



X-ray / Cryogenic Test Facility

New Cryogenic Optical Test Capability at MSFC's SOMTC

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X-ray / Cryogenic Test Facility

Primary Facility

- 20' diameter x 60' length horizontal test volume
- 1700' of 3', 4', & 5' diameter tube connecting chamber to x-ray sources
- Thermal Environment: 20K to 344K
- Vacuum Environment: $< 5 \times 10^{(-7)}$ Torr
- Large (6000 sq ft), Class 1000 clean room

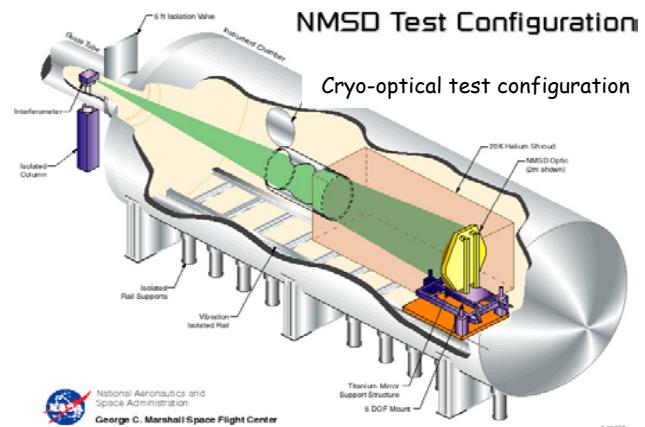




X-ray / Cryogenic Test Facility

Primary Facility Uses to Date

- X-ray optics and detector calibration
- Thermal cycle and balance testing of instruments
- Dynamic characterization testing of inflatable structures at varying temperatures
- Cryogenic testing of direct incidence optics
- Cryogenic deformation testing of composite structures

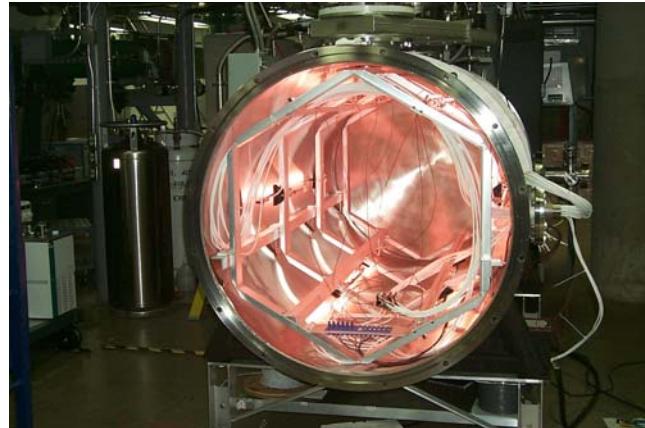




X-ray / Cryogenic Test Facility

Other Capabilities

- 4' x 8' Preconditioning Chamber
 - 5×10^{-6} Torr
 - Ambient to 250F
 - 24 infrared tubular quartz tungsten filament lamps each rated at 1600 Watts
 - TQCM and LN₂ Cold Plate
- 4' x 8' CryoOptical Test Chamber
 - Finally to the topic of this discussion





