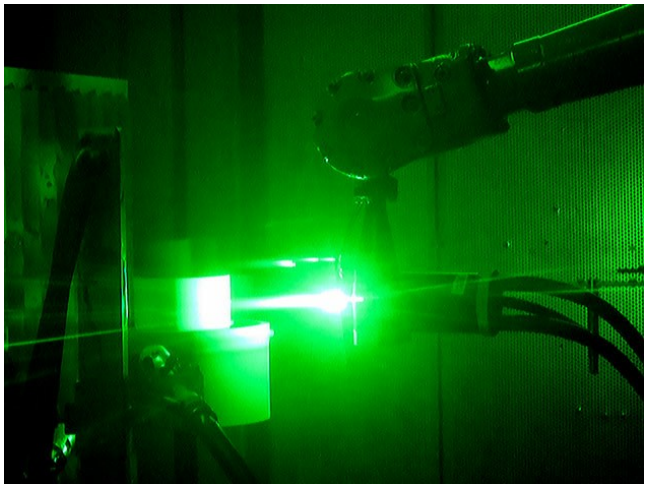
ULTRASONIC FLOW METER FOR THERMAL SPRAYING A131

APPLICATION NOTE

Ultrasonic flow meter for thermal spraying

The company Flame Spray Technologies in The Netherlands uses the Bronkhorst ultrasonic flow meter series in their client-specific spraying solutions to apply coatings that improve wear, corrosion and temperature resistance for example aerospace applications. These compact ultrasonic flow meters enable better control of the coating **quality** and **easily fit** in a control cabinet.

HVOF (high velocity oxygen fuel) and plasma spraying are two of Flame Spray Technologies' main coating application processes. In HVOF, a liquid fuel such as kerosene or ethanol is mixed with oxygen and ignited to combustion. Metal or carbide powders are injected into the hot combustion gas stream and jetted with high velocity onto a substrate to be coated. In plasma spraying, an electric arc adds energy to an argon gas stream which gets ionised and carries molten metal or ceramic powders to a substrate. Flow control plays an important role to control the supply of liquids or gases to these processes.



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Application requirements thermal spray process

Supply of a constant gas or liquid flow to a thermal spray process determines the quality and thickness of the applied coating. Therefore, a **high accuracy** and **reproducibility** of the flow instrument is required. As calibration is conducted by Flame Spray Technologies as part of their service package to customers, the control **stability** and **calibration accuracy** are important aspects as well.

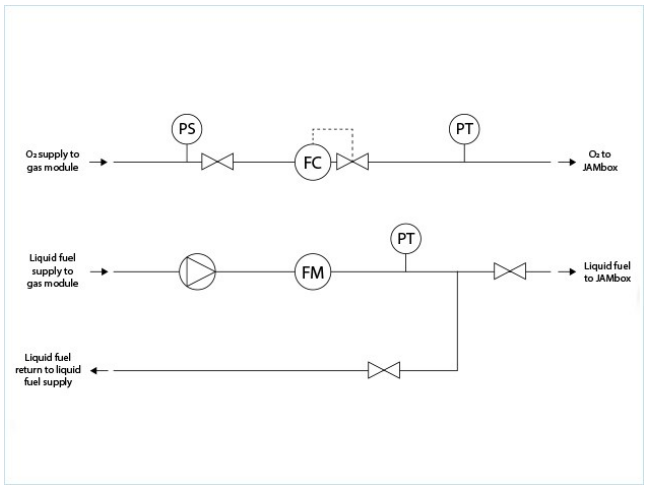
Important topics

- OEM version of the ultrasonic flow meter has a compact design and easy to fit in a control cabinet
- High accuracy and repeatability of liquid and gas flows
- Calibration - also for end users - enables quality assurance
- Training and advice on calibration

Process solution

As part of their HVOF thermal spray equipment, the Bronkhorst ES-FLOW ultrasonic flow meter 'OEM version' is used to supply liquid kerosene or ethanol to the process. The accuracy of the ES-FLOW fits well with the current application. This ultrasonic flow meter can measure and control liquids independent of fluid density, temperature and viscosity at affordable costs. The ES-FLOW controls a pump to obtain the desired process pressure. In addition, an EL-FLOW Select thermal mass flow controller is applied to supply the oxygen, at a typical flow rate of about 1000 L_n/min.

In this case a model of the ES-FLOW without display has been chosen, to benefit from the rectangular shape and compact design to easily fit into the control cabinet of the HVOF thermal spray equipment. The device is connected to the customer's operating system via Profinet.



Flow scheme

Control of the coating application process guarantees the quality of the coating, with thicknesses even smaller then a millimeter. To that end, calibration of the thermal spray equipment and its components is very important. Therefore, Flame Spray Technologies includes calibration and maintenance of their equipment on-site. To calibrate the Bronkhorst flow instruments in the field, they use robust mobile calibration units from Bronkhorst. Flame Spray Technologies employees are trained in using these mobile calibration units by the training department at Bronkhorst headquarters in the Netherlands. To measure the thickness of the sprayed layers, Flame Spray Technologies has its own lab. In cases when onsite calibration is not a possible, remote calibration is an option as well.

More information

Interested in where our ultrasonic flow meters are used? Check our blog: Top 3 applications for ultrasonic flow meters.

Related application story: Ultrasonic flow meter used in HVOF thermal spraying process.

OEM version of Ultrasonic flow meter

Recommended Products

ES-FLOW™ ES-113C

Min. flow 2 ... 100 ml/min
Max. flow approx. 1500 ml/min
Pressure rating 100 bar
Compact and robust; IP66/IP67

EL-FLOW SELECT F-201CV

Min. flow 0,16…8 mln/min
Max. flow 0,5…25 ln/min
Pressure rating 64 bar
Compact design
High accuracy and repeatability

Do you need advice on ultrasonic flow meters for thermal spraying? Contact us

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Subject *: Please select the subject

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Question / Comments:

Yes, I understand that my data will be kept for analytical purposes and I have read and agree to the Privacy Note*:

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