



ISO/TC 44/SC 11/WG 3
Brazing qualification

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**Brazing — Specification and qualification of brazing procedures
for metallic materials**

WD stage

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Foreword

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee *ISO/TC 44, Welding and allied processes, Subcommittee SC 11, Qualification requirements for welding and allied processes personnel*.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Introduction

The purpose of this document is to provide general set of rules for qualification independent of product or application.

All new brazing procedure tests are to be carried out in accordance with this document from the date of its issue. However, this document does not invalidate previous brazing procedure tests made to former national standards or specifications or previous issues of this document.

Where additional tests have to be carried out to make the qualification technically equivalent, it is only necessary to do the additional tests on a test piece which should be made in accordance with this document.

Brazing — Specification and qualification of brazing procedures for metallic materials

1 Scope

This document specifies requirements for the specification and qualification of brazing procedures for brazing of metallic materials. The principles of this document can be applied to other materials, metallic and non-metallic.

The document specifies requirements for brazing of the test piece, testing of the test specimen, essential variables and their range of qualification, acceptance criteria, brazing procedure qualification record (BPQR) and brazing procedure specification (BPS).

Tests shall be carried out in accordance with this document. Additional tests may be required by application documents.

The document does not cover testing of residual stresses, corrosion resistance and impact properties.

This document applies to brazing processes in accordance with ISO 857-2 with local and global heating (see 8.4.1). The principal of this document can be applied to other brazing processes.

NOTE Annex D gives guidance on general quality requirements for brazing.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 857-2:2005, *Welding and allied processes – Vocabulary – Soldering and brazing processes and related terms*

ISO 4063, *Welding, brazing, soldering and braze welding of metals – Nomenclature of processes and reference numbers for symbolic representation on drawings*

~~ISO 5173:2009 + Amd 1:2011, Destructive tests on welds in metallic materials – Bend tests. Amended by ISO 5173:2009/Amd 1:2011~~

ISO 13585, *Brazing – Qualification test of brazers and brazing operators*

ISO/TR 15608, *Welding – Guidelines for a metallic materials grouping system*

ISO 17672, *Brazing – Filler metals*

ISO 18279, *Brazing – Imperfections in brazed joints*

ISO/CD 18496, *Brazing – Fluxes for brazing – Classification and technical delivery conditions*

ISO/TR 25901-1:2016, *Welding and related processes – Vocabulary – Part 1: General terms*

EN 12797, *Brazing – Destructive tests of brazed joints*

EN 12799, *Brazing – Non-destructive examination of brazed joints*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 857-2:2005, ISO/TR 25901-1:2016, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

brazing

joining process in which a molten filler material is used that has a liquidus temperature above 450 °C but lower than the solidus temperature of the parent material(s).

3.2

brazing procedure specification

BPS

document that has been qualified and provides the required variables of the brazing procedure to ensure repeatability during production brazing

3.3

preliminary brazing procedure specification

pBPS

a document containing the required variables of the brazing procedure which is not yet qualified

3.4

brazing procedure qualification record

BPQR

record comprising all necessary data from qualification of a preliminary brazing procedure specification.

3.5

manufacturer

workshop or site or both which is (are) under the same technical and quality management.

3.6

examiner

person appointed to verify compliance with the applicable standard.

Note 1 to entry: In certain cases, an external independent examiner can be required.

[ISO/TR 25901-1:2016, 2.5.29]

3.7

examining body

organization appointed to verify compliance with the applicable standard.

Note 1 to entry: In certain cases, an external independent examining body can be required.

[ISO/TR 25901-1:2016, 2.5.30]

3.8**filler metal(s)**

added metal required for ~~soldered or~~ brazed joints, which can be in the form of rod, wire, foil, powder, pastes or preforms

3.9**flux**

non-metallic material which, when molten, promotes wetting by removing existing oxide or other detrimental films from the surfaces to be joined and prevents their re-formation during the joining operation

3.10**test piece**

brazed assembly which is used for testing purposes.

Note 1 to entry: Adapted from ISO/TR 25901-1:2016, 2.2.1.5.

3.11**test specimen**

part or portion cut from the test piece in order to perform a specified destructive test.

