

MAGNETISM OF NICKEL-COPPER (MONEL) ALLOY

Ashcroft[®] Monel system Duragauge[®] pressure gauges are identified with the alphabetical symbol “P” stamped on the socket wrench flat.

On occasion, some of our customers discover the sockets of these gauges are slightly magnetic. This does not indicate the socket is something other than Monel. Depending on minor variations in the alloy composition of the Monel, the socket may be either magnetic or non-magnetic. To quote an excerpt from INCO International’s Monel Handbook . . .

“It will be noted . . . the Curie temperature lies within the ambient range. It is affected by variations in chemical composition . . . therefore, some heats will be magnetic at room temperature and others not.”

A metal is not magnetic above the Curie temperature.

Monel pressure gauges have K Monel Bourdon tubes, an age hardenable alloy, which becomes magnetic only at cryogenic temperatures below -100°C or approximately -150°F .

A test to confirm whether a socket or Bourdon tube is Monel can be accomplished by placing a drop of nitric acid on the surface of the metal.

The acid will react vigorously with Monel and will generate a green froth. Stainless steel will not react at all and steel will turn black.

Another method used is to heat the pressure gauge to about 120°F (50°C); at this temperature, the socket should lose its magnetism.

If a steel socket is suspected, file or abrade a clean white area on the socket and wrap it in a wet cloth for an hour; steel will develop a film of red rust while Monel and stainless steel will be unaffected.