

# Can Assemblies for POWGEN Sample Environments

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## Purpose and Scope

The purpose of this document is to specify the types of sample cans, lids, hardware and other accessories appropriate for each sample environment equipment used at BL-11A (POWGEN), including the materials of which they are made.

## Discussion

Beamline 11a, POWGEN, employs multiple sample environments, covering temperatures ranging from 2K with a cryostat to 1473K with a vacuum furnace. Care must be taken to select can types and accessories appropriate to the temperature range of the sample environment equipment. The use of materials incompatible with the full temperature range of the sample environment should be avoided, if possible, at all times, even if the intended range of operation is less.

## Reference

PCS Procedure SIO-0751, ILL Furnace Installation and Operations at SNS

### **Sample Environment (SE): POWGEN Auto-Changer PAC (AC-005)**

Temp Range (K): 10 – 300  
Can Style: PAC  
Can Body: vanadium with 6,8 or 10 mm nominal diameter  
Inner Diameter: 6.0, 7.6 or 9.2 mm  
Maximum Sample Height: 50 mm  
Can Collar: titanium with barcode and threads  
Can Gasket: copper disk  
Can Lid: aluminum with threads to match collar  
Can Hardware: none  
Stick Adapter: none

### **Sample Environment (SE): 50mm Orange Cryostat with V tail (CRYO-004)**

Temp Range (K): 2 – 300  
Can Style: PAC  
Can Body: vanadium with 6,8 or 10 mm nominal diameter  
Inner Diameter: 6.0, 7.6 or 9.2 mm  
Maximum Sample Height: 50 mm  
Can Collar: titanium with barcode and threads  
Can Gasket: copper disk  
Can Lid: aluminum with threads to match collar  
Can Hardware: none  
Stick Adapter: none

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**Sample Environment (SE): ILL Vacuum Furnace (HOT-001)**

Temp Range (K): 300 – 1473  
Can Style: NIST  
Can Body: vanadium with 6,8 or 10 mm nominal diameter  
Inner Diameter: 6.0, 7.6 or 9.1 mm  
Maximum Sample Height: 47 mm (6mm ID) or 50 mm (8 and 10mm ID)  
Can Collar: titanium with six holes  
Can Gasket: none  
Can Lid: boron nitride with six through holes and M8-1.25 screw hole  
Can Hardware: molybdenum #4-40 threaded rods, washers and nuts  
Stick Adapter: niobium screw M8-1.25 with welded nut

**Sample Environment (SE): AGES Gas Flow Insert (HOT-003) with HOT-001**

Temp Range (K): 300 – 1123  
Can Style: baskets  
Can Body: quartz with frit bottom  
Inner Diameter: approximately 10.7 mm  
Maximum Sample Height: 50 mm  
Can Collar: none  
Can Gasket: none  
Can Lid: quartz wool  
Can Hardware: none  
Stick Adapter: Macor glass-ceramic pins

**Sample Environment (SE): Janis Cryofurnace (CCR-17) – Low Temp Stick**

Temp Range (K): 5 – 500  
Can Style: PAC  
Can Body: vanadium with 6,8 or 10 mm nominal diameter  
Can Collar: titanium with barcode and threads  
Inner Diameter: 6.0, 7.6 or 9.2 mm  
Maximum Sample Height: 50 mm  
Can Gasket: copper disk  
Can Lid: aluminum with threads to match collar  
Can Hardware: none  
Stick Adapter: stainless steel PAC adapter

**Sample Environment (SE): Janis Cryofurnace (CCR-17) – High Temp Stick**

Temp Range (K): 30 – 750  
Can Style: NIST  
Can Body: vanadium with 6,8 or 10 mm nominal diameter  
Can Collar: titanium with six 1/8"-32 holes  
Inner Diameter: 6.0, 7.6 or 9.1 mm  
Maximum Sample Height: 47 mm (6mm ID) or 50 mm (8 and 10mm ID)  
Can Gasket: copper ring or none  
Can Lid: titanium or stainless with six through-holes and 5/16"-18 post  
Can Hardware: stainless steel socket cap 1/8"-32 screws  
Stick Adapter: none