[ISO/TR 25901-1:2016, 2.2.1.6]

4 Preliminary brazing procedure specification (pBPS)

A preliminary brazing procedure specification shall be prepared in accordance with Annex A

5 Brazing procedure test

The brazing and testing of test pieces shall be in accordance with clauses 6 and 7.

The brazing operator who undertakes the brazing procedure test satisfactorily in accordance with this standard is qualified for the appropriate range of qualification in accordance with ISO 13585 providing that the relevant testing requirements are met.

6 Test piece**6.1 General**

The test piece or pieces shall be brazed using a type of joint design proposed in the pBPS and be representative for the intended production.

6.2 Shape and dimensions of test pieces

If not specified in application standard the shape and dimension of the test piece shall be agreed by the contracting parties.

The test piece is typically a basic lap or butt joint in sheet material or a sleeve joint in tube (for examples of applicable joint configurations, see Annex C).

The size of the test piece shall be ~~sufficient to ensure a reasonable heat distribution and the size and number of test pieces shall be~~ sufficient to allow all required tests to be carried out. Additional test pieces may be prepared in order to allow for extra and/or for re-testing specimens.

~~NOTE Requirements concerning test piece design may be given in applicable product standard.~~

6.3 Brazing of test pieces

Preparation and brazing of test pieces shall be carried out in accordance with the pBPS, and under the general conditions of brazing in production which they shall represent.

Brazing and testing of the test pieces shall be witnessed by an examiner or an examining body.

7 Examination and testing

7.1 Extent of testing

As a minimum, testing shall be carried out in accordance with Table 1, EN 12797 and EN 12799.

Table 1 – Examination and testing of the test pieces

Test piece	Type of test	Extent of testing
T-joint	Visual, and Metallographic, or Bend	100 % 2 sections ^a 2 specimens ^b
Lap joint	Visual, and Metallographic, and Shear, or Peel	100 % 2 sections ^a 2 specimens 2 specimens
Butt joint	Visual, and Metallographic, and Tensile, or Bend	100 % 2 sections ^a 2 specimens 2 specimens ^b
^a Either peel testing or radiographic testing shall be used. When the tensile strength of the filler metal is equal or higher than that of the parent material a peel testing may be less suitable.		
^b Either transverse bend testing or radiographic testing shall be used.		
^a Normally a macro section will be sufficient. However, micro sections can be required.		
^b One first surface and one second surface test.		

Application standards may specify additional tests, e.g.:

- longitudinal tensile test;
- volumetric testing (RT or UT)
- corrosion tests;

- chemical analysis;
- ~~micro examination~~;
- cruciform test.

NOTE Specific service, material or manufacturing conditions may require more comprehensive testing than is specified by this document in order to gain more information and to avoid repeating the brazing procedure test at a later date just to obtain additional test data.

7.2 Test specimens

The shape and dimensions of test specimens shall be in accordance with EN 12797 or EN 12799 or in an application standard. For other test specimens where the shape and dimensions are not specified, they shall be agreed by the contracting parties.

7.3 Non-destructive testing

The extent of non-destructive testing shall be in accordance with 7.1 and Table 1 and be carried out on the test pieces prior to cutting of the test specimens. Visual testing and radiographic testing shall be performed in accordance with EN 12799.

7.4 Destructive testing

7.4.1 General

The extent of destructive testing shall be in accordance with 7.1 and Table 1.

7.4.2 Transverse Bend testing

The testing and test specimens shall be in accordance with EN 12797 and Table 1.

One first surface bend test specimen and one second surface bend test specimens shall be tested. The first surface is defined as the surface from which the filler metal is applied. The second surface is defined as the opposite surface from which the filler metal is applied.

