

The electrostatic Charging Phenomena

The corona discharge is the **unimpeded discharge of the free electrons from an electrical conductor**. This process is only possible under a high electrical field strength, and increase with the increased voltage. The air stream increases the corona discharge on the electrode, because the electrons are pushed away.

The **free electrons seeks the shortest route to the next grounded part**. They **contact the powder particles and remain adhered to them**. The **ionised powder particles are attracted all grounded objects like the free electrons**. The free electrons that don't hit powder particles and the ionized air are called **space charge** and have an influence on the coating quality.

As soon as the ionized powder particles meet the grounded workpiece, a **counter-charge is created on the workpiece**. Both charges mutually attract one another. Because the powder is not electrically conductive, **the charge cannot discharge and the attractive force remain, ensuring the first adhesion**. The discharging current, consisting of free electrons, air ions, and the influence current of the counter-charge, flows from the grounded workpiece.

The charged powder is pushed towards the grounded workpiece by **only the electric force equal to the charge of the particle**.

