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Oakhurst Dairy – New Milk Cooler**SECTION 15110 - VALVES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following general-duty valves:
1. Bronze ball valves.
  2. Stainless steel ball valves.
  3. Bronze check valves.
  4. Bronze gate valves.
  5. Bronze globe valves.
  6. Cast-iron plug valves.
  7. Resilient-seated, cast-iron, eccentric plug valves.
- B. Related Sections include the following:
1. Division 15 Section "HVAC Instrumentation and Controls" for control valves and actuators.

**1.3 DEFINITIONS**

- A. The following are standard abbreviations for valves:
1. CWP: Cold working pressure.
  2. EPDM: Ethylene-propylene-diene terpolymer rubber.
  3. NBR: Acrylonitrile-butadiene rubber.
  4. PTFE: Polytetrafluoroethylene plastic.
  5. SWP: Steam working pressure.
  6. TFE: Tetrafluoroethylene plastic.

**1.4 SUBMITTALS**

- A. Product Data: For each type of valve used. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.

**1.5 QUALITY ASSURANCE**

- A. ASME Compliance: ASME B31.9 for building services piping valves.

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1. Exceptions: Domestic hot- and cold-water force main piping valves unless referenced.
- B. ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.
- C. NSF Compliance: NSF 61 for valve materials for potable-water service.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Prepare valves for shipping as follows:
  1. Protect internal parts against rust and corrosion.
  2. Protect threads, flange faces, grooves, and weld ends.
  3. Set angle, gate, and globe valves closed to prevent rattling.
  4. Set ball and plug valves open to minimize exposure of functional surfaces.
  5. Set butterfly valves closed or slightly open.
  6. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
  1. Maintain valve end protection.
  2. Store valves indoors and maintain at higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

**PART 2 - PRODUCTS****2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

**2.2 VALVES, GENERAL**

- A. Refer to Part 3 "Valve Applications" Article for applications of valves.
- B. Bronze Valves: NPS 2 and smaller with threaded ends, unless otherwise indicated.
- C. Ferrous Valves: NPS 2-1/2 and larger with flanged ends, unless otherwise indicated.
- D. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream pipe, unless otherwise indicated.
- F. Valve Actuators:
  1. Handwheel: For valves other than quarter-turn types.
  2. Lever Handle: For quarter-turn valves NPS 6 and smaller, except plug valves.

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- 3. Wrench: For plug valves with square heads. Furnish Owner with 1 wrench for every 10 plug valves, for each size square plug head.
- G. Extended Valve Stems: On insulated valves.
- H. Valve Flanges: ASME B16.1 for cast-iron valves, ASME B16.5 for steel valves, and ASME B16.24 for bronze valves.
- I. Valve Grooved Ends: AWWA C606.
  - 1. Solder Joint: With sockets according to ASME B16.18.
    - a) Caution: Use solder with melting point below 840 deg F for angle, check, gate, and globe valves; below 421 deg F for ball valves.
  - 2. Threaded: With threads according to ASME B1.20.1.
- J. Valve Bypass and Drain Connections: MSS SP-45.

**2.3 COPPER-ALLOY BALL VALVES**

- A. Manufacturers:
  - 1. Two-Piece, Copper-Alloy Ball Valves:
    - a) Conbraco Industries, Inc.; Apollo Div.
    - b) Crane Co.; Crane Valve Group; Crane Valves.
    - c) Crane Co.; Crane Valve Group; Jenkins Valves.
    - d) Crane Co.; Crane Valve Group; Stockham Div.
    - e) DynaQuip Controls.
    - f) Flow-Tek, Inc.
    - g) Grinnell Corporation.
    - h) Hammond Valve.
    - i) Honeywell Braukmann.
    - j) Jamesbury, Inc.
    - k) Jomar International, LTD.
    - l) Kitz Corporation of America.
    - m) Legend Valve & Fitting, Inc.
    - n) Milwaukee Valve Company.
    - o) Nexus Valve Specialties.
    - p) NIBCO INC.
    - q) R & M Energy Systems (Borger, TX).
    - r) Red-White Valve Corp.
    - s) Richards Industries; Marwin Ball Valves.
    - t) Watts Industries, Inc.; Water Products Div.
- B. Copper-Alloy Ball Valves, General: MSS SP-110.
- C. Two-Piece, Copper-Alloy Ball Valves: Brass or bronze body with full-port, chrome-plated bronze ball; PTFE seats; and 600-psig minimum CWP rating and blowout-proof stem.

