

# Hall C Target Configuration Jan 24, 2018



## Engineering Report

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Document Title: Hall C Target Configuration for Jan 24, 2018	
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Description: Configuration report for the Hall C Target ladder installed for the Fall 2017 run period and altered 1/24/2016. This document gives BDS positions, target thicknesses, cell thicknesses and overall assembly data. The target configuration can be found in JLAB Drawing TGT-301-1001-0110 Rev C which can be found in the JLAB document repository.

# 1 Revision History

Revision: 0	1/24/2018	Original
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## 2 Purpose and Scope

This report documents the configuration for the Hall C Target as installed for the Fall 2017 run period and altered on 1/24/2018. Target thicknesses and uncertainties are included. Reference TGT-CALC-17-002 for calculation details. The target configuration can be found in JLAB Drawing TGT-301-1001-0110 Rev C which can be found in the JLAB document repository.

### 3 Target list and lifter positions

The following lifter positions were determined by alignment of the system.

Target name	Lifter position	Target Material
Loop 1 4 cm	33360185	4 cm Loop 1
Loop 1 10 cm	29577088	10 cm Loop 1
Loop 2 10 cm	23827667	10 cm Loop 2
Loop 3 10 cm	16205625	10 cm Loop 3
10 cm dummy with C *	11424989	Aluminum 7075/Carbon
10 cm dummy	10807261	Aluminum 7075
4 cm dummy	10059485	Aluminum 7075
Optics #1 +/-10 and 0	8498909	Carbon
Optics #2 +/-5 cm	7783645	Carbon
Carbon Hole	6508765	Carbon
Carbon 6%	5793501	Carbon
Carbon 6%	5078237	Carbon
Carbon 0.5%	4362973	Carbon
10B4C	3647709	B4C
11B4C	2932445	B4C
Be	2217181	Be 99.99%
Carbon 1.5%	1501405	Carbon
Home	0	N/A

\* Note: Carbon target located at Z=0 on 10 cm dummy target position one.

Lifter positions have been adjusted 3.5 mm up from original survey/alignment encoder positions.

## 4 Target Thicknesses

### 4.1 Hydrogen loops

Entrance and exit window thicknesses are given below. Loop 1 is in standby with helium gas. Loop 2 is connected to the H2 panel and Loop 3 is connected to the D2 panel.

Target	Entrance (mm)	Exit (mm)	Length (mm)	Material
Loop 1 (4 cm)	$0.165 \pm 0.0019$	0.151 $\pm$ 0.0053 Tip 0.151 $\pm$ 0.0097 Wall	$40 \pm 0.26$	AL 7075
Loop 1 (10 cm)	$0.104 \pm 0.0025$	0.133 $\pm$ 0.0096 Tip 0.162 $\pm$ 0.014 Wall	$100 \pm 0.26$	AL 7075
Loop 2 (10 cm)	$0.150 \pm 0.011$	0.191 $\pm$ 0.019 Tip 0.219 $\pm$ 0.018 wall	$100 \pm 0.26$	AL 7075
Loop 3 (10 cm)	$0.130 \pm 0.012$	0.188 $\pm$ 0.013 Tip 0.184 $\pm$ 0.017 wall	$100 \pm 0.26$	AL 7075

### 4.2 Dummy Targets

The dummy targets are aluminum foils mounted on separate frames with foils located at Z positions corresponding to the cryotarget exit and entrance windows.

Target	Thickness Total (g/cm <sup>2</sup> )	Material
4 cm Dummy	0.0789 $\pm$ 0.00014 0.0811 $\pm$ 0.00014	Al 7075
10 cm Dummy	0.1816 $\pm$ 0.0003 0.1815 $\pm$ 0.0003	Al 7075

### 4.3 Optics Target

The optics target has two positions with carbon (99.95% C) foils in a linear array with foils located nominally at:

1. Three foils located at Z = 0 cm and  $\pm$  10 cm
2. Two foils located at Z =  $\pm$  5 cm

The nominal thickness of each carbon foil is:  $0.044 \pm 0.001$  g/cm<sup>2</sup>.

#### 4.4 Solid Targets

Solid targets are located on the solid target ladder nominally at  $Z = 0$ .

Target name	Thickness (g/cm <sup>2</sup> )	Target Material
Carbon on 10 cm dummy	$0.4426 \pm 0.0008$	Aluminum 7075/Carbon 99.95%
Carbon Hole	$0.171 \pm 0.001$	Carbon 99.95%
Carbon 4.9%	$1.683 \pm 0.009$	Carbon 99.5%
Carbon 4.9%	$1.690 \pm 0.009$	Carbon 99.5%
Carbon 0.5%	$0.1749 \pm 0.00035$	Carbon 99.95%
10B4C	$0.5722 \pm 0.001$	B4C (99.9% Chem/ 95% iso-enrichment)
11B4C	$0.6348 \pm 0.001$	B4C (99.9% Chem/ 95% iso-enrichment)
Be	$1.314 \pm 0.001$	Be (99.99%)
Carbon 1.5%	$0.5244 \pm 0.001$	Carbon 99.95%
Home	0	N/A

## 5 Pictures:









