

**Design Review of
Crystal Holder for Transmission Monochromator
(IMMY/XOR-CAT)**

November 7, 2005

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Instrument Description

Transmission monochromator (BL9 Monochromator V.3 from ESRF, 1998)

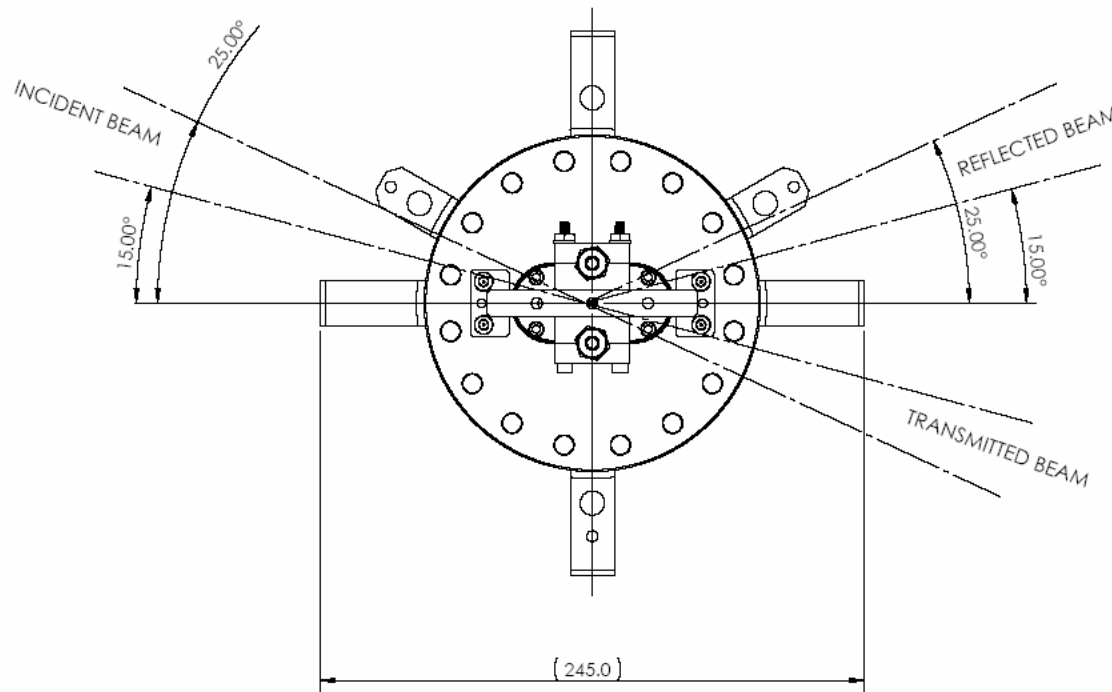
- A single-crystal UHV x-ray monochromator that splits the beam.
- Permits monochromator-crystal rotation from 0~30° in the horizontal plane
- Provide monochromator-crystal two-theta Bragg angles from 20 to 80°.
- Equipped with a crystal holder capable of holding 3 different monochromator crystals and a vertical translation stage which permits switching between the crystals *in situ*.
- But, there exist direct connections between the liquid and the vacuum.

Vacuum Policy

- In general, no brazed, welded, or other direct connections between the liquid and UHV system of the beamline or front end are allowed.
- The use of intermediate air or vacuum “guards” between the coolant passages and the UHV system is highly encouraged.

