \times 10^{-9}$	
Signature Block			
Examiner:	  Jenord Alston CWI 09111931 QC1 EXP. 11/1/2018		
Design Authority:	 David Meekins		
Pressure Test Technician	 Paul B. Hood		
Examination Result (pass/fail)	Pass		