## Can Assemblies for POWGEN Sample Environments

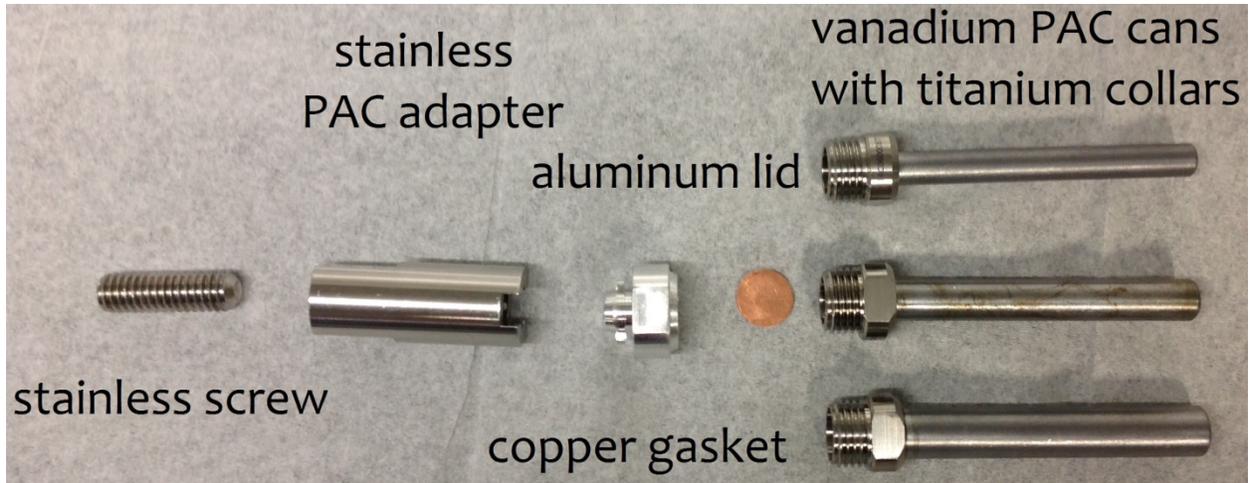


Figure 1. PAC can assembly and adapter for Powgen AutoChanger, Orange Cryostat and Janis Cryofurnace with low temperature stick

