



eltech



Plasma Treatment



Plasma Treatment For Wire And Cable



Boosting surface tension via corona discharges or Plasma treatment

eltech manufactures Wire and Cable Corona Treater to solve printing problem.corona treatment of cable is essential otherwise printing will not remain on cable.

The purpose of surface treatment of polymer-based materials is to increase surface wettability through electrical discharge. The low surface energy of polymerbased substrates often leads to poor adhesion of inks, glues and coatings. To obtain optimum adhesion,it is necessary to increase the surface energy of the substrate to just above that of the material to be applied. Surface treatment with Corona results in improved surface adhesion properties.

Sufficient surface tension is a prerequisite If the wettability of a solid surface is high enough, a liquid will form a shallow droplet or will spread without any external forces. On surfaces with low wettability the liquid will form small globular spheres that run off. If the wettability of a cable's insulation surface is too low, the printing ink from an ink-jet or a printing wheel gets repelled. The print will not be brilliant. For example, a numeral "6" might not be distinguished from an "8" and the print can be wiped off.

If the surface tension of an insulation is not high enough, it can be increased very comfortably, economically and with ecological soundness by means of a corona treatment inline just before the printing station. All corona systems use the sparks of an electrical discharge in the surrounding atmosphere for the surface modification, which results in better wetting and adhesion. The sparks of the corona discharge remove contaminating thin layers from the surface and oxidises the plastic surface to a depth of typically five atomic layers.This modification occurs without any change to the electrical, mechanical or optical properties of the cable. (Treated cable cannot be visually distinguished from non-treated cable). Also, the burning of holes in the cable insulation will not occur in a well-designed corona station

A rule of thumb for wetting holds:

A solid substrate will be wetted if its surface tension exceeds the surface tension of the liquid.

Experience has shown that typical solvent-based inks need a substrate with surface tension of 38 mN/m and water-based inks need about 45 mN/m. The table shows that except for the most common PVC, all plastics have wetting problems.

Surface tension and corona treatability of some cable insulation materials:

Material	Abbreviation	Surface Tension	Corona Treatability
Polydimethylsiloxane	PDMS	14 mN/m	very hard
Polytetrafluoroethylene	PTFE	18 mN/m	hard
Ethylene-propylene-rubber	EPM/ EPDM	22 mN/m	easy
Polyamide	PA	26 mN/m	medium
Polyethylene	PE	31 mN/m	very easy
Polyimide	PI	36 mN/m	easy
Polyvinylchloride	PVC	39 mN/m	very easy

Plasma Treatment



Technical Specification

- Plasma treatment head 5-8 mm
- Input Supply : 230 V A.C Single Phase
- Power consumption : 1000 watt
- Working air pressure : Oil and water free ,2-3 Bar
- Output Frequency: 40-50 Khz
- Weight :35 Kg unpacked
- Dimension :450 mm x 550 mm x 850 mm

Features

- Advanced IGBT Technology
- Compact simple construction
- Ultra High Frequency
- Soft Start
- Maximum Operator safety
- Force cooled convertor for longer life

Protection Features

- No air trip
- Air pressure regulator
- Overload trip
- Thermal Trip
- Audio /Visual alarm
- MCB protection

Plasma Treatment Head



Eltech Engineers

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