

# High Pressure Discharges with Imposed Stability Resulting in Reduced Power Requirements

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## **Abstract**

High pressure plasma discharge columns which are long and straight, as well as uniform in the axial direction, have been generated in a steady state. These discharges, stabilized by rotation of the containment envelope about a horizontal axis, have reduced heat transport to the wall due to the absence of buoyancy-driven radial convection and the elimination of eddies caused by sheared flow. These “rotating tube discharges” may take the form of electric arcs powered with dc or low frequency ac; or of electrodeless plasmas, heated by electromagnetic wave at rf or microwave frequencies.