

ITER ECH TRANSMISSION SYSTEM TEST STAND AND PROTOTYPE COMPONENT DEVELOPMENT*

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Progress in developing a test stand for high power testing of prototype ECH components for ITER will be described. The US ITER Project Office is responsible for providing the ECH transmission lines for ITER. Evacuated 63.5 mm diameter corrugated waveguide will be used on the ITER system and a total of 24 lines are needed. Each line is designed to handle 170 GHz power at 2 MW operating in the HE₁₁ mode. The ITER Organization has completed a conceptual design of the system. A number of prototype components have been procured primarily from industrial suppliers and testing of vacuum performance and mechanical alignment has been performed. A 140° miter bend was developed and tested at low power as an alternative to two adjacent 90 degree miter bends. A waveguide pumpout prototype and a compact waveguide switch have been built. Work on installing a power supply and interim 400 kW 140 GHz gyrotron has progressed and procurement of a 170 GHz 0.5-1 MW gyrotron has begun. The design phase for the new gyrotron has been completed by CPI. Low power testing of a grating coupler is underway. The grating will be used in a resonant ring for very high power testing of components at the 2 MW level or higher. Other options for the directional coupler needed for the resonant ring are being investigated such as a cross-guide coupler. Low power testing and analysis of waveguide components is underway at MIT¹.

1. M.A Shapiro, et al, Bulletin of the American Physical Society Vol. 54 No. 15 P 108

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