



BSI Standards Publication

Guidance for production, testing and diagnostics of polymer insulators with respect to brittle fracture of core materials

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

National foreword

This Published Document is the UK implementation of CLC/TR 62662:2011. It supersedes PD IEC/TR 62662:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PEL/36, Insulators for power systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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

© BSI 2011

ISBN 978 0 580 75926 0

ICS 29.080.10

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 November 2010.

Amendments and corrigenda issued since publication

Date	Text affected
31 December 2011	This corrigendum renumbers PD IEC/TR 62662:2010 as PD CLC/TR 62662:2011

**Guidance for production, testing and diagnostics of polymer insulators
with respect to brittle fracture of core materials
(IEC/TR 62662:2010)**

Guide pour la production, les essais et
diagnostics des isolateurs polymériques
en rapport avec les ébréchures des
matériaux du noyau
(CEI/TR 62662:2010)

Empfehlungen und Anleitungen für die
Herstellung, Prüfung und Diagnose von
Polymerisolatoren hinsichtlich Spröbruch
des Kernwerkstoffes
(IEC/TR 62662:2010)

This Technical Report was approved by CENELEC on 2011-10-24.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

This document (CLC/TR 62662:2011) consists of the text of IEC/TR 62662:2010 prepared by IEC TC 36 "Insulators".

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

Endorsement notice

The text of the Technical Report IEC/TR 62662:2010 was approved by CENELEC as a Technical Report without any modification.

Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61109	-	Insulators for overhead lines - Composite suspension and tension insulators for a.c. systems with a nominal voltage greater than 1 000 V - Definitions, test methods and acceptance criteria	EN 61109	-
IEC/TR 62039	-	Selection guide for polymeric materials for outdoor use under HV stress	-	-

TECHNICAL REPORT



Guidance for production, testing and diagnostics of polymer insulators with respect to brittle fracture of core materials

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

Q

ICS 29.080.10

ISBN 978-2-88912-172-4

CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
1 Scope.....	10
2 Normative references	10
3 Terms and definitions	10
4 Description of brittle fracture	11
5 Identification of brittle fracture	12
6 Failure mechanisms	12
6.1 Description of identified failure mechanisms.....	12
6.2 Mechanism M1 – Acid generated by electrical activity	12
6.3 Mechanism M2 – Acid ingress from environment	13
6.4 Mechanism M3 – Acid generated inside the core	14
7 Risk assessment	14
7.1 FMEA approach	14
7.2 Results.....	15
7.3 Discussions	17
8 Guidance for material selection and production	17
8.1 Rod materials and production process.....	17
8.1.1 Fibreglass	17
8.1.2 Resins	18
8.1.3 Rod production	18
8.2 Housing and sealing.....	18
9 Preventive methods.....	19
9.1 Sealing.....	19
9.2 Corona rings	19
9.3 Material selection	20
9.4 Housing quality	20
9.5 Handling, transportation and storage.....	20
Bibliography.....	21
Figure 1 – Typical brittle fracture	11
Table 1 – Risk potential number (RPN) and standardized risk potential of brittle fracture failure modes	15
Table 2 – Risk assessment of the identified brittle fracture failure modes.....	15