

AFC module status: Liquid Hydrogen Absorber

Shigeru Ishimoto KEK

CM20 at RAL, Feb 10-13, 2008



Nufact07, Okayama



OUTLINE

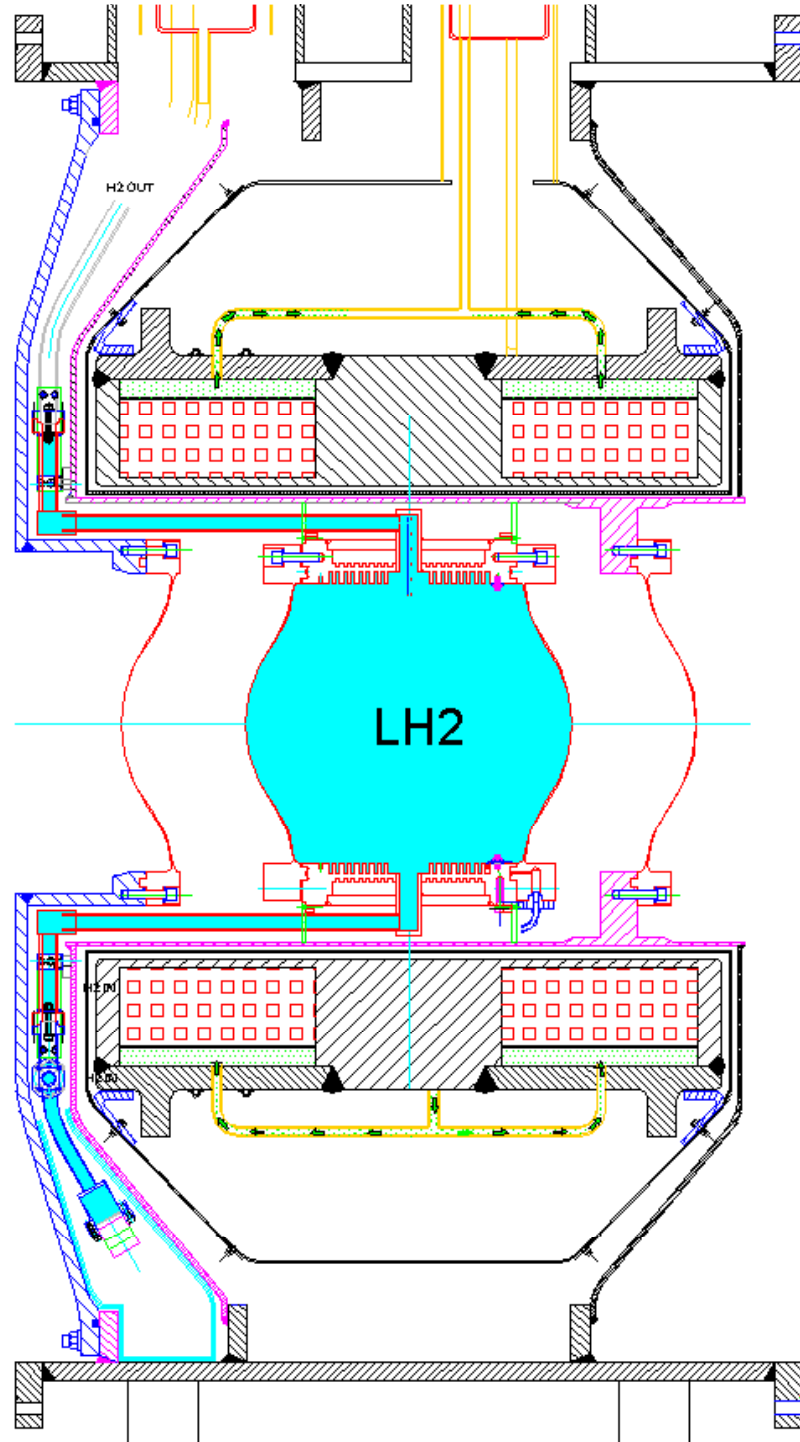
- 1) MICE Absorber Design by KEK
- 2) MICE Absorber Design by MIRAPRO
- 3) MICE Test Cryostat at KEK
- 4) Superfluid L-He Absorber R&D at KEK
- 5) Summary and Plan

