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Specialized test procedure—Flow rate determination

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Application

This procedure is used when performing metering system accuracy tests.

Purpose

This procedure is used to determine the approximate flow rate at which a meter is tested and to establish whether the flow rate exceeds the meter/system capacity.

Reference

R.271, R.280, R.290 of the Weights and Measures Regulations and Notice of Approval.

Procedure

Maximum flow rates are determined with the nozzle or loading valve fully opened. Minimum flow rates are determined in order to maintain the test run at or slightly above the minimum approved flow rate for the meter. This procedure is applied during the fast and slow tests to determine whether the operating flow rates are within the approved limits of the meter.

Stabilize the flow rate for the test run (e.g., run approximately 100 L of a 500 L test run).

While maintaining the flow rate (i.e., do not stop or change the flow rate), time an even number of litres or kilograms with a stopwatch.

The flow rate is calculated as follows:

$$\text{Flow rate (L/min)} = \frac{\text{quantity delivered(L)}}{\text{time elapsed(s)}} \times 60\ \text{s/min}$$

Or, for Coriolis effect meters measuring in mass units:

$$\text{Flow rate (kg/min)} = \frac{\text{quantity delivered(kg)}}{\text{time elapsed(s)}} \times 60\ \text{s/min}$$

Examples

If it takes 15 seconds to run 100 L, the approximate flow rate is:

$$\text{Flow rate} = \frac{100\ \text{L}}{15\ \text{s}} \times 60\ \text{s/min} = 400\ \text{L/min}$$

If it takes 45 seconds to run 90 kg of product, the approximate flow rate is:

$$\text{Flow rate} = \frac{90\ \text{kg}}{45\ \text{s}} \times 60\ \text{s/min} = 120\ \text{kg/min}$$

Interpretation of results

If the system is capable of operating beyond the approved maximum flow rate of the meter, an automatic flow control valve must be installed downstream from the meter.

For accuracy tests, the meter must run at flow rates between its approved minimum and maximum.

Revisions

The purpose of revision 1 was to add the procedure for determining kilograms per minute for mass to mass testing of Coriolis effect meters.