~~During testing, the test specimens shall not reveal any one single flaw > 3 mm in any direction. Flaws appearing at the corners of a test specimen during testing shall be ignored in the evaluation.~~

An alternative method for testing of T-joints is given in Annex XXX. Move to new annex

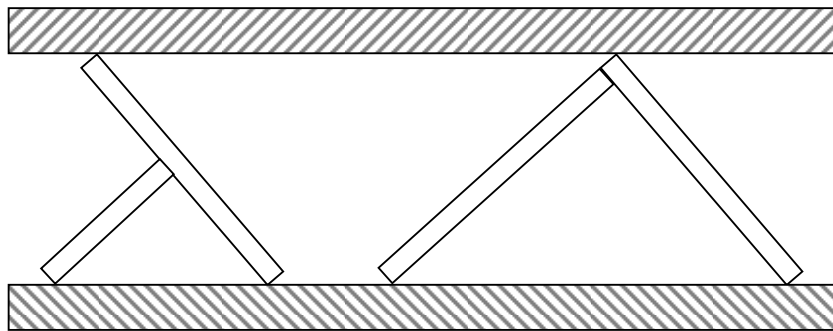


Figure XX.1 – Types of configuration of transverse bend testing of T-joint

7.4.3 Peel testing

The test specimens and the testing shall be performed in accordance with EN 12797.

7.4.4 Shear testing

The test specimens shall be in accordance with one of the types defined in EN 12797. The test specimen shall fracture in the weakest parent material, unless otherwise specified.

NOTE If the specimen fractures in the braze metal although the requirements in clause 7.5 are met the overlap length is considered to be too small and the joint should be re-designed.

7.4.5 Transverse tensile testing

The test specimens shall be in accordance with one of the types defined in EN 12797. The tensile strength shall not be less than the specified minimum tensile strength of the weaker parent material in the annealed condition or, 95 % of thereof if the test specimen fractures in the parent material.

7.5 Acceptance levels

The acceptance requirements for imperfections found by all test methods in accordance with this document shall, unless otherwise specified, be assessed in accordance with ISO 18279. A brazing procedure is qualified if the imperfections in the test piece are within quality level B in ISO 18279 and no imperfection pass through the joint length. (align with change in ISO 13585 regarding level C)

7.6 Re-testing

If the test piece fails to comply with any of the requirements for visual testing or NDT specified in clause 7.5, one further test piece shall be brazed and subjected to the same testing. If this additional test piece does not comply with the requirements, the brazing procedure test has failed.

If any test specimens fail to comply with the requirements for destructive testing in accordance with 7.4 but only due to braze imperfections, two further test specimens shall be tested for each one that failed. The additional test specimens can be taken from the same test piece if there is sufficient material or from a new test piece. Each additional test specimen shall be subjected to the same tests as the initial test specimen that failed. If either of the additional test specimens does not comply with the requirements, the brazing procedure test has failed.

8 Essential variables and range of qualification

8.1 General

Each of the conditions given in Clause 8 shall be met in order to comply with this document.

Changes outside of the ranges specified shall require a new brazing procedure test.

8.2 Brazing process

Each qualification test qualifies only one brazing process. A change of brazing process requires a new qualification test.

Brazing processes are defined in ISO 857-2 and listed in the following, preceded by their process numbers in accordance with ISO 4063.

- 911 Infrared brazing
- 912 Flame brazing, torch brazing
- 913 Laser beam brazing
- 914 Electron beam brazing
- 916 Induction brazing
- 918 Resistance brazing
- 919 Diffusion brazing
- 921 Furnace brazing
- 922 Vacuum brazing
- 923 Dip-bath brazing
- 924 Salt-bath brazing
- 925 Flux bath brazing
- 926 Immersion brazing

NOTE The principles of this document can be applied to other brazing processes.

8.2.1 Specific to processes

For processes where global heating is applied (process 92) a change in brazing temperature shall not exceed outside the range specified in the BPS.

When applicable the furnace atmosphere is limited to the same type of atmosphere, e.g. reducing or inert, carburizing or decarburizing, and hydrogen or disassociated ammonia.

For brazing processes where fuel gases apply the qualification is limited to the same type of fuel gas and flame.

8.2.2 Product type

The brazing of one product type qualifies for other product types in accordance with Table 2.

Table 2 — Range of qualification for product type

Product type for test piece	Range of qualification
Plate	Plate
Pipe	Pipe and plate

8.2.3 Type of joint

Range of qualification for type of joint is given by Table 3.