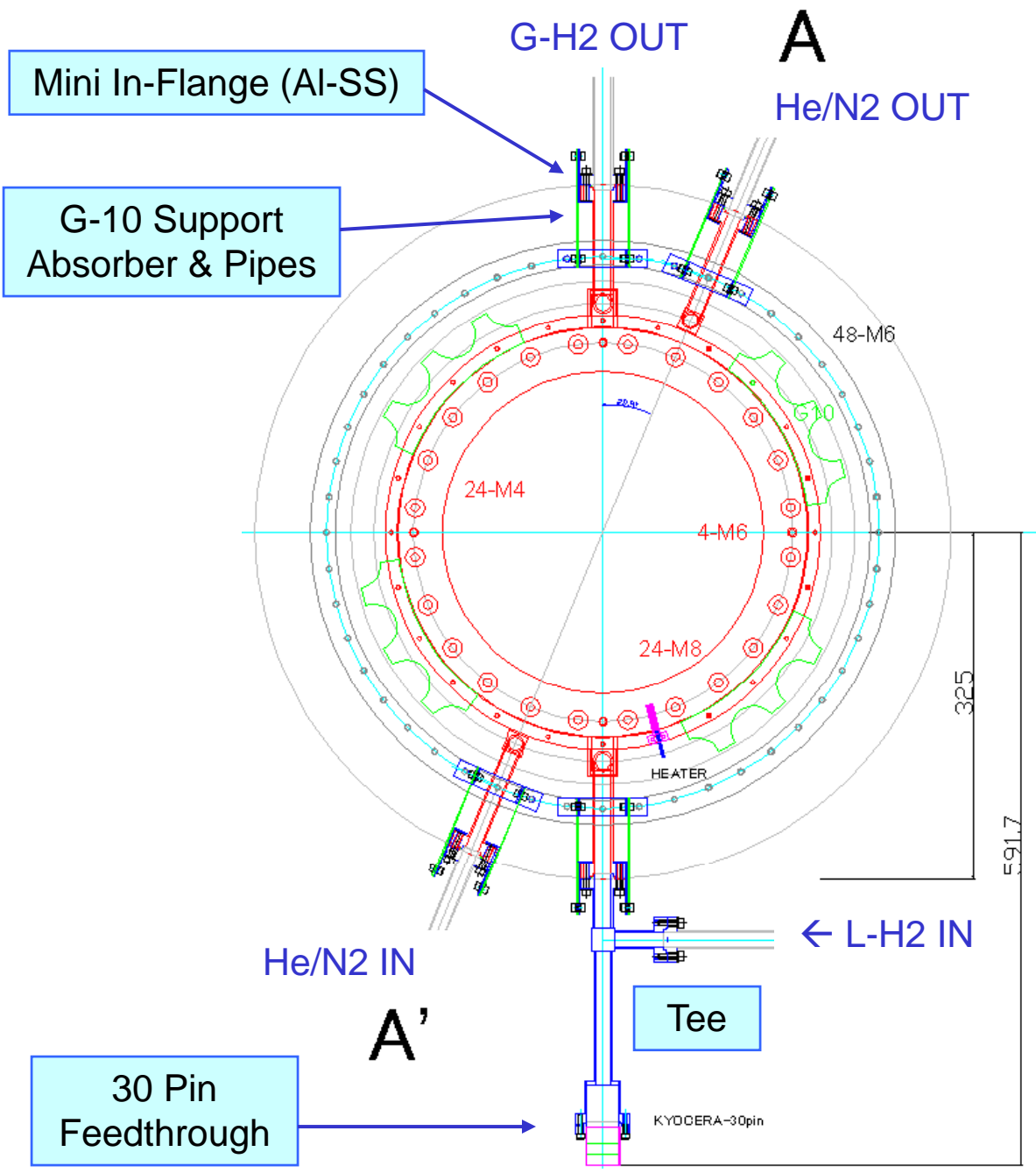


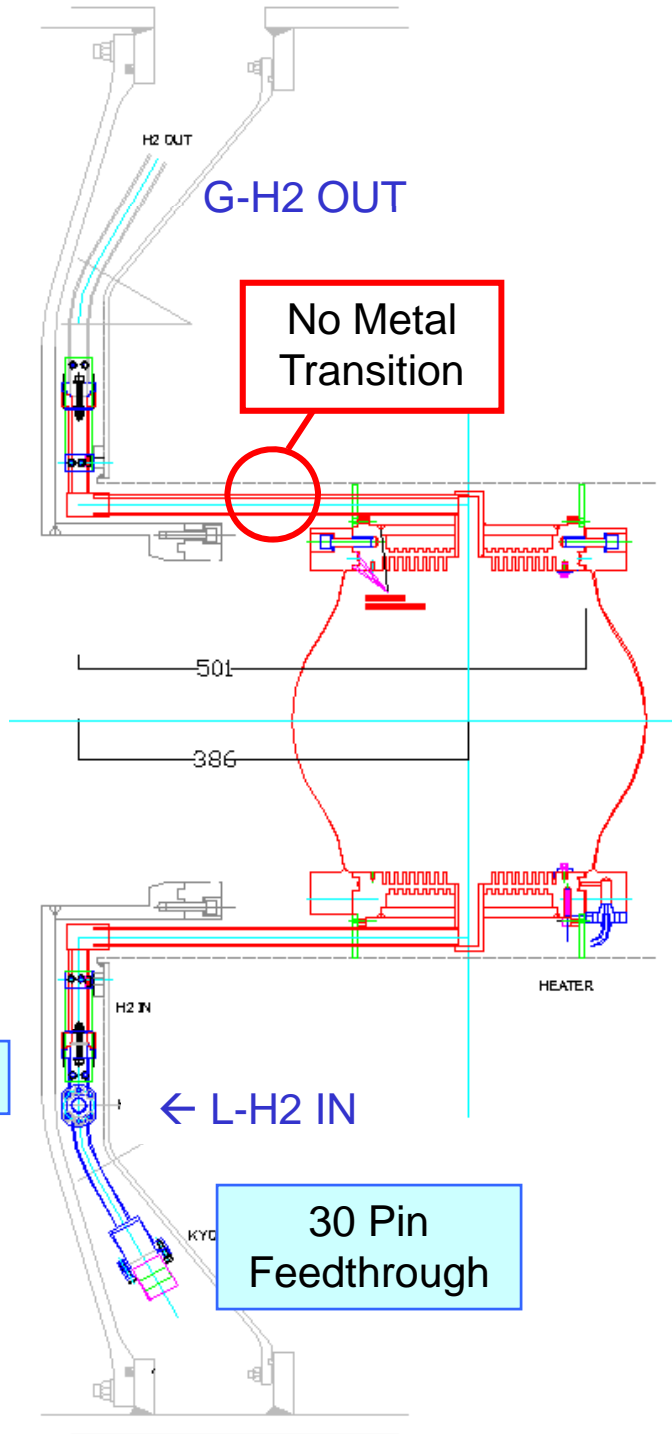
AFC Module with MICE Absorber



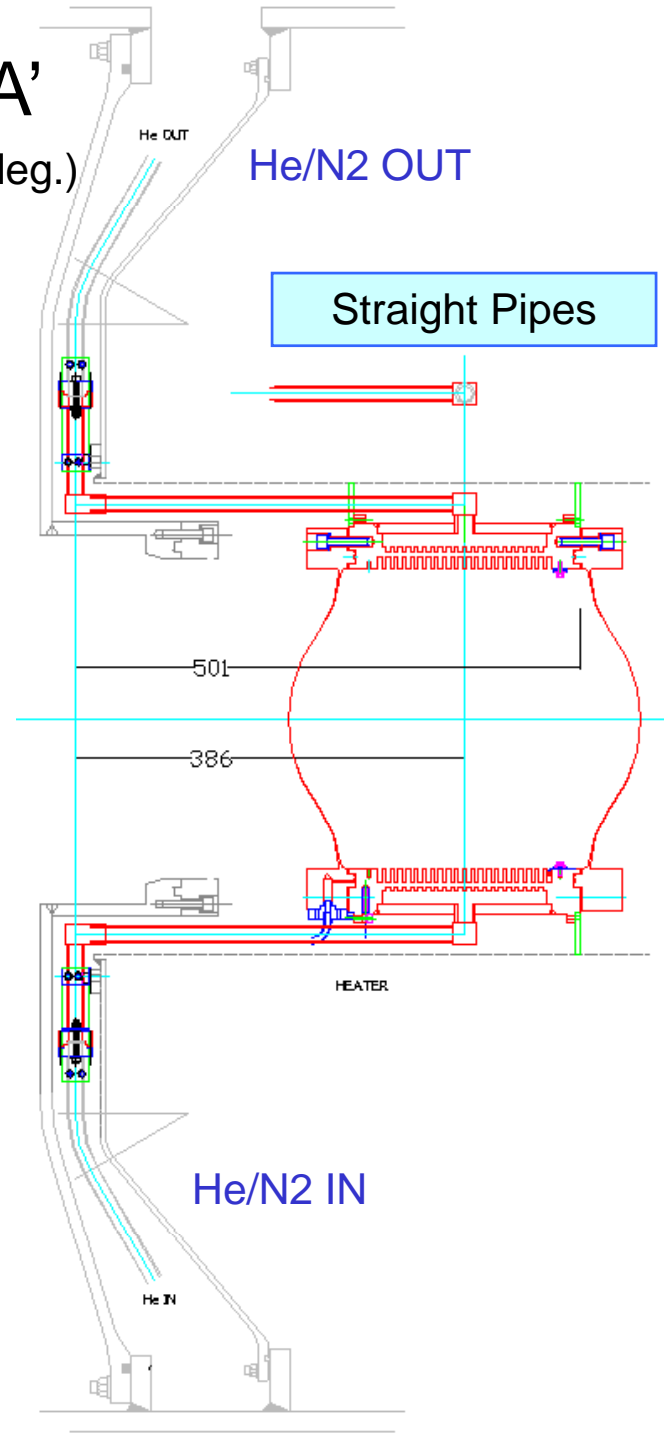
- Mini-Flanges
(In-Seal)
- G10 Supports
- LH2 IN
- 30 Pin
Feedthrough





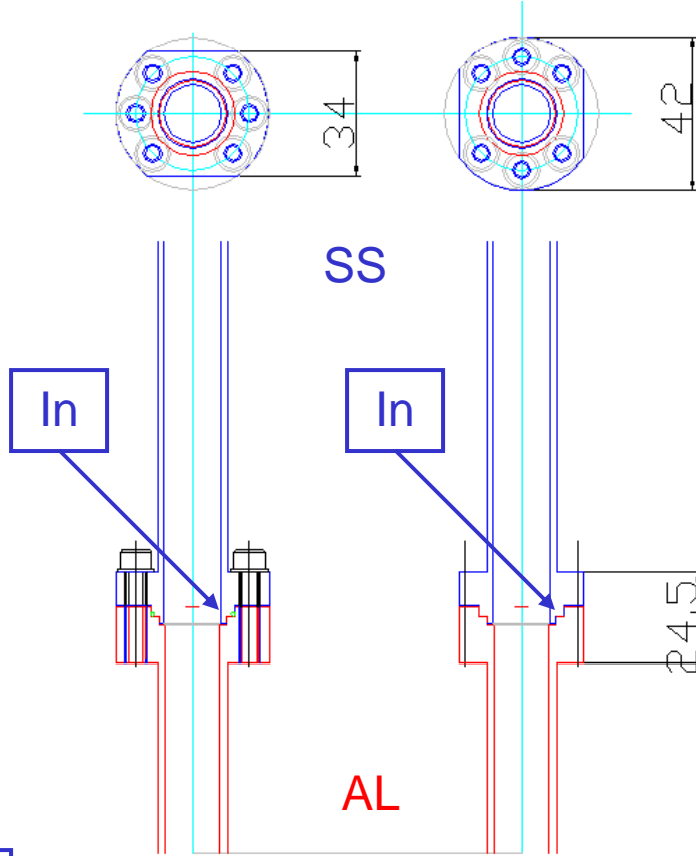


A-A'
(22.5 deg.)





Mini In-Flange; Al/SS joints

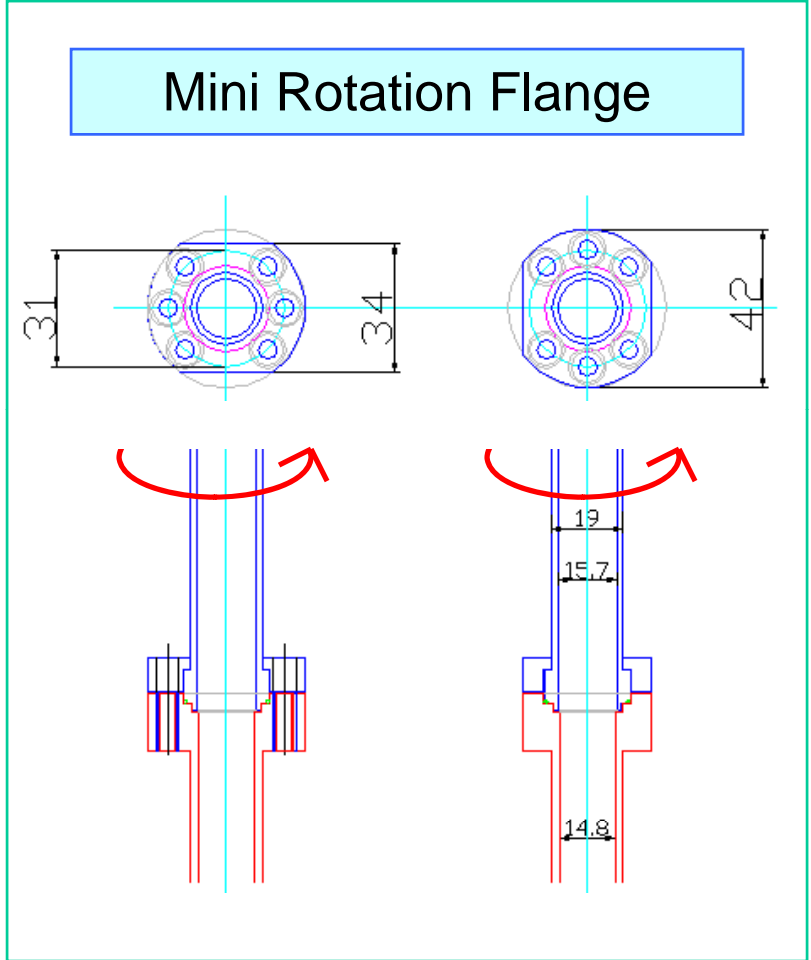


LH2
IN/OUT

SS OD=3/4"=19.05 mm, t=1.65 mm, ID=15.75 mm
AL OD=3/4"=19.05 mm, t=2.11 mm, ID=14.83 mm

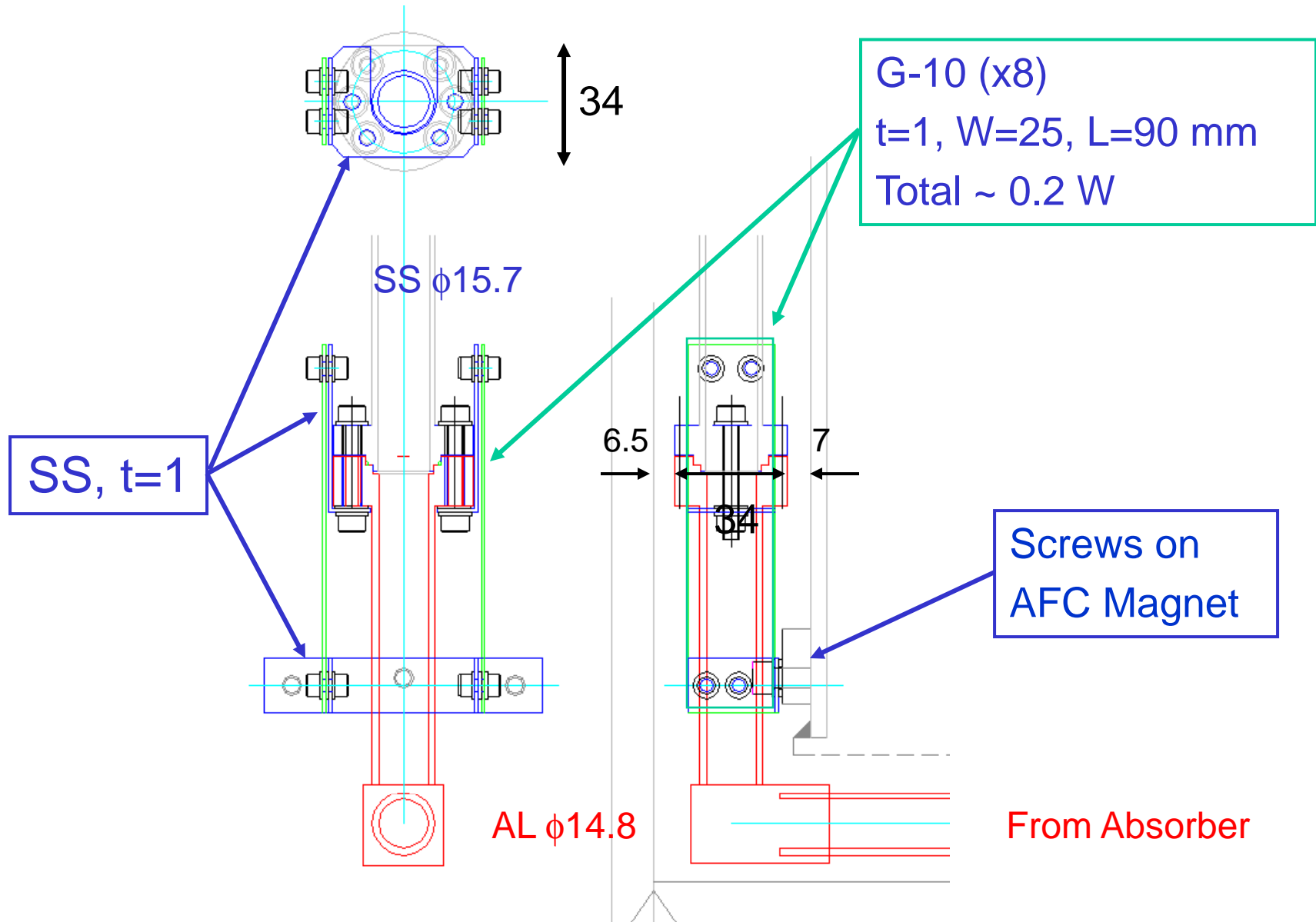
He
IN/OUT

SS OD=5/8"=15.875 mm, t=1.24 mm, ID=13.39 mm
AL OD=5/8"=15.875 mm, t=1.65 mm, ID=12.57 mm



