

To minimize torsional losses at high pressures between the moving tapered piston and tapered cylinder surfaces, an indium coated conical steel washer is positioned at the interface. The indium provides a low friction, low shear strength bearing surface. To provide for a compressible seal between the piston and cylinder assembly so that a confining pressure can be generated upon the specimen, a thin pyrophyllite cone is placed immediately below the conical steel washer.

The Abey-Stromberg apparatus uses two identical disk shaped samples in each experiment, thereby doubling the sample volume. The resultant test volume is more than one order of magnitude greater than that of other devices. Each pyrophyllite disk is contained within an indium coated metal ring. The rings have a triangular cross section and fill the space between the tapered wall of the cylinder and the vertical sample wall. The indium serves to torsionally decouple the sample from the ring.

In order to establish a good mechanical coupling between the sample end faces and the torquing piston and cylinder surfaces, the latter were microsandblasted with 400 to 600 mesh silicon carbide powder, and the disk end faces were coated with a thin film of 40 micron diamond and silicon carbide powders mixed in equal proportion.