Atmospheric Pressure Plasma Jet for Non-Thermal Resistant Materials

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Temperature of plasma boundaries on surface undergoing treatment is crucial factor for classifying the device as a tissue tolerable plasma generator. Atmospheric pressure plasma jet (APPJ) is a kind of non thermal plasma operating at atmospheric pressure that can realize large area homogeneous glow discharge. Usually, high flow of substrate gas mixtures consisting of inert carrier gas such as helium and another reactive gas are used (1,2).
Group of Brisset proved that pathogens in aqueous targets can be inactivated by plasma techniques but the thermal factor was not responsible for the lethal effect on the targeted bacteria, (3).

Analysis of RF powered APPJ working parameters in dependence on gas flow rate and feedgas (air, oxygen, nitrogen, helium, argon, and their mixtures) was performed. It was possible to achieve temperatures below 40^{o}C compromising applied power and gas flow-rate. Photographs of the air plasma jet in different flow conditions are presented in table 1.

Table 1. *Photographs of the plasma jet generated in RF powered device with different flow of air. P=80 W, f=12,98 MHz.*

Gas flowrate, [m^3/h] / Temperature, [^{o}C]				
0,2 / 170	0,4 / 120	0,6 / 90	0,8 / 60	1 / 35
				

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References

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