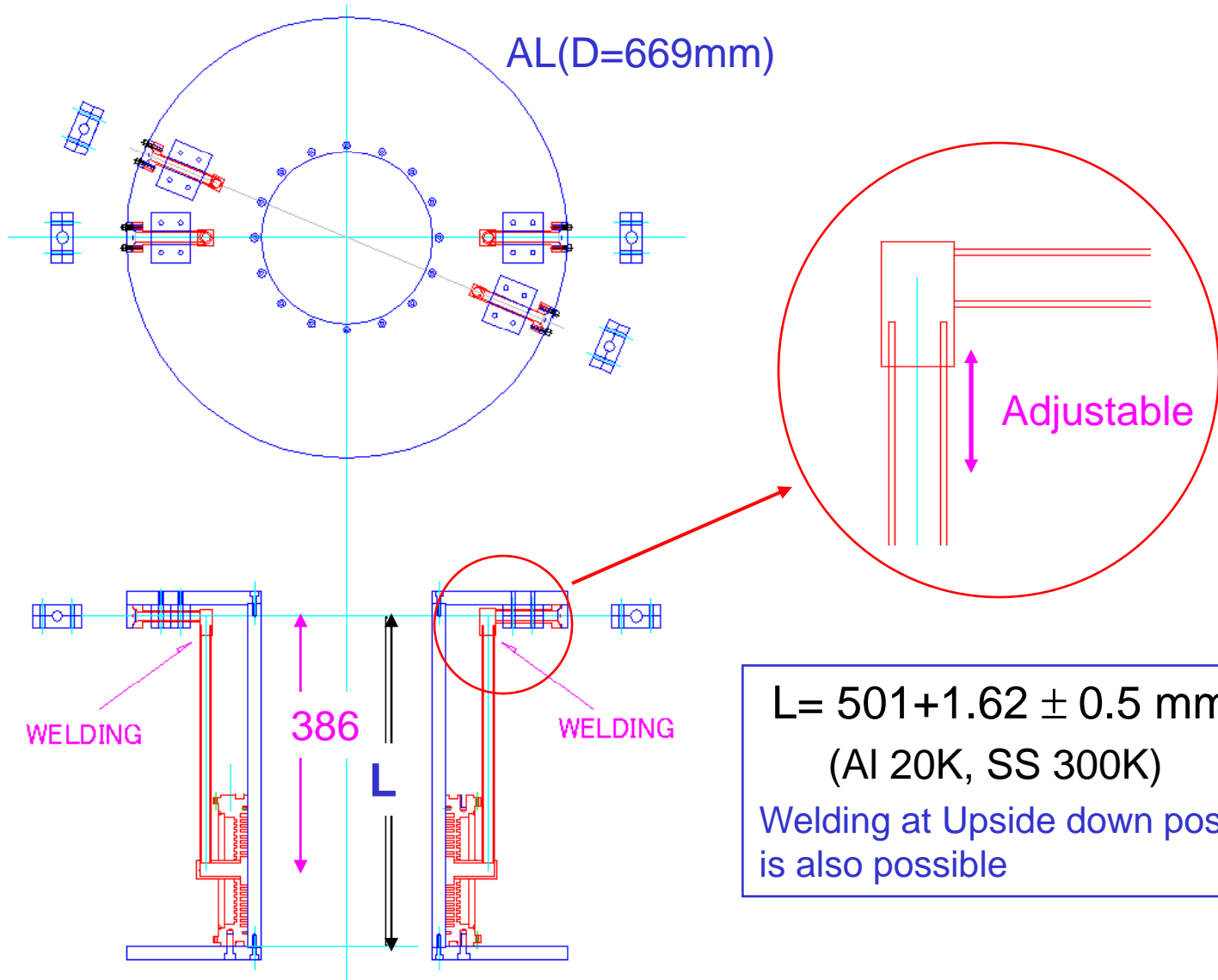


Detail of Flange and G-10 Support



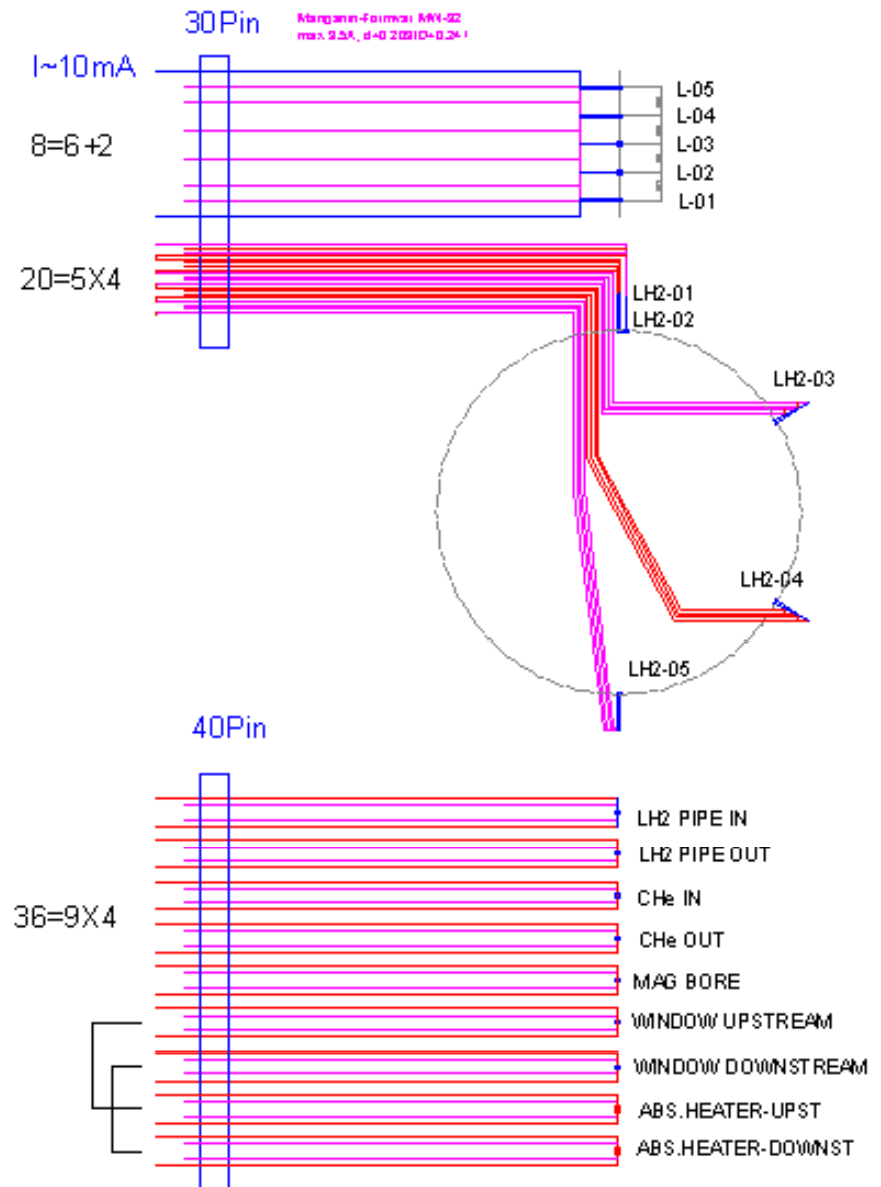
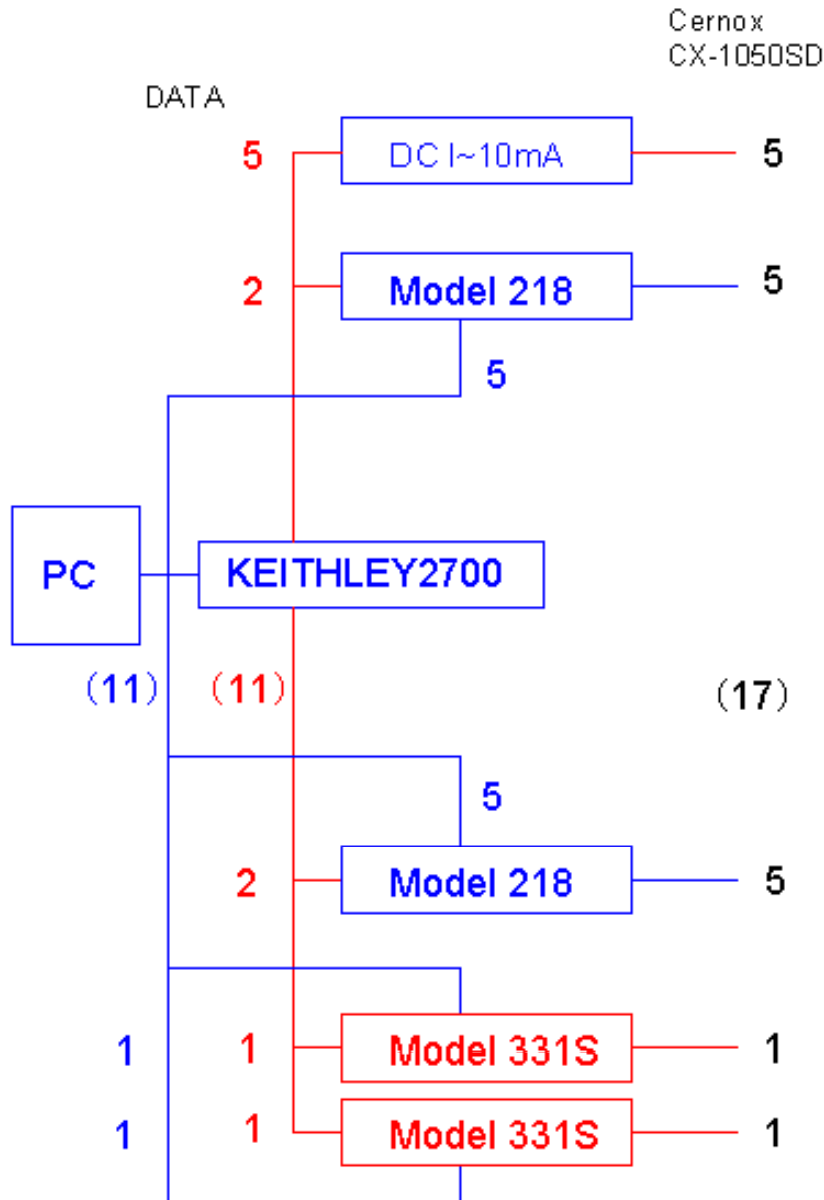