Table 3 – Range of qualification for type of joint

Type of joint in test piece	Range of qualification
T-joint	T-joint
Lap joint	Lap joint
Butt joint	Butt joint

8.2.4 Branch connection

A test with any branch angle α cover all branch angles α .

8.2.5 Parent material group(s)

In order to minimize the number of brazing procedure tests parent materials are assigned to M-number groupings in Normative Annex E. grouped in accordance with ISO/TR 15608.

A change of parent material from one M-number grouping to another shall require requalification. However, brazing of dissimilar materials need not be requalified if a material assigned to each group has been qualified individually for the same brazing filler metal, flux, atmosphere, and process. Similarly, the brazing of materials assigned to two different M-numbers in a single test piece qualifies for both metals assigned to each group brazed to itself for the same brazing filler metal, flux, atmosphere, and process.

The ranges of qualification are given by Table 4.

Separate brazing procedure qualifications are required for each parent material or parent material combinations not covered by table 2 or by the grouping system.

If one parent material belongs to two groups or sub-groups, it shall always be classified in the lower group or subgroup.

NOTE — Minor compositional differences between similar grades arising from the use of national standards do not need requalification

Table 4 — Range of qualification for material groups and sub-groups

Material group of the test piece	Range of qualification
1.1 or 1.2	1.1 and 1.2 ^a
8.1	8.1 ^b
21 or 22	21 and 22 ^a
31, 32, 33 or 34	31, 32, 33 or 34 ^a
35	35
41 or 42	41 and 42 ^a
43, 45 or 46	43, 45 and 46 ^a
44	44
51, 52 or 53	51, 52 and 53 ^a
^a — Also cover any dissimilar joint combinations between these material groups	
^b — Also cover any dissimilar joint combination between material group 8.1 and 1.1 or 1.2	

8.2.6 Filler metals, flux and brazing filler application

The brazing filler metal type based on its class in accordance with ISO 17672, or other standards that provide equivalent technical conditions, is qualifying for other filler metal types within the same class. One filler metal form (for example, from preformed ring to paste) only qualifies for the same form.

A test with a flux classified in accordance with ISO 18496, or other standards that provide equivalent technical conditions, only qualifies for brazing within that same classification.

The brazing filler metal application qualifies for other filler metal application in accordance with Table 5.

Table 5 — Range of qualification for brazing filler application

Test piece brazing filler application	Range of qualification
Face fed	Face fed
Pre-placed	Pre-placed
NOTE "Face fed" is also known as "applied to the mouth of the joint", which can be manually or mechanically fed	

8.2.7 Dimensions

Ranges of qualification for parent material thickness are given by Table 6 and for pipe diameter by Table 7. For dissimilar parent material thicknesses, the range of qualification based on each part separately and given by Table 6.

For lap joints the range of qualification for the overlap is 0-25 % greater than the overlap used in the test.

The joint gap shall not deviate from the interval recommended by the filler metal manufacturer.

Table 6 — Range of qualification for parent material thickness

Dimensions in millimeters

Thickness of test piece t	Range of qualification
$t < 3$	0,5t to 2t
$3 \leq t < 10$	1,5 to 2t
$10 \leq t \leq 25$	5 to 2t

Table 7 — Range of qualification for pipe outside diameter

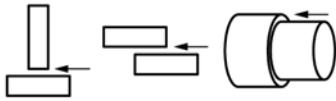
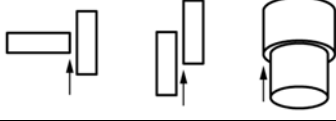
Dimensions in millimeters

Outside diameter of test piece <i>D</i>	Range of qualification
$D < 10$	$D < 10$
$10 \leq D \leq 25$	$0,5D$ to $2D$
$D > 25$	$D \geq 25$

8.2.8 Filler metal flow direction

Ranges of qualification for the filler metal flow direction are given by Table 8. Any other flow direction shall be qualified separately. For procedure qualification, an angular deviation of maximum $\pm 15^\circ$ from filler metal flow positions applies.

Table 8 — Range of qualification for filler metal flow direction

Illustrations	Filler metal flow direction of the test piece	Range of qualification
	Horizontal flow	Horizontal flow and vertical down-flow
	Vertical down-flow	Vertical down-flow
	Vertical up-flow	All flow directions

8.2.9 Post braze heat treatment

Addition or deletion of post-braze heat-treatment requires requalification of the BPS.

