



Technical Specification 43-88

Issue 6 2016

Selection and treatment of wood poles and associated timber for overhead lines

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**Operations Directorate
Energy Networks Association
6th Floor, Dean Bradley House
52 Horseferry Rd
London
SW1P 2AF**

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Issue 5 published, 2010.

Amendments since publication

Issue	Date	Amendment
Issue 6	February 2016	<p>Major revision of Issue 5: (i) to align document with normative reference BS EN 14229 (ii) to reflect changes made to the Standards referenced (iii) to clarify existing requirements and add new requirements in respect of the quality of wood pole manufacture.</p> <p>NOTE: To avoid confusion due to the re-numbering of existing clauses and addition of new clauses, the clause numbering below refers to this revised Issue 6. The clause numbers of Issue 5 are given in brackets, where relevant, for cross referencing.</p> <p>This issue includes the following principal technical changes.</p> <p>Foreword: Standard wording added in respect of ENA Engineering Documents template. Content revised due to the alignment with BS EN 14229 and updated information on relevant regulations for creosote.</p> <p>Clause 2 (Issue 5, Clause 3): References updated, deleted or added as relevant.</p> <p>Clause 3 (Issue 5, Clause 2): Majority of definitions deleted as they are referenced in BS EN 14229. New definition added for 'dean and stark method' and 'delamination'.</p> <p>Clause 4: Minor amendments to clause headings and new title added to Table 1. Issue 5, Clause 4.3 and 4.2 moved to Clause 5.</p> <p>Clause 5: Major restructuring to this clause.</p> <p>Clause numbering and order of headings reconfigured to align with BS EN 14229 Clause 5.</p>

	<p>Clauses 5.2.1 and 5.2.2 have been moved from Clause 4. Where wording is a repeat of BS EN 14229, this has been removed and replaced with a reference.</p> <p>New Clause 5.2.3 inserted to align with BS EN 14229.</p> <p>Clause 5.3 (Issue 5, Clause 5.1.3): Titled amended. Wording