

Accurate dosing of release agent



Application note A075-GP03-0817F



◆ Car dashboard

In their automotive department, a major automotive company manufactures 'skin' that covers a car's dashboard, to give it a 'leather look'. This skin is produced by spraying liquid, coloured polyurethane into a nickel mould.

To allow an easy skin release from the mould without any damage, prior to spraying the polyurethane, an external release agent has to be applied onto the mould surface. The quantity of this agent determines the 'looks' of the final part - which of course must have the correct homogeneous gloss and colour.

The amount of external release agent is essential in this respect. The skin will remain adhered to the mould when too little agent is applied, whereas too much agent will give glossy spots on the skin. Either way, production loss will occur. Bronkhorst was requested to supply a suitable mass flow controller for the application.



Experimental setup

Application requirements

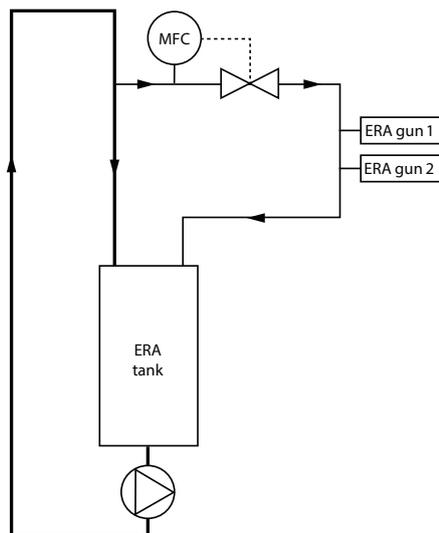
In the past, some problems occurred with supplying external release agent using mechanical solutions, such as pressure regulators and gear pumps. These 'old' solutions were not suitable for low flow use and were unstable at low viscosities.

Moreover, their maintenance and calibration costs were high, and the process had to be adjusted continuously by the operator. A new solution to adequately dose external release agent should overcome these problems.

Important topics

- ◆ Accurate dosing of release agent
- ◆ Improved process control
- ◆ Visualisation and alarm settings
- ◆ Process data management

Process solution



Flow scheme

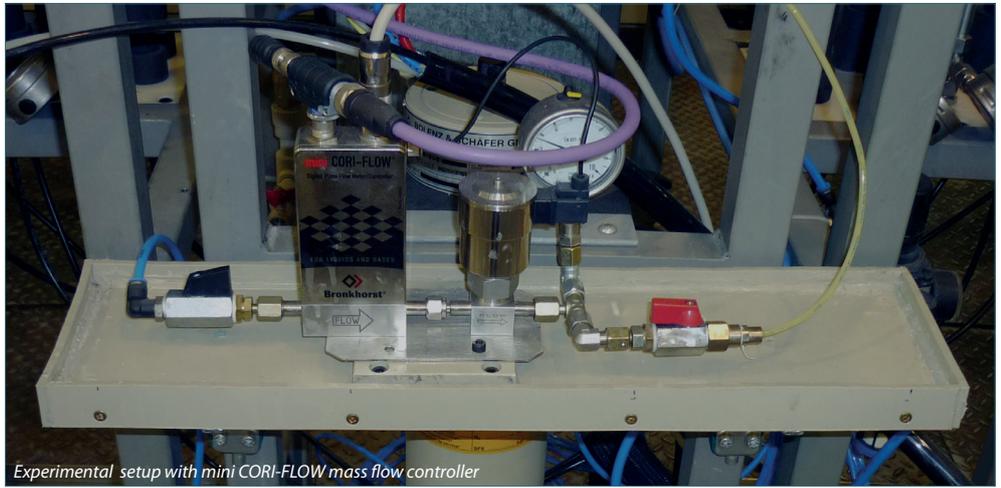
A Bronkhorst mini CORI-FLOW M14 mass flow controller combined with a C51 valve forms the basis of the solution to accurately supply external release agent to the nickel mould surface. These compact devices are mounted next to the robot arm that sprays the agent by means of a spray nozzle. The robot arm moves along the surface of the mould, where the required amount of agent is sprayed homogeneously. This setup is being used for water-based as well as solvent-based release agents.

This solution results in a stable flow, even with low flows of less than 5 grams per minute. Compared to the old solutions, the overall release agent application process stability has been improved, with respect to the colour and gloss of the manufactured car dashboard skin. Also reproducibility is high, as the linear flow curves have the same output for all installations. After change of setpoint, the response time is excellent.

Due to the compactness of the M14 and C51 units, they are easy to install and integrate in existing installations. Data can be transferred from the M14 by means of RS232, Profibus and analog outputs. Control & monitoring allow easy visualisation and data capturing.

This solution meets increased quality demands by OEMs, as real mass flows are being measured and controlled. The downtime necessary for calibration and maintenance is largely reduced.

The customer is very pleased with the unequalled results of the solution, as well as with the preceding engineering and cooperation with Bronkhorst. This is demonstrated by the fact that currently, about 100 combinations of M14 and C5I are being used at the automotive factories worldwide. ■



Recommended Products



mini CORI-FLOW M14 with C5I Valve
 mini CORI-FLOW series, compact Coriolis Mass Flow Meter/Controller for liquids and gases. Both analog and digital output. Housing according to IP65 classification. World's smallest Coriolis Mass Flow Controller. Flow ranges from 0-20 g/h up to 0-30 kg/h. The C5I control valve is directly operated by a magnetic coil with IP65 (weatherproof) housing and is closed when de-energized.

- ◆ Accuracy: 0,2 % reading +/- zero stability
- ◆ SS316L wetted parts, all metal
- ◆ No moving parts
- ◆ Temperature: 0...70 °C
- ◆ Alarm and totalizer facilities
- ◆ Fast response (up to 50 msec.)
- ◆ Easily re-rangeable for different flow rates
- ◆ Power: +15 ... 24Vdc; pressure: up to 100 bara
- ◆ C5I allows a pressure drop of max. 5 to 40 bar

Contact information



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GP: General Purpose

03: Automotive

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