Pipe Welding Method





Instrumentation of Sensors & Heaters



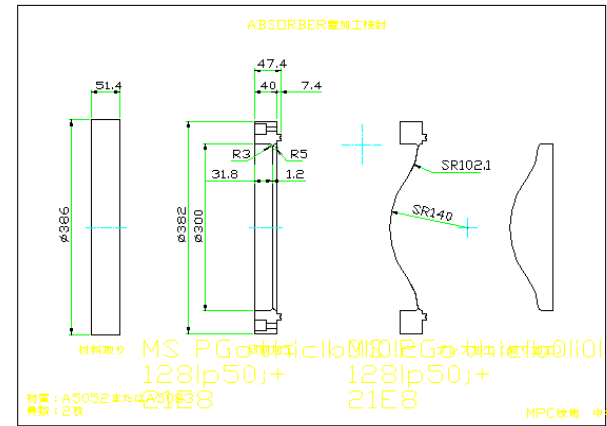


MICE Absorber Design by MIRAPRO





MICE Absorber Design by MIRAPRO



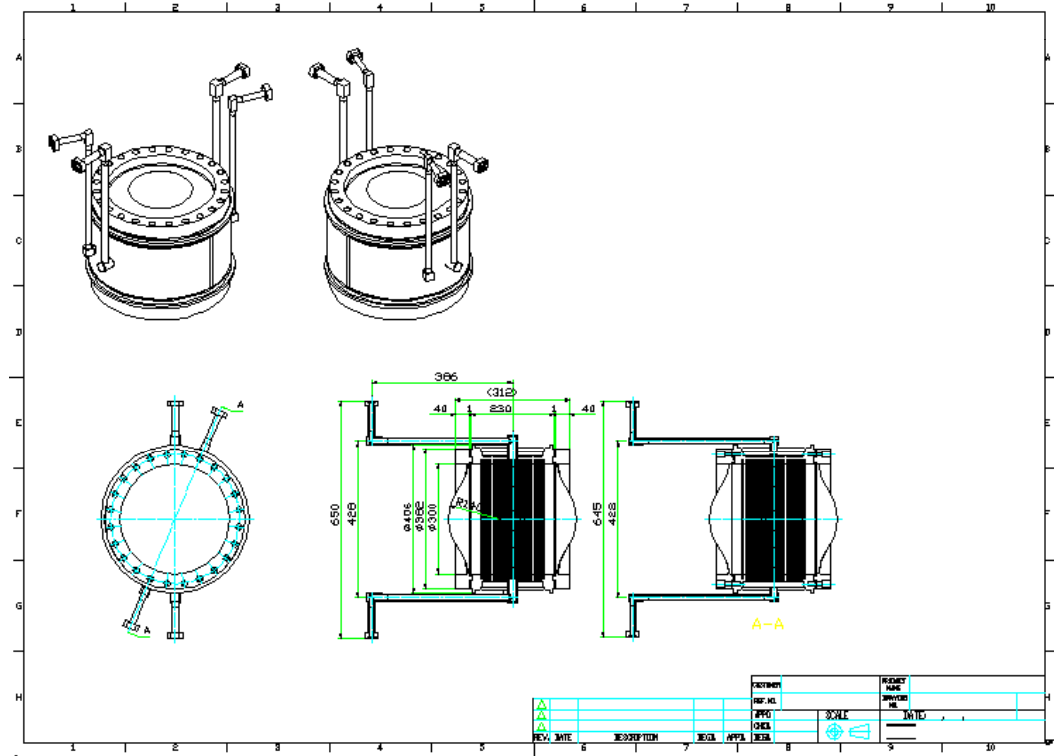
MIRAPRO Co.

Restart Design; Jan, 08
Rough Estimation; Feb, 08

Official Order; Jun, 08

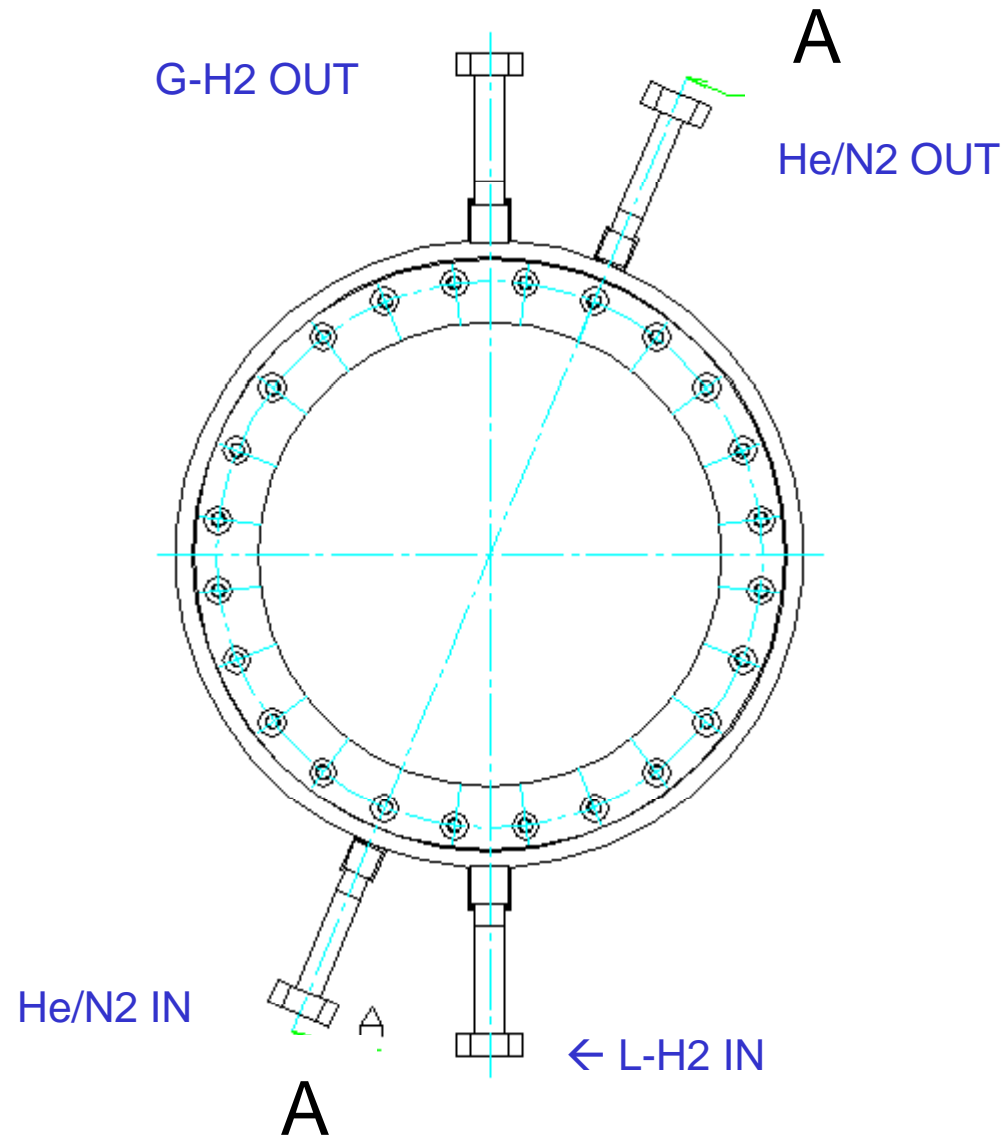
Absorber Body #1 to KEK;
~ Sep, 08

Assembly and Test;



