



**SLOVENSKI STANDARD**  
**oSIST prEN 13067:2019**  
**01-julij-2019**

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**Osebe za varjenje polimerov - Usposobljenost varilcev - Varjenje plastomerov**

Plastics welding personnel - Qualification of welders - Thermoplastics welded assemblies

Kunststoffschweißpersonal - Anerkennungsprüfung von Schweißern - Thermoplastische Schweißverbindungen

Personnel en soudage des plastiques - Qualification des soudeurs - Assemblages soudés thermoplastiques

**Ta slovenski standard je istoveten z: prEN 13067**

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83.080.20	Plastomeri	Thermoplastic materials

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English Version

## Plastics welding personnel - Qualification of welders - Thermoplastics welded assemblies

Personnel en soudage des plastiques - Qualification des  
soudeurs - Assemblages soudés thermoplastiques

Kunststoffschweißpersonal - Anerkennungsprüfung  
von Schweißern - Thermoplastische  
Schweißverbindungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 249.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 13067:2019 (E)****European foreword**

This document (prEN 13067:2019) has been prepared by Technical Committee CEN/TC 249 “Plastics”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13067:2012.

In comparison with the previous edition, the following technical modifications have been made:

- in Clause 1 Scope for the different group of materials in a) for sheets, pipes and fittings, group 1 includes also ABS; b) is for lining membranes and flooring. In c) for pipes and fittings, the group 10 is for PA-U 11 or PA-U 12;
- in Table 2 for the group of material 6 PVC-P the range of  $e_n$  has been modified from  $e_n = 2$  to  $1 \leq e_n \leq 3$  and the Sub groups 6.5 and 6.6 has been added; for the group of material 7 PE, the Sub groups 7.6, 7.7, 7.8, 7.9, 7.10 have been added and the range of the nominal wall thickness is:  $0,75 \leq e_n \leq 1$ ;
- Figure 9 — Test piece for lining membranes – Butt weld with V preparation, has been added and the numbering of the other ones has been changed;
- Subclause 10.4 Non-destructive tests on the high voltage test, has been added.

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## Introduction

This document covers the principles to be observed in the qualification testing of welder performance for the welding of thermoplastic materials.

The ability of the welder to follow verbal or written instructions and testing of his skill are important factors in ensuring the quality of the welded product.

This document is intended to provide the basis for the mutual recognition by examining bodies for qualification relating to welders competence in the various fields of application.

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**prEN 13067:2019 (E)****1 Scope**

This document specifies the method of testing the knowledge and skill of a welder who is required to carry out welds on thermoplastics in new constructions and repair work.

The skill examination of a welder is an essential condition for the assurance of the quality of the welding work.

The application of this document guarantees that the examination is carried out according to a uniform test procedure.

This document applies when the contractor or the authorities responsible for the application require it. Gas and water utility network industries with alternative qualification programmes are excluded from this document.

This document applies to the following welding processes:

- hot gas welding: round nozzle, high speed nozzle, wedge;
- extrusion welding;
- heated tool welding: butt, saddle, socket, wedge;
- electrofusion welding: socket, saddle;
- solvent welding: socket.

This document applies to the welding of the following products:

- sheet;
- pipe;
- fittings;
- lining membrane.

This document covers the welding of the following groups of materials:

- a) for sheets, pipes and fittings:
  - group 1: PVC (including all kinds of PVC-U, PVC-C) or ABS;
  - group 2: PP (including all kinds of PP);
  - group 3: PE (including all kinds of PE);
  - group 4: PVDF;
  - group 5: ECTFE or PFA or FEP;
- b) for lining membranes and flooring:
  - group 6: PVC-P;
  - group 7: PE (including all kinds of PE);



- group 8: ECB;
  - group 9: PP.
- c) for pipes and fittings only:
- group 10: PA-U 11 or PA-U 12

## 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.

EN 12814-1, *Testing of welded joints of thermoplastics semi-finished products — Part 1: Bend test*

EN 12814-2:2000, *Testing of welded joints of thermoplastics semi-finished products — Part 2: Tensile test*

EN 12814-4, *Testing of welded joints of thermoplastics semi-finished products — Part 4: Peel test*

EN 12814-8, *Testing of welded joints of thermoplastics semi-finished products — Part 8: Requirements*

EN 13100-1, *Non destructive testing of welded joints of thermoplastics semi-finished products — Part 1: Visual examination*

EN 13100-4, *Non destructive testing of welded joints of thermoplastics semifinished products — Part 4: High voltage testing*

EN 14728, *Imperfections in thermoplastic welds — Classification*

CEN/TS 16892, *Plastics — Welding of thermoplastics — Specification of welding procedures*

ISO 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

## 3 Terms and definitions

For the purposes of this document, the following term and definition apply.

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

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

### 3.1

#### **AD-WLD break**

failure mode in an extrusion welded membrane peel test specimen where the failure is through the weld material

**prEN 13067:2019 (E)****3.2****applicant**

person who has submitted an application to be admitted into the certification process

**3.3****assessment**

process that evaluates a person's fulfilment of the requirements of the certification scheme

**3.4****candidate**

applicant who has fulfilled specified prerequisites and has been admitted to the certification process

**3.5****certificate**

document issued by the certificate issuing authority under the provisions of this document, indicating that the named person has fulfilled the certification requirements

**3.6****certificate issuing authority****CIA**

establishment responsible for issuing the welder qualification test certificate and for approving the PWE and or the Invigilator, working for example in compliance with EN ISO/IEC 17024

**3.7****invigilator**

qualified person, approved by Certificate Issuing Authority (CIA), who can supervise the practical and theoretical tests

Note 1 to entry: 3.7 and 3.9 can be the same person.