New Cryogenic Optical Test Capability

4' x 8' CryoOptical Test Chamber Features

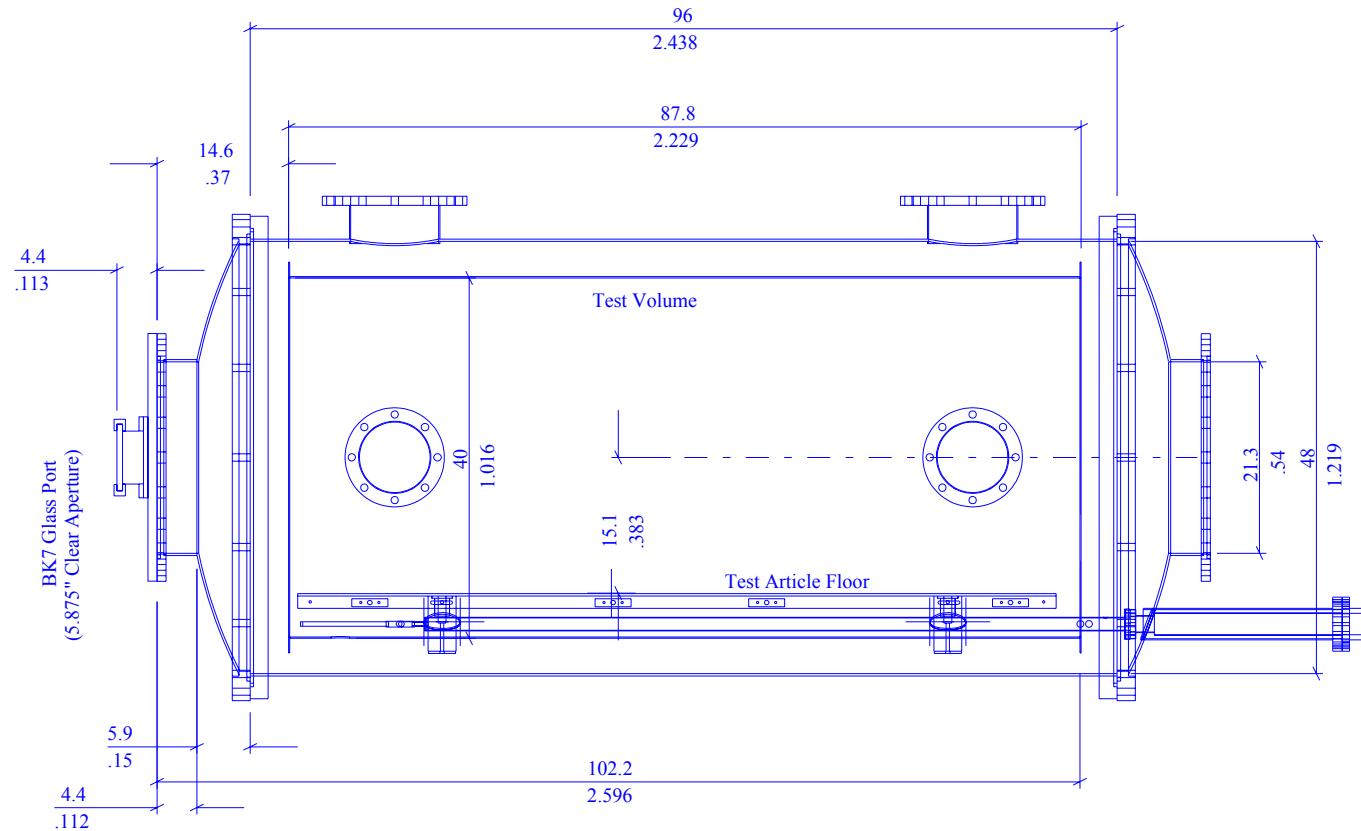
- Test Volume: 1.02 m diameter x 2.23 m deep
- Refrigeration: ~ 1 kW at 20K via reverse Brayton cycle refrigerator. Programmable rates are possible. Control selectable to 0.1 K.
- Temperature Range: 310K to 12K
- Vacuum Level: 5×10^{-6} Torr (ambient temperature) via turbomolecular pump
- Optical Instrumentation: WaveScope, PhaseCam, and IPI available
- Heat Transfer maximized by use of free-molecular conductivity methods
- Window: 142 mm clear aperture BK-7 existing. Apertures to 20" dia w/o chamber modification
- Temperature Instrumentation: Silicon diodes and thermocouples
- Additional electrical/fluid feedthroughs are available
- Actively cooled test stands



New Cryogenic Optical Test Capability

XRCF 4' Cryogenic Chamber

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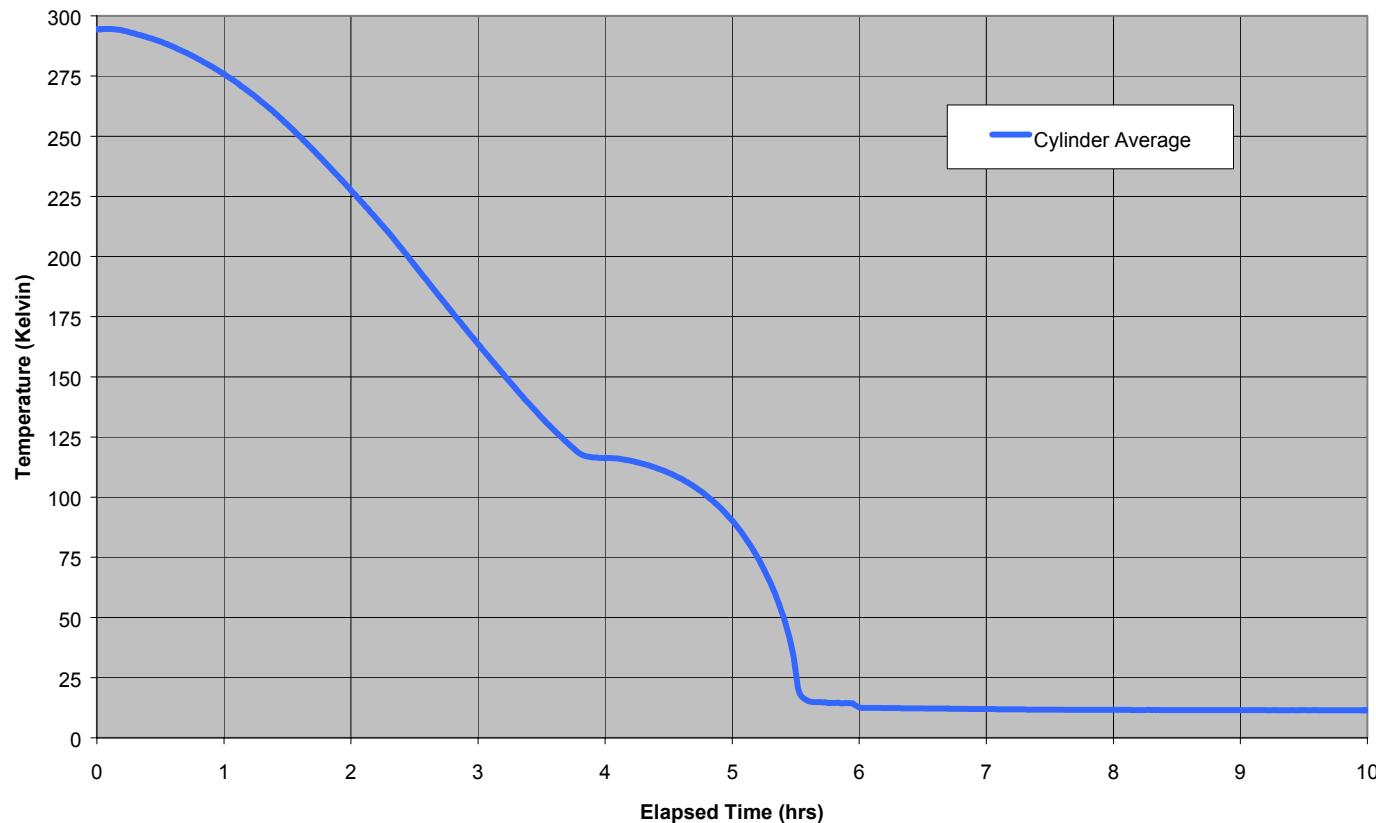
Key Dimensions (inches over meters)