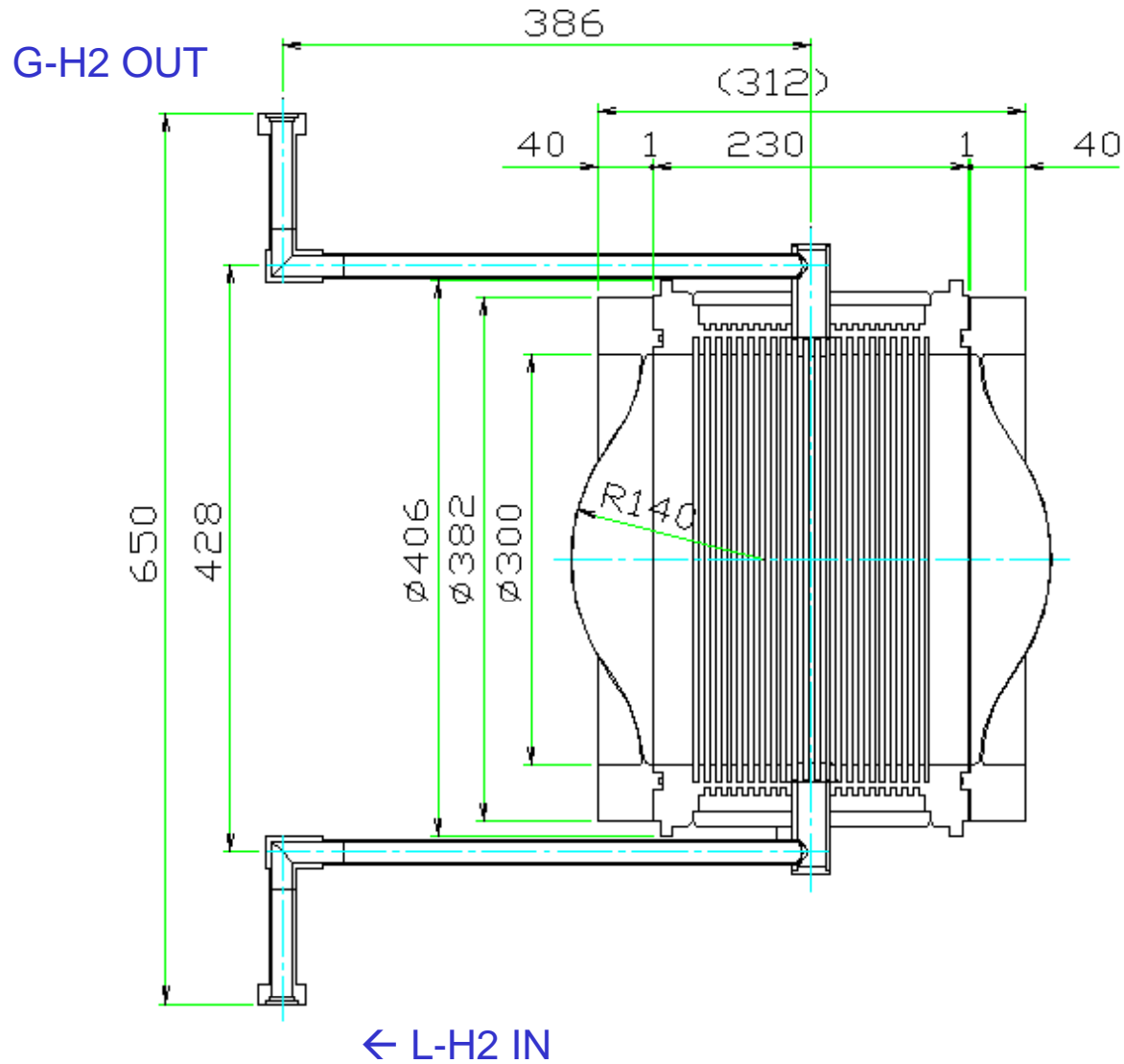


MICE Absorber Design by MIRAPRO



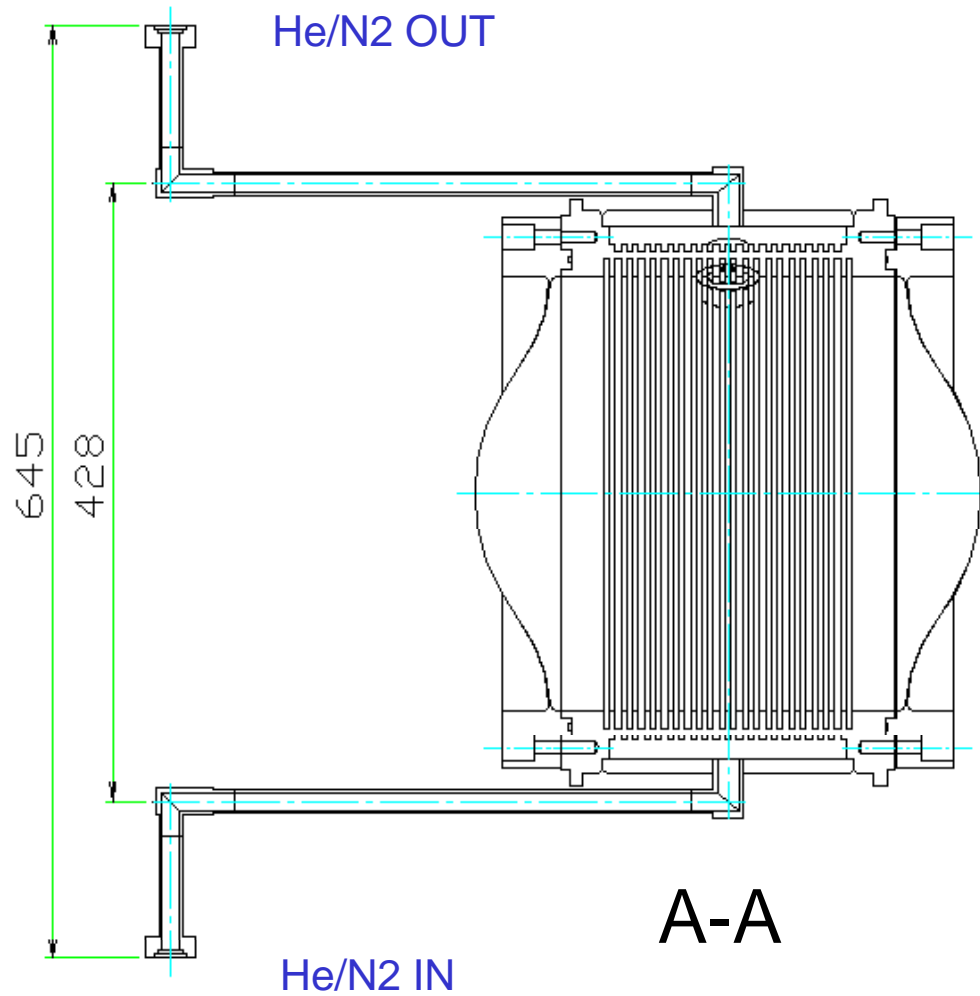


MICE Absorber Design by MIRAPRO



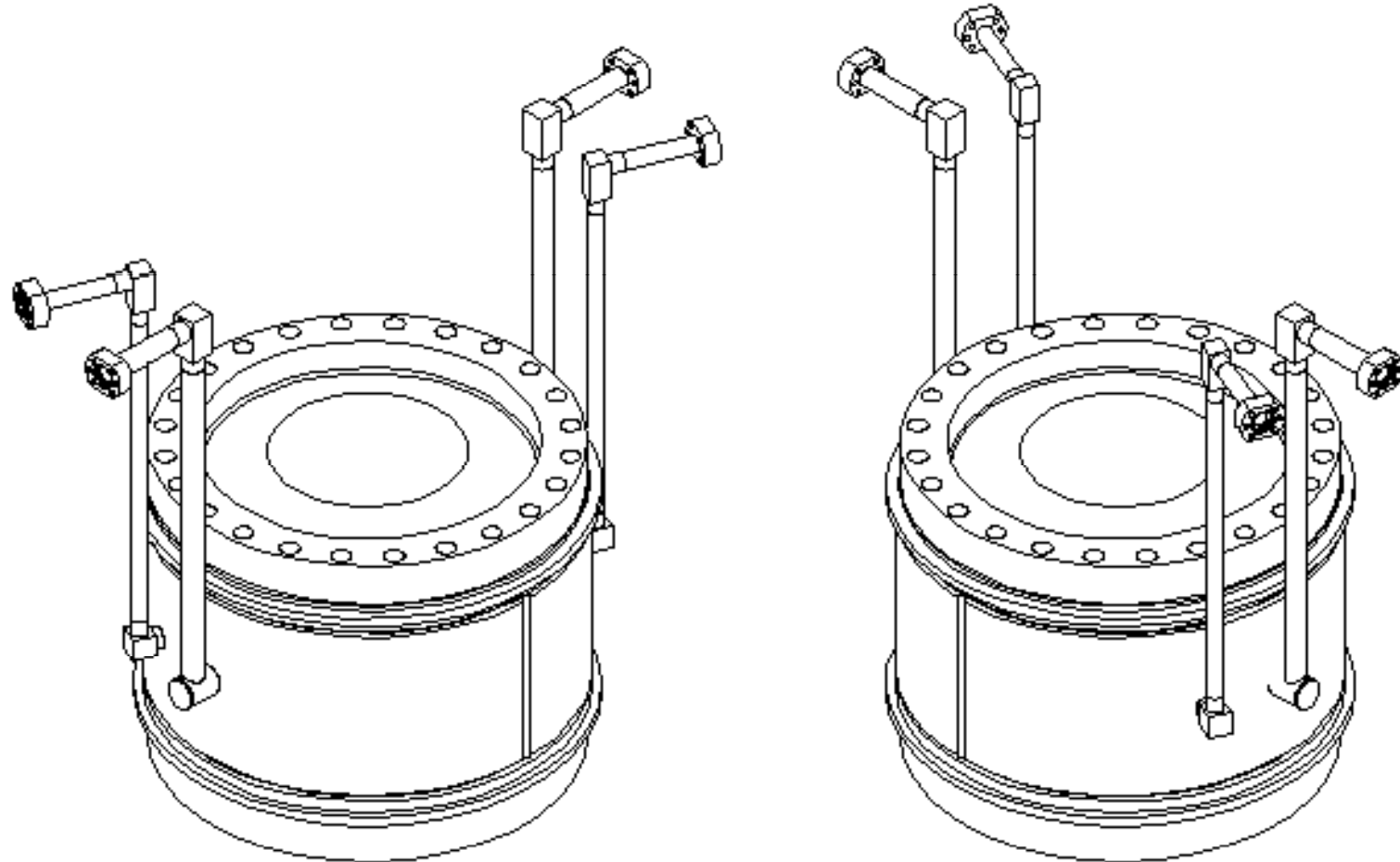


MICE Absorber Design by MIRAPRO





MICE Absorber Design by MIRAPRO



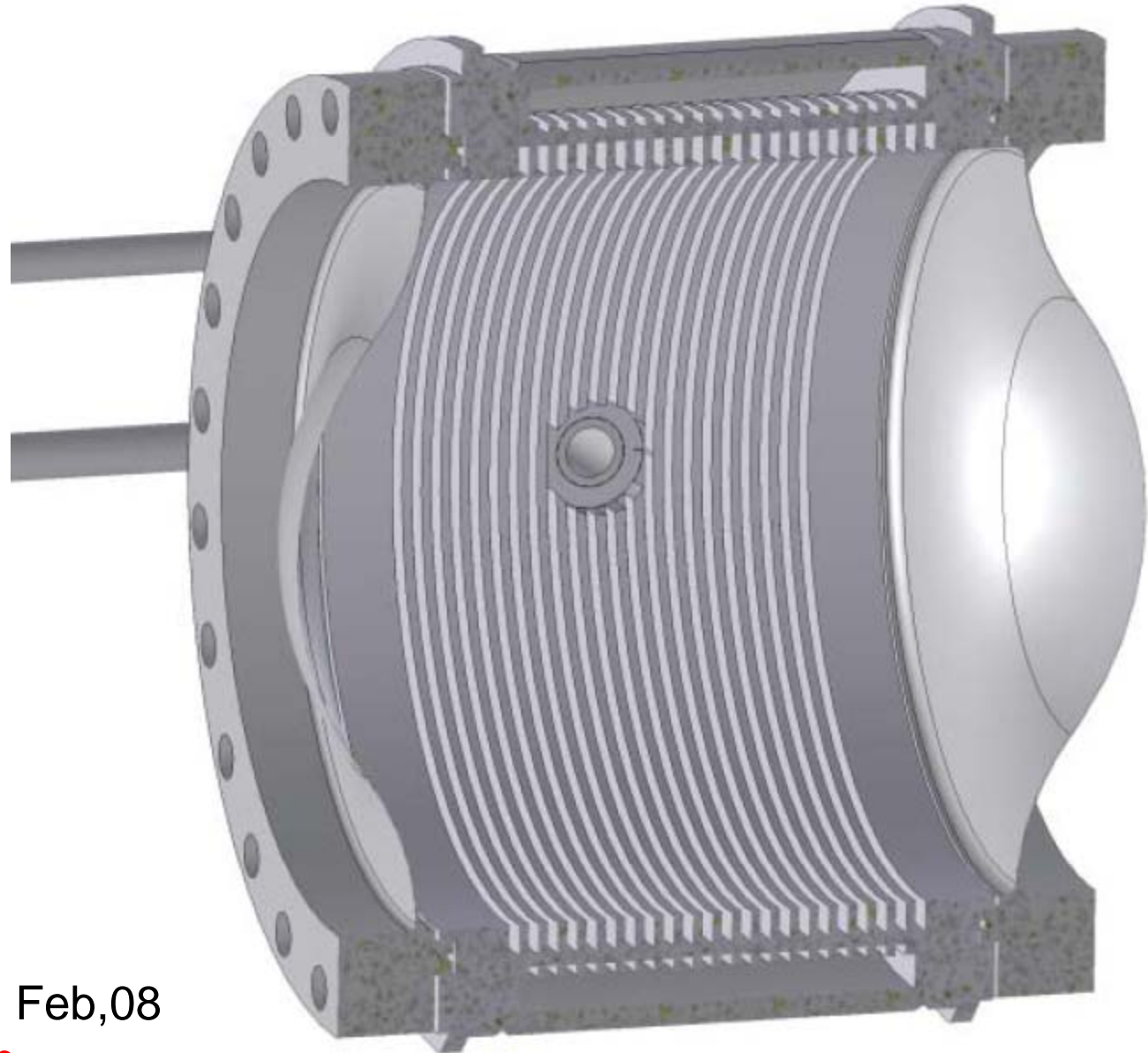