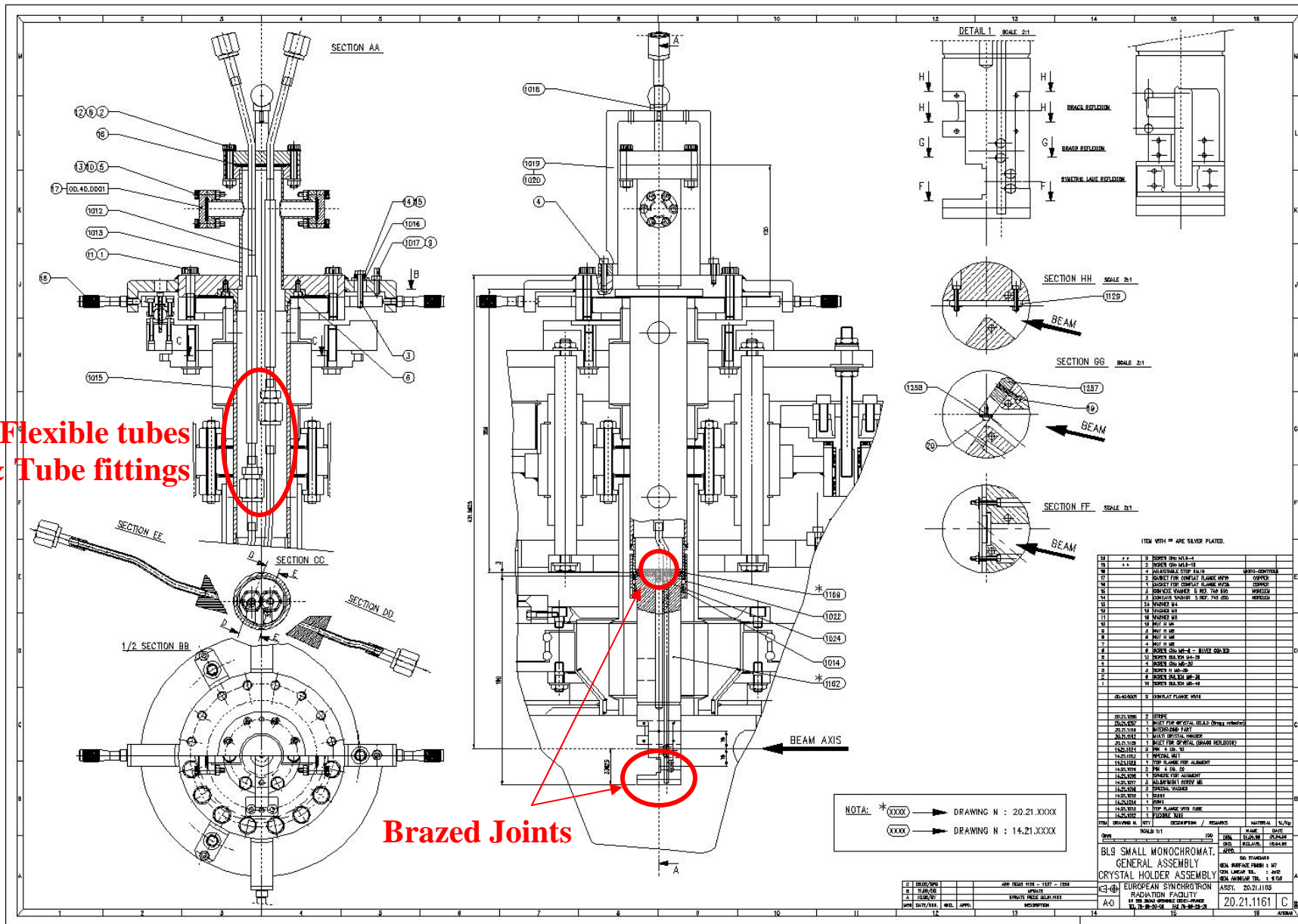
Design Guideline

- Remove brazed direct connections between the liquid and the UHV
- Use the same stages, but a crystal holder capable holding only two crystals.
- Design should have a simple and rugged structure.
- Not require heat/thermal calculations
 - Smoothly and fully rounded OFHC Cu tubing - ϕ 1/4"
 - No intermediate connections (no diameter changes)

