

WVU DESIGN GUIDELINES & CONSTRUCTION STANDARDS

DIVISION 22 – PLUMBING

SECTION 222000 – MECHANICALLY GROOVED PIPING

PART 1 - GENERAL

- 1.1 Any deviances from the following instructions must be approved during design by WVU Facilities Management Personnel.
- 1.2 Definitions
 - A. (DZR) Dezincification Resistant brass
 - B. (EPDM) Ethylene Propylene Dimonomer
 - C. (NFPA) National Fire Protection Association
 - D. (NPS) Nominal Pipe Size: Measuring pipe using inches
 - E. (PSI) Pounds per Square Inch: Unit used to measure pressure
- 1.3 Mechanical grooved end pipe couplings, fittings, valves and specialties are permitted to be installed or finished in lieu of welded, threaded, or soldered fittings and flanged end components on the following piping systems.
 - A. Domestic Water
 - B. Hydronic
 1. Hot water
 2. Chilled water
 3. Condensing water
 4. Glycol piping
 - C. Sprinkler System/ Fire Protection
 - D. Steam

PART 2 - PRODUCTS

- 2.1 Recommended Manufacturers: Victaulic Company of America (Basis of Design)
 - A. Any other products or manufacturers will be considered when adequate information is provided to WVU Facilities Management Personnel.

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2.2 Valves

A. Mechanical Grooved Butterfly Valves

1. 300 PSI rating with disc offset from the stainless steel stem centerline to allow 360 degree seating. EPDM seat shall be pressure responsive, bubble tight seal
 - a. Grooved ductile iron valve for carbon steel applications
 - b. Grooved stainless steel valve for stainless steel applications
 - c. Grooved brass casting valve for copper system
 - d. Grooved ductile iron valve for fire protection systems with weatherproof actuator and pre-wired supervisory switches

B. Tri-Service Valve Assembly

1. Combination shut-off, throttling and non-slam check valve. Working pressures to 300 psi.
 - 1) Basis of Design
 - a) Vic®-300 MasterSeal™ butterfly valve with Series 716 or Style 779 Venturi Check. Series 779 check valve with venturi like taps for flow measurement.
 - b. 14" through 24" sizes. Working pressures to 232 psi.
 - 1) Basis of Design
 - a) Victaulic AGS Vic300 butterfly valve with gear operator and with Series W715 Check Valve.

C. Grooved End Check Valves

1. For Hydronic Systems:
 - a. Spring Assisted with 300 psi rating with stainless steel spring and shaft
2. For Fire Protection Systems:
 - a. Wet Systems - Spring Assisted with 265 psi rating with stainless steel spring and shaft; Alarm Check valves rated to 300 psi. Must be compatible to accept riser check kit.
 - b. Dry Systems – Low differential, latched clapper design with black enamel coated ductile iron body. Stainless steel spring and shaft with EPDM Seal and brass seat. Valve internal parts shall be replaceable without removing valve from installed position. Required air pressure is 13psi and water working pressure is rated to 300 psi.

D. Manual Balancing Valves

1. 2" and under
 - a. Valves shall be Y-patterned globe style with 4 full turn hand wheel for precise measurement. Valves shall be made of A metal DZR brass.
2. 2" to 16"

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- a. Valves shall be Y-patterned globe style with ductile-iron body and hand wheel capable of 8, 12, or 20 turn. All other parts shall be made of A metal DZR brass.

2.3 Couplings

- A. Designs that permit gaps or spaces at bolt pads or require a torque per written manufacturer's installation instructions are not permitted. Gasket must be compatible for the intended service and rated from -30 to 250 deg F.
- B. Domestic Water
 1. Grooved Copper 2" and above: rigid style coupling with visually verified angled bolt pad
 2. Grooved Stainless Steele 2" and above: rigid style coupling with visually verified angled bolt pad
- C. For Hydronic/Plumbing Systems:
 1. 2" to 12" Rigid: Installation ready coupling with visually verified angled bolt pad
 2. Flexible couplings may only be used in lieu of flex connectors for noise and vibration attenuation and for accommodation of expansion and contraction.
 - a. 2"-8" Flexible: installation ready coupling with visually verified bolt pad to bolt pad contact
 - b. 10"-12" Flexible: visually verified bolt pad to bolt pad contact
 3. 14" and above: rigid and flexible must be two-segment couplings with lead-in chamfer on housing key and wide-width Flush Seal gasket.
 4. Grooved Copper 2" and above: rigid style coupling with visually verified angled bolt pad
- D. For Saturated Steam:
 1. Rigid type, suitable for saturated steam piping system on schedule 40 or 80 carbon steel pipe with operating temperatures to +366 deg F and 150 psi in pipe size NPS 2 through NPS 8 (DN50 through DN200)
 2. Pipe & Fittings shall meet Victaulic specification OGS-200 groove profile.
- E. For Fire Protection:
 1. 2" to 12" Rigid: Installation ready coupling with visually verified angled bolt pad
 2. Flexible couplings used in seismic areas where required by NFPA 13.
 - a. 2"-8" Flexible: installation ready coupling with visually verified bolt pad to bolt pad contact
 - b. 10"-12" Flexible: visually verified bolt pad to bolt pad contact

2.4 Hydronic Specialties

- A. Strainers:
 1. 300 PSI rating with stainless steel basket. Removable cover shall be mechanically coupled.
 2. Grooved end tee strainer

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3. Grooved end wye strainer
- B. Suction Diffuser:
 1. grooved ends w/ removable startup screen
- 2.5 Sprinkler Heads
 - A. In lieu of rigid pipe offsets or return bend for sprinkler drops, multiple-use flexible stainless steel sprinkler drop system may be used.
 1. Drop shall consist of braided type 304 stainless steel flexible tube and zinc plated steel reducers for connections to sprinkler head.

PART 3 - EXECUTION

- 3.1 Quality Assurance
 - A. All grooved products shall be of the same manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. A factory trained representative (direct employee) of the coupling manufacturer shall provide on-site training for contractor's field personnel in the use of grooving tools, application of groove, and product installation. Training should be documented and submitted to engineer and owner.
 - B. Grooved piping installation certification: an IACET certified manufacturer's inspector shall inspect the installation of all grooved piping products to ensure that the installation has been made in accordance with the manufacturer's installation instructions as follows:
 1. Inspector shall make observations of coupling installations in accordance with the latest revisions of the coupling manufacturer's installation instructions. The frequency of the observations shall be adjusted with the pace of the project to ensure that 100% of the installation is observed at each stage of completion.
 2. The installation contractor must provide access to all couplings and fittings.
 3. The inspector's observations shall be recorded, and all deficiencies noted in the installation shall be tagged for remediation.
 4. At the conclusion of each day's observations, the inspector shall issue a report of their findings referencing the specific systems examined and describing any deficiencies requiring corrective action to the Engineer of Record and the installing contractor.
 5. Upon conclusion of the required inspection and confirmation that any and all deficiencies have been corrected, the manufacturer shall provide a report to the Engineer and installing contractor certifying that the entire installation is in compliance with the manufacturer's requirements.
 6. All costs for required for inspection and additional testing above and beyond the protocol requirements listed above and all costs associated with repair, replacement, schedule impacts, etc., shall be borne by the contractor.

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3.2 Warranties

- A. Upon completion of the manufacturer's inspection of installation, grooved coupling manufacturer shall provide an extended warranty on the HVAC system as agreed upon by the owner, on applicable projects, for the grooved mechanical couplings and fittings.

END OF SECTION 222000