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**3.8****manufacturer**

company, contractor or organization who is responsible for the welding

**3.9****Plastics Welding Examiner****PWE**

qualified person approved by Certificate Issuing Authority (CIA), who verifies the compliance with this standard

**3.10****qualification test**

theoretical and practical tests in order to verify the knowledge and the skill of the welder

**3.11****range of qualification**

welding processes, types of joint, materials, thicknesses and diameters for which a welder is qualified

**3.12****test piece**

assembly which is welded during the practical test

**3.13****test specimen**

part or portion cut from the test piece for the test specified

**3.14****test house**

establishment having all relevant test equipment to carry out the required tests and working for example in compliance with EN ISO/IEC 17025

**3.15****training centre**

educational establishment for training plastics welding personnel and/or Plastics Welding Examiner approved by CIA

**3.16****welding process**

technique characterized by the method of softening to obtain permanent assembly

**3.16.1****electrofusion welding**

softening of fitting and pipe surfaces to be welded is obtained by means of a heating element embedded in the fitting which remain between welded joints

**3.16.2****extrusion welding**

welding process in which an extruder unit with a melting chamber gives the extruded material required by the thickness and shape of the joint

Note 1 to entry: Hot air or inert gas heats simultaneously the parent material.

**3.16.3****heated tool welding**

welding process in which the joint surfaces are adequately heated by exposure, through direct contact with heated elements and are welded under pressure, which includes butt fusion welding (also called hot plate welding, platen welding or mirror welding) and socket fusion welding

**3.16.4****heated wedge**

welding process in which the lining membrane welded is gripped by rollers which guide and propel the welding machine which uses either hot gas to heat the lining membrane and the wedge to effect the weld or electrically heated wedge to heat the lining membrane in the area being welded

**3.16.5****high-speed nozzle**

welding process in which the welding rod is suitably guided and pre-heated and the nozzle tip is provided with a profiled area to apply the welding pressure

**3.16.6****hot gas welding**

welding process in which the materials to be unified are softened by hot air or inert gas and are pressed together

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### 3.16.7

#### **round nozzle**

welding process in which the pressure is applied via the welding rod or a suitable attachment such as a pressure roller

### 3.16.8

#### **solvent welding**

softening of fitting and pipe surfaces, by means of a solvent contained in the cement

Note 1 to entry: After suitable cure time, the solvent dries leaving the parent material in the interface between welded joints.

### 3.17

#### **welding Procedure Specification**

##### **WPS**

document providing in detail the required variables for a specific application to assure repeatability

### 3.18

#### **welding record sheet**

document recording in detail the variables used during the practical test

### 3.19

#### **welder**

person making a welded assembly by any process, whose manual skill and knowledge are two of the determining factors influencing the quality of the welded joint, or person performing a welding operation by means of mechanical or automatic equipment

## 4 Admission to the qualification tests

Only applicants whose training and/or for whose previous activities show that they are likely to pass the planned test may be admitted as a candidate. As a rule this is the case if one of the following conditions is met:

- completed apprenticeship as plastics fabricator;
- at least two years experience as a plastics welder confirmed by manufacturer's declaration;
- completion of both a technical and practical training course in preparation for the plastic welders qualification test.

An example of a suitable training course is defined in Entry [1] in the Bibliography or may be identified in national standards.

## 5 Testing of skill and knowledge

### 5.1 General

During the qualification test, the candidate shall demonstrate his practical skill according to 5.2 and his theoretical knowledge according to 5.3.

### 5.2 Practical test

This part of the qualification test is carried out under the supervision of the PWE or Invigilator.

The candidate shall complete the test piece specified by the required sub-group in Table 1 or Table 2 in accordance with the relevant WPS.

All welding equipment, materials and documents necessary to complete the test piece shall be available to the candidate.

All welding shall be performed in a horizontal position.

The time taken by the candidate to complete the test piece shall correspond to that taken under production conditions.

### 5.3 Theoretical test

#### 5.3.1 General

This part of the qualification test is carried out under the supervision of the PWE or Invigilator.

The candidate's knowledge of the practical working rules for skilful and safe working shall be evaluated in the theoretical test.

#### 5.3.2 Lining membranes (M) and sheets (S)

The candidate shall answer 20 multiple-choice questions for one welding process. If the candidate is being tested in more than one welding process, the number of multiple-choice questions shall be increased by five per welding process up to a maximum of forty.

Completion of the 20 questions theoretical test shall not exceed one hour and be continuous without access to teaching aids. For any extra question a maximum time of 3 min shall be added to the previous hour.

The questions shall cover the subjects in 5.3.4 as appropriate .

#### 5.3.3 Pipes and fittings (P)

The candidate shall answer 20 multiple-choice questions for each welding process. If the candidate is being tested in more than one subgroup the number of multiple-choice questions shall be increased by seven for each subgroup.

EXAMPLE The number of questions for testing subgroups: 2.4+3.4+3.6 is 47 questions

Completion of the 20 questions theoretical test shall not exceed one hour and be continuous without access to teaching aids. For any extra question a maximum time of 3 min shall be added to the previous hour.

The questions shall cover the subjects in 5.3.4 as appropriate .

#### 5.3.4 Questions

The questions shall cover the following subjects, as appropriate:

- rules for welding of thermoplastics to which the test is designed to apply, meaning of the welding signs and symbols of the range of work;
- operation and control of the welding equipment;
- welding processes;
- knowledge concerning on-site welding;
- correct preparation of the work pieces for welding;