8.2.10 Related to the manufacturer

A qualification of a pBPS in accordance with this document obtained by a manufacturer is valid for brazing in workshops or sites under the same technical and quality control of the manufacturer.

Brazing is under the same technical and quality control when the manufacturer who performed the brazing procedure qualification retains complete responsibility for all brazing carried out to it.

9 Brazing procedure qualification record (BPQR)

The brazing procedure qualification record (BPQR) is a statement of the results of assessing each test piece including re-tests. The relevant items listed for the BPS shall be included, together with details of

any features that would be rejectable by the requirements of clause 7. If no rejectable features or unacceptable test results are found, a BPQR detailing the brazing procedure test piece results is qualified and shall be signed and dated by the examiner or the examining body.

A BPQR format shall be used to record details for the brazing procedure and the test results, in order to facilitate uniform presentation and assessment of the data.

An example of BPQR format is shown in Annex B.

10 Brazing procedure specification (BPS)

A brazing procedure specification (BPS) shall provide all necessary information required to make a braze joint. The brazing procedure specification shall be designed as an instruction for the brazer or brazing operator to apply and the tolerances given for each essential variable may therefore not be the full ranges of qualification given in the BPQR. It is however practical that tolerances are given in relevant cases, e.g. for gap or overlap length.

A brazing procedure specification is considered preliminary (pBPS) until it is qualified documented by a BPQR.

The brazing procedure specification (BPS or pBPS) shall contain at least, when applicable, the following information (including applicable tolerances for variables):

- Identification of the manufacturer;
- Identification of the BPS;
- Reference to the brazing procedure qualification record (BPQR) or other documents as required;
- Parent material designation and reference standard(s), and material group in accordance with ISO/TR 15608
- Dimensions of the parent material (thickness and pipe outside diameter)
- Joint design/configuration sketch containing all relevant dimensions, e.g. overlap length and gap
- Brazing process
- Brazing filler material flow direction
- Brazing filler material designation and reference standard(s)
- Brazing filler material type
- Brazing filler material application
- Brazing flux designation and reference standard(s), and trade name
- Brazing flux type
- Fuel gas designation or composition, and gas flow
 - Brazing temperature
 - Furnace atmosphere

- Post braze heat treatment relation to transformation temperature
- Method of preparation and cleaning of the joint before and after brazing
- Degree of mechanisation ~~and travel speed~~ (manual, mechanized, automatic)

An example of BPS format is shown in Annex A.

Annex A (informative)

Brazing procedure specification (BPS)

Reference no:	
Manufacturer's name and address:	
Manufacturer's brazing procedure (BPS no):	

Brazing process:		Method of joint preparation:	
Joint type:		Material thickness (mm):	
Parent material(s) and specification(s):		Outside diameter (mm):	
Degree of mechanization: (manual/mechanized/automatic)		Brazing position:	
Gap (mm):		Overlap, L (mm):	

Joint design and preparation details (sketch):
--

Brazing filler metal type and specification:		Method of pre-braze cleaning:	
Brazing filler metal form:		Method of post-braze cleaning:	
Method of filler metal supply:		Nozzle size and number:	
Flux type and specification:		Heating gas type:	
Flux form:		Heating gas pressure:	
Method of flux supply:		Preheat temperature:	
Jig/fixture details:		Post-braze heat treatment:	

Manufacturer's representative Name, date and signature:	Examiner / Examining body Name, date and signature:

Annex B (informative)

Brazing procedure qualification record (BPQR)

Manufacturer (name and address):			
Examiner/examining body (name and address):			
Manufacturer's brazing procedure (BPS no):		Examiner or examining body reference no:	

Method of qualification:	Mark with X
Submission of documentary evidence that a relevant procedure proven by experience is already in existence.	
Submission of a relevant procedure previously accepted by another examiner or examining body.	
Carrying out of appropriate brazing procedure tests for the present examiner or examining body.	
In the case of a) or b), reference numbers of the documents submitted:	