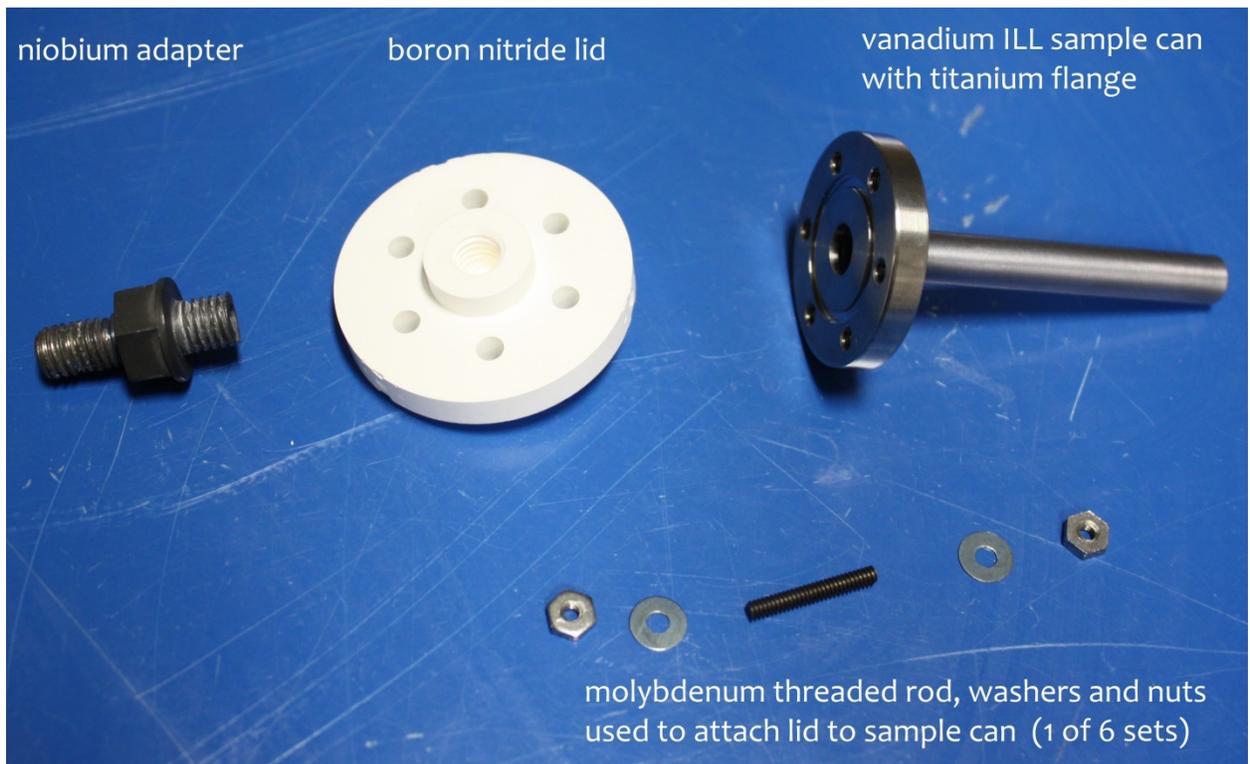


Figure 2. Can assembly for ILL Vacuum Furnace.

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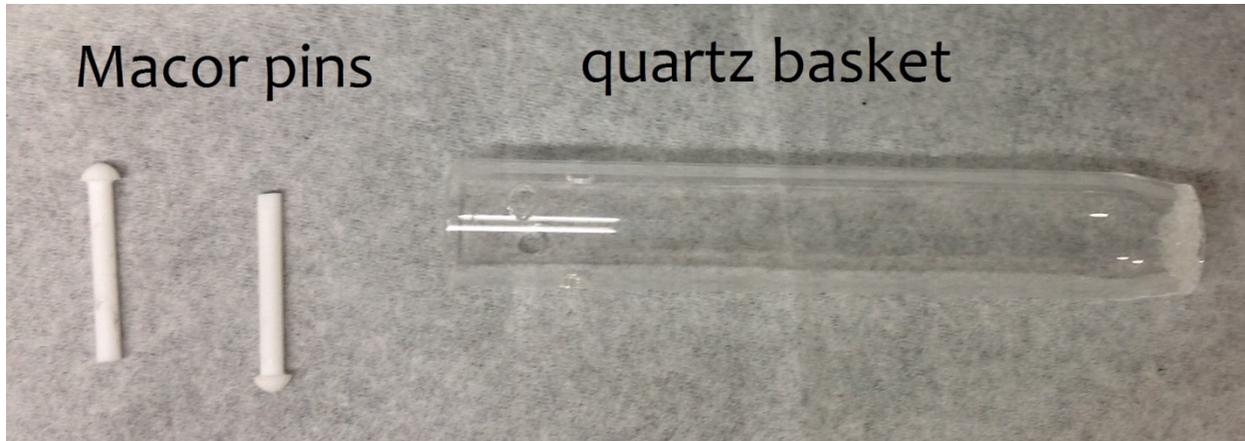


Figure 3. Quartz basket and Macor pins for AGES with ILL vacuum furnace.

