Gas Industry Standard

GIS/C5:2018

Specification for

Distribution pipe fittings cast in grey cast iron for use up to 7 bar maximum operating pressure

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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 needs to 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 GC/PS/C5	February 1972
Revised as BGC/PS/C5	October 1975
Editorial update to reflect demerger November 2000	June 2001
Editorial update to reflect merger October 2002	November 2002
Editorial Update for Compliance with GRM	August 2004
Edited by BSI in accordance with BS 0-3:1997	August 2006
Reviewed on behalf of the Gas Distribution Networks' Technical Standard Forum by BSI	September 2013
Reviewed by TSF and editorial updates completed	November 2018
Reviewed by TSF	April 2023

1 Scope

This Gas Industry Standard specifies requirements for the production of distribution pipe fittings cast in grey cast iron (grades 14, 17 and 20 as specified in BS EN 1561). They are intended for supply to the gas industry for use up to 7 bar maximum operating pressure.

This standard applies to material for castings for split tees in accordance with GIS/C8 and gate valves in accordance with GIS/V7-1 requiring materials in accordance with BS EN 1561. It does not apply to grey iron pipe fittings in accordance with BS EN 969 or BS 4622.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Formal standards

BS EN 1561, *Founding — Grey cast irons*.

BS EN ISO 6892-1, *Metallic materials. Tensile testing. Method of test at room temperature*.

BS EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*.

Gas industry standards

GIS/C8, *Specification for distribution split tee and collar pipe fittings cast in grey or ductile iron for use up to 7 bar maximum operating pressures*.

3 Term and definition

For the purposes of this standard the following term and definition applies.

3.1
grey cast iron

iron–carbon cast material in which the free carbon is present as graphite, mainly in lamellar form (flake graphite)

NOTE The characterizing properties of the material are its tensile strength and hardness.

4 Quality of metal

The composition of grey cast irons shall be in accordance with BS EN 1561.

The phosphorus content shall be in accordance with Table 1.

Table 1 — Phosphorus content of iron

Grade of iron	Phosphorus % (maximum)
14	0.50
17	0.35
20	0.15

5 Freedom from defects

Casting shall be visually examined for presence of defects. Rectification shall only be permitted for defects which do not entail reducing the thickness in critical areas. Defects shall not be rectified by welding nor impregnation by use of sodium silicate based solutions.

Castings shall be dressed clean, ready for machining and finishing operations. They shall be free from chill and other indication of free carbides and they shall be machinable.

Castings shall not show defects during subsequent manufacturing operations.

6 Moulding

The castings shall be accurately moulded to the engineering pattern or working drawing.

7 Marking

Products conforming to GIS/C5 shall be permanently marked with the following information:

a) the number and date of this standard, i.e. GIS/C5:2018[1)];

b) the name or trademark of the manufacturer or their appointed agent;

c) the manufacturer's contact details;

d) where authorized, the product conformity mark of a third party certification body, e.g. BSI Kitemark.

8 Sampling

Sampling shall be in accordance with BS EN 1561:1997, Clause **8**.

The castings represented by the test bar shall be retained as a separate batch until the tensile strength and phosphorus content of the iron are known.

9 Provision of test bars

Provision of test bars shall be in accordance with BS EN 1561:1997, Clause **8**.

When castings are subject to previously agreed heat-treatment, test bars shall be included with each heat-treatment batch.

10 Dimensions of test bars

Dimensions of test bars shall be in accordance with BS EN 1561:1997, Clause **8**.

11 Tests

Tensile tests shall be in accordance with BS EN ISO 6892-1. Brinell hardness tests shall be in accordance with BS EN ISO 6506-1.

NOTE Information on the relationship between hardness, tensile strength and wall thickness is given in BS EN 1561:1997, Annexes B and C.

[1)] Marking GIS/C5:2018 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

12 Retests

Re-testing shall be carried out in accordance with BS EN 1561:1997, Clause **10**.

13 Pressure testing

Split tee fittings shall be pressure tested in accordance with GIS/C8.

Other castings shall be tested in accordance with BS EN 1561.

14 User instructions

User instructions shall be provided with each item of equipment.

Bibliography

Formal standards

BS 4622:1970, *Specification for grey iron pipes and fittings*.

BS EN 969:1996, *Specification for ductile iron pipes, fittings, accessories and their joints for gas pipelines — Requirements and test methods.*

Gas Industry Standards

GIS/V7-1, *Specification for distribution valves — Part 1: Metal-bodied line valves for use at pressures up to 16 bar and construction valves for use at pressures up to 7 bar.*