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Successful charging Some tips for electrostatic fixation

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Successful charging

Some tips for electrostatic fixation

Successful electrostatic charging – the reliable bonding of different materials to each other using high voltage – is quite simple. Provided that a few, but fundamental, points are observed, secure fixation of the most diverse materials to each other within a production process should be straightforward enough.

The following tips are intended to help you work successfully with our charging systems. If you are still not quite certain about how to proceed or if you have any special requirements with regard to the charging system used, please do not hesitate to contact us directly. For our contact details, please refer to the rear page of this leaflet.

Principle: Electrostatic discharging before charging!

To electrostatically bond materials successfully, you require a charging system, material to be charged and a counter electrode to provide the counter potential necessary for charging, and the neutralization of the material to be charged.

A situation should be avoided whereby the charging system first has to eliminate carried-over electrostatic fields from the material before the charge can be applied in the intended way. This could result in a drastic degradation of the electrostatic fixation. The ionizing unit used to eliminate such undefined electrostatic fields should be set up in a reasonable distance (at least 100 mm) from the charging electrode. This ensures that the electrostatic discharging system does not interfere with the intended charging.

Selection of the charging system

Charging electrode	Charging generator	Application	Special features
ALS	AG series	All standard applications	Detachable high-voltage contacts, replaceable pin strip, all connector variants of high-voltage cable possible.
Triode ALM	TR series	Where a targeted field is required, e.g. near metals	Detachable high-voltage contacts, replaceable pin strip, all connector variants of high-voltage cable possible.
PAE	AG series TR series	Spot charging electrode where a regionally restricted field is required	One charging pin.
Three-finger electrode	AG series TR series	Film edge fixation on extruders	Finger length can be adapted if space is at a premium.
ALW	AGW, HW	High requirements	Voltage stabilized, edge coverage of ALW not guaranteed, connector variants axial and radial possible.





Suitable material

Material suitable for electrostatic fixation must fulfil the following requirements:

- It should be insulating, not electrically conductive.
- It should be dry, clean and free from oil and grease.
- It should have no conductive coating.
- It should not be too bulky, not too thick.
- It should have a small air inclusion.
- It should have small recovery and roll-up forces.
- If electrostatically conductive, it should have no contact with a counter potential.
- If printed or coated with electrically conductive inks or varnishes, the print or coating should not have any contact with ground potential – and in particular not at the edge where the printed or coated finishes are cut.

The counter electrode, the counter potential, the ground potential ... examples

In order to achieve a fixation using an electrostatic charge, the charge applied with the charging electrode needs to "relate" to a counter potential. Both applied charge potentials – positive or negative – attract each other and therefore ensure that the material is fixed.

Contact with counter electrodes Material to be fixed and counter electrode touching each other	Note
Full surface area 	Unstable material may get stuck to the large surface. Suitable for blocks, stable material sections, taut webs.
Reduced surface area 	Unstable material may get stuck in the recesses. Suitable for blocks, stable material sections, taut webs.
Round, angular profiles 	Unstable material may get stuck between the guide strips. Suitable for blocks, stable material sections, taut webs.
Metal roll 	If the web tension is insufficient, material may get wrapped around the roll. Electrically conductive roll bearing required. Suitable for all material webs.

Contact-free counter electrodes The counter potential is generated by means of the ions of an ionizing unit	Note
Ionizing unit without air assistance. Ions are effective within the stray field of the unit.	Distance "behind / below" the material approx. 20 to 30 mm.
Air-assisted ionizing bar. Ions flow with the air stream across a distance towards the material.	Distance "behind / below" the material approx. 20 to 30 mm.

Tips for the installation and use of the charging electrodes

- The charging electrodes must be installed in a position where they are protected from any unauthorized access.
- Short-circuits and spark-overs must be avoided, as they might damage the charging electrode itself or the material and production system.
- Ensure that you neutralize the material before charging.
- The distance from the charging electrode to the metal must be greater than the distance to the material to be charged or to the counter electrode.
- The distance from the charging electrode to the material to be charged should amount to between 15 and 100 mm. The greater the distance, the higher the voltage required.
- Always mount the charging electrodes using plastic holders. HAUG offers special holders suitable for the purpose.
- Always keep the charging electrodes clean. Contamination may result in short-circuits and functional failure.
- Conductive chemicals or water must not come into contact with the charging electrode.
- Flammable materials must not be allowed to get near the charging electrodes. The use of the charging systems in explosive areas is not permitted.
- The counter electrodes must be grounded separately from the electronic system of the equipment.
- The charging pins are consumables. They should be allowed to become blunt. Short-circuits and spark-overs will result in the erosion of the charging pins.

Subject to technical changes!