

Table 24.5 Example of different pressure measurement applications (F.B. Lehmann, Aalen, Germany).

Application	Medium	Type of device	Installation	Bar	Accuracy (%)
Monitoring the pressors in the milling chamber of agitator ball mills	Liquids	In-line seal with analogue transmitter and sensor signal evaluator	Directly in pipe between feed pump and milling chamber	0–2.5	0.3
Pressure monitoring in barrier pressure systems for mechanical shaft seals	Compressed air, nitrogen	Pressure switch with adjustable contacts	Directly on the barrier fluid reservoir in the airline	0–7	0.5
Pressure differential in filter systems as an indicator of the degree of filter clogging	Air	Differential pressure transmitter with diaphragm	In the vicinity of the filter	0–0.05	0.2
Fill level measurement in vessels with an agitator	Liquids	Piezoresistive pressure transmitter	At the bottom of the container in direct contact with the product	Depends on application	0.3
Weight sensing in silos and vessels with an agitator	Bulk goods liquids	Pressure sensor (load cell) with analogue transmitter and sensor signal evaluator	Under the feet of silos and containers	Depends on application	0.3
Airflow regulation on winnowing equipment	Air	Differential pressure transmitter with diaphragm	Separately in a control cabinet	2×10^{-5} –0.002	0.07

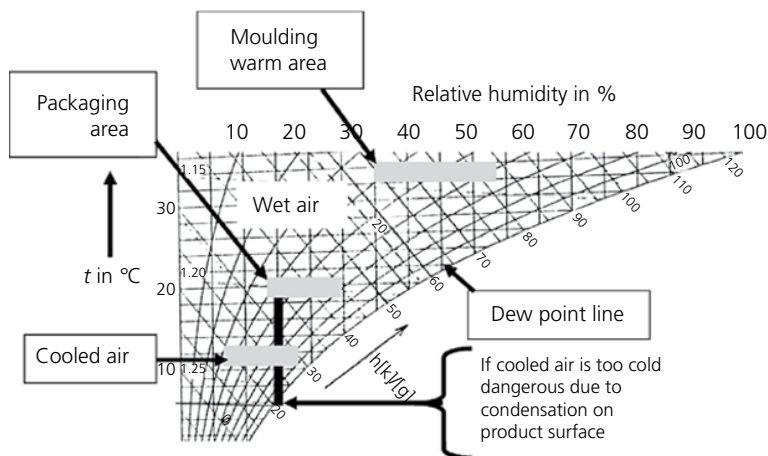


Figure 24.14 Extract from Mollier i, x diagram showing the relationship between temperature and the relative humidity when condensation occurs (dew point).

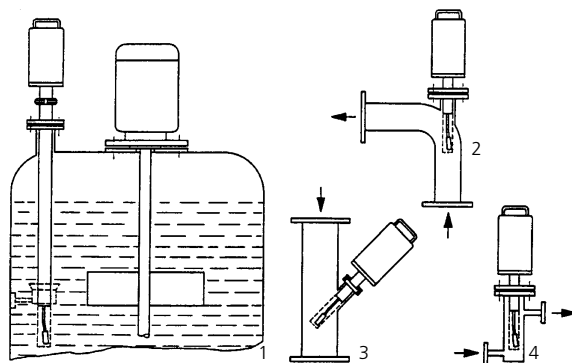


Figure 24.15 Typical installation positions for convimeter type of viscometer.

and the automatic correction of the flow properties. When making other products where more precise flow properties are required, for example enrobing to an exact weight declaration, the viscosity often needs to be modified by adding fat. In this case, off-line batch measurements should be made. These measurements are also required when manufacturing aerated masses and the yield value is lowered by adding an emulsifier, such as PGPR (Chapter 11).

An in-line viscometer can be used and Figure 24.15 shows possible positions for installing a process viscometer to measure non-Newtonian flow. Most concentric instruments pose the problem that the same chocolate remains between two cylinders, while the product intended to be measured flows by. The convimeter (Figure 24.16) overcomes this by having the bob set at an angle and so acting as a pump and changing the sample.