

Application Story

Electrostatic spray systems

ESTA PAINTING FOR HIGHLY CONDUCTIVE PAINTS AND COATINGS

Application

Today's coatings are very different than legacy, solvent based, paints and coatings. As paint companies develop water-based paints to reduce VOC's (volatile organic compounds), a new problem must be resolved in order to achieve maximum coating transfer efficiency. Due to the water content in the new paints, these coatings are highly conductive.

Today's high efficiency electrostatic bells and spray guns directly charge the paint with 50 to 90KV. The now negatively charged paint is attracted to the positive grounded parts being painted, causing paint to attract to all sides of the part. Because more paint goes onto the part, less coating is wasted in the form of over spray.

But none of this is possible if the highly conductive coating itself is causing a direct short to ground. The solution is to isolate the paint supply from ground. It still becomes charged, but because it's isolated, high voltage can be maintained at the applicator. Traditional solvent based paints/coatings are resistive and don't require isolation. For flow feedback, our high precision gear meters usually work quite well.

But due to the lack of lubricity of most water-based paints, gear meters are unsuitable. Therefore, we were looking for a solution for this new, demanding challenge.

The challenge for measurement technology with direct charge, water-based paints is twofold. Compatibility with high friction paints/coatings and provide a method to send flow rate data to a monitoring Programable Logic Controller.



KEM KÜPPERS IN BODY PAINTING

Technical Data

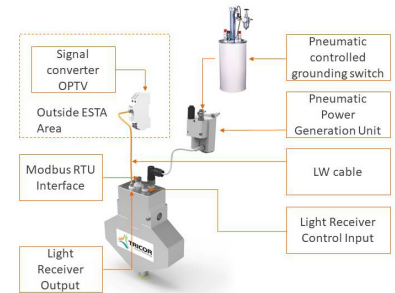
| | |
|-------------------------|---|
| Medium: | Water borne and some 2 components/hardener |
| Temperature: | +20 °C up to +30 °C [+68 °F up to +86 °F] |
| Pressure: | up to 200 bar [2,900 psi] |
| Measuring range: | 50 up to 1,000 ml/min |
| Viscosity: | 50 - 1.000 cP (varies depending on coating material and temperature) |
| Density: | 1.1 - 1.3 kg/l |
| Certification: | ATEX/CSA: Zone 2; II 3G Ex nA IIC T4 / Class1 Div2 Group A-D T4 |

Solution

The first Coriolis mass flow meter for ESTA applications. To meet these challenges, KEM Kueppers developed the world's first Coriolis meter system compatible with electrostatic direct charge water-borne paints and coatings. The ESTA (Electrostatic Application) system uses a combination of components to use an electronic Coriolis meter at the same voltage potential as the paint supply regardless if the high voltage is active or the system is at ground potential. The four primary components include the TCM 0325 of the SPECIALTIY series with fiber optics for pulse output/input, light receiver, the pneumatic driven 24 V DC power supply, and a pneumatically controlled grounding switch to isolate or ground the conductive paint supply.

Advantages

- Mass based measurement, independent of density and viscosity
- Measuring accuracy up to 0.1 % of reading (depending on flow dynamics)
- Reproducibility better 0.05 %
- Adapted response times for painting applications
- Compact version
- Wear-free
- Low maintenance
- Especially suitable for particle-loaded paint compounds
- Solution of the metrological challenge from one source
 - Coriolis Mass Flow Meter TRICOR Series
 - Pneumatic actuator
 - Fiber optic amplifier
 - Light receiver
- Fast delivery times
- Well-balanced price-performance ratio



Certificates:

- Pressure Equipment Directive 97/23/EC, 2014/68/EU
- HPO - Certification
- Explosion protection according to 2014/34/EU
- CSA/UL - Certification
- Accreditation according to ISO 17025



Coriolis Mass Flow Meter
(TRICOR SPECIALITY Series)