



**NSAI**  
Standards

Irish Standard  
I.S. EN 50678:2020&AC:2021-04

# General procedure for verifying the effectiveness of the protective measures of electrical equipment after repair

**I.S. EN 50678:2020&AC:2021-04**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

EN 50678:2020/AC:2021-04

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

*This document is based on:*

EN 50678:2020

*Published:*

2020-03-06

*This document was published under the authority of the NSAI and comes into effect on:*

2021-05-03

ICS number:

17.220.20

NOTE: If blank see CEN/CENELEC cover page

NSAI  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

Sales:  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

## National Foreword

I.S. EN 50678:2020&AC:2021-04 is the adopted Irish version of the European Document EN 50678:2020, General procedure for verifying the effectiveness of the protective measures of electrical equipment after repair

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

**Compliance with this document does not of itself confer immunity from legal obligations.**

*In line with international standards practice the decimal point is shown as a comma (,) throughout this document.*

This page is intentionally left blank



Corrigendum to EN 50678:2020

English version

---

*Replace the formula in 5.3, "Measurement of protective bonding resistance" with the following formula:*

"For cross section areas above 1,5 mm<sup>2</sup> and other cable lengths the limit shall be calculated by the following formula:

$$R = \rho \frac{l}{A} + 0,1\Omega \text{ or } R = \frac{l}{\kappa A} + 0,1\Omega$$

where

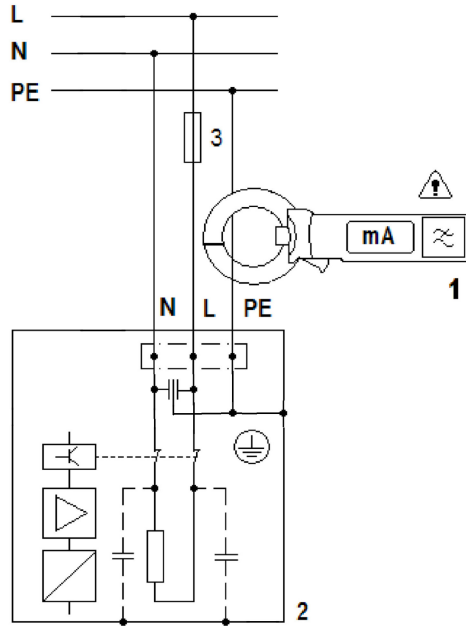
- $R$  is the electrical resistance ( $\Omega$ );
- $\rho$  is the standard value of electrical resistivity ( $\Omega \text{ mm}^2/\text{m}$ ) for the metal used for the PE conductor;
- $l$  is the length of the cable in meters (m);
- $A$  is the cross-sectional area of the conductor in square millimetres (mm<sup>2</sup>);
- $\kappa$  is the electrical conductivity (m/( $\Omega \text{ mm}^2$ )).

NOTE 2 The value of 0,1  $\Omega$  in the equation above considers the influence of the contact resistance."

EN 50678:2020/AC:2021

Replace Figure 3e, "Example of protective conductor current — direct method with clamp" with the following figure:

"



**Figure 3e — Example of protective conductor current — direct method with clamp**

"

EUROPEAN STANDARD

**EN 50678**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2020

ICS 17.220.20

English Version

## General procedure for verifying the effectiveness of the protective measures of electrical equipment after repair

Procédure générale visant à vérifier l'efficacité des mesures de protection des équipements électriques après réparation

Allgemeines Verfahren zur Überprüfung der Wirksamkeit der Schutzmaßnahmen von Elektrogeräten nach der Reparatur

This European Standard was approved by CENELEC on 2019-12-16. CENELEC 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 CEN-CENELEC Management Centre or to any CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

