Electro-Technic BD-20AC Corona Treater

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Tool Type: Surface treatment
Location: Elings 3430
Description: High frequency generator used for surface treating of polymers
Manufacturer: Electro-Technic Products Inc.

About

Corona discharge wands use a high frequency electric field to ionize the surrounding air over a very short range. In principle, their operation is similar to a tesla coil, which accumulates charge until a high enough voltage is reached to produce a spark. Each spark produces a small amount of plasma (as indicated by the light produced) which creates active ions that increase the surface energy of polymers.

The primary reason to increase the surface energy of a polymer is to make is stickier. For instance, many paints, inks, and functional biological & chemical reagents will adhere to corona-treated polymers much better than untreated polymers. Additionally, some polymers, such as PDMS, will stick to each other after corona treatment.

Safety Concerns

High Voltage - Keep the electrode tip away from your body. Care should be taken to prevent the electrode from arcing to any worn metal items, such as jewelry. Since this is a very low current device, a spark will cause discomfort but not harm. However, the sudden shock could be alarming and catalyze other accidents.

High-Temperature Plasma - Do not operate this device near any flammable liquids or gases. The electric spark may ignite them.

Ozone Generator - Ozone, produced at the electrode tip, has a somewhat pungent odor but should dissipate harmlessly in a ventilated area. Do not use in confined spaces with poor ventilation.

High Frequency (RF) - If you wear a pacemaker or other medical electronic device, consult your physician before use.

Operating Procedures

1) Plug the device in.
2) Bring the electrode tip near a large metal object or a ground connection.
3) Power on the device with voltage knob set to minimum.
4) Adjust the voltage knob to obtain the desired spark length. (Test the spark length against your metal object or ground connection. Start with 1/8“ to 1/4” if this is a new recipe.)
5) Treat your sample with the discharge wand by bringing the electrode close to the surface and sweeping it with the spark. Treatment distance and time will depend on your substrate and desired effect.
6) When finished, set the voltage to minimum, power off the device, then unplug it.

Detailed Specifications

See attached reference documentation for full specification.

Output voltage - 10 to 48 kV
Frequency - 4 to 5 MHz
Operation - Continuous

Reference Documentation

Operating Manual

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Last update: **2024/09/26 20:04**