



UNIPIPE COMPRESSED AIR & GAS PIPING SYSTEM SPECIFICATION

GENERAL-SERVICE COMPRESSED AIR, GAS & FLUID PIPING

PART 1 – GENERAL

1.1 SUMMARY

- A. This specification includes piping and related specialties for compressed air, inert gas (Argon, Helium, Nitrogen, CO₂, and Arcal) and fluid (motor oil, transmission fluid, hydraulic oil, windshield washer fluid, waste oil, anti-freeze) systems operating at 232 psig in diameters 20mm (¾”) to 160mm (6”), and 145 PSI in diameters 200mm (8”) to 250mm (10”). Operating temperature at -22°F to +212°F continuous operation, and intermittent operating temperature up to 266°F. Vacuum rating of up to 29” Hg on 20mm (¾”) to 90mm (3-½”), and 25” Hg on 110mm (4”) to 250mm (10”).
- B. This specification also covers UNIPIPE HP (high pressure) piping and related specialties for compressed air, inert gas (Argon, Helium, Nitrogen, CO₂, and Arcal) and fluid (motor oil, transmission fluid, hydraulic oil, windshield washer fluid, waste oil, anti-freeze) systems operating at 1,015 psig in diameters 20mm (¾”) to 63mm (2-1/2”), Operating temperature at -22°F to +212°F continuous operation, and intermittent operating temperature up to 266°F.

1.2 ENGINEERING STANDARDS & QUALITY ASSURANCE

- A. ASME Compliance: Comply with ASME B31.1 (power piping), ASME B31.3 (process piping), and ASME B31.9 (low pressure building services piping).
- B. Piping manufactured to ASTM B241
- C. ISO 9001:2008 SGS Certificate ES13/13865
- D. CNR Number for All Canadian Provinces
 - Category A - OA16981.5
 - Category B - OB21369.5
 - Category C - OC21414.5
 - Category D - OD21371.5
 - Category H - OH21366.5
- E. Quailcoat Pipe Coating Quality Certificate

- G. Pressure / Temperature Certification
6°F/3488 PSI (-15°C/240.5 Bar)
248°F / 2886 PSI (+140°C/199 Bar)

1.3 COMPLIANCE WITH ISO 8573-1 2010

- A. Unipipe Solutions certifies that its UnipipeAIR and UnipipeHP products can be used in plants that must meet the ISO 8573-1 standard with purity classes 1.1.1.
- B. At the end of the assembly operations, a perfect cleaning purge must be done to get a solid particulate concentration equal or lower than the class 1 of the same standard. The full compliance with the standard in question, can be certified only through specific tests performed directly on the plants, according to the same ISO 8573 specification.
- C. Unipipe Solutions systems cannot take the place of any filtering/purification systems. The pipeline will only maintain the air quality obtained by compressors, filters, separators, dryers and other air treatment equipment supplied from third parts.
- D. Main requirements and comments:

Class 1. Particulate

In each cubic meter of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 - 0.5 micron size range, 400 particles in the 0.5 - 1 micron size range and 10 particles in the 1 - 5 micron size range.

To comply with these parameters, suitable suction and delivery filtration systems must be used.

Class 1. Water

A pressure dewpoint (PDP) of -100°F or better is required and no liquid water is allowed.

The design of the system must provide for a correct sizing of the pipes and drying systems suitable to keep the system free from the presence of water.

Class 1. Oil

In each cubic meter of compressed air, not more than 0.01mg of oil is allowed

To prevent the presence of oil, suitable compressors and filtration/separation systems (capable of guarantee the limit values) must be used.

PART 2 – PRODUCTS

2.1 TUBES, AND FITTINGS

- A. Unipipe Aluminum piping system is grade Aluminum alloy EN AW 6060 - T5 according to EN 755-2/2008 (Corresponding to 6063T5-ASTM 241). It is extruded and calibrated within the tolerances of +/- 0.1%, and available in the following diameters:

AIR/NITRO/VACUUM

20 mm outside	18 mm inside
25 mm outside	22.8 mm inside
32 mm outside	29.6 mm inside
40 mm outside	37.4 mm inside
50 mm outside	47.2 mm inside
63 mm outside	59.4 mm inside
75 mm outside	71.2 mm inside
90 mm outside	86 mm inside
110 mm outside	104 mm inside
140 mm outside	132.4 mm inside
160 mm outside	151.4 mm inside
200 mm outside	191 mm inside
250 mm outside	240 mm inside

HP/OIL

20 mm outside	16 mm inside
25 mm outside	20 mm inside
40 mm outside	32 mm inside
50 mm outside	40 mm inside
63 mm outside	51 mm inside

- B. Unipipe pipes are heat painted externally using polyester powders of not less than 60 µm thickness with “Qualicoat” certificate (lic. 472). The internal surface is phosphatized.
- C. Fittings are Unipipe Aluminum Alloy EN Aw 6061 T6 corresponding to ASTM B241 - 6061T6 A360 & ZL104 Aluminum without the use of plastic or polyamide fitting bodies. Pipe-to-pipe sealing utilizes standard HNBR O-Rings.
- D. The nuts on the fittings are anodized with a minimum thickness of 13 µm.
- E. The fitting bodies have a cathoporesis treatment with a minimum thickness of 10 µm.
- F. Fittings 20mm (¾”) to 250mm (10”) utilize 304 Stainless Steel double bite grip/locking rings that bites into pipe past the powder coated surface.
- G. Unipipe ball valves utilize Aluminum Alloy EN Aw 6061 T6 corresponding to ASTM B241 - 6061T6 A360 & ZL104, and have stainless steel internal ball, and teflon seals.

- H. Unipipe or equal are heat painted cast iron valve bodies with brass disc and EPDM seals with lug style bolt connections
- I. Unipipe aluminum class 150 ANSI flanges.

PART 3 – INSTALLATION

3.1 PIPE INSTALLATION

- A. All Unipipe aluminum piping to be installed in accordance with Unipipe installation instructions and specifications.
- B. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls.
- C. Install piping adjacent to equipment and machines to allow service and maintenance.
- D. Install nipples, flanges, unions, transition or any other special fittings, and valves with pressure ratings same as or higher than system pressure rating, unless otherwise indicated.
- E. Industry best practice is to Install branch connections (drops) to compressed-air usage points from top of main. Provide drain leg and drain trap at low points.
- F. Install piping to permit valve servicing.
- G. Install piping free of sags. All piping should be either level or with 1% pitch to a low point with a drain off the bottom of the pipe at the lowest point(s).
- H. Install unions, adjacent to each valve and at final connection to each piece of equipment and machine, unless connections and/or valves have tightening features that allow disassembly.
- I. Install sleeves for piping penetrations of walls, ceilings, and floors.
- J. Install escutcheons for piping penetrations of walls, ceilings, and floors.
- K. Provide fire caulk around all penetrations thru fire separations in accordance with the building code. Do not penetrate firewalls without specific instructions from the engineer.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Horizontal and vertical Unipipe piping shall be supported by Unipipe or any other typical industrial pipe fastening hardware. Hangers can be solid rods or flexible cables. Hangers to be spaced at nine-foot intervals or less, or as required by any local codes. Hangers need to eliminate sag, prevent vibration, and allow accurate leveling or grading.

- B. Install supports for vertical tubing every 10' to 12" or as required to secure the piping network.



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