MIRAPRO Co.



MIRAPRO Co.





MIRAPRO Co.

Rough Estimation; Feb,08

Body ~ 2,000K yen
(~ \$18,180)

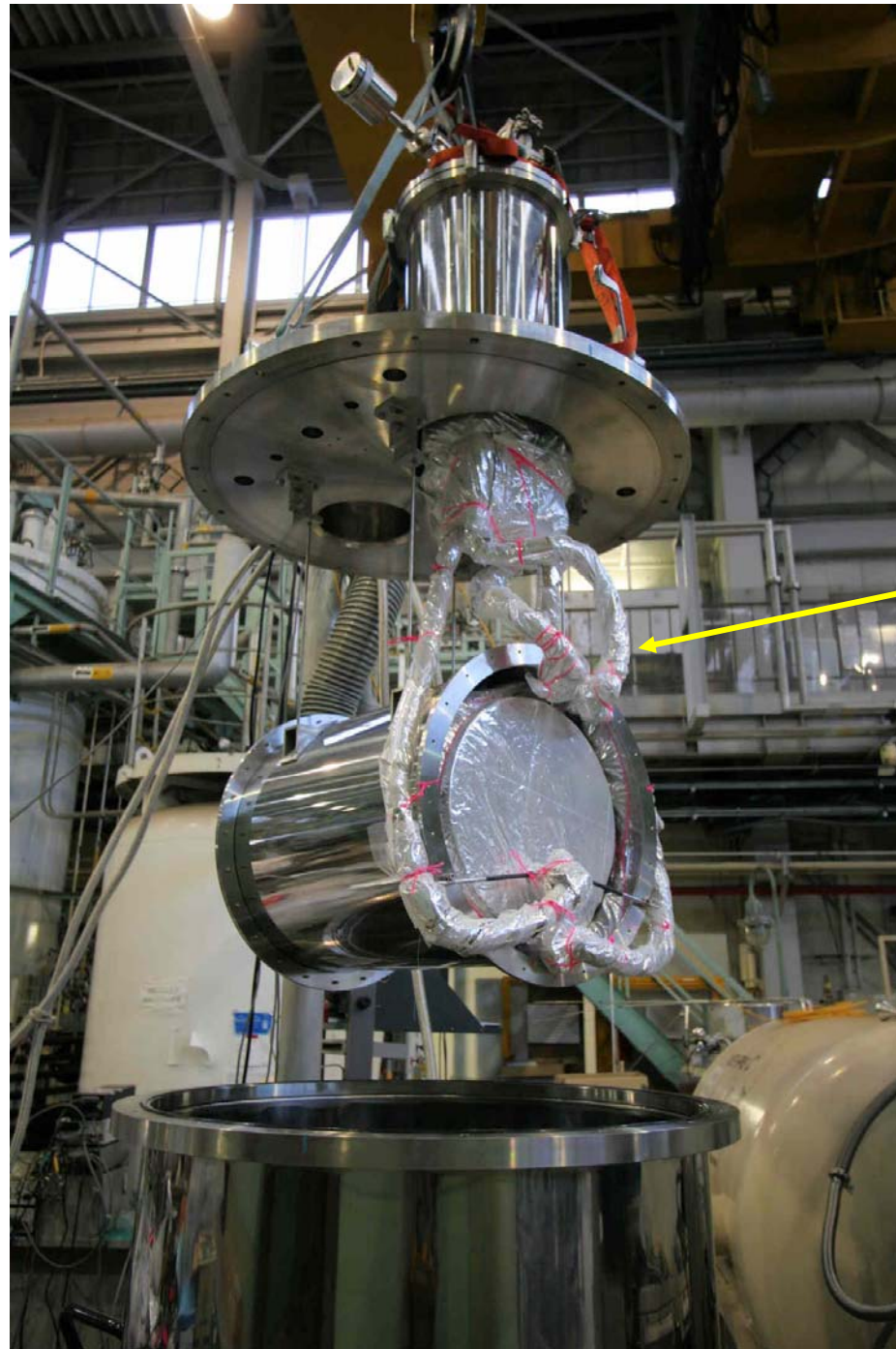


MICE Test Cryostat at KEK





Insert to
Vacuum
Chamber



Pipes with
MLI ~2 layers





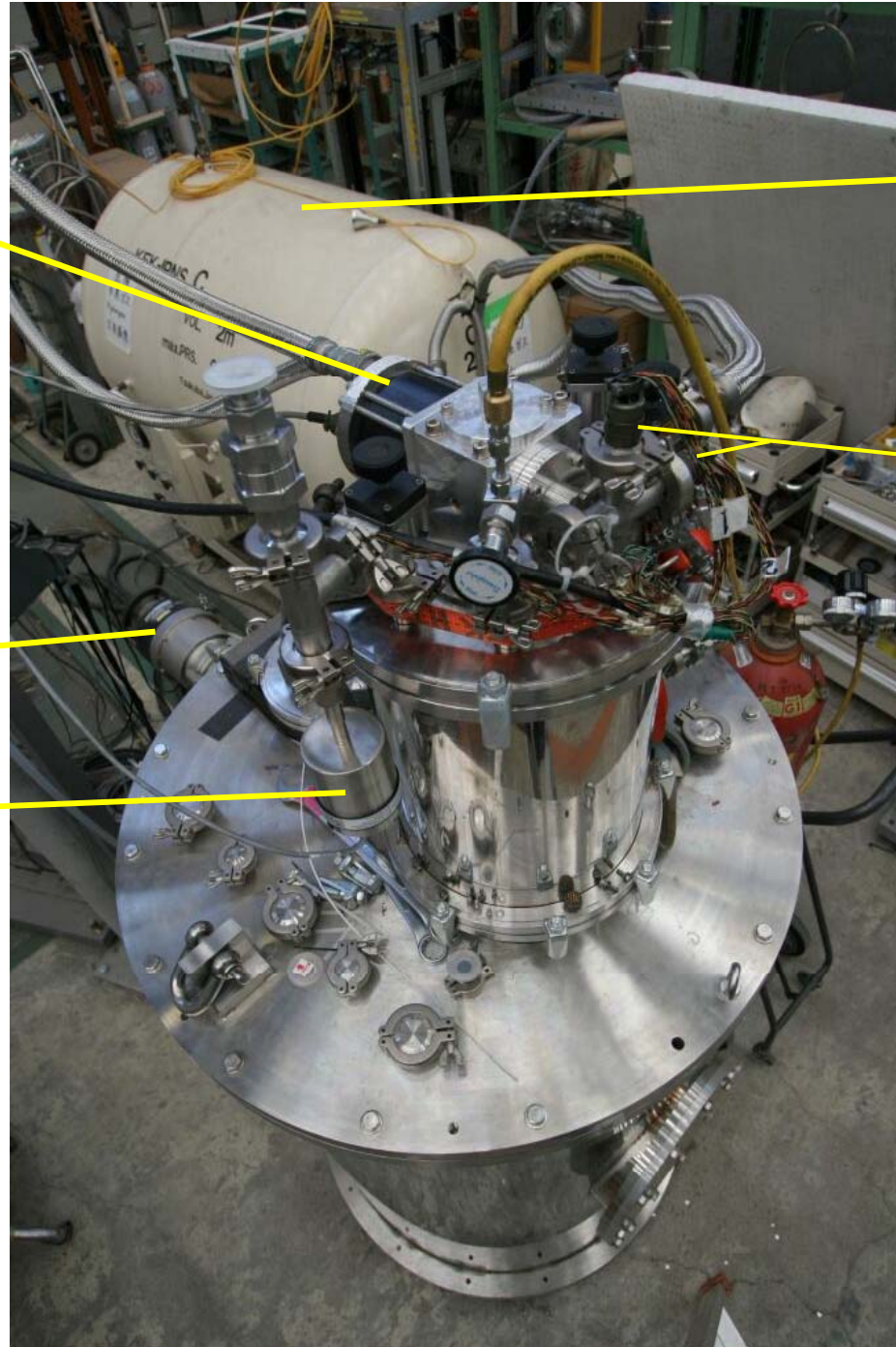
Cryocooler

H2 gas tank
(2000 l)

