

### 2.3.8. Pressure gauges

- 2.3.8.1.** All Tanks and containers shall be equipped with listed liquid pressure gauging devices tested as per **Section 6**.
- 2.3.8.2.** Pressure gauges shall be attached directly to the container opening or to a valve or fitting that is directly attached to the container opening.
- 2.3.8.3.** For high-pressure section, the gauge shall have a range of 0 to 300 psi (0 to 20.1 bar) and for low-pressure section, range shall be 0 to 50 psi (0 to 3.45 bar)

### 2.3.9. Pipes

- 2.3.9.1.** Pipes used shall be Carbon Steel (Black Steel), brass, copper HDPE (High density Polyethylene, PE-100) and MDPE (Medium density Polyethylene, MDPE-80) . Pipes shall be listed with Civil Defence. See **section 6**. for acceptable test standards.
- 2.3.9.2.** LPG fill line shall be seamless steel to ASTM A53, ASTM A333 Gr 6 , API 5L, A106 GrB, API 5L GrB schedule 80.
- 2.3.9.3.** Vapour Phase piping must be minimum Schedule 40, Carbon Steel, Seamless conforming to ASTM 106 Gr. B or API 5L with fittings conforming to ASTM A 105, Class 150.
- 2.3.9.4.** Design, fabrication, installation and testing of Piping must conform to ANSI B 31.3 – Process piping.
- 2.3.9.5.** A Hydrostatic Relief (UL approved) must be installed between two Valves in all lines in Liquid Phase service..
- 2.3.9.6.** Below ground Distribution pipe work shall be seamless steel to ASTM A53, A 106 with Denso /Bitumen Tape wrapping or HDPE(PE-100)/MDPE (PE-80) SDR11 . Any underground steel pipe work shall be equipped with properly designed Cathodic protection. Maximum Operating Pressure for HDPE(PE-100)/MDPE (PE-80) shall be calculated according to maximum soil temperature in UAE as + 40 °C including pressure reduction temperature factor as per ISO 13761.
- 2.3.9.7.** Above ground distribution pipe work shall be Seamless Carbon steel Pipe to ASTM A53, Grade B and ASTM 106, Grade B.
- 2.3.9.8.** Above Ground copper Pipe shall confirm to ASTM B280/ BS 2871. Copper piping cannot be used for Maximum Operating Pressure above 75 mbar and cannot be used for risers and droppers with length above 20 m.” Also copper pipe is not applicable in areas with potential risk of third party damage (at roofs and walls).
- 2.3.9.9.** Cast Iron pipes and fittings are not allowed in the system.