PPPS 2019



Contribution ID: 1167

Type: Poster

5P24 - Indigenously developed pulsed power sources for nonequilibrium plasma applications

Friday 28 June 2019 13:30 (1h 30m)

Nonequilibrium plasma techniques offer an innovative approach to the cost effective solution of various preeminent environmental problems lacing the world today such as acid rain, global warming, ozone depletion, and smog etc. In the developing world, polluting and less efficient conventional equipment need to be upgraded with eco-friendly and energy efficient technologies. Plasma based technologies have proved their significance as an eco-friendly and energy efficient solution in various areas including surface engineering (metallic and non-metallic), water, food and medical engineering etc. In developed countries, plasma based systems have started taking a lead role in the surface coating industries. In plasma equipment, mostly RF or DC power sources are used as an energy source. RF power sources have certain limitations such as high capital and maintenance cost. Similarly DC power source have poor control on process parameters. Therefore due to above mentioned inherent limitation of RF and DC power sources, existing user hesitate to replace polluting equipment with costly plasma based system. In order to increase the penetration of plasma based systems among developing nations, pulsed power sources gives a hope that can overcome the limitations of RF and DC based plasma sources. At institute for plasma research Gandhinagar India, several pulsed power based equipment have been developed and commissioned at various locations in India for Nonequilibrium plasma applications. This includes plasma nitriding, plasma source ion implantation, physical vapor deposition (PVD), and high-power pulsed magnetron sputtering (HPPMS). The results of above mentioned indigenously developed system confirm that pulsed power sources are better alternate over conventional RF and DC power sources. These indigenously developed power sources are economical, compact and capable to provide better control on process parameters as well. In this paper, technical experience gained during the development of pulsed power sources for various Nonequilibrium industrial plasma system will be presented.

Authors: Prof. GUPTA, Suryakant (Institute for plasma research); Mrs KALARIA, Keena (Institute for plasma research); Mr VAGHELA, Naresh (Institute for plasma research)

Presenter: Prof. GUPTA, Suryakant (Institute for plasma research)

Session Classification: Poster - Compact and Explosive Pulsed Power and Pulsed Power Systems

Track Classification: 7.3 Compact Pulsed Power