GIS/PWC1:2025

Gas Industry Standard

Specification for

Acoustic Cladding of Gas Pipe and Equipment Supplementary to ISO 15665:2003

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Contents

Foreword

Gas Industry Standards (GIS) are revised, when necessary, by the issue of new editions. Users should ensure that they are in possession of the latest edition. Contractors and other users external to Gas Transporters should direct their requests for copies of a GIS to the department or group responsible for the initial issue of their contract documentation.

Comments and queries regarding the technical content of this document should be directed in the first instance to the contract department of the Gas Transporter responsible for the initial issue of their contract documentation.

This standard calls for the use of procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Compliance with this engineering document does not confer immunity from prosecution for breach of statutory or other legal obligations.

Mandatory and non-mandatory requirements

For the purposes of a GIS the following auxiliary verbs have the meanings indicated:

can indicates a physical possibility;

may indicates an option that is not mandatory;

shall indicates a GIS requirement;

should indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better, level of protection.

Disclaimer

This engineering document is provided for use by Gas Transporters and such of their contractors as are obliged by the terms of their contracts to comply with this engineering document. Where this engineering document is used by any other party, it is the responsibility of that party to ensure that the engineering document is correctly applied.

Brief history

First Published as BGC/PS/PWC1: Part 1	October 1979
Amended issue published as GBE/PWC1: Part 1	June 1993
Editorial update to reflect demerger November 2000	June 2001
Editorial update to reflect merger October 2002	November 2002
Editorial update to comply with GRM	July 2004
Editorial update for National Grid re-branding	October 2005
Technical review to create supplementary specification to ISO 15665. Publication as a GIS.	January 2025

Key changes

Section	Amendment
All	Alignment to ISO 15665 as a supplementary document
All	All Incorporation SP/PWC/1 Parts 1 and 2 into singular document

1. Scope

Add:

This Gas Industry Standards (*GIS) specifies additional and modified requirements for acoustic cladding of gas pipe and other equipment such as valves, regulators and flanges. It does not cover acoustic cladding of large vessels.

This specification is supplementary to ISO 15665:2003 and amends the requirements of ISO 15665:2003 with either additions, removals or replacements instructions for specific clauses and the relevant clause in ISO 15665:2003 is stated. Where no supplementary requirement is included in this specification then the requirements of ISO 15665:2003 apply as appropriate.

Where *Add*: is written this will be in addition to ISO 15665:2003

Where *Modify*: is written, this is an amendment to ISO 15665:2003

2. Normative References

Add:

2.1 International Standards

BS EN 485 part 1-4	Aluminium and aluminium alloys - Sheet, strip and plate
BS 1473	Specification for wrought aluminium alloys for general engineering purposes: rivet, bolt and screw stock
BS EN 10143	Continuously hot-dip coated steel sheet and strip. Tolerances on dimensions and shape
BS 5970	Thermal insulation of pipework, ductwork, associated equipment and other industrial installations in the temperature range of -100°C to +870°C. Code of practice

2.2 Gas Distribution Network (GDN) standards

GIS/PA10:2020	Maintenance Painting at Works and Site for Above Ground Pipeline and Plant Installations

3. Terms and Definitions

For the purposes of this document, the terms and definitions given in ISO 15665 shall apply.

Add:

3.1	**Contractor**	The person, firm or company with whom a Gas Transporter enters into a contract to which this Standard applies, including the Contractor's personal representatives, successors and permitted assigns
3.2	**Engineer**	The engineer appointed by a Gas Transporter and notified in writing to the Contractor to act as Engineer for the purposes of the contract
3.3	**Small bore pipe**	Pipe of 25 mm nominal size and below

4. Classes of acoustic insulation

As per ISO 15665.

5. Guide to the reduction of noise from pipes

As per ISO 15665.

6. Construction of typical acoustic insulation systems

6.1 General

Add:

Acoustic Insulation systems that are easily removable shall be used to facilitate inspection of insulated assets.

6.2 Cladding

6.2.1 General

Add:

If mastic sealants are used in between cladding/jacket sheets, they should be applied while the sheets are being assembled and not after assembly.

6.2.2 Materials for the outer layer

Add:

Metal jacket materials shall meet the following requirements:

a) For carbon steel surfaces, it shall be galvanized mild steel, aluminium coated mild steel or stainless steel sheet.

b) For stainless steel surfaces, it shall be aluminium, aluminium coated mild steel or stainless steel sheet. Galvanized steel shall **not** be used.

c) Stainless steel sheet shall have similar rigidity and durability to the galvanized mild.

d) Galvanized mild steel sheet shall be to BS 2989.

e) Aluminium alloy sheet shall be to BS 1470, material designation 3103 condition H4.

f) Aluminium coated mild steel shall have an aluminium coating which does not contain more than 6% magnesium.

