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Design of an ECR coaxial microwave plasma source using solid state microwave generator LOUIS LATRASSE, MARILENA RADOIU, SAIREM SAS, 12 Porte du Grand Lyon, 01702 Neyron, Cedex France — Since the use of electrodes in plasma processing presents many disadvantages, e.g. contamination or corrosion, microwaves are frequently used to supply high density plasmas. Stable and reliable microwave plasma equipment based on magnetrons and designed for automatic control of the operating variables has already proved its efficiency in low temperature diamond deposition, exhaust gas abatement, thin film deposition, etc. Large-scale processing with high density and uniform plasma is necessary for surface treatments that need highly uniform etching or deposition rates. To meet these industrial requirements, Sairem has designed a new ECR coaxial microwave plasma source with very high performances in terms of plasma density and working pressure range. Furthermore, each plasma source has its own microwave generator, the solid state generator developed by Sairem, which uses transistor technology. The advantages and the performance of this combination of technology will be reported. For example, plasma scaling up requires to distribute and apply uniform electric field over large areas. Thus, by distributing the plasma sources and by controlling the supply of power of each source, it is now possible to produce large, uniform and high density plasma without scale limitation.

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