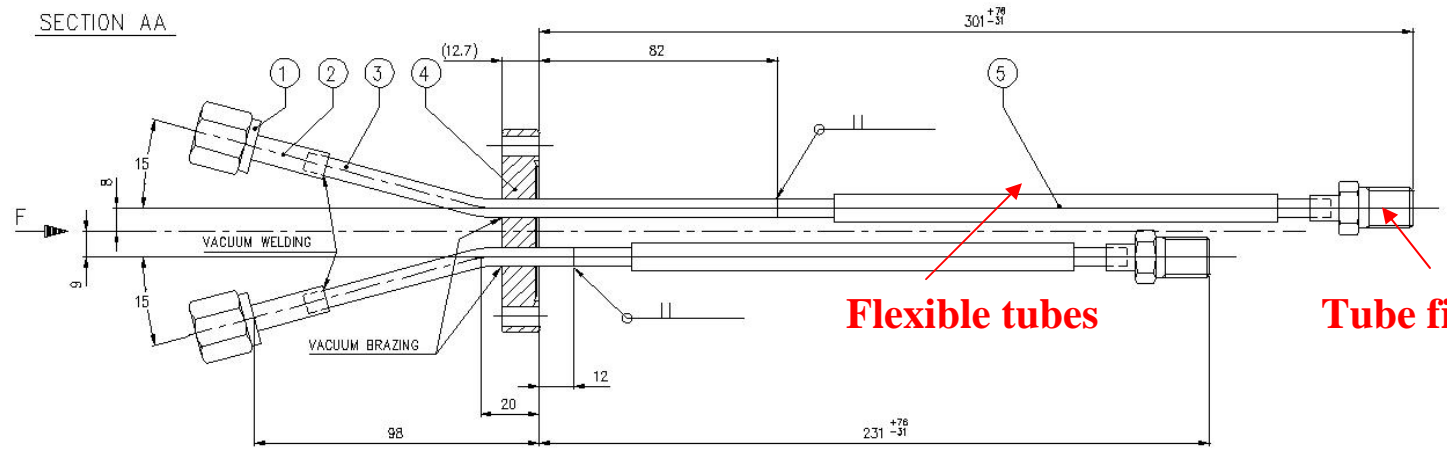


**Flexible tubes
& Tube fittings**

Brazed Joints

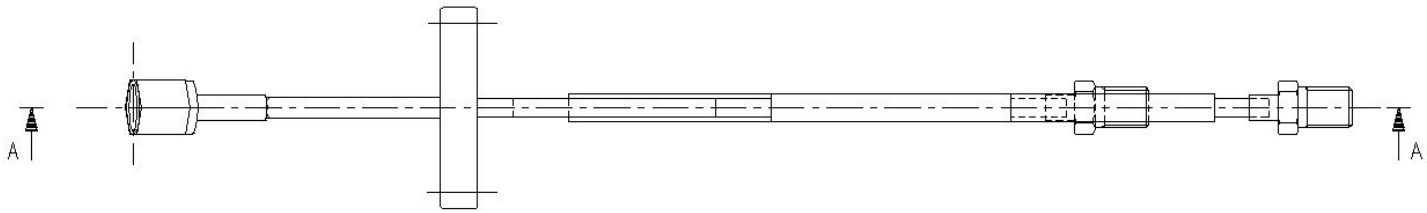


SECTION AA

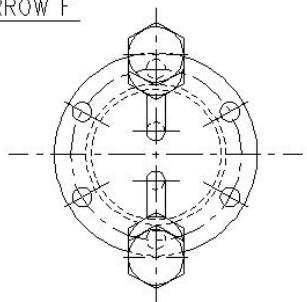


