

Notes for guidance on the selection and installation of Pressure Gauges

Forward

These notes have been prepared to assist in the selection and installation of pressure gauges for the purpose of ensuring, as far as possible, that pressure gauges give satisfactory service in the application for which they are intended and to ensure the highest possible level of safety. For further information, reference should be made to BSEN 837-1, 837-2 & 837-3 on which these notes are largely based.

Scope

These notes are concerned with pressure gauges.

Materials

The most usual wetted parts used in the construction of these gauges are made from brass and bronze and similar non-ferrous materials. Such gauges are suitable for use on air; oil, water and other non-corrosive fluids. For corrosive fluids, alternative materials, e.g. stainless steel should be specified. For special applications, e.g. when the pressure medium may solidify in the tube or may contain solids in suspension, alternative designs of pressure gauges such as diaphragm or a chemical seal type should be used.

Environmental conditions should be taken into account when considering suitable materials for construction parts other than for wetted parts.

Safety on gas and steam pressure measurement

For certain gas applications, safety pattern gauges **MUST** be used and these must incorporate a solid baffle between dial and pressure element, a splinter-proof or clear plastic window and blow-out release. Surface mounting gauges with a blow-out release at the back, **MUST** be mounted at least 20mm away from the surface panel by means of distance pieces.

For oxygen, safety pattern gauges **MUST** be used, and **MUST** be supplied, degreased and kept free from oil contamination.

For acetylene, safety pattern gauges **MUST** be used.

For steam and gases, other than oxygen and acetylene, gauges of normal construction and of a diameter of less than 100mm may be used for pressure ranges up to 25 bar. For gauges 100mm diameter and greater the gauge must have a blow-out device. For higher pressure ranges, safety pattern must be used.

Jointing

Where parallel threads are used on the shank, the joint **MUST** be made on the flat seating using a washer of a suitable material, see BSEN 837-2. The joint on the sealing washer **MUST** be tightened by means of the hexagon or square provided on the screwed shank and not by grasping the case.

Maximum working pressure

While gauges will withstand the full scale pressure, the working pressure should not exceed 75% of the full scale range for steady pressures and 65% of the full scale range for fluctuating pressures.

Pulsation etc.

If pressures are expected to pulsate violently, oscillate with high frequency or occur with sudden shock, the manufacturer should be consulted.

Mechanical Vibration

Gauges should be mounted away from vibration and connected by means of flexible piping. If this is not possible the manufacturer should be consulted. Where liquid filled case gauges are used, a safety release **MUST** be incorporated in the case.

Temperature

If used on steam or other hot gases or liquids, gauges **MUST** be protected by the use of an effective syphon or by other means. A gauge is unduly hot if it cannot be grasped by hand without discomfort. It should also be remembered that gauges used on water may burst if exposed to frost. Working fluids at a temperature exceeding 60 deg. C should not enter the bourdon tube or other wetted parts.

Mounting

All gauges should be mounted in a vertical position unless otherwise agreed with the manufacturer.

Connecting pipes

The connecting pipes to surface and flush mounted gauges should be flexible in order to avoid any strain on the gauge, particularly where excessive expansion and contraction of the pipe takes place with changes of temperature. If rigid piping is used a loop or coils in the pipe may provide the required flexibility.

Cock and valves

Gauges should normally be fitted with either a cock or valve. This enables the gauge to be removed at any time for checking or any other purpose. These cocks or valves **MUST** be opened or closed slowly to avoid sudden changes of pressure being applied to the gauge.