6.3 Porous layer

Modify:

The following are examples of suitable materials for use as porous layer:

- mineral fibre (glass, rock, ceramic).
- open-cell flexible plastic/elastomeric foam.

6.4 Support of the cladding

As per ISO 15665.

7. Installation

7.1 General

Add:

Further installation requirements as defined by this specification are provided in Annex - A.

7.2 Extent of insulation

As per ISO 15665.

7.3 End caps

As per ISO 15665.

7.4 Acoustic enclosures

Add:

For the purpose of this specification, the term acoustic boxes shall be used to describe the acoustic insulation fitted to components such as valves and flanges. Acoustic boxes that are large enough for a person to enter are deemed to be acoustic enclosures and are not covered by this specification.

For other than simple boxes, an outline drawing of its requirements to facilitate the production of detail drawings shall be issued.

Each section of an acoustic box shall include a rigid frame to which the inner and outer sheets are fixed.

Unless stated otherwise and insulation material dependant, acoustic boxes shall comprise a layer of insulation material retained between an outer layer and a perforated metal inner sheet. The perforated sheet shall have 50% open area and, if made of carbon steel, shall be hot-dip galvanized. Galvanized perforated sheet shall not be used where stainless steel pipes or valves are being clad.

Acoustic boxes shall be robustly constructed and shall be of a shape and size that allows fitting without affecting the operation of the enclosed equipment. There shall be at least 6 mm clearance between the enclosed equipment and the inside face of the acoustic box.

Acoustic boxes shall be of split construction and so assembled that removal of one or two sections shall not cause the remainder to fall off. Each section shall incorporate quick release toggle type catches and locating devices.

Acoustic boxes shall either be supported from the rim of the flange of the equipment being enclosed or shall be free standing.

In special cases, acoustic boxes shall be provided with easily removable panels of sufficient size to allow easy maintenance or viewing of the enclosed equipment.

All acoustic boxes shall have a 12 mm diameter vent hole in the outer sheet, positioned so as to prevent the ingress of water.

All acoustic box frames and structures shall be suitably protected against corrosion. The method proposed by the Contractor shall be stated in the tender.

Any small-bore pipe that is to enter an acoustic box should do at box joints rather than by passing through the box wall. If it is necessary to re-position some of the pipe, the work shall be completed by the Gas Transporter or the pipework Contractor prior to fabrication of the acoustic boxes.

Modify:

Demountable sections of acoustic boxes shall have two lifting handles. They shall be fitted with weight stickers, and no section shall exceed allowable manual handling limits.

7.5 Prevention of mechanical damage

Add:

For protection of pipe and equipment before application of acoustic insulation see Annex - A of this specification.

8. Combined thermal and acoustic insulation

8.1 General

Add:

Thermal-acoustic insulation systems are available on the market that utilise multiple layers of different materials that provide a specific function to the system as a whole. However, the fundamental principles of acoustic insulation performance as provided in ISO 15665 are applied and these entire systems are qualified to a particular ISO 15665 insulation class.

9. Acoustic insulation that meet the insulation class requirements

As per ISO 15665.

Annex - A Installation requirements

A.1 General

The Engineer shall ensure that adequate supervision is provided on site and that the Gas Transporter appointed supervisor understands the essentials of correct acoustic cladding installation.

Any proposed deviation from this specification shall be clearly specified in writing and shall not be implemented without a written acceptance.

Cladding shall be applied by contractors who are approved installers by the insulation system manufacturer (where applicable), using competent staff experienced in this class of work. Evidence of previous works completed/track records to be provided.

The work shall be performed as per the insulation system manufacturer and controlling standards requirements. A detailed method statement and inspection and test plan should be provided to ensure that all work performed is recorded and the appropriate quality assurance procedures are followed.

The finished cladding shall be of good appearance and free from dents and sharp edges.

Nameplates, code inspection plates and stampings on equipment shall be left permanently visible and the cladding shall be properly sealed around them. If this requirement is impracticable, a second plate, permanently marked with the same information and with the word 'DUPLICATE' shall be fixed on the outside of the cladding in the most convenient, adjacent position.

No welding or drilling of pressure parts shall be permitted. Attachments to structural items such as pipe supports shall not be permitted.

Prior to starting work, the Contractor shall be issued with outline drawings of any acoustic boxes where required.

A.2 Materials

The Contractor shall be responsible for ensuring that all materials used, comply with the relevant requirements of this specification and quoted referenced standards.

All cladding materials shall be protected against damage and stored in dry conditions under cover.