Flexible tubes

Tube fittings



VIEW ON ARROW F

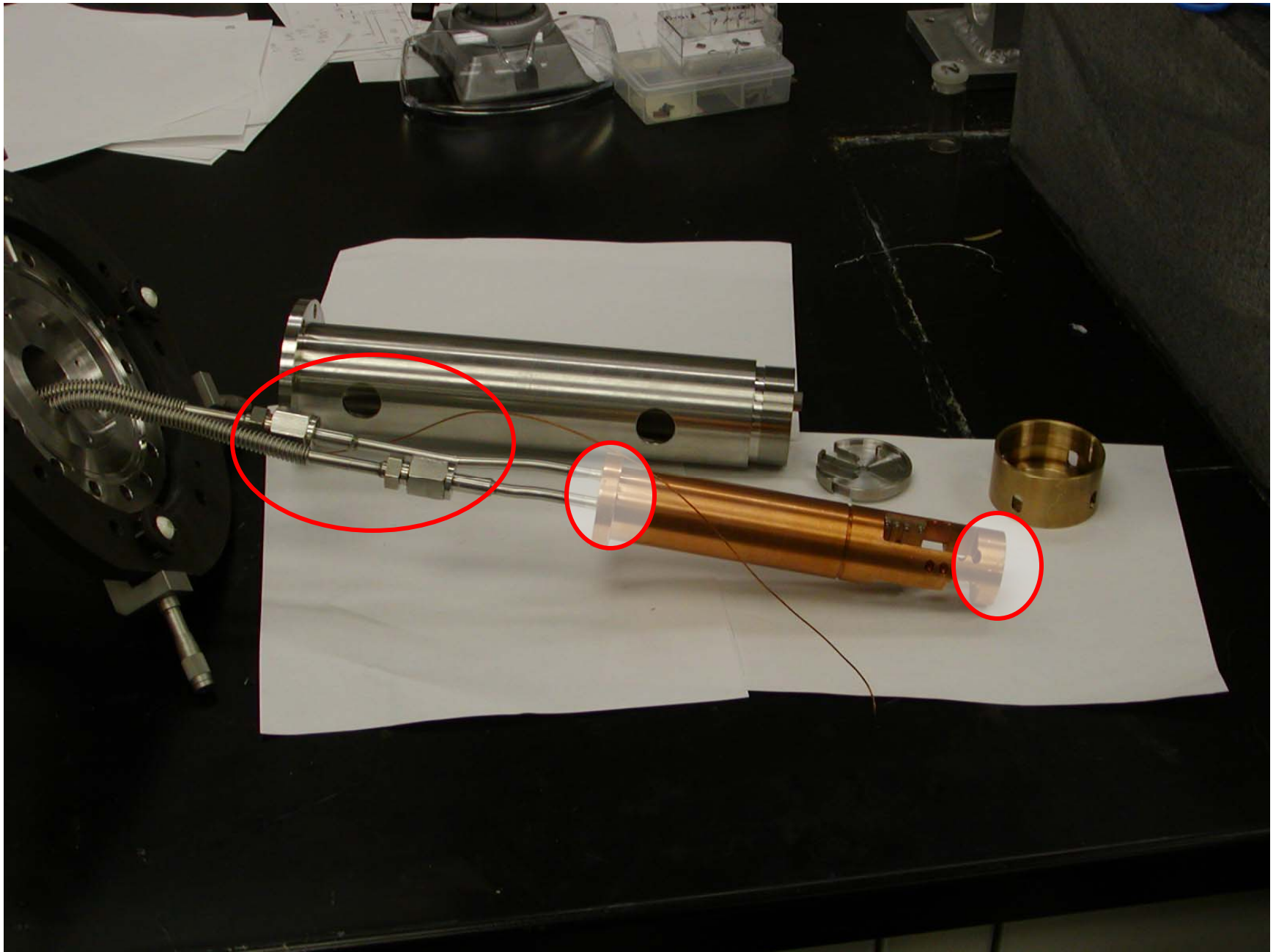


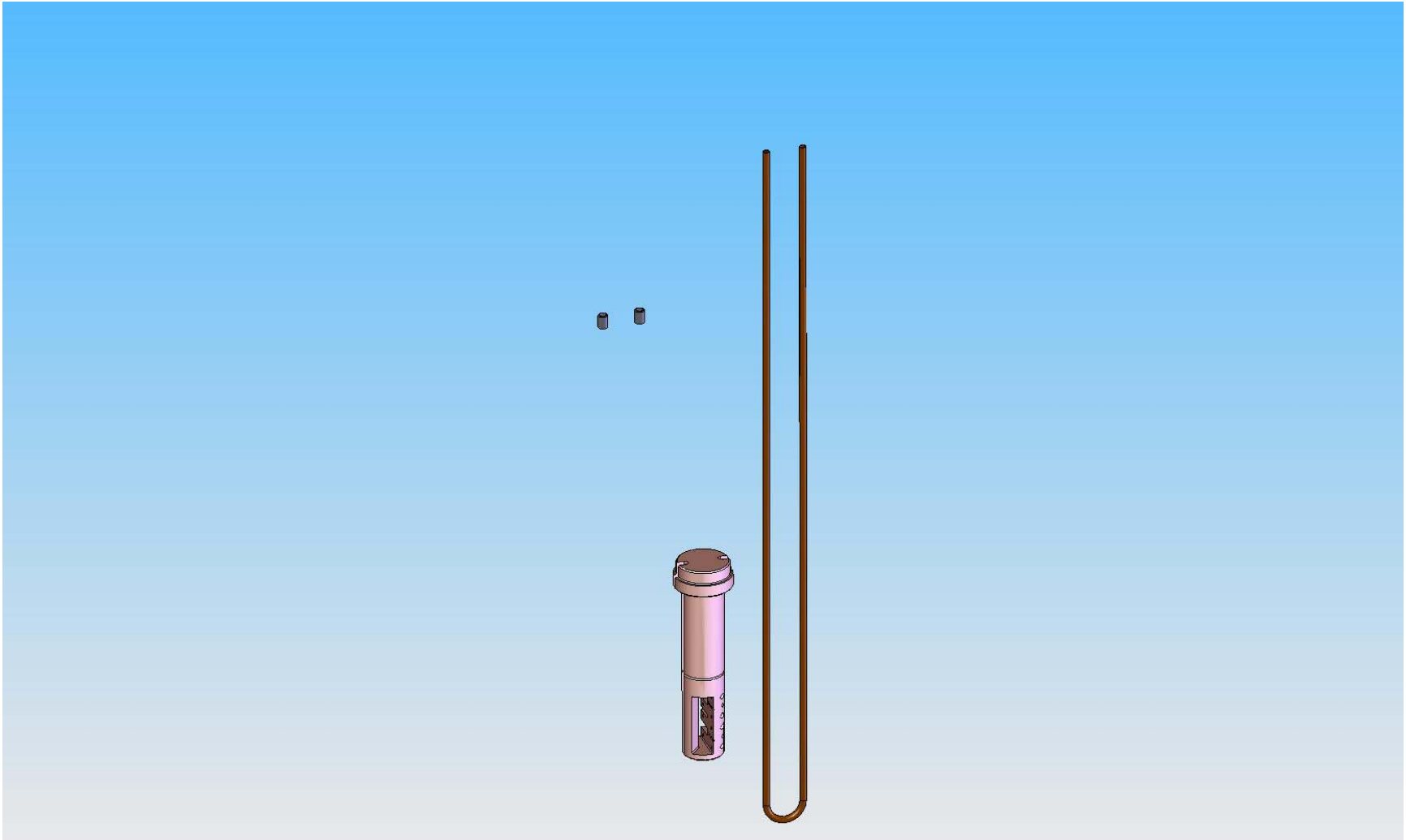
REMOVE ALL BURRS AND SHARPS EDGES.

