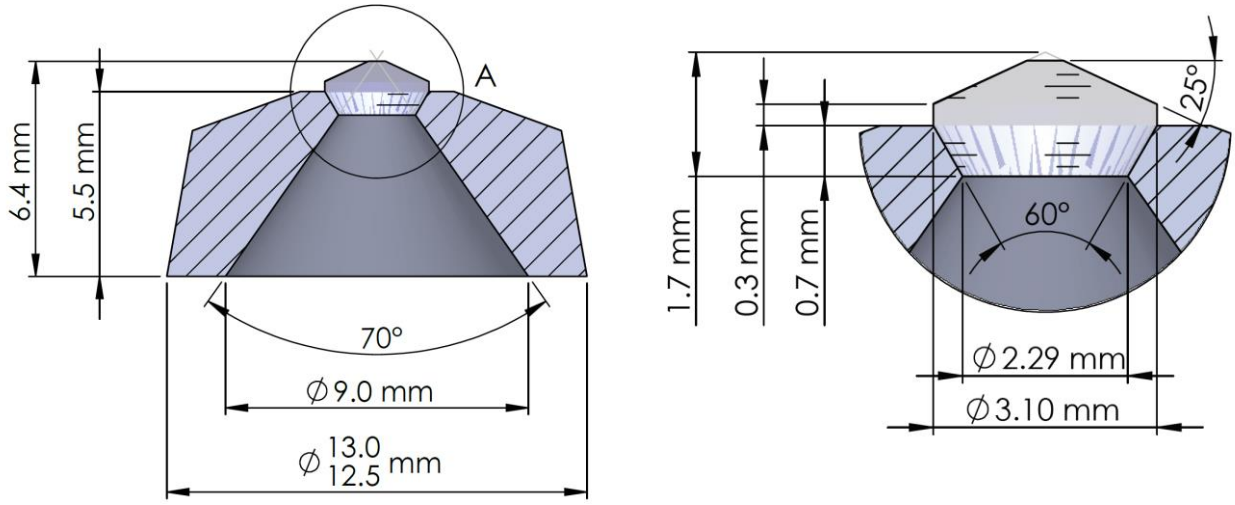
Mini-BX80 Diamond Anvil Cells (DAC)

Diamond-seat options for 80 degrees x-ray opening

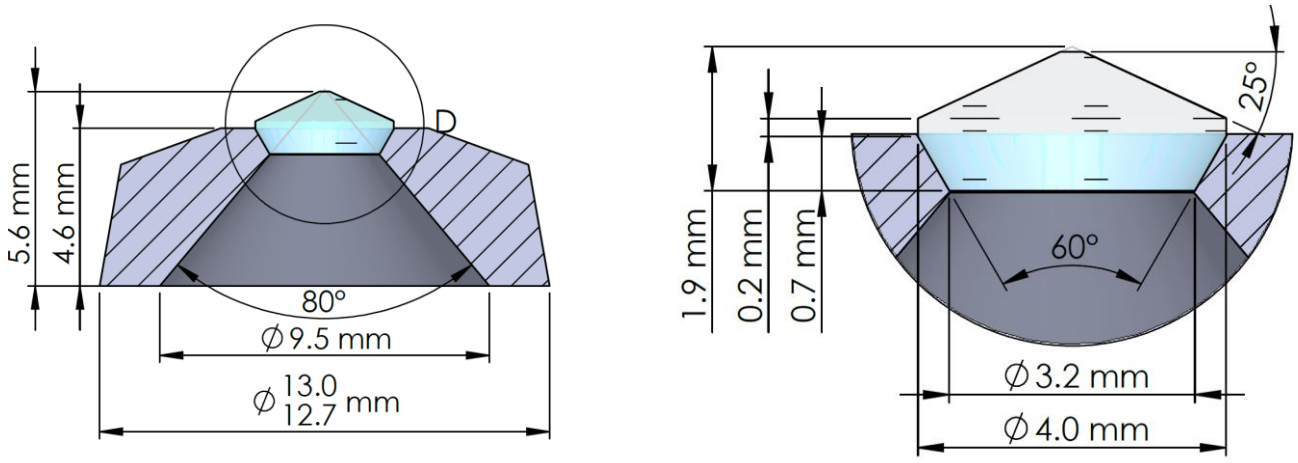
The stability of the diamond depends on the relative thickness and pavilion angle. The thicker the diamond and the larger is pavilion angle – the more stable is the configuration. For 70 degrees diffraction opening one can use 3.1 mm diameter diamond 1.7 mm high with 25 degrees pavilion angle (with classic Boehler-Almax (BA) geometry with 60 degrees support angle). In order to increase the diffraction angle to 80 degrees one needs to either use significantly larger diamonds to keep the same 25 degrees pavilion angle (e.g. 4.0 mm diameter, 2 times the volume), or use smaller diamonds (e.g. 3.3 mm) but decrease the pavilion angle to 20 degrees significantly weakening the anvil.