**2.4 STAINLESS STEEL BALL VALVES**

- A. Manufacturers:

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1. Two-Piece, Stainless Steel Ball Valves:
  - a) Conbraco Industries, Inc.; Apollo Div.
  - b) Crane Co.; Crane Valve Group; Crane Valves.
  - c) Crane Co.; Crane Valve Group; Jenkins Valves.
  - d) Crane Co.; Crane Valve Group; Stockham Div.
  - e) DynaQuip Controls.
  - f) Flow-Tek, Inc.
  - g) Grinnell Corporation.
  - h) Hammond Valve.
  - i) Honeywell Braukmann.
  - j) Jamesbury, Inc.
  - k) Jomar International, LTD.
  - l) Kitz Corporation of America.
  - m) Legend Valve & Fitting, Inc.
  - n) Milwaukee Valve Company.
  - o) Nexus Valve Specialties.
  - p) NIBCO INC.
  - q) R & M Energy Systems (Borger, TX).
  - r) Red-White Valve Corp.
  - s) Richards Industries; Marwin Ball Valves.
  - t) Watts Industries, Inc.; Water Products Div.
- B. Stainless Steel Ball Valves, General: MSS SP-110.
- C. Two-Piece, Stainless Steel Ball Valves: Stainless Steel body with full-port, stainless steel ball; PTFE seats; and 600-psig minimum CWP rating and blowout-proof stem.

**2.5 FERROUS-ALLOY BALL VALVES**

- A. Manufacturers:
  1. American Valve, Inc.
  2. Conbraco Industries, Inc.; Apollo Div.
  3. Cooper Cameron Corp.; Cooper Cameron Valves Div.
  4. Crane Co.; Crane Valve Group; Stockham Div.
  5. Flow-Tek, Inc.
  6. Foster Valve Co.
  7. Hammond Valve.
  8. Jamesbury, Inc.
  9. Jomar International, LTD.
  10. Kitz Corporation of America.
  11. KTM Products, Inc.
  12. McCANNA, Incorporated.
  13. Milwaukee Valve Company.

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- 14. NIBCO INC.
- 15. PBM, Inc.
- 16. Richards Industries; Marwin Ball Valves.
- 17. Worcester Controls.
- B. Ferrous-Alloy Ball Valves, General: MSS SP-72, with flanged ends.
- C. Ferrous-Alloy Ball Valves: Class 150, full port.

**2.6 BRONZE CHECK VALVES**

- A. Manufacturers:
  - 1. Type 3, Bronze, Swing Check Valves with Metal Disc:
    - a) American Valve, Inc.
    - b) Cincinnati Valve Co.
    - c) Crane Co.; Crane Valve Group; Crane Valves.
    - d) Crane Co.; Crane Valve Group; Jenkins Valves.
    - e) Crane Co.; Crane Valve Group; Stockham Div.
    - f) Grinnell Corporation.
    - g) Hammond Valve.
    - h) Kitz Corporation of America.
    - i) Legend Valve & Fitting, Inc.
    - j) Milwaukee Valve Company.
    - k) NIBCO INC.
    - l) Powell, Wm. Co.
    - m) Red-White Valve Corp.
    - n) Walworth Co.
    - o) Watts Industries, Inc.; Water Products Div.
  - B. Bronze Check Valves, General: MSS SP-80.
  - C. Type 1, Class 125, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
  - D. Type 1, Class 125, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.
  - E. Type 1, Class 150, Bronze, Horizontal Lift Check Valves: Bronze body with bronze disc and seat.
  - F. Type 1, Class 150, Bronze, Vertical Lift Check Valves: Bronze body with bronze disc and seat.
  - G. Type 2, Class 125, Bronze, Horizontal Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
  - H. Type 2, Class 125, Bronze, Vertical Lift Check Valves: Bronze body with nonmetallic disc and bronze seat.
  - I. Type 3, Class 125, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.

