

Abstract Submitted
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Progress in joining, reuse, and customization of WR284 waveguide in the laboratory.¹ MIKE CLARK, KEN FLANAGAN, JASON MILHONE, PAUL NONN, CARY FOREST, University of Wisconsin - Madison — A system of five 20 kW magnetrons is being installed for the Big Red Ball (BRB) to produce and heat the plasma with 2.45GHz RF energy. An existing system of two 6 kW magnetrons of the same frequency is actively used for the same purpose on Plasma Couette Experiment Upgrade (PCX-U). In each experiment, the RF is transmitted to the vessel via WR284 waveguide. Waveguide occasionally needs to be disassembled, modified and rebuilt for different reasons such as physics interests, ongoing problems (arcing), or efficient utilization of laboratory space. Reuse of disassembled waveguide parts is desirable for cost savings. Methods of assembly, disassembly, and modification of waveguide will be discussed. Also, frequently used designs of chokes, windows, and limiters will be shown. Materials used include copper, brass, and even aluminum. The vacuum vessel of PCX-U is a 1 meter diameter, 1 meter tall cylinder comprised of 1/2" thick stainless steel. PCX-U has one removable end. The vacuum vessel of the BRB is a 3 meter diameter, sphere comprised of two hemispheres of 1-1/2" thick cast A356 aluminum. Rings comprised of hundreds of SmCo magnets in each vessel create a cusp field to contain the plasma and provide a resonance surface for the RF.

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