

## **APPLICATION CONSIDERATIONS OF HIGH POWER MICROWAVE PRESSURE/VACUUM WINDOWS**

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Many industrial microwave heating processes are accomplished under pressure or vacuum, such as is quite common in semiconductor fabrication and pharmaceuticals manufacturing. Because microwave power is most commonly generated at atmospheric pressure, microwave power is delivered into a pressure or vacuum chamber through a transition between pressure levels.

Typically, the pressure/vacuum transition, often called a “window,” is a separate component assembly located between other waveguide components, although it may also be located at the point of entry into the chamber. In either case, the window assembly must be designed and rated to handle the electromagnetic fields to which it will be subjected during normal operation. Determining the field strengths at the window can be a complicated task depending on the system design and process characteristics. Simply choosing a window based on its power rating can result in failure under certain high power conditions. Similarly, configuring a system to minimize the field strength at the window can ensure greater reliability and window life expectancy. This paper reviews various pressure/vacuum transition designs and performance expectations as well as considerations for selection and implementation.