IMPROVING THE BONDING ON ALL TYPE OF MATERIALS:
PLASTICS, ELASTOMERS, COMPOSITE AND METALLIC
Electrical discharge treatment solutions fitted to improve the surface bonding

Some plastic materials, as polymers type polyethylenes or polypropylenes, do not have the necessary surface properties (we speak of surface tension or surface energy) to allow a proper bonding of products we wish to apply on. They present neutral molecular chains, always moving: **nothing sticks on their surface!**

Therefore, it is very difficult to apply any product at their surface, whether it is for ink printing, painting, gluing, varnishing, PU foaming, coating...

Some methods as mechanical abrasion, chimical attack with chlorinated or fluoride components, or per flame treatment present important inconveniences: damages, distortions, over-treatment, environmental risks....

STTS proposes today a cost effective and robust technology, the CORONA or PLASMA electrical discharge treatment. These processes improve considerably the wettability and adhesion coefficient, necessary for a good surface bonding for any type of substrates.

**Electrical discharge treatment solutions fitted to improve the surface bonding**

**Corona and Plasma Technologies**

**BENEFITS**

- **Efficiency:** consistent surface treatment (repeatable process)
- **Quality:** the surface aspect of the substrate stays unchanged
- **Cost-effective:** stable and known energy consumption
- **Reliability:** robust technology with very low necessary maintenance
- **User-friendly:** simple to use and easy to implement
- **Ecological:** clean technology which use no solvants
- **Custom-made:** independant or moving work stations

**Electrical discharge treatment**

- **Corona discharge**
  - **BLOWN SPARKS**
  - **SINGLE HEAD** system
  - **MULTIPLE HEAD** system
  - **Direct CORONA** system
  - **Ceramic CORONA** system
  - **Indirect CORONA** system

- **Plasma discharge at Atmospheric Pressure**
  - **System with SINGLE TORCH**
  - **System with MULTIPLE TORCHES**

**Solution type**

- **Classical CORONA**

**Solution Classical CORONA**

**System with SINGLE TORCH**

**System with MULTIPLE TORCHES**

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The CORONA technology

Very old and known technology, this type of plastic surface treatment uses the corona effect, electrical effect well known by physicians.

It consist of the application of a low or high voltage electric field throughout an air gap. The electrons, while accelerating, ionize oxygen and nitrogen gas particles which graph at the material surfaces in order to create polar sites. Those allow the chemical link with the products we wish to bond.

Solutions

CORONA TYPE DIRECT
- Principle: the material goes inbetween an electro and a counter-electro (ground) which can be a cylinder or a mandrel.
- Use: sheet, films, plates or parts until 6 mm thickness.
- Application examples: printing or laminating on advertisement bags, packaging films, labels, electrical wires, syringes, tubes, simple or double-sided adhesive foam, silkscreening or tampoprinting machines...

CORONA TYPE EFFLUVAGE INDIRECT
- Principle: the material is treated with the help of a specific electrod which does not need any counter-electrod.
- Use: flat parts or surfaces with slight relief, without any limit in thickness neither in width.
- Application examples: automotive or aeronautic parts and connectors, profiles, foams, home appliances, medical parts and products, pharmaceutical, cosmetic, furniture manufacturing, doors, polypropylene panels for clean rooms and industrial buildings, cellular foams, honeycomb panels, tubes etc...

CORONA TYPE BLOWN SPARKS
- Principle: low frequency system with a lower voltage (from 10 to 15 KV) applied between two electrod within a treatment head, which discharge is blown on the substrate to be treated.
- Utilisation: flat or hollow surfaces, simple or complex relief parts, profiles.
- Application examples: silkscreening, tampoprinting, adhesive applications, seal gluing, automotive parts, connectors, toys, medical and pharma or cosmetic parts...
The atmospheric pressure PLASMA technology

It is a relatively recent technology, allowing to create an electrical discharge type corona within a torch. We create a plasma gas within the torch thanks to a high voltage discharge and with air (or another gas) crossing this plasma with a turbulence effect. A reaction separates the plasmagene elements inside of the torch which are those who will treat the surface of the part.

The plasma this way created is not « electrically conductive » and allows therefore to surface treat conductive and non conductive parts, but also to have a cleaning effect on the surface.

Solution

ATMOSPHERIC PRESSURE PLASMA

- Principe: the material to be treated scrolls under the plasma torch.
- Utilisation: all surface of all materials having some relative reduced dimensions, with any relief.
- Application examples: optical headlight joint runner, membrane seal or tamper resistance, electronic printed circuits, electrical connectors...
There are many applications where a surface treatment proves necessary. Since more than 30 years specialist of surface treatment solutions, STTS relies on its experience to answer all material adhesion questioning arising. The technical solutions that we propose are perfectly suited to our customers’ difficulties thanks to a prior study and then a specific design completely custom-made. Our systems are then fully integrated in the production process (in line or off-line in independent work stations), with specific designed installations fitted to the applications.

**APPLICATION areas**

- All type of parts shapes, simple or complex
  - Films, labels, paper...
  - Flexible plates foam type
  - Thick or rigid surfaces, full or cellular (honeycomb)
  - Shaped parts
  - Wires and cables
  - Profiles
  - Conductive surfaces

- A diversity of materials and substrates
  - Polypropylene, polyethylene, and all type of polymers thermoplasts and thermosets
  - Elastomers, rubber
  - Composites
  - Metal, carbon
  - Glass

- All area of activities
  - Automotive / Aeronautic
  - Shipbuilding / Defense
  - Electronics / Electrical engineering
  - Medical / Pharma / Cosmetics
  - Packaging
  - Construction / Building / Decoration
  - Home appliances
Complete solutions for improving adhesion to plastic, rubber or composite materials
Solutions complètes pour l’amélioration de l’adhérence sur supports plastiques, caoutchouc ou composites