One of the alternatives is to decrease the conical support angle to 30 degrees. This allows to use relatively small diamonds (3.2-3.3 mm) and relatively large pavilion angle (~26 degrees).

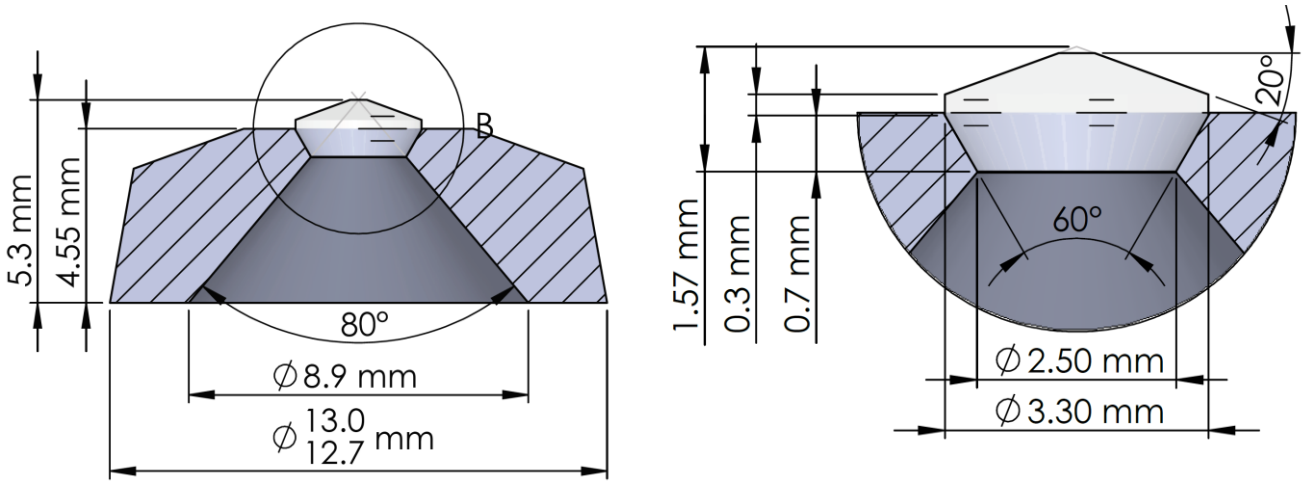
Typical "Classic" Boehler-Almax geometry with 60 degrees support cone and 70 degrees opening



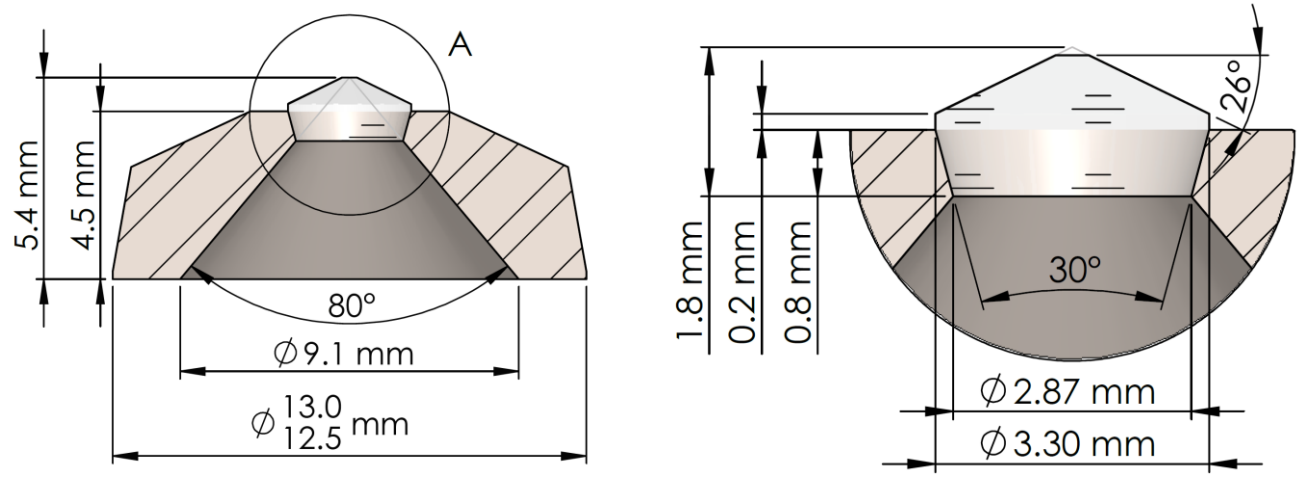
B-A geometry with 60 degrees support cone, 4 mm anvil and 80 degrees opening



B-A geometry with 60 degrees support cone, 3.3 mm anvil and 80 degrees opening



New B-A geometry with 30 degrees support cone, 3.3 mm anvil and 80 degrees opening



Note: first 3 cases (with 60 degrees B-A support) use tungsten carbide seats while the last one is using Vascomax seats.