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KLM Technology Group #03-12 Block Aronia, Jalan Sri Perkasa 2 Taman Tampoi Utama 81200 Johor Bahru Malaysia	<b>SPECIFICATION FOR PNEUMATIC TEST</b>  <b>(PROJECT STANDARDS AND SPECIFICATIONS)</b>	

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## SCOPE

This Project Standard and Specification prescribes minimum requirements on pneumatic test procedure and acceptance criteria of piping works.

## REFERENCES

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

1. ASME B31.3 Process Piping
2. ASME SECTION IX "Welding and Brazing Qualifications"
3. ASME SECTION XIII Div 2, AT-502

## DEFINITIONS AND TERMINOLOGY

**Category D fluid service** (per ASME B31.3) – A fluid service in which all the following apply:

- The fluid handled is nonflammable, nontoxic, and not damaging to human tissues.
- The design gauge pressure does not exceed 10.35 bar.
- The design temperature is between -29°C and 186°.

**Category M fluid service** (per ASME B31.3) – A toxic fluid service in which exposure to very small quantities of the fluid in the environment can produce serious irreversible harm to persons on breathing or bodily contact, even when prompt restorative measures are taken.

**Damaging to human tissues** (per ASME B31.3) – A fluid which, under expected operating conditions, can harm skin, eyes, or exposed mucous membranes so that irreversible damage may be done unless prompt restorative measures are taken.

**Design pressure** – The pressure of each component in a piping system which is not less than the pressure at the most severe condition of coincident internal or external pressure (minimum or maximum) expected during service.

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**Test pressure** – The pressure does not exceed stress intensity of yield strength of each component in a piping system at test temperature and should not be lower than design pressure.

## UNITS

This Standard is based on International System of Units (SI) except where otherwise specified. However, nominal sizes of piping component shall be in accordance with inch system.

## PNEUMATIC TESTING

### Circuit Monitoring and Checking

For pneumatic testing of circuits, access to the area of the test shall be limited to only the personnel directly involved in the test or personnel involved in the inspection and monitoring.

During the pressure test the total circuit shall be inspected and tested for any leaks. If any leaks are found on flanged, threaded, plugged or welded joints the system pressure shall be totally released prior to any rectification work starting.

Disciplinary action shall be taken against any individual and/or supervisor authorizing and/or undertaking work on the pressurized system.

For flanged joint testing during pneumatic testing of circuits the flange joints shall be hermetically sealed by means of adhesive paper tape and a pinhole made in the tape to permit easy detection of leaks.

The following equipment and components shall not be included in the system, and this equipment shall be isolated from the test section.

- a. Rotating equipment such as pumps, compressors and turbines.
- b. Safety valves rupture discs, flame arrestor, and stream traps.
- c. Pressure vessels with sophisticated internals.
- d. Equipment and piping lined with refractoriness.
- e. Storage tanks.
- f. Filters, if filter element(s) is not dismantled.
- g. Heat exchangers of which tube sheets and internals have been designed for differential pressure between tube side and shell side.
- h. Instrument such as control valves, pressure gages, level gages, and flow meter. (Excluding thermocouples)

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## Exclusions

The followings are excluded from the testing requirements of this specification :

- a. Any package unit previously tested by the vendor in accordance with the applicable codes.
- b. Plumbing systems, which are tested in accordance with the applicable plumbing codes.
- c. Lines and systems which are open to the atmosphere such as drain, vents, open discharge of relief valve, and atmospheric sewers.

## TEST MEDIUM

The gas used as test medium shall use the nonflammable and nontoxic gas such as N<sub>2</sub> or inert gas, if not compressed air.

## TEST PRESSURE

The test pressure shall be 110% of design pressure and according to test pressure. Equipment for testing should be have as following:

- Air Compressor
- Flexible hose
- Calibrated Pressure gauge
- Oil filter
- Temporary piping set
- N<sub>2</sub> cylinder, if required
- Safety valve

### Note:

Safety valve required for pneumatic testing, rapid opening or pop action of over pressure, should be installed and connected with an adequate system of piping not containing valve which can isolate tested system.

## BLINDS FOR PRESSURE TEST

1. Plain test blanks shall be used with 3mm flat gaskets for blanking flat face, and raised face. Provide full face blanks and gaskets for Class 150 connections. However, where permanent operational blinds are installed, they may be used for pressure testing, provided they are rated the testing pressure.
2. Plate material, extra length bolts and gaskets, which are made at the Job Site could be used the testing.