5		2	FLEXIBLE Ref. 321-4-Y-6MR	CAJON	
4	00.40.0002	1	CONFLAT FLANGE NW3B		
3		2	TUBE OD 1/4" TH. 091mm	ST. STEEL	
2		2	EMBOUT Ref. SS-4-VCR-3	CAJON	
1		2	FEMALE NUT Ref. SS-4-VCR-1	CAJON	
ITEM	DRAWING N.	QTY	DESCRIPTION / REMARKS	MATERIAL	w./kg
SCALE: 1:1					
0mm _____ 100				NAME	DATE
				DRN. D.BRISSY	20.03.96
				CKD. B.CLAVEL	15.04.96
				APPD.	
BL20 MONOCHROMATOR CRYSTAL HOLDER FLEXIBLE TUBES				ISO STANDARD	
				GEN. SURFACE FINISH : N7	
				GEN. LINEAR TOL : ±0.12	
EUROPEAN SYNCHROTRON RADIATION FACILITY BP 220 38043 GRENOBLE CEDEX-FRANCE TEL 76-88-20-00 FAX 76-88-20-20				GEN. ANGULAR TOL : ±0.5	
				ASSY. 14.21.1011	
A 2				14.21.1012	

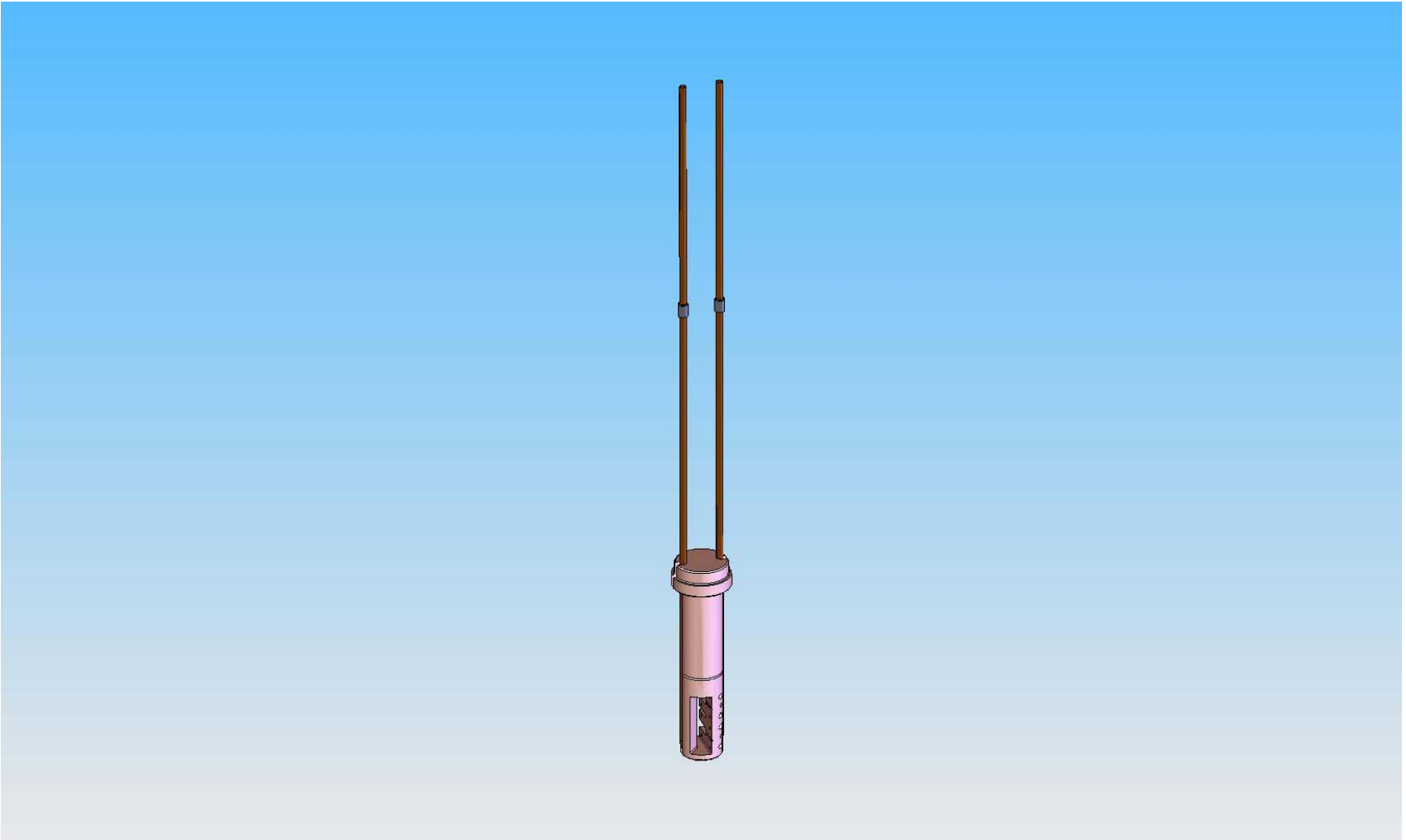
MOD.	DATE/DRN.	CKD.	APPD.	DESCRIPTION

AUTOCAD

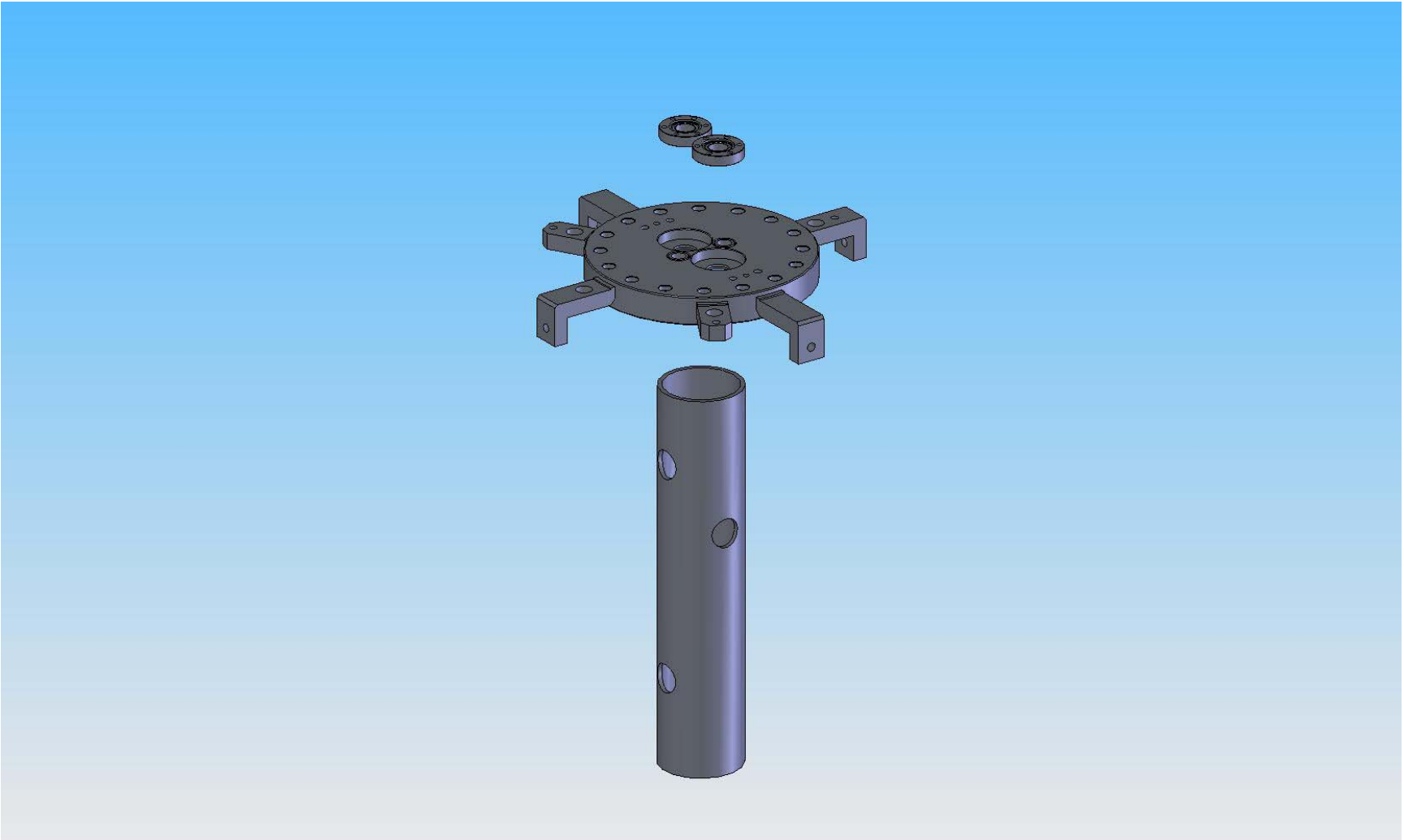




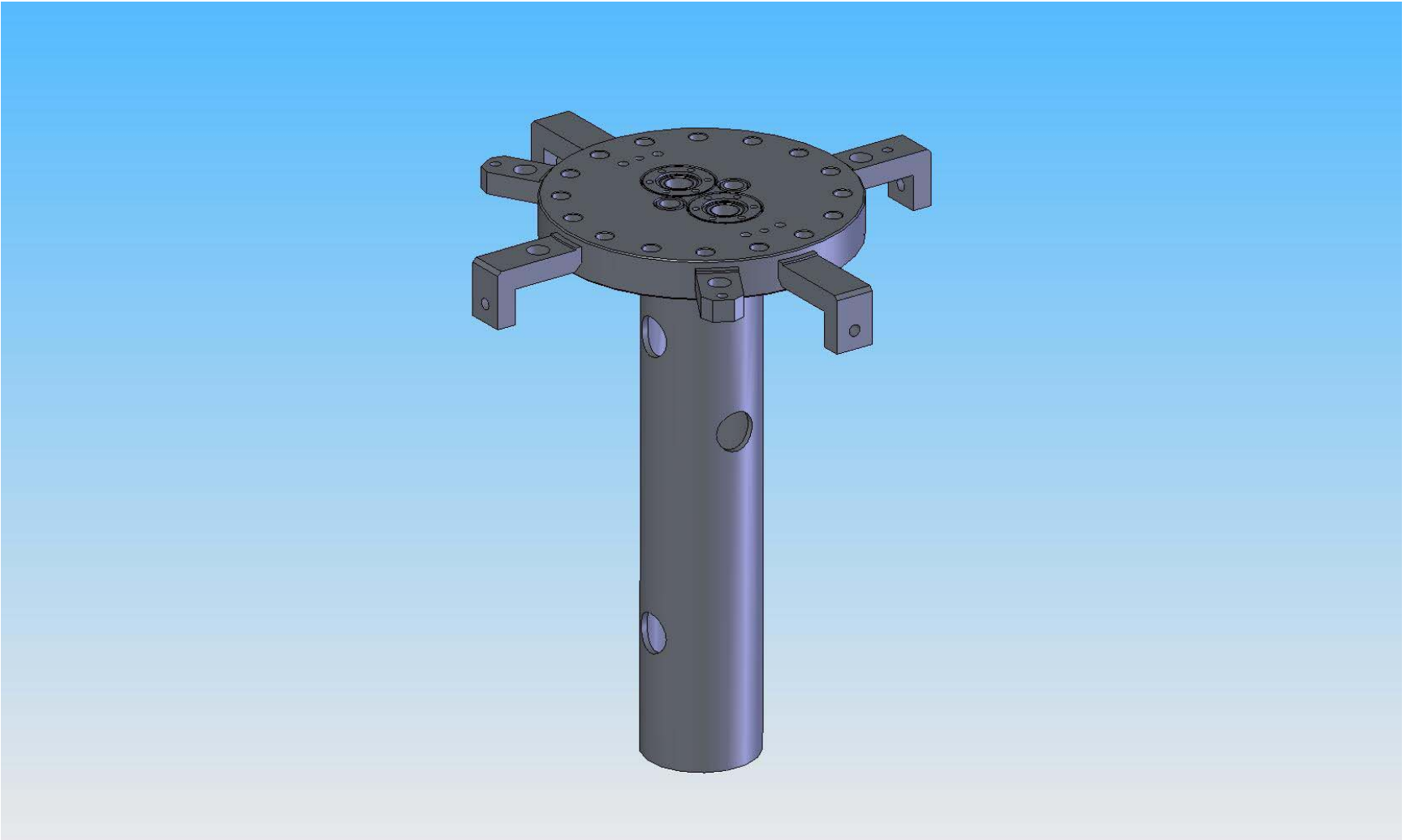
Multi Crystal Holder, Cu-Tubing, and Sleeves
(Exploded View)