Variables	Procedure test details	Range of approval:
Brazing process	912	912 Flame brazing
Material thickness (mm)	3	1,5 – 6
Outside diameter (mm)	100	≤ 100
Overlap length (mm)	22	≤ 22
Parent material(s)	32	32, 33 and 34
Brazing filler metal type and temperature	870 °C	Unlimited
Method of filler metal supply:	Face fed	Face fed
Plate or pipe	Plate	Plate
Brazing positions	Vertical up	Vertical up & Vertical down
Others	-	-
Reference numbers of documents submitted to justify range of approval:		

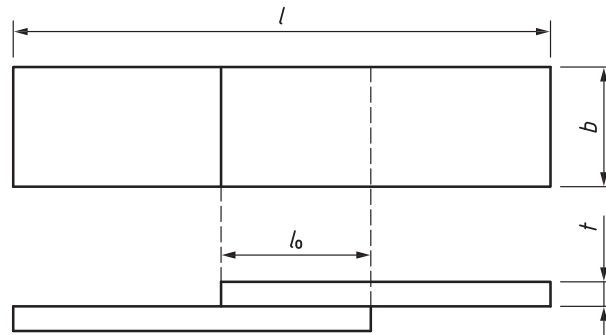
It is hereby verified that this brazing procedure complies with the requirements of the following standards or any other equivalent documents.

Manufacturer's representative: Name, date and signature	Examiner / Examining body: Name, date and signature:

Annex C (informative)

Examples of test pieces

Examples of test pieces are shown in Figures C.1 to C.5



Key

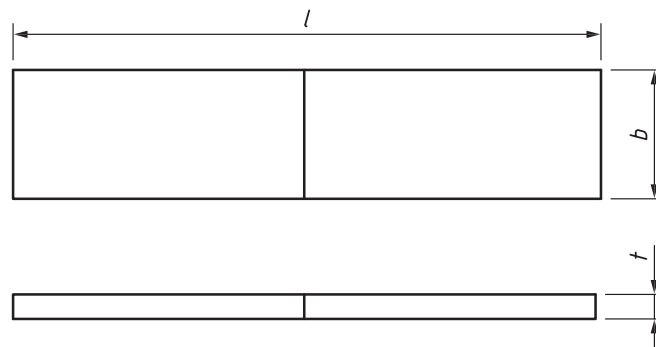
b – is the width

l – is the total length

t – is the thickness

l_o – is the overlap length

Figure C.1 – Test piece – Lap joint



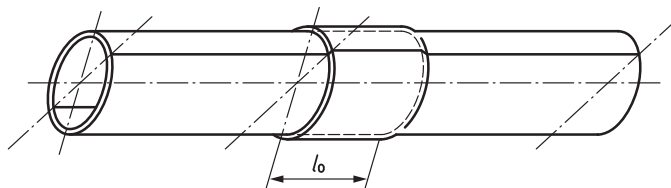
Key

b – is the width

l – is the total length

t – is the thickness

Figure C.2 – Test piece – Butt joint



Key

l_o – is the overlap

Figure C.3 – Test piece – Simple lap joint

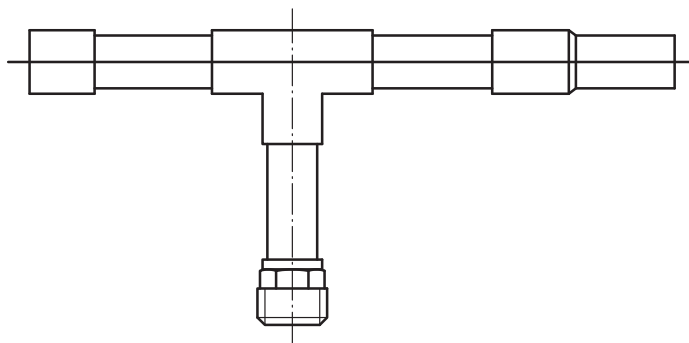
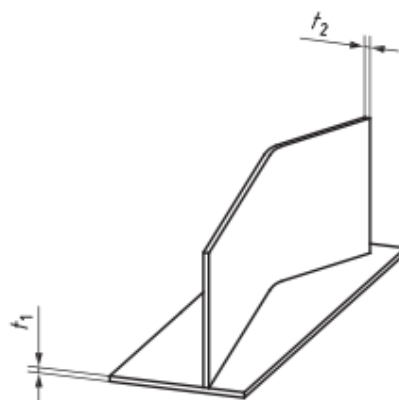