Bendix 18 pin
connector x2

TMP

H2 press.
transducer



Top view of
cryostat



MICE Test Absorber MLI Wrapped



MLI --- 1 layer

Al-Mylar 9μ x5
+ Polyester Mesh x6

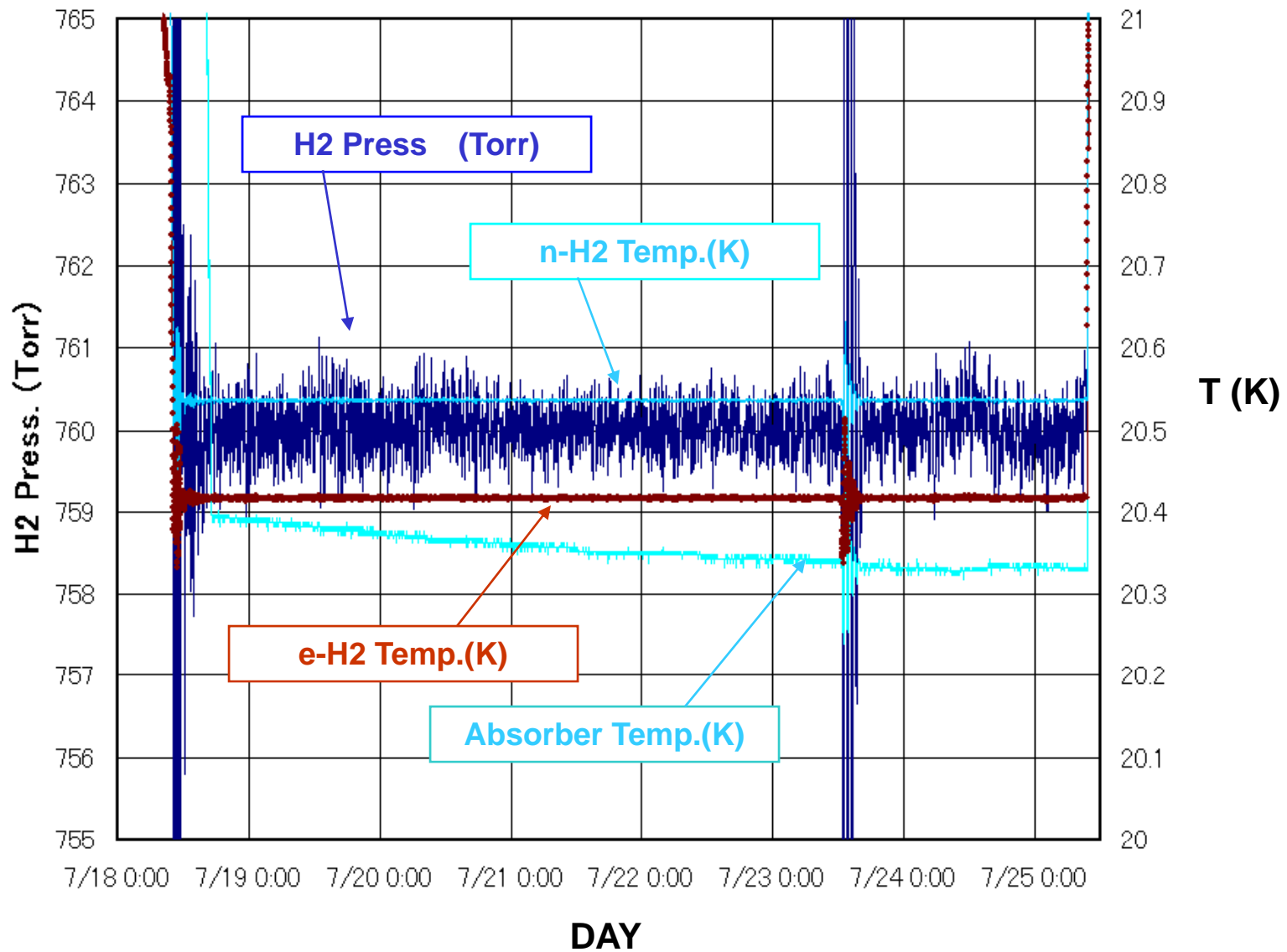
Window
1 layer

Body
4 layers





MICE-KEKTEST - LH2 Press. Control (PID-Heater) 2007 Jul.



