Technical Bulletin

Fusible Plug Pressure Performance

Mueller Refrigeration fusible plugs are critical safety devices designed to protect refrigeration systems from explosion or fire by providing a pressure relief path when a specific temperature is reached. Unlike standard pressure relief valves that actuate based on internal pressure, a fusible plug functions by melting a low-temperature alloy element when the environment reaches a predetermined temperature threshold.

Pressure Capacity and Operating Limits

A common technical inquiry is the maximum pressure a fusible plug can withstand. While these devices are specifically temperature-sensitive, it should be noted that they also exhibit high pressure-bearing capabilities under normal operating conditions:

- **Lab Testing:** Hydrostatic tests in Mueller laboratories have demonstrated that these plugs can maintain integrity at pressures up to 10,000 PSIG when held at ambient temperatures.
- **Operational Margin:** Fusible plugs are designed to withstand the saturated pressure of a refrigerant as long as the operating temperature remains at least 20°F (11°C) below the stamped melting temperature of the plug.
- **Melting Points:** Common Mueller fusible plugs are rated for melting temperatures such as 168°F, 210°F, and 283°F.

The "Creep" Phenomenon

As the operating temperature of the system approaches the rated melting temperature of the fusible alloy, the metal enters its "plastic range". In this state, internal system pressure can cause the alloy to extrude or "creep" beyond the plug body.

This "creeping" will continue under high-temperature/high-pressure conditions until a leak eventually develops. Therefore, pressure only becomes an issue for the integrity of the plug when the system temperature is no longer within the safe operating margin (the 20°F buffer).

UL 207 Certification and Marking

It is important to note that the UL 207 certification for fusible plugs specifically addresses their temperature rating, not a standard design pressure.

- **Testing Standard:** In accordance with UL 207, tests are conducted to verify the specific relief temperature at which the element melts and blows out.
- **Marking Exemptions:** Under UL 207, Section 31.9, most refrigerant-containing components must be permanently marked with their design pressure; however, fusible plugs are explicitly exempt from this pressure-marking requirement. This further underscores that their safety function is defined by temperature rather than a specific pressure limit.

Summary

Mueller Fusible Plugs are engineered as high-reliability, leak-proof safety devices whose performance is defined by temperature rather than pressure limits. In accordance with UL 207—which explicitly exempts these components from standard pressure-marking requirements—internal system pressure does not compromise component integrity provided the operating temperature remains outside the alloy's plastic range (at least 20 °F below the rated melting point).