



**SLOVENSKI STANDARD**  
**SIST EN 13133:2001**  
**01-december-2001**

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**Trdo spajkanje - Preskušanje spajkalcev**

Brazing - Brazer approval

Hartlöten - Hartlöterprüfung

Brasage fort - Qualification des braseurs en brasage fort

**iTeh STANDARD PREVIEW**

**Ta slovenski standard je istoveten z: EN 13133:2000**

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25.160.50

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ICS 25.160.50

English version

## Brazing - Brazer approval

Brasage fort - Qualification des braseurs en brasage fort

Hartlöten - Hartlöterprüfung

This European Standard was approved by CEN on 27 July 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This European Standard for the approval testing of brazers (as defined in 3.1) specifies basic requirements essential to the brazing process, test conditions, assessment and certificates. Because of the wide range of applications of brazing this standard does not specify detailed acceptance criteria as these are product-specific and have in each case to be agreed prior to the contract (see clause 4). It is anticipated that, where necessary, specific requirements for individual industries will be developed within this framework and detailed in the relevant application standard. The recommended format for the certificate of approval testing is given in annex A.

With regard to the approval test, the brazer should be required to show adequate practical experience and knowledge of the brazing processes, materials and safety requirements for which he is to be approved to a written procedure.

This standard applies to hand torch (flame) brazing and only to approval of brazers whose manipulative skills have a direct bearing on the outcome and effectiveness of the brazed joint. It does not apply to those who are not required to apply manipulative skill, since such approval is not normally necessary.

If a special professional education and examination in the domestic field included brazing, this standard does not apply to a brazer while he is employed in that field.

The certificate of approval testing is issued under the sole responsibility of the examiner or examining body.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12797 Brazing - Destructive examination of brazed joints

[SIST EN 13133:2001](#)

EN 12799 Brazing - Non-destructive testing of brazed joints

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EN 13134 Brazing - Procedure approval

### 3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

#### 3.1

##### **brazer**

the person who performs the brazing in a manual operation, he guides the heating means and ensures the introduction of the brazing filler metal.

#### 3.2

##### **brazing**

the process of joining generally applied to the joining of materials by a heating process during which the parent materials do not melt and the filler metal is drawn into the joint by capillary action. It is generally applicable to joining systems where the filler metal melts at 450 °C or above.

#### 3.3

##### **brazing procedure specification (BPS)**

a document providing the designations or values of the required variables necessary to achieve consistent brazing for the defined application.

NOTE An example of the format to be used is given in annex B and EN 13134.

#### 3.4

##### **manufacturer**

the person or organization responsible for the manufacture of the brazed joints.

#### 3.5

##### **examiner or examining body**

a person or organization appointed to verify compliance with the applicable standard.

NOTE The examiner or examining body may be a notified body or recognized third-party, if required.

#### 3.6

##### **filler metal(s)**

the relevant metal(s) and/or alloys selected for making the joint(s).

#### 3.7

##### **fluxes**

specific chemical compounds or mixtures designed to remove and inhibit formation of oxides of the metals during the heating cycle.

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### 3.8

#### **test piece**

the assembly which is brazed together during the approval test.

### 3.9

#### **test specimen**

a sample taken from a test piece.

## **4 Information and requirements to be agreed and to be documented**

The following information and requirements shall be agreed and documented prior to the contract.

- a) The application standards to be used, if any, together with any supplementary requirements (see clause 1 and 6.1).
- b) The BPS, including the brazing process and the brazing variables (see 5.1).
- c) The joint design for the test pieces together with relevant tolerances and the number of test pieces required (see 5.2 and 7.1).
- d) The specifications of the parent materials (see 5.3).
- e) The specifications of the brazing consumables (see 5.4 and 5.5).
- f) The design and method of preparation of the test specimens and, where appropriate, the number to be taken from any test piece (see 7.4).
- g) The acceptance/non-acceptance criteria, including (where appropriate) the level of confidence (see 7.4)
- h) 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 (see 7.4).
- i) The extent of visual testing and additional testing requirements for the non-destructive and/or destructive tests (see clause 8).
- j) The range of approval, where this is possible (see clause 10).
- k) Records and documentation.

**NOTE** Examples of the formats to be used are given in annexes A, B and C.

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## 5 Brazing variables

### 5.1 General

The test piece shall be prepared in accordance with the BPS (see 4 b)).

### 5.2 Test piece

The test piece may be any design of joint which is relevant to the end work (see 4 c)). Typically this will be a basic lap or butt joint in sheet material or a sleeve joint in tube.

The size and thickness of the materials should be similar to that which will be required to be joined in production. If desired, the test pieces can actually be production assemblies. The test pieces may be, for example, one of the types shown in annex D.

### 5.3 Parent materials

Parent materials shall be relevant to the end work and selected to comply with to the relevant material standards (see 4 d)).

### 5.4 Brazing filler metals and flux

Brazing filler metals and flux may be applied in any form but shall be the same as those to be used in production (see 4 e)).

### 5.5 Fuel/gases

Fuel/gases shall be selected to be relevant to the heating requirement (see 4 e)). Typical examples include :

- a) natural gas/air
- b) natural gas/oxygen
- c) propane/air
- d) propane/oxygen
- e) acetylene/air
- f) acetylene/oxygen

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### 5.6 Brazing torch

A torch similar to that used in production shall be used.

## **5.7 Joint location**

On-site brazing may require a brazer to make joints in close proximity to walls, etc. Joints may be horizontal or vertical. Similar constraints on access for torches may also be encountered in mass production. Approval tests shall be designed to reproduce these conditions.

## **5.8 Jigs and fixtures**

If necessary, jigs and fixtures shall be used to position the components of a test piece.

## **6 Conditions for brazing test**

### **6.1 Test location**

The approval test shall take place in a workshop but simulate the on-site limitations (see 4 a) and 5.7). It enables one to judge the ability of the brazer to perform on-site and workshop brazing operations in the selected jointing technique.

### **6.2 Conduct of the test**

The brazer shall prepare the parts (cutting, cleaning, etc.), set up the heating means and conduct the necessary verification to carry out the test according to the BPS.

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## **7 Approval of test piece**

### **7.1 General**

The test pieces (see 4 c)) shall be brazed according to the BPS.

### **7.2 Supervision**

Brazing and inspection of the test piece(s) shall be conducted in the presence of the examiner or examining body's representative.

### **7.3 Assessment of test piece components**

The brazer shall assess the test piece components for:

- a) joint fit up;
- b) joint lengths;
- c) degree/absence of local deformation;

and will be permitted to refuse the test piece components if he considers that these are not in accordance with the written BPS.

### **7.4 Inspection and retests**

The test piece(s) shall be provisionally inspected by the brazer. If he assesses that the first test piece in a series is not likely to be of the required quality, he shall be permitted to make a replacement test piece.

Following the brazer's own inspection, the test pieces shall be submitted to the examiner or examining body for the relevant non-destructive and/or destructive tests as detailed in clause 8.

For the design and method of preparation of test specimens see 4 f).

If only a single test piece is being made and it fails to comply with the specified acceptance criteria (see 4 g)), the brazer shall be advised of the reason and allowed to make a further test piece. If this second test piece fails, it shall be deemed that the brazer is not yet competent to produce joints to the specified acceptance criteria without further training after which the complete test shall be repeated. For the case of testing of a series of test pieces, see 4 h).