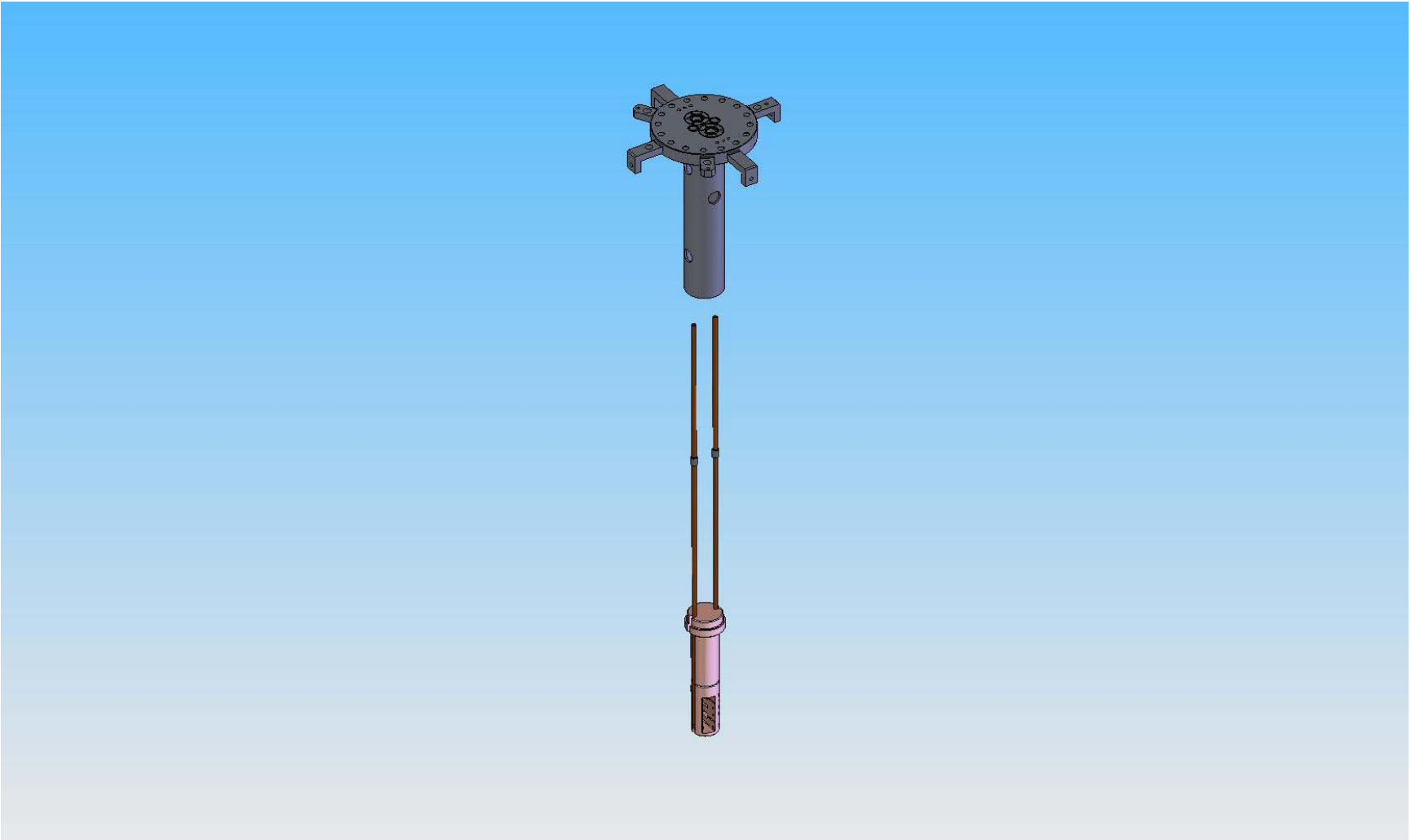
Cooling Tube Assembly



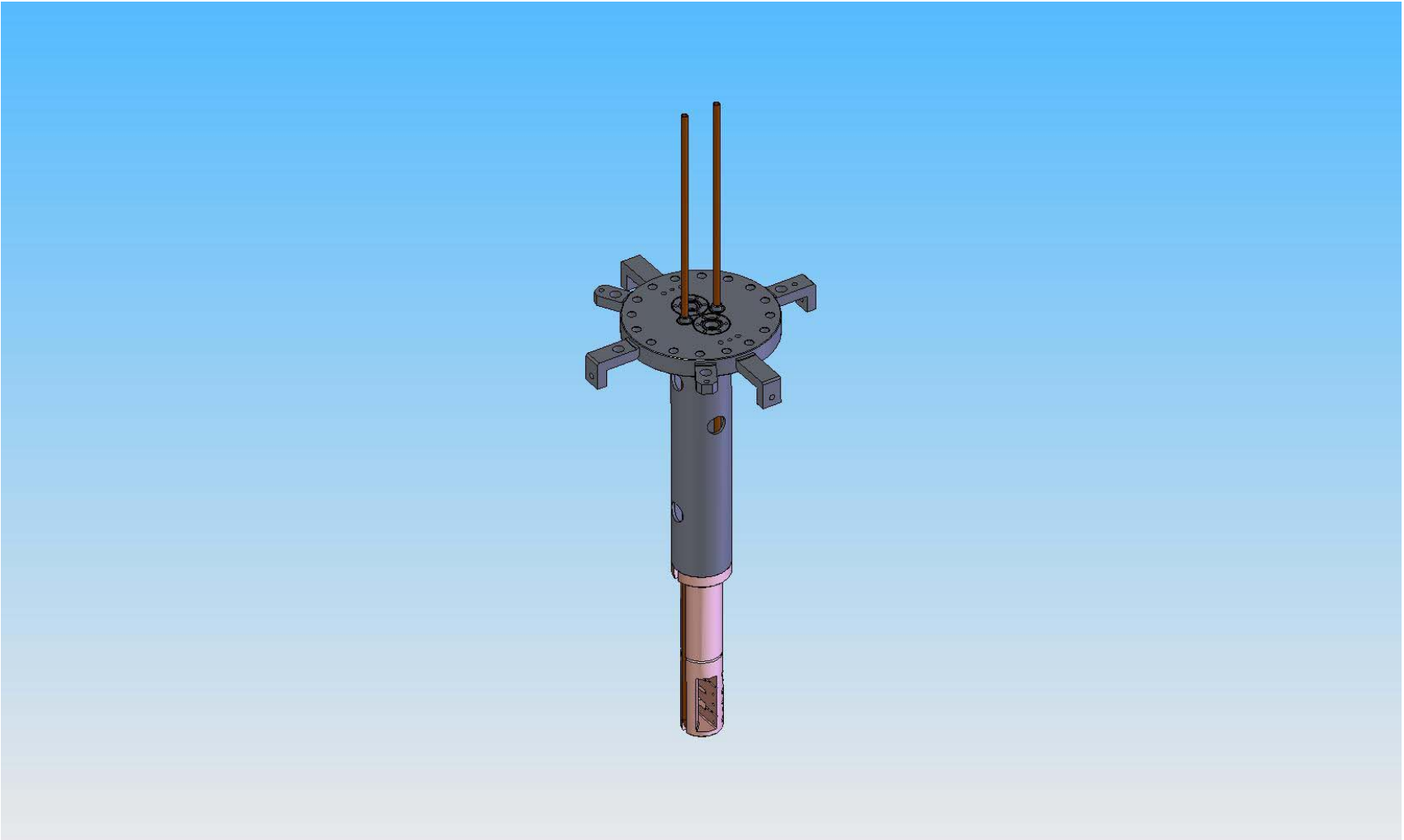
Flanges and Guide
(Exploded View)