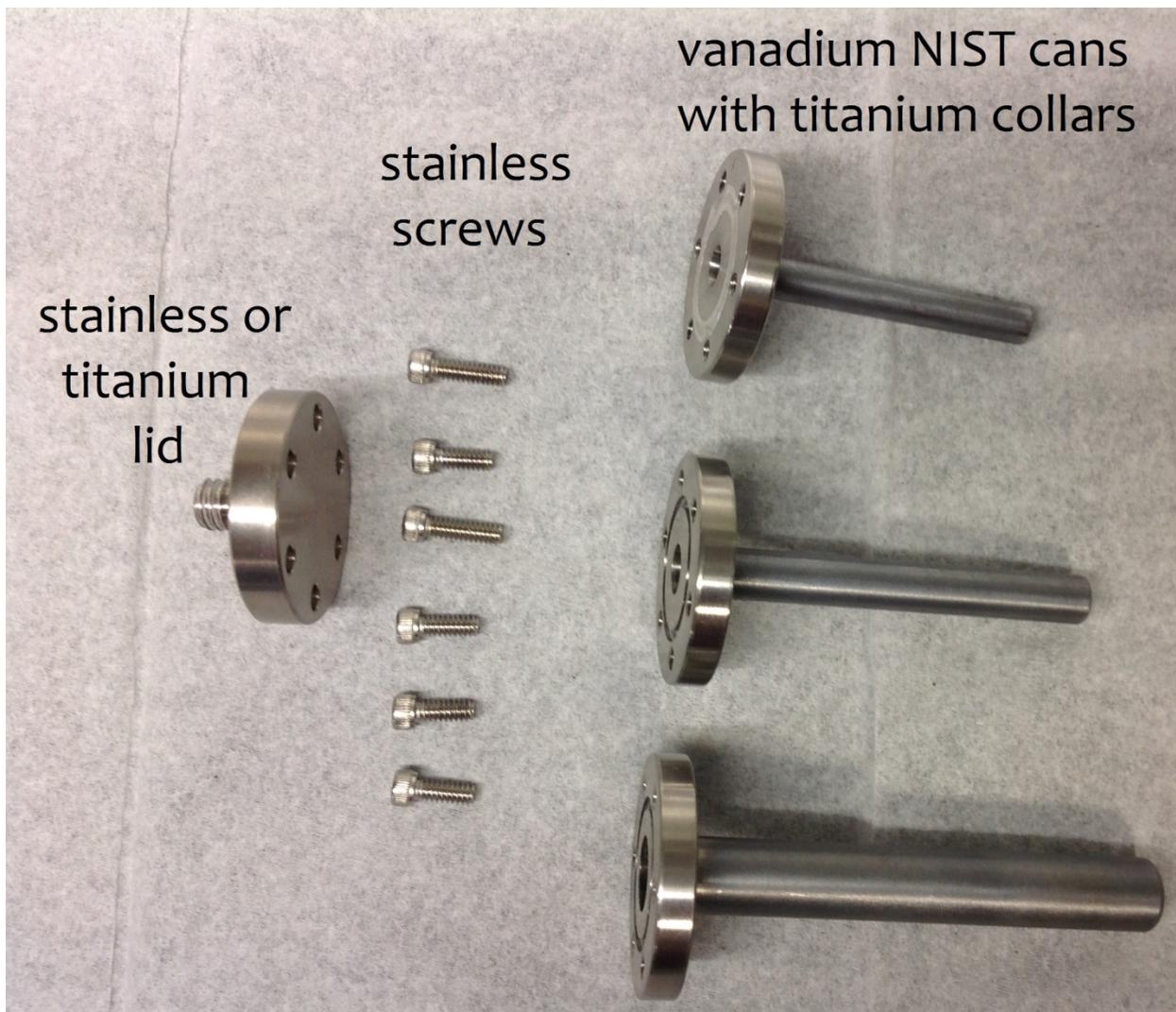


Figure 4. Can assembly for Janis Cryofurnace with high temperature stick.