During installation, the materials shall be protected with weatherproof sheeting after each day's application, and whenever the weather is inclement. Weatherproof sheeting shall be properly secured.

The materials shall not cause a known hazard to health from particulate matter or toxic fumes, e.g., during application, in use, on removal, or in an emergency situation such as fire.

The Contractor shall, prior to starting work, provide copies of material safety data sheets and product/technical data sheets.

Any materials liable to be in contact with the surface being clad shall not cause it to corrode under normal site conditions or cause an adverse reaction with the applied coating.

Any mastic sealants and bedding strip materials used are suitable for operating temperature range of the asset(s) being insulated.

On stainless steel surfaces operating above 50℃, the water leachable chloride content of the insulation shall not exceed 10 ppm and should be used in conjunction with a suitable barrier paint which does not contain zinc in a metallic form.

On aluminium surfaces other than jacket material, the chloride content of the insulation shall not exceed 25 ppm and the alkalinity shall be in the pH range of 7 to 8.5.

Insulation banding strip may be metallic or non-metallic. If metallic, it shall be the same material as the jacket. It shall have a minimum width of 12 mm. If self-adhesive tape is used for insulation banding, it shall be good commercial quality tape with a minimum width of 50 mm.

Rubber or Neoprene bedding strip shall be 50 mm wide and a minimum of 3 mm thick. The material shall be flexible to provide good isolation from vibration and shall retain its physical properties over the operating temperature range of the asset(s) being insulated.

Nuts, bolts, screws and washers shall be either stainless steel, or of mild steel which has been galvanized, sherardized or bright zinc coated.

Lifting handles, toggle catches and other fittings shall be corrosion resistant and shall be compatible with the materials to which they are attached.

Self-tapping screws shall be to BS 1473, Grade HB 15

A.3 Insulation of pipe

Pipe shall be covered, as far as possible, with preformed sections of insulation cut and profiled to fit and secured as per the manufacturer's interval recommendations.

All bends, tees and elbows shall be covered with mitred sections of the same insulation thickness as on straight pipe.

The finished layers of insulation shall be even, solid, tightly jointed and well secured. Any gaps between sections of insulation shall be tightly packed with material of the same type.

Where multiple layers of insulation are specified, both longitudinal and circumferential joints shall be staggered.

Cladding/jacket sheets shall be as large as practicable to reduce the number of joints.

Cladding/jacket sheets shall have minimum 25 mm longitudinal and 25 mm circumferential lapped joints which shall be arranged to shed water. All lapped joints shall be secured and sealed (e.g. with mastic) during assembly between the entire overlap of the joint to prevent the ingress of water.

Where applicable, the sealant shall be visible when the joint is completed. On completion of the installation all excess sealant shall be removed from the surface of the jacket.

The insulation shall be profiled as closely as possible around branch connections. Where appropriate according to insulation system type, a clearance of approximately 6 mm shall be provided between the cladding/jacket and the branch and this annulus shall be filled with mastic.

No part of an outer metal jacket shall come into contact with the pipe.

Acoustic insulation should not terminate within 500 mm vertically both above or below ground level of the pipe air to ground transition. The insulation shall not cross an Insulation Flange or Insulation Joint.

Where pipe supports require cladding, provision shall be made to accommodate any relative movement caused by thermal expansion between the pipe and its support. For a sliding support, the cladding shall cover only the moving portion of the support. For fixed supports, the Contractor shall be advised of the anticipated degree and direction of the movement. Gaps left in the cladding to cater for such movement shall be kept to a minimum.

The Engineer shall advise the Contractor on suitable minimum clearances that should be provided between the cladding and the pipe supports to accommodate pipe movement.

A.4 Site Requirements and Regulations

The Contractor shall be governed by the requirements and regulations relating to the specific site. These will generally cover the following:

a) Site instructions, discipline and tidiness.

b) Site access, roads and parking facilities.

c) Site amenities and services.

d) Locations of temporary stores and buildings.

e) Safety regulations and precautions.

f) Permit to Work system.

g) Rubbish disposal.

h) Fire prevention.

i) Security

j) Personnel protective equipment.

Annex - B Protection of pipe and equipment before application of insulation

All pipe and equipment which require acoustic cladding shall have been adequately protected against corrosion by specialist coatings, designed and qualified for use under insulation, before cladding starts.

The execution of corrosion protection work is not the responsibility of the Contractor, before starting work the Engineer shall confirm that the protection is satisfactory.

All surfaces to be clad shall be clean, dry and free from frost at the time of application of the cladding.

Where stainless steel, aluminium or cuprous metal pipe is to be clad (but excluding impulse pipe made from these materials), some form of protection of the pipe surface may be necessary, depending upon the chloride level of the insulation material used (see BS 5970 for guidance).