Figure C.4 – Test piece – Multiple joints



Key

t_1 – is the thickness

t_2 – is the thickness

Figure C.5 – Test piece – T joint

Annex D (informative)

Quality requirements for brazing

D.1 Information and requirements for the work shop

The following information and requirements should be agreed and documented prior to the contract, when applicable:

- a) The application standards to be used, if any, together with any supplementary requirements
- b) The BPS, including the brazing process and the brazing variables
- c) The joint design for the test pieces together with relevant tolerances and the number of test pieces required
- d) The specifications of the parent materials
- e) The specifications of the brazing consumables
- f) The handling of parent materials and brazing consumables
- g) The design and method of preparation of the test specimens and, where appropriate, the number to be taken from any test piece
- h) The acceptance criteria
- i) The principle of and procedure for retesting of a series of test pieces, including any additional requirements with regard to the number of test pieces/test specimens and any retraining and time delay conditions prior to reassessment
- j) The extent of visual testing and additional testing requirements for the non-destructive and/or destructive tests
- k) Records and documentation.

Annex E (Normative)

Material Grouping System

10.1 Parent Metal Numbers

Parent metals have been grouped by Metal Number (M No.) in the following table so that the required number of qualifications may be reduced. These assignments do not imply that base metals may be indiscriminately substituted for a base metal which was used in the qualification test without consideration of the compatibility from the standpoint of metallurgical properties, postweld heat treatment, design, mechanical properties, and service requirements.

10.2 Basis for Classification of Parent Metals for Brazing Qualification

10.2.1.1.1 General

Where classification is dependent on the amount of a given element, the controlling value is the maximum content given in the Parent metal specification.

Ferrous Alloys. The Parent metal numbers for ferrous alloys are listed below:

M No.

100	Steels containing 1% or less chromium
110	Steels containing more than 1% chromium. See (1) below.
120	Steels containing aluminum or titanium
130	Stainless steels, austenitic
140	Stainless steels, austenitic containing titanium of less than 0.3%
150	Stainless steels, martensitic, and ferritic
160	Stainless steels, martensitic, and ferritic containing less than 0.3% combined aluminium and titanium
170	Cast iron
180	Cast iron, austenitic

Aluminium and Aluminium Alloys. The Parent metal numbers for aluminium and aluminium alloys are listed below:

M No.

200	Aluminum and aluminum alloys containing no magnesium
210	Aluminum alloys containing less than 1% magnesium
220	Aluminum alloys containing 1% or more magnesium

Copper and Copper Alloys. The Parent metal numbers for copper and copper alloys are listed below:

M No.

300	Copper and copper alloys
310	Copper alloys containing 0.5% to 1% lead
320	Copper alloys containing more than 1% and no more than 7% lead
330	Copper alloys containing more than 1% silicon
340	Copper alloys containing 0.5% to 1% aluminum or beryllium
350	Copper alloys containing more than 1% and no more than 5% aluminum or beryllium
360	Copper alloys containing more than 5% aluminum or beryllium

Nickel and Nickel Alloys. The Parent metal numbers for nickel and nickel alloys are listed below:

M No.

400 Nickel and nickel-copper alloys

410 Nickel-molybdenum alloys

420 Nickel-chromium-iron and nickel-chromium-molybdenum alloys

430 Nickel-chromium-iron and nickel-chromium-molybdenum alloys containing less than 1.5% combined aluminium and titanium

Titanium and Titanium Alloys. The Parent metal number for titanium and titanium alloys is listed below:

M No.

500

Zirconium and Zirconium Alloys. The Parent metal number for zirconium and zirconium alloys is listed below:

M No.

600

Magnesium Alloys. The Parent metal number for magnesium alloys is listed below:

BM No.

700

Cobalt Alloys. The Parent metal number for cobalt alloys is listed below:

BM No.

800