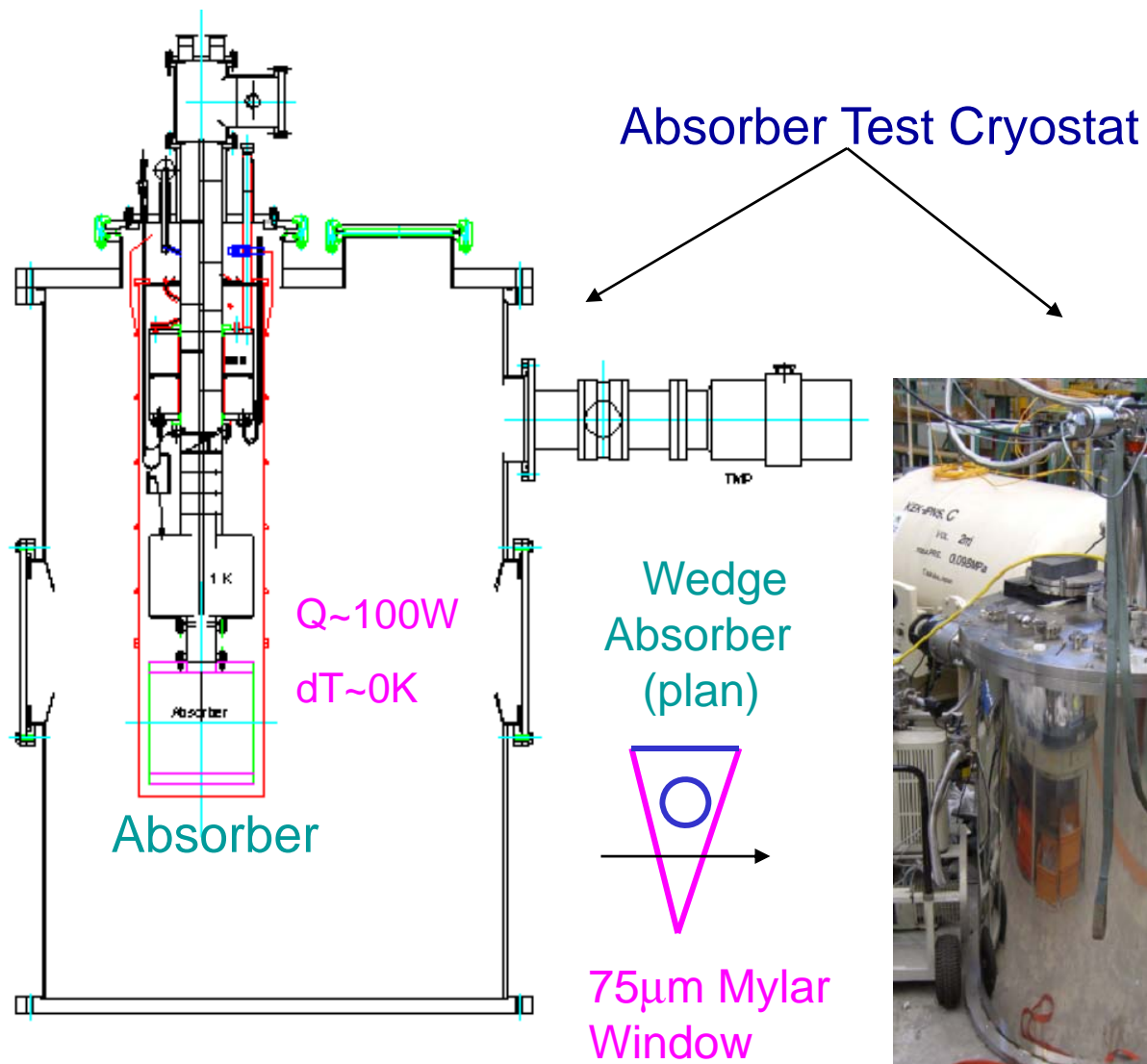


Superfluid L-He Absorber R&D at KEK





Superfluid L-He Absorber

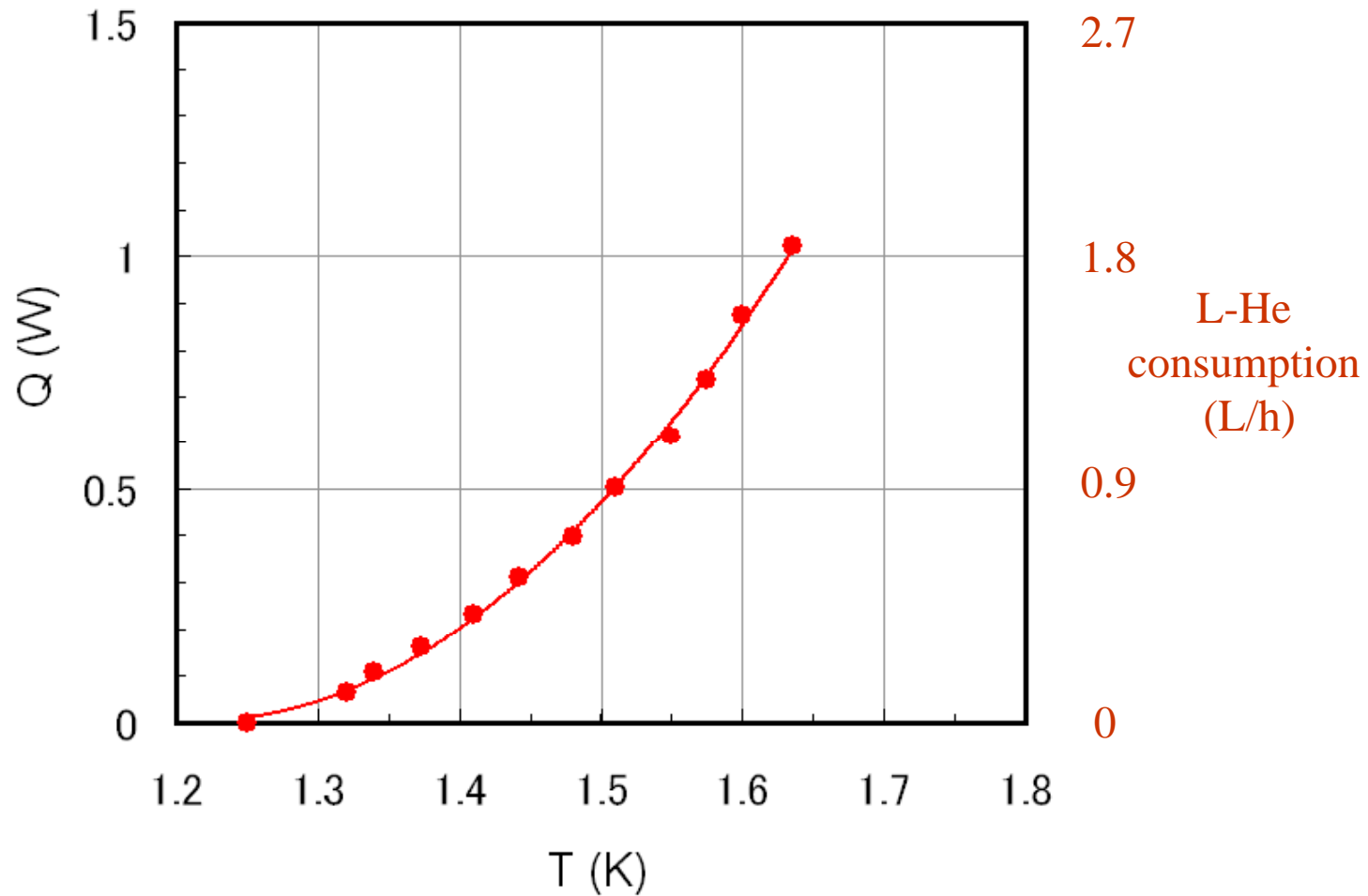




Cooling Power Test with $S_p=120 \text{ m}^3/\text{hr}$

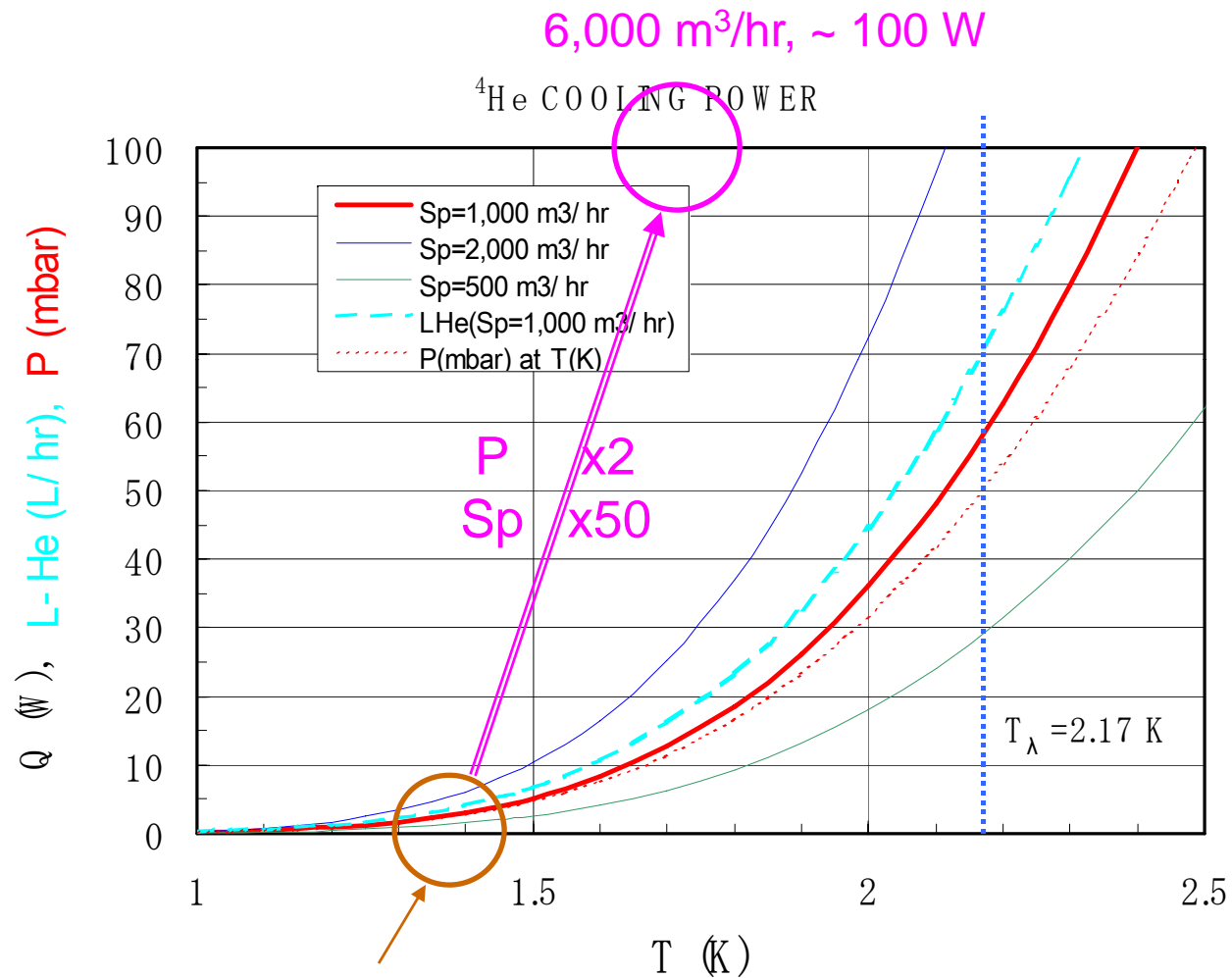


Cooling Power of ^3He Target
Feb-22, 2007 M. Iio and S. Ishimoto





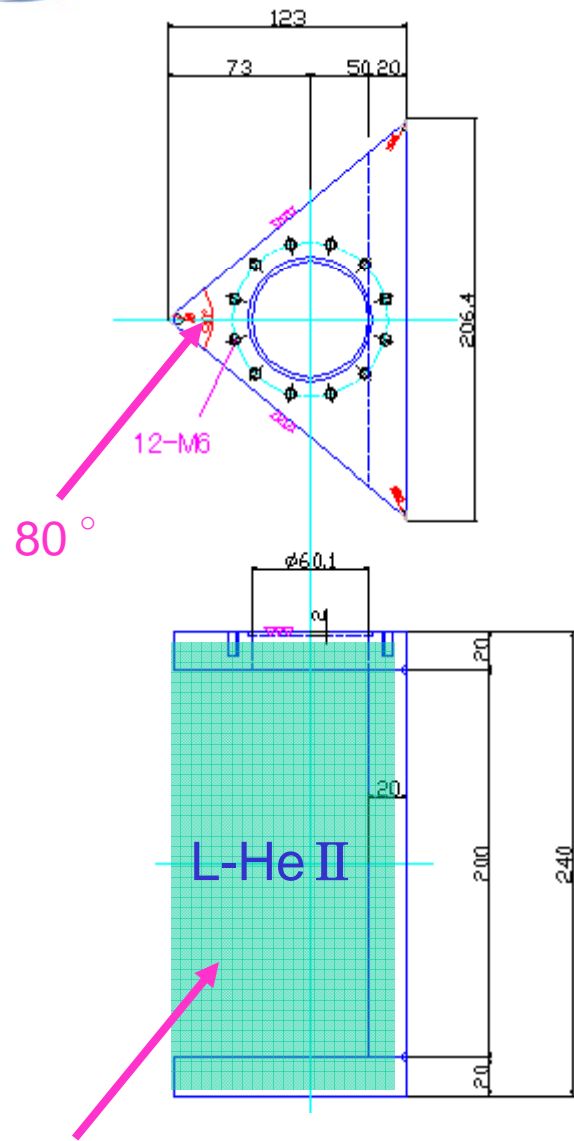
Cooling Power of Superfluid He Absorber



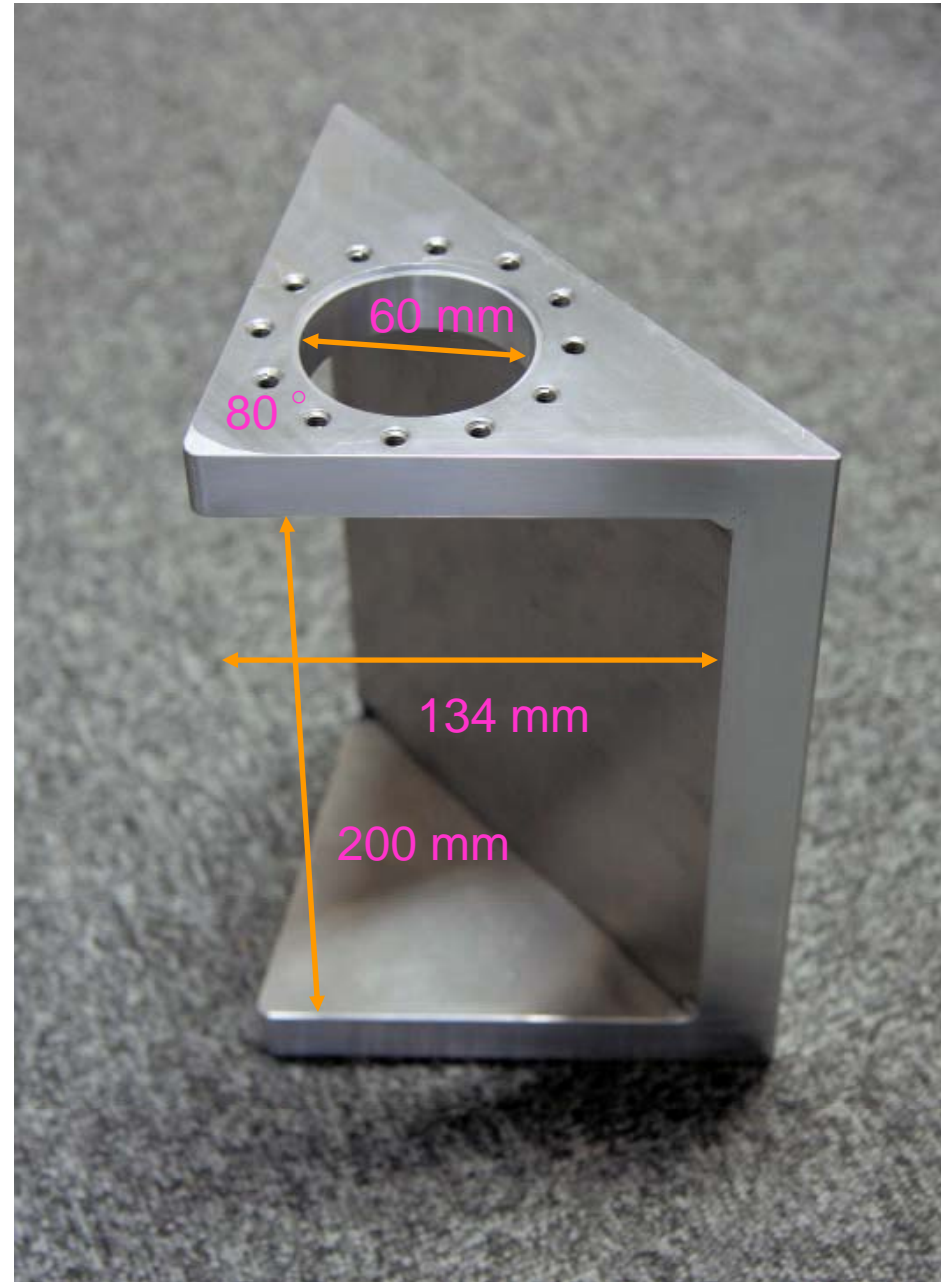
Superfluid L-He Target
($S_p=120$ m³/hr, 1.0 W at 1.63 K)



Superfluid L-He Absorber



Mylar 0.075 mm





Summary and Plan



- 1) MICE Absorber Design by KEK
 - KEK design finished
- 2) MICE Absorber Design by MIRAPRO
 - Restart absorber design and cost estimation
 - Order ~May, 08, + 3 month delivery to KEK
- 3) MICE Test Cryostat at KEK
 - Temperature controlled by Cryocooler heater
- 4) Superfluid L-He Absorber R&D at KEK
 - Test absorber was designed and fabricated



Thank You