

## **AUTOWAVE<sup>R</sup> LABORATORY MICROWAVE PACKED BED REACTOR\***

Michael L. Tracy CPI Beverly MA, Todd A. Treado - CPI

Beverly MA

Doug Parent - CPI

Los Angeles CA

A station for performing laboratory microwave catalysis experimentation is described. The station consists of a 2450 MHz microwave source and a unique dual-feed microwave applicator. A computer controls and monitors the microwave power using a LabView<sup>R</sup> interface. Optional process controls and monitors can be added. The microwave applicator is designed for heating a dielectric fluid as it flows through a catalyst bed. The reactor is designed to safely handle pressurized, flammable liquids.

The reactor utilizes a dual wave-guide feed design that minimizes the peak heating in the catalyst column – thus reducing the chance of localized boiling. The dual feed arrangement excites a TE<sub>21</sub> mode in the cylindrical catalyst column. This mode can provide microwave illumination over a larger catalyst volume than would be achieved using the lowest TE<sub>11</sub> mode. The dielectric fluid is heated as it percolates up through the catalyst column.

The microwave design and mechanical design of the reactor will be presented.

\*patent pending