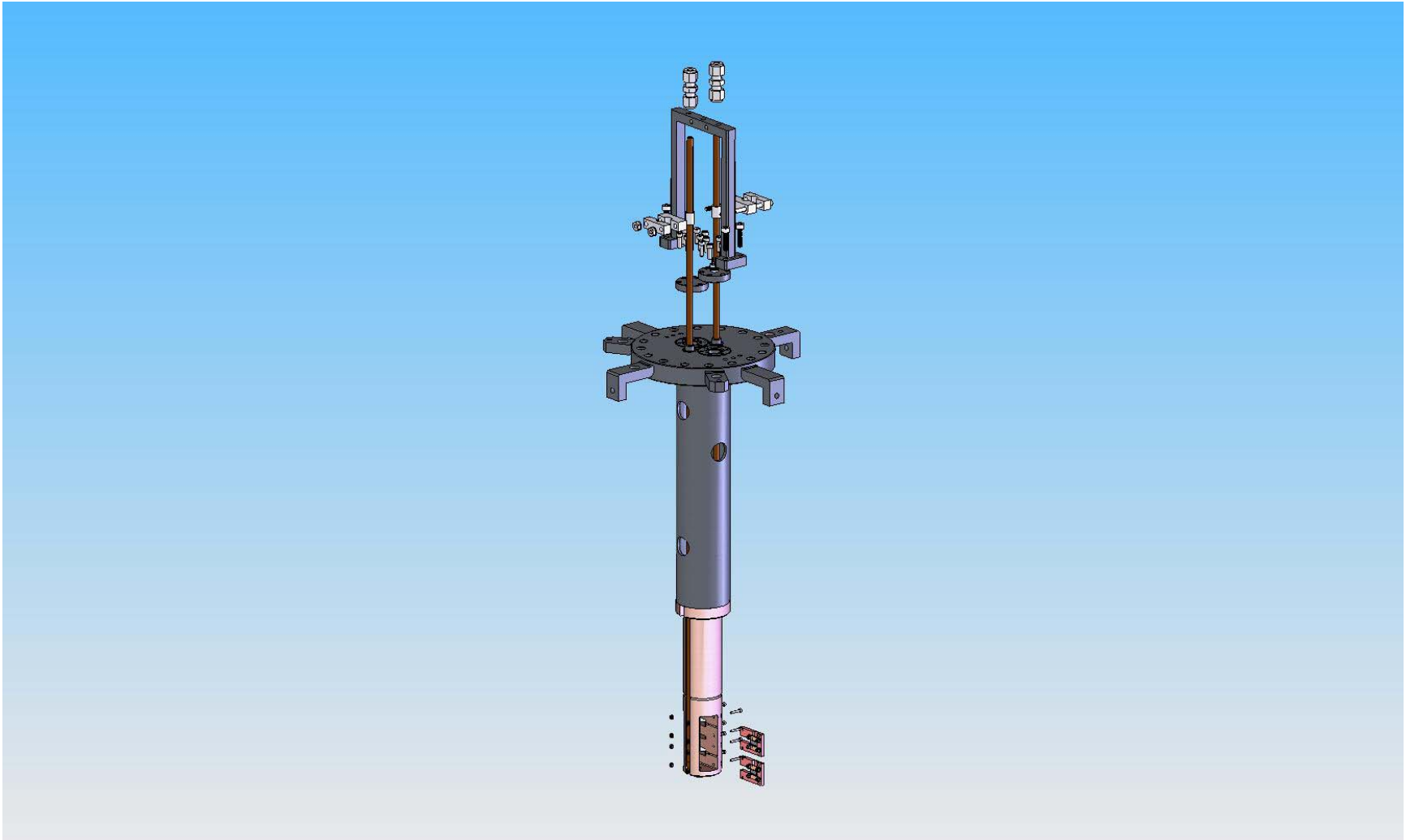
Flange Guide Assembly



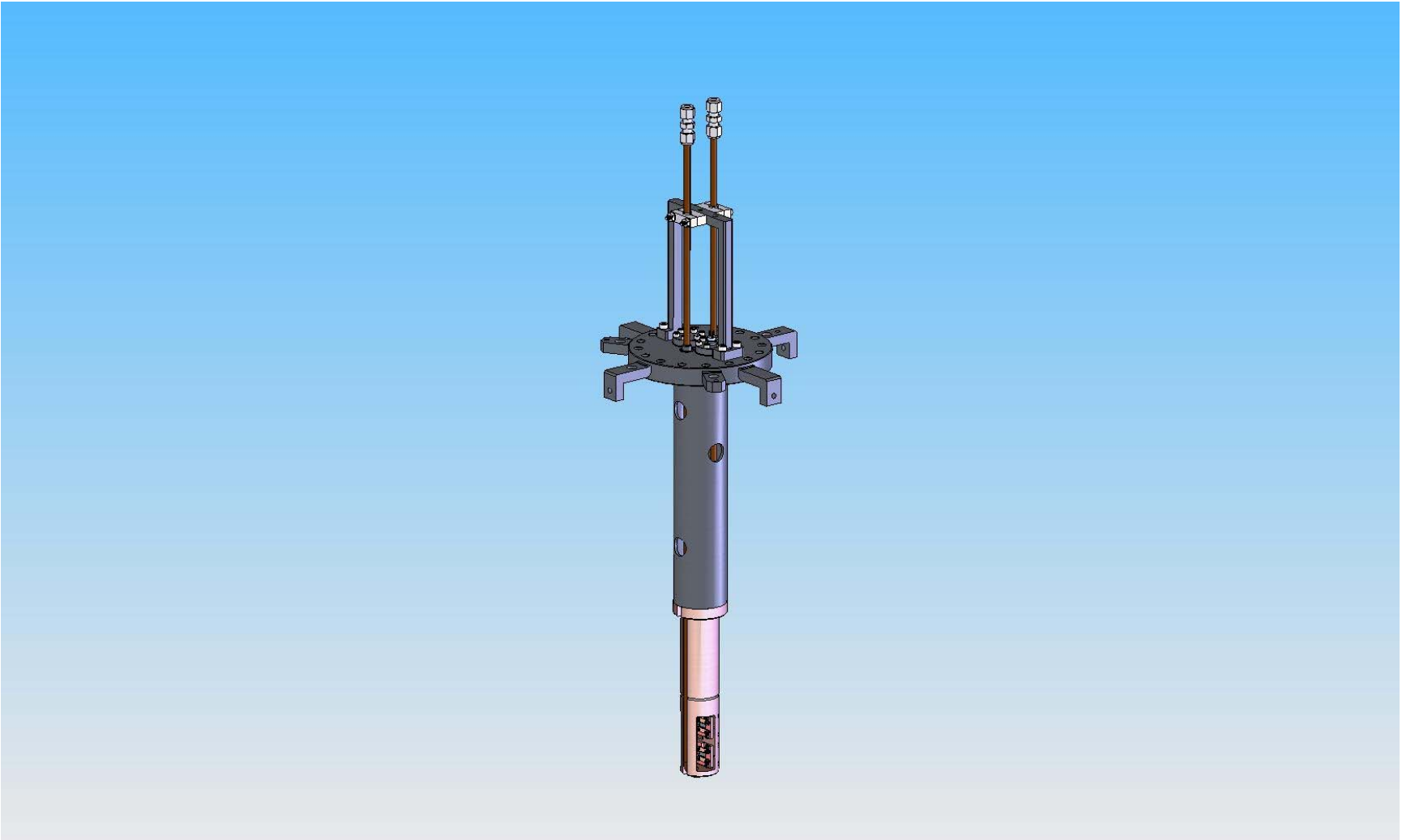
Crystal Holder Weldment
(Exploded View)



Crystal Holder Weldment



Crystal Holder Assembly
(Exploded View)



Crystal Holder Assembly
(Assembly)

Fabrication and Installation Plan

Quantity required: - 1 crystal holder assembly

- 4 holder assemblies

Price Estimated (total): ~ \$ 11,000

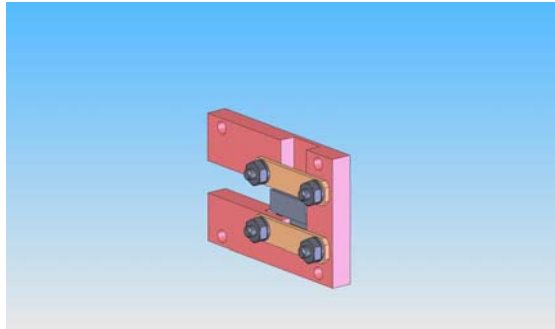
Delivery: 4 ~ 6 wks

Possible vendors: 1. Johnson Ultravac, Canada

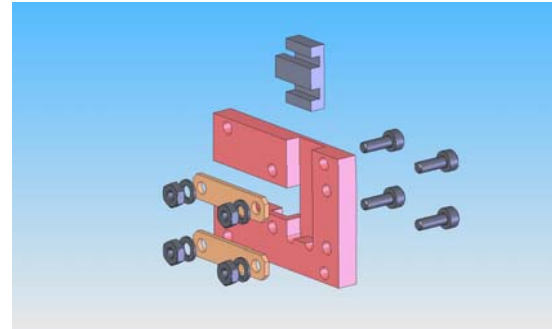
2. Central shop (Machining be done outside)

Installation planned: December shutdown (Dec. 23, 05~Jan 23, 06)

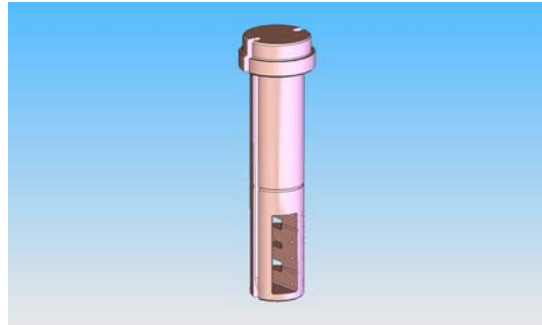
-End-



Holder Assembly



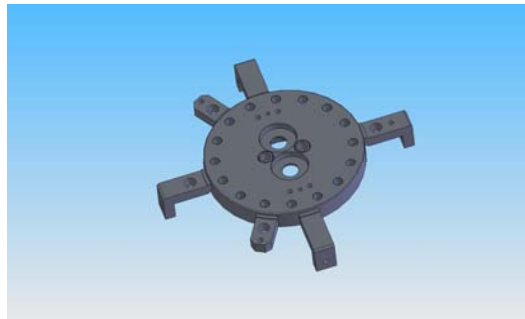
(Exploded View)



Multi Crystal Holder



Guide Tube



Flange Weldment