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- J. Type 3, Class 150, Bronze, Swing Check Valves: Bronze body with bronze disc and seat.
- K. Type 4, Class 125, Bronze, Swing Check Valves: Bronze body with nonmetallic disc and bronze seat.
- L. Type 4, Class 150, Bronze, Swing Check Valves: Bronze body with nonmetallic disc and bronze seat.

**2.7 GRAY-IRON SWING CHECK VALVES**

- A. Manufacturers:
  - 1. Cincinnati Valve Co.
  - 2. Crane Co.; Crane Valve Group; Crane Valves.
  - 3. Crane Co.; Crane Valve Group; Jenkins Valves.
  - 4. Crane Co.; Crane Valve Group; Stockham Div.
  - 5. Flomatic Valves.
  - 6. Grinnell Corporation.
  - 7. Hammond Valve.
  - 8. Kitz Corporation of America.
  - 9. Legend Valve & Fitting, Inc.
  - 10. Milwaukee Valve Company.
  - 11. Mueller Co.
  - 12. NIBCO INC.
  - 13. Powell, Wm. Co.
  - 14. Red-White Valve Corp.
  - 15. Walworth Co.
  - 16. Watts Industries, Inc.; Water Products Div.
- B. Gray-Iron Swing Check Valves, General: MSS SP-71.
- C. Type I, Class 125, gray-iron, swing check valves with metal seats.
- D. Type II, Class 125, gray-iron, swing check valves with composition to metal seats.

**2.8 BRONZE GATE VALVES**

- A. Manufacturers:
  - 1. American Valve, Inc.
  - 2. Cincinnati Valve Co.
  - 3. Crane Co.; Crane Valve Group; Crane Valves.
  - 4. Crane Co.; Crane Valve Group; Jenkins Valves.
  - 5. Crane Co.; Crane Valve Group; Stockham Div.
  - 6. Grinnell Corporation.

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7. Hammond Valve.
  8. Kitz Corporation of America.
  9. Legend Valve & Fitting, Inc.
  10. Milwaukee Valve Company.
  11. NIBCO INC.
  12. Powell, Wm. Co.
  13. Red-White Valve Corp.
  14. Walworth Co.
  15. Watts Industries, Inc.; Water Products Div.
- B. Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy handwheel.
- C. Type 1, Class 125, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.
- D. Type 1, Class 150, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge and union-ring bonnet.
- E. Type 2, Class 125, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.
- F. Type 2, Class 150, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge and union-ring bonnet.

**2.9 CAST-IRON GATE VALVES**

- A. Manufacturers:
1. Cincinnati Valve Co.
  2. Crane Co.; Crane Valve Group; Crane Valves.
  3. Crane Co.; Crane Valve Group; Jenkins Valves.
  4. Crane Co.; Crane Valve Group; Stockham Div.
  5. Grinnell Corporation.
  6. Hammond Valve.
  7. Kitz Corporation of America.
  8. Legend Valve & Fitting, Inc.
  9. Milwaukee Valve Company.
  10. NIBCO INC.
  11. Powell, Wm. Co.
  12. Red-White Valve Corp.
  13. Walworth Co.
  14. Watts Industries, Inc.; Water Products Div.
- B. Cast-Iron Gate Valves, General: MSS SP-70, Type I.