**EN 50678:2020 (E)**

**Contents**

	Page
European foreword .....	3
Introduction .....	3
1 Scope .....	5
2 Normative references .....	6
3 Terms and definitions .....	6
4 Requirements .....	9
5 Tests .....	9
5.1 General .....	9
5.1.1 General test conditions .....	9
5.1.2 Visual inspection .....	10
5.1.3 Test of the protective measures against electric hazards .....	10
5.1.4 Confirmation of the compliance of additional protective measures .....	10
5.1.5 Documentation and evaluation of test .....	10
5.2 Visual inspection .....	11
5.3 Measurement of protective bonding resistance .....	11
5.4 Measurement of the insulation resistance .....	14
5.5 Measurement of protective conductor current .....	21
5.6 Measurement of the touch-current .....	27
5.7 Confirmation of the compliance of the specifications for the protective measure SELV/PELV .....	31
5.8 Measurement of the leakage current produced by a floating input with a rated input voltage above 50 V AC or 120 V DC .....	31
5.9 Confirmation of the operation of further protective measures .....	32
5.10 Confirmation of the polarity of mains plug wiring .....	32
5.11 Functional test .....	32
6 Documentation and evaluation of test .....	32
7 Test equipment .....	33
Annex A (informative) General guidance and rationale .....	34
A.1 Intended audience .....	34
A.2 Rationale .....	35
A.2.1 Clause 5 – Tests .....	35
A.2.2 Subclause 5.3 – Measuring of protective bonding resistance .....	35
A.2.3 Subclause 5.4 – Measurement of insulation resistance .....	35
A.2.4 Alternative method .....	37
A.2.5 Differential method .....	37
Annex B (informative) Schematics for test sequences .....	38
Annex D (normative) Special National Conditions .....	41
Bibliography .....	42



## **European foreword**

This document (EN 50678:2020) has been prepared by CLC/TC 85X “*Measuring equipment for electrical and electromagnetic quantities*”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-12-16
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-12-16

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

**EN 50678:2020 (E)**

## **Introduction**

This standard intends to provide a general test procedure to verify the effectiveness of the basic protective measures for current-using equipment or appliances after they have been repaired, thus ensuring the safety of people using repaired equipment.

This standard may be considered to support compliance with the European Directive 2009/104/EU concerning the minimum safety and health requirements for the use of work equipment by workers at work.

In general, the test procedure for verification of products after repair is the responsibility of the related product technical committees. This document may be taken into consideration by product technical committees if they need to take into consideration modified or additional tests for verification after repairs for products falling within their scope.

## 1 Scope

This document specifies requirements for setting a uniform procedure to verify the effectiveness of the protective measures for current-using equipment or appliances after they have been repaired.

This procedure is applicable to current-using equipment or appliances with a rated voltage above 25 V AC and 60 V DC up to 1 000 V AC and 1 500 V DC, and currents up to 63 A, connected to final circuits. They may be either pluggable equipment type A connected or permanently connected.

This document is not intended to replace test covered by safety standards nor product standards, for example type tests, routine tests and acceptance tests.

This document assumes that the current-using equipment or appliances under consideration complies with its related product standard, has been introduced on the market, has been in use, has failed, and has then been repaired.

It intends to verify that operations for repairs have not jeopardized basic protective measures, for example to verify the continuity of the protective conductor, the withstand capability of the insulation or to verify that no metallic part is loose or is inadvertently inserted in the device.

This document does not apply to:

- recurrent tests defined in EN 50699;<sup>1</sup>
- devices and equipment that are part of the fixed electrical installations. For these, tests for verification after repair are covered by HD 60364-6;
- audio/video, information and communication technology equipment;
- uninterruptible Power Supply (UPS);
- charging stations for electro-mobility;
- power supplies;
- programmable Logic Controllers (PLC);
- power Drives;
- devices for EX-zones or for mining applications in general;
- products already covered by standards addressing similar topics such as:
  - medical equipment covered by EN 60601-1. For these devices, tests for verification after repair are covered by EN 62353;
  - arc welding equipment covered by EN IEC 60974-1. For these devices, tests for verification after repair are covered by EN 60974-4.
  - machinery covered by EN 60204-1. For these devices, EN 60204-1 applies.

---

<sup>1</sup> Under preparation. Stage at time of publication: prEN 50699:2019.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-