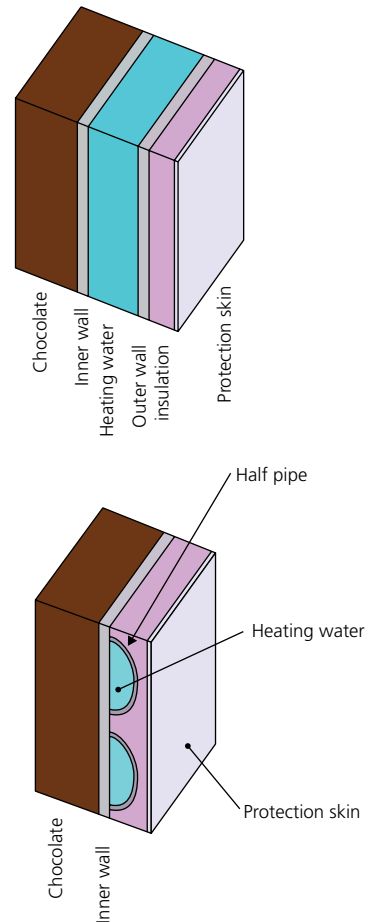


Figure 12.10 Illustration of sections through the walls of chocolate storage tanks.

Chocolate tank construction



It is important to remember that, if the equipment that maintains the temperature of the chocolate in the tank should fail, the chocolate will eventually solidify and the stirrer motor will be overloaded. Not only could this condition result in damage to the tank stirrer, its gearbox and motor it would also require that the tank is emptied by manual labour. If chocolate is allowed to solidify in a tank the heating systems generally do not have sufficient power to re-melt the chocolate. It is recommended that monitoring devices are fitted to the heating systems to warn the operating staff when a breakdown occurs.

12.8 Jacketed pipe work

Jacketed pipe (Figure 12.11) can be manufactured from either mild steel or stainless steel. If mild steel is used the pipe will be joined with flanges and gaskets. For stainless steel pipes hygienic unions can be used, these are available

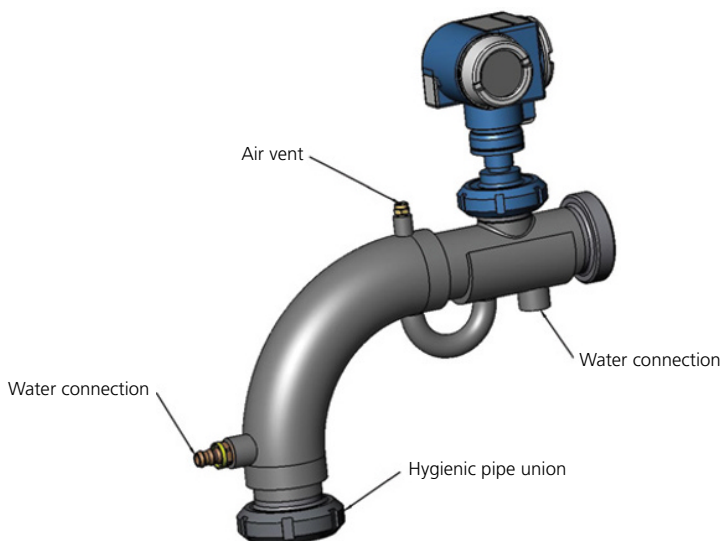


Figure 12.11 Illustration of section of lagged pipeline with pressure transmitter.

to the maximum size of 100 mm (4 in) and for most types the generally accepted maximum pressure rating is 10 bar. Wherever possible an over-pressure protection device should be fitted in to the pipework, preferably just after the pump. This can be either a conventional spring operated valve or a pressure transducer interlocked with the stop circuit of the pump. If a spring device is fitted, it must be kept at the same temperature as the other pipe in the system, the the discharge pipe from the valve must also be kept warm.

For stainless steel jacketed pipe it is recommended that type 316 stainless steel is used throughout and good manufacturing practices should be used at all times during the welding process. On completion both the jacket and the internal pipe should be pressure tested.

12.8.1 Corrosion of stainless steel

The corrosion resistance of stainless steel is greatest when a layer of oxide film is formed on its surface. If the oxide film is damaged or destroyed the stainless steel becomes much less resistant to corrosion. Care must be taken when welding and fabricating not to contaminate the stainless steel with particles of carbon steel and procedures must be in place to restore any damaged areas.

Any anti-corrosion water treatment should not impair the heat transfer function of the water and ideally contain a biocide. The treatment chemicals must be compatible with all the metals used in the system and be of a food grade quality.

Solid particles, sludge and fouling organisms should not be allowed to settle in the bottom of jacketed pipe work and tanks, since this contributes to the corrosion process.