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- C. Class 125, NRS, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, nonrising stem, and solid-wedge disc.
- D. Class 125, OS&Y, Bronze-Mounted, Cast-Iron Gate Valves: Cast-iron body with bronze trim, rising stem, and solid-wedge disc.
- E. Class 125, NRS, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, non-rising stem, and solid-wedge disc.
- F. Class 125, OS&Y, All-Iron, Cast-Iron Gate Valves: Cast-iron body with cast-iron trim, rising stem, and solid-wedge disc.

**2.10 BRONZE GLOBE VALVES**

- A. Manufacturers:
  - 1. Cincinnati Valve Co.
  - 2. Crane Co.; Crane Valve Group; Crane Valves.
  - 3. Crane Co.; Crane Valve Group; Jenkins Valves.
  - 4. Crane Co.; Crane Valve Group; Stockham Div.
  - 5. Grinnell Corporation.
  - 6. Hammond Valve.
  - 7. Kitz Corporation of America.
  - 8. Legend Valve & Fitting, Inc.
  - 9. Milwaukee Valve Company.
  - 10. NIBCO INC.
  - 11. Powell, Wm. Co.
  - 12. Red-White Valve Corp.
  - 13. Walworth Co.
- B. Bronze Globe Valves, General: MSS SP-80, with ferrous-alloy handwheel.
- C. Type 1, Class 125, Bronze Globe Valves: Bronze body with bronze disc and union-ring bonnet.
- D. Type 1, Class 150, Bronze Globe Valves: Bronze body with bronze disc and union-ring bonnet.
- E. Type 2, Class 125, Bronze Globe Valves: Bronze body with nonmetallic disc and union-ring bonnet.
- F. Type 2, Class 150, Bronze Globe Valves: Bronze body with nonmetallic disc and union-ring bonnet.
- G. Type 3, Class 125, Bronze Globe Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.
- H. Type 3, Class 150, Bronze Globe Valves: Bronze body with bronze disc and renewable seat. Include union-ring bonnet.



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Oakhurst Dairy – New Milk Cooler**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- C. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- D. Examine threads on valve and mating pipe for form and cleanliness.
- E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- F. Do not attempt to repair defective valves; replace with new valves.

**3.2 VALVE APPLICATIONS**

- A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
  - 1. Shutoff Service: Ball, or gate valves.
  - 2. Throttling Service: Globe valves.
  - 3. Pump Discharge: Spring-loaded, lift-disc check valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Low-Pressure, Compressed-Air Piping: Use the following types of valves:
  - 1. Ball Valves, NPS 2 1/2" and Smaller: two-piece, 400-psigCWP rating, copper -alloy
  - 2. Manifold Ball Valves, one piece blowout proof stem, bronze or 316 SS trim, vented ball 600 lbs.wog.
- D. Domestic Water Piping (CW, HW): Use the following types of valves:
  - 1. Ball Valves, NPS 2 and Smaller: Two-piece, 400-psigCWP rating, copper alloy.
- E. Select valves with the following end connections:
  - 1. For Copper pipe, NPS 2 and Smaller: Solder-joint or threaded ends.
  - 2. For Copper pipe, NPS 2-1/2 to NPS 4: Flanged ends.
  - 3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
  - 4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends.
  - 5. For Steel Piping, NPS 5 and Larger: Flanged ends.

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6. For Grooved-End, Copper Tubing and Steel Piping: Valve ends may be grooved.

**3.3 VALVE INSTALLATION**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe.
- E. Install valves in position to allow full stem movement.
- F. Install check valves for proper direction of flow and as follows:
  1. Swing Check Valves: In horizontal position with hinge pin level.
  2. Dual-Plate Check Valves: In horizontal or vertical position, between flanges.
  3. Lift Check Valves: With stem upright and plumb.

**3.4 JOINT CONSTRUCTION**

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Grooved Joints: Assemble joints with keyed coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

**3.5 ADJUSTING**

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION 15110