

TEMPERATURE CONTROL AND MONITORING OF MICROWAVE TORCH FOR BIOMEDICAL APPLICATIONS

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Biomedical applications' requirements to plasma sources are not so different from requirements for most of applications. More or less, the most important one is temperature control due to higher sensitivity of treated material to the heat. Gas discharge treated samples could be heated via temperature transfer with gas media or direct heating from the interaction with the charged particles. Direct heating from the charged particles is the minor process in comparison with heat transfer from the surrounded gas especially when the gas was ignited at the discharge device and interact with hotter surfaces at its.

That's the case of surface wave sustained plasma with SURFATRON device. While the temperature monitoring of the treated sample could be done with infrared thermography or direct contacted measurement, control of the parameter is no so simple. Multicomponent mixture of geometry-, dynamic- and external- parameters should be taken into a count when temperature control is trying to be done. In some particular cases cooling could be achieved if someone use a gas mixtures or different surrounding/supporting gas is used in parallel with the working one. Vortex or a reversed vortex flow regime of operation could decrease gas discharge temperature, too.

The purpose of this work is to present methodology of plasma temperature monitoring and potential experimental solutions of gas temperature control.

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