



SSDAC-80 Diamond Anvil Cells (DAC) with symmetric 80° x-ray diffraction openings

Model SSDAC-80

The SSDAC-80 (Spherical Seat DAC with 80 degrees symmetric X-ray opening) is based on large symmetric opening SSDAC-70 (upgrade of an earlier BX-90 DAC), but has a different aspect ratio to allow up to 80 degrees symmetric X-ray opening. It was specifically designed for single crystal x-ray diffraction on a laboratory-based Rigaku diffractometer and for use with Böhler-Almax type conical seats where diamond tilt alignment can be crucial. The design allows the cell to be used with two membranes (compression and decompression) and still keep up to 80 degrees symmetric x-ray opening.

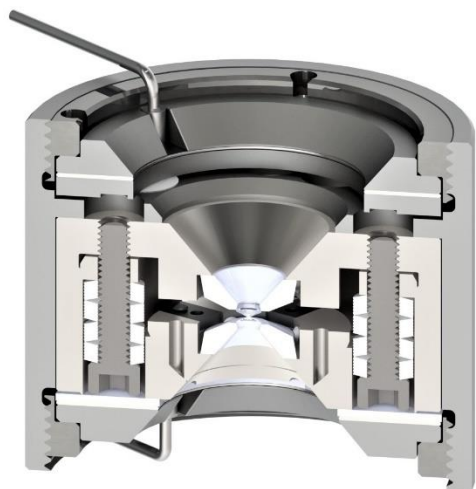
SSDAC-80 is a single crystal diffraction DAC, but it can be used with a variety of experimental techniques where large symmetric opening is required such as X-ray total scattering measurements, Brillouin and other optical spectroscopies as well as powder x-ray diffraction. The DAC can be provided with a detachable pin for mounting on a diffractometer goniometer. If 80 degrees symmetric opening is not absolutely crucial, a more stable 70 degrees configuration is recommended (SSDAC-70).

SSDAC-80 has the same diameter (although slightly different height) and hole pattern as iBX70 / iBX80 and SSDAC-70 DACs and is compatible with equipment designed for those DACs (DAC holders, membrane cans, gearboxes for gas-loading systems, etc.).

The DAC can be used with several diamond / seat combinations, but to make full use of the large symmetric opening the Böhler-Almax type diamond / seats with conical support are preferred. Because the diamond tilt in this DAC can be adjusted with a spherical seat base, the SSDAC is especially useful for cases where the diamond culets are not perfectly parallel to the bases of the diamond seats. The minimum 2x diamond + seat height for SSDAC-80 is ~10.5 mm.

With proper diamond culet size (<250 μm), diamond alignment, and sample preparation the DAC can be routinely used in sub-Megabar and Megabar pressure range.

The DACs allows for multiple ways of pressure control – either with screws, mechanical gearboxes, or with membranes (see e.g. Sinogeikin et al., *Rev. Sci. Instruments* 86, 072209, 2015). The DAC can be preloaded to starting pressure with four #8-32 screws and then engaged with remote pressure control device. The DAC can be supplied as stand-alone version, with one membrane enclosure, or in double-membrane symmetric configuration which provides up to 80 degrees symmetric X-ray and optical opening with proper choice of membranes.



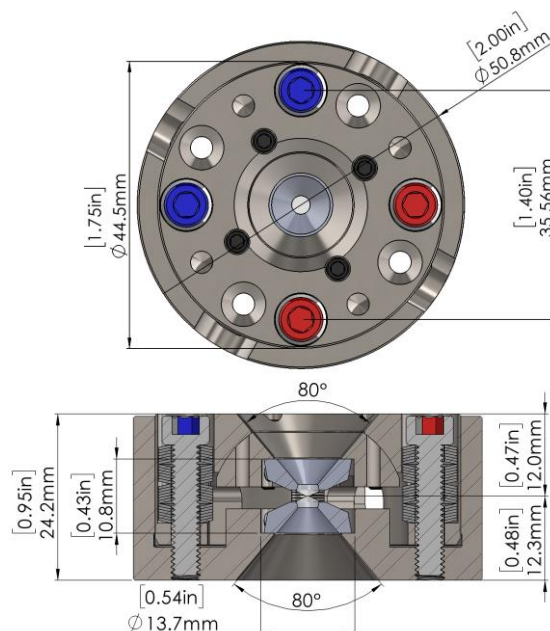


Specifications of SSDAC-80 Diamond Anvil Cell

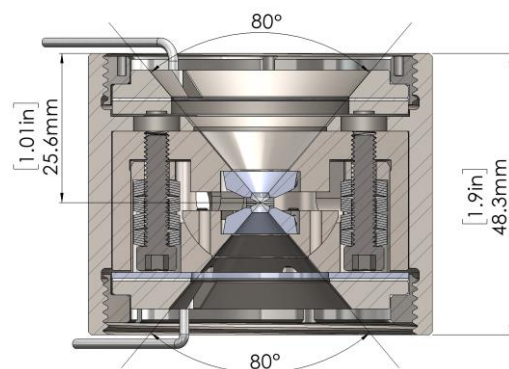
Main DAC Specifications

- Height: ~24.0-24.5 mm
- Diameter: 2.00" = 50.8 mm
- Working distance: ~12.0 / 12.5 mm
- Mass: ~ 280 g
- Optical / top angle: 80° max.
- X-ray angle (max): 80° symmetric
- DAC material: *Stainless Steel 440C or Vascomax C300/C350 Tempered to HRc ~55*
- Seats: *Tungsten carbide (typ.), Vascomax, cBN (optional)*
- Screws: *#8-32, 2RH+2LH (all RH optional) 0.750"- 0.875" long*
- Screw position: *4x 90° apart on 1.40" / 44.45mm BCD*
- Spring washers: *7.6-8.0 mm OD, 4.2 mm ID, 0.4 mm thick (typ.)*
- Diamond seat diameter: *12.5 – 13.0 mm (13.4 mm max)*
- Minimum height of two seats+diamonds: *10.5 mm*

DAC Dimensions



SSDAC-80 in 2 membrane can

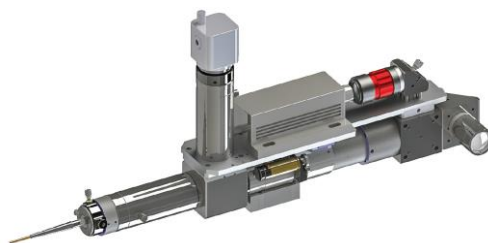


Related equipment

Pressure controllers



Ruby pressure systems



DAC Accessories



For more information please visit <http://dactools.com/diamond-cells>



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