



# APPLICATION REPORT Machinery & Apparatus

## Flow measurement of paint for road markings

- Cost reduction by increasing paint use efficiency
- Installation of a single straight tube Coriolis mass flowmeter in confined space of line marking trucks
- Reliable and accurate readings of flow and temperature at low flow rates and high pressures
- Bluetooth® functionality allows access to process trends and meter diagnostics from the truck cabin



### 1. Background

Transport for NSW is the leading transport and roads agency of the Government of New South Wales (NSW), Australia. It is charged with maintaining and upgrading road network markings across the road network in the southern NSW region.

The client employs several line marking trucks which are automated and provide data to the team on the line marking process. These trucks perform various marking types and colours depending on the road.

### 2. Measurement requirements

The road marking process needs to be as efficient as can be to save on paint and to apply only those quantities that are necessary, yet it must be in line with the quality requirements in terms of line marking thickness. To always coat with respect to the process media, accurate information about flow rate and temperature is of the essence to the client.

The characteristics of the paint applied to the roads can change significantly with temperature, resulting in a varying density between 1.65...1.7 SG, i.e. up to 50 kg/m<sup>3</sup> at peak times. This can influence the resulting spraying and marking quality.

The paint flow rate was to be accurately measured, logged and monitored remotely. Given the high pressure rating (75 ...80 bar), the low flow conditions as well as the confined installation space on the marking trucks, the client had some difficulties selecting a suitable technology.



Automated line marking by a truck



## 3. KROHNE solution

The application has been solved by the OPTIMASS 7400 F Coriolis mass flowmeter. The KROHNE flowmeter meets all requirements in terms of flow and temperature measurement, accuracy, and repeatability as well as footprint. Mounted upstream of the spray nozzles, the flowmeter monitors the paint being supplied to the guns. This allows the client to gather and log relevant data which pertain to the quality of the paint, the painting process and the resulting line marking specification.



OPTIMASS 7400 F measuring paint for road markings

Unlike ordinary twin-bent tube Coriolis mass flowmeters for high-pressure processes on the market, the OPTIMASS 7400 has a much smaller footprint, featuring just a single straight tube. Given the low flow rates and the high pressure rate, a flow sensor made of titanium (DN15 tube size) was selected. The KROHNE flowmeter fits perfectly with the confined installation space of the trucks, where bent tube flowmeters cannot be used. Due to its sensor design, there is also virtually no pressure loss, and the flowmeter is self-draining and easy to clean to prevent clogging. The flowmeter was supplied as a field mount version with a remotely installed signal converter (F) as the location of the sensor made the installation of the converter housing difficult.



Line marking truck

## 4. Customer benefits

KROHNE has supplied 4 units over a 5-year period with very successful results on the Transport NSW road marking trucks. The OPTIMASS 7400 F helped the client obtain a better overall marked line product. In this way, the versatile flowmeter has achieved a measurable increase in paint use efficiency which in turn provides a cost reduction for the client as well as the NSW Government.



Field mount signal converter of the KROHNE Coriolis meter (left)

The flowmeter has so far not missed a beat whilst withstanding extreme roadside temperatures and vibration, monitoring millions of litres of paint. Succeeding in this application is the result of a flowmeter capable of handling low flow, high pressures and limited installation spaces combined with the right titanium measuring tube material that KROHNE offers for those applications as standard.

Having mainly used the 4...20 mA and pulse signals to output the readings to the telemetry system, the client also started using Bluetooth® available with the most recent flowmeter commissioned. Using the KROHNE OPTICHECK Mobile app for secure Bluetooth® communication, the truck drivers have access to the trends in the process and to relevant diagnostic indications of the meter right from their cabin.

The use of the OPTIMASS 7400 F still has future potential for the client. As paint density is an essential control variable, the transport agency will be looking to utilise the integrated density measurement of the KROHNE flowmeter in the future so as to start logging density for paint quality reasons.

## 5. Product used

### OPTIMASS 7400 F

- Coriolis mass flowmeter for advanced process applications and high accuracy ( $\pm 0.1\%$  of MV)
- Integrated measurement of mass, volume flow, temperature and density
- Device commissioning, verification, and monitoring via a secure wireless Bluetooth® connection using the OPTICHECK Flow Mobile app



### Contact

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Do you require technical advice for your application?  
application@krohne.com

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