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New Cryogenic Optical Test Capability

CryoOptical Test Chamber
Shroud Verification Test





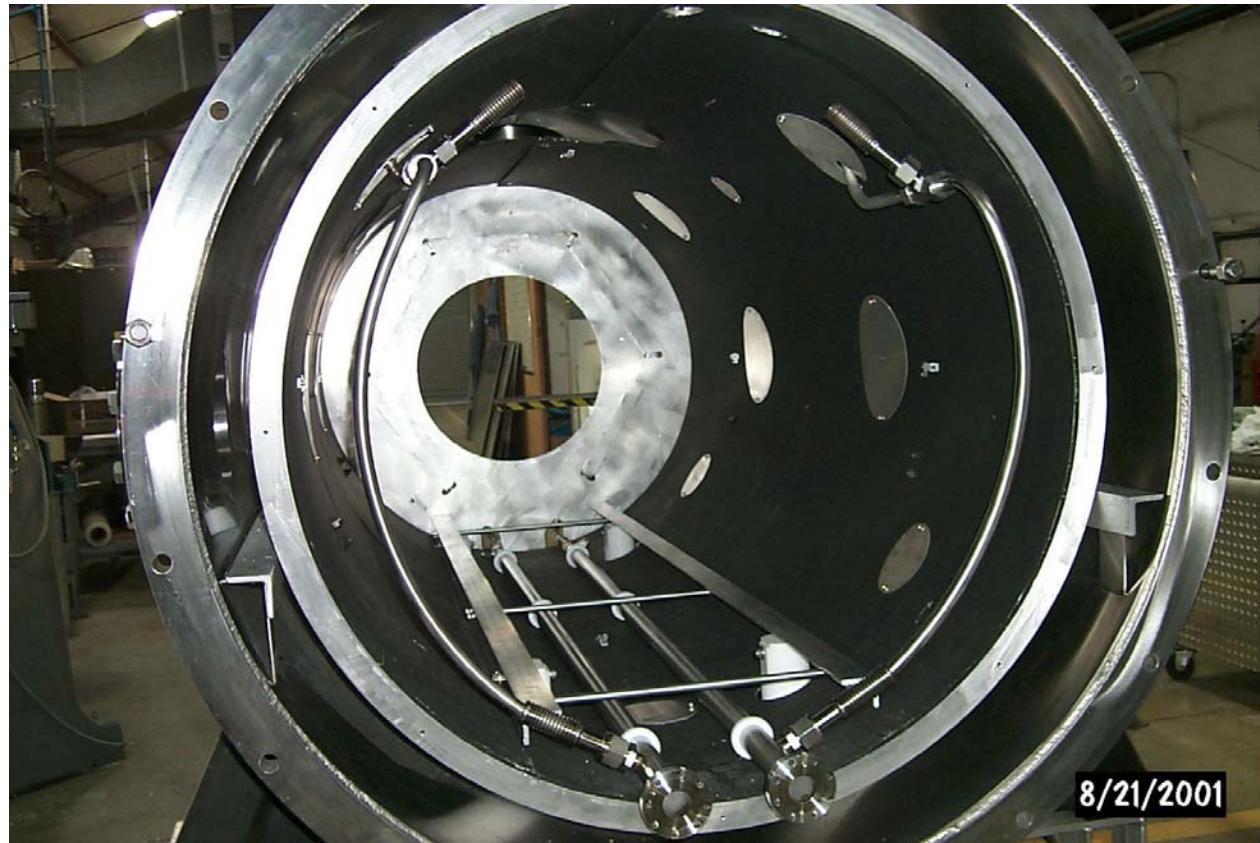
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