

Brazing —

Part 4: Methods for specifying brazing procedure and operator approval testing

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- BNF Metals Technology Centre
- British Association for Brazing and Soldering
- British Non-Ferrous Metals Federation
- Electricity Supply Industry in England and Wales
- Heating and Ventilating Contractors' Association
- Institute of Refrigeration
- Joint Industry Board for Plumbing Mechanical Engineering Services in England and Wales
- Plumbing Trades Union
- Society of British Aerospace Companies Limited
- Welding Institute
- Coopted member

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Foreword

This Part of BS 1723 has been prepared under the direction of the Welding Standards Committee. BS 1723 was originally published as one standard, but this revision has been divided into four Parts as follows:

- *Part 1: Specification for brazing;*
- *Part 2: Guide to brazing;*
- *Part 3: Methods for non-destructive and destructive testing;*
- *Part 4: Methods for specifying brazing procedure and operator approval testing.*

This format has allowed the aspects covered in the guide (see BS 1723-2) to be widened and approvals (both procedure and operator) and methods of testing are included for the first time. Part 4 of the standard includes approval testing of brazing operators and procedure approval for brazing various parent materials. The latter having a bearing on the former. The brazing operator test approval also calls upon the non-destructive and destructive tests specified in BS 1723-3.

This Part of BS 1723 covers the following approval procedures which are a matter for agreement between the contracting parties at the time of placing the order:

- a) approval testing of brazing procedures for brazing various parent materials;
- b) approval testing of brazing operators working to approved brazing procedures;
- c) approval testing of brazing operators when brazing procedure approval is not required.

Brazing operators who work on, and satisfactorily produce, samples as required in a) should be considered as approved in accordance with the requirements of b) for the same test conditions without undergoing further tests.

When non-destructive testing is used for the examination of test brazes, the acceptance levels should be set so that the single or multiple defects are in line with those that are non-rejectable in the manufactured component to which the test relates.

The size and distribution of defects in brazed joints are not universal in character and acceptance or rejection will depend upon the criteria set for defect size, type and distribution as agreed between the contracting parties.

As this Part of BS 1723 is based on requirements to be agreed between the contracting parties, it has been published as a method for specifying and not as a specification. For this reason it is not appropriate for it to be claimed that a brazing procedure or a brazing operator has complied with this Part of BS 1723. A claim of compliance can only be made against the criteria procedures agreed in accordance with this Part of BS 1723.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1.1 Scope

This Part of BS 1723 describes methods for specifying the approval testing of brazing procedures and approval testing of brazing operators as follows.

- a) Section 2 covers the approval testing of brazing methods described in BS 1723-2, using filler metals specified in 6.1 of BS 1723-1:1986.

Approval of a brazing procedure in accordance with this Part of BS 1723 does not imply that the procedure is suitable for all conceivable conditions of service. It may be necessary for the contracting parties to agree to additional test procedures to validate the quality of the product and the procedure by which it is manufactured.

- b) Section 3 covers the approval testing of brazing operators who are to be engaged in the joining of test samples and brazed constructions by the methods described in BS 1723-2 for which an approved brazing procedure is employed.

NOTE 1 The operator carrying out successful brazing procedure approval testing is automatically approved as a brazing operator for that procedure.

NOTE 2 When a brazing procedure has been approved, it is the responsibility of the manufacturer to ensure the procedure is used on the contract where specified and for the ability of the brazing operators to apply the agreed brazing procedure.

- c) Section 4 covers the approval testing of brazing operators who will be engaged in the production of brazed constructions using the methods described in BS 1723-2, and for which the brazing procedure does not have to be approved.

NOTE 3 Users of this standard should be aware of the specific problems associated with joining by brazing some combinations of parent materials and the application of special processes may be necessary to prevent cracking or brittleness of both the parent materials and the filler metal forming the joint. Consideration should always be given to the provision of a detailed brazing procedure with the corresponding approval by the appropriate route.

NOTE 4 The titles of the publications referred to in this standard are listed on the inside back cover.

1.2 Definitions

For the purposes of this Part of BS 1723 the definitions given in BS 1723-1 and BS 499-1 apply together with the following.

1.2.1

brazing procedure

a specific course of action followed when brazing, including a list of materials and the brazing process used

1.2.2

brazing procedure test

the making and testing of a brazed joint, representative of that to be used in production, in order to prove the feasibility of a brazing procedure

NOTE 1 This term is not usually applied to any tests that may have been made during the development of a brazing procedure.

NOTE 2 Sometimes additional joints of different designs are brazed in order to obtain necessary test data and to establish the tolerance limits of the process.

1.2.3

approved brazing procedure

a documented brazing procedure that has been approved by an inspecting authority (1.2.7), either by means of a brazing procedure test or as a result of authentic documented experience gained with the brazing of joints similar to that to which the brazing procedure applies

1.2.4

test

a critical trial (often involving stress) or examination of one or more properties of a material, product or set of observations

1.2.5

test sample

an assembly brazed in accordance with an approved brazing procedure. It may be one of the following:

- a) a brazed construction, either taken from production or made specifically for test purposes;
- b) a brazed joint detached from a brazed construction;
- c) a simulation that will adequately replicate the brazed joint in the production assembly, e.g. for approval testing.

1.2.6

test piece

a portion detached from a test sample and prepared for testing

NOTE This term is synonymous with the term "test specimen".

1.2.7

inspecting authority

that competent independent body or association which verifies compliance with this Part of BS 1723

NOTE In some circumstances, a competent person delegated by the purchaser may be acceptable.

1.2.8

brazing operator approval test

a documented test which has been approved by an inspecting authority (1.2.7) and carried out by a brazing operator working to an approved brazing procedure

1.2.9

brazing operator

any person preparing and making brazed joints or constructions by one of the following brazing processes: flame, induction, resistance, furnace, immersion, infra-red, electron beam and laser brazing