

With the development of new processes in Petro-Chem and other areas, low temperature services are becoming more common. Experience has established the following guidelines for this area. These are general; specific applications should be reviewed with Worcester personnel.

1. Carbon steel is not usable below -20°F . It becomes brittle and loses its resistance to sudden pressure rise. (This includes hardware, body bolts and nuts). Stainless steel or specially formulated and treated carbon steel is required.
2. TFE has a high shrink rate resulting in high valve torque below -70°F . Polyfill® seats have a lower shrink rate and may be used to -70°F . Special configurations may be used to -454°F .
3. The following materials are recommended as indicated:
 - a. EPR to -70°F .
 - b. Buna "N" body seals will also perform to -70°F .
 - c. Delrin® AF will perform to -70°F and has less shrinkage than TFE in services at -100°F or below .
4. Valves must have the relief hole in the upstream side of the ball to prevent seat collapse, for as the body cavity warms up with the valve closed, expansion of trapped media can occur. This hole is extremely important in this service. There are other special services where this relief is mandatory.
5. The best body seal is our standard Teflon® coated "S" gasket, (used in fire valves). Standard TFE seals do not perform well below -20°F , particularly if there is thermal cycling involved. They will not seal if the thermal cycle exceeds 200°F .
6. For cryogenic services below -100°F , a different valve seat is required. Use Worcester's standard cryogenic valve.
7. If using actuators, try to expose them to warmth if possible . If not, they should be cleaned of all grease and given a coating of silicone or other very light oil as a lubricant due to the tendency for the grease to congeal. The rubber seals in our actuators are not very good below -20°F . Electric actuators are better for services below freezing due to pneumatic airline freeze-ups, etc., but must include a heater and thermostat.
8. Regarding valve lubrication, the Dow Corning® DC-7 furnished as a standard on all balls is not good below -30°F . It becomes very stiff. A number "0" silicone grease could be used if absolutely required to -100°F , however, the valves will work well with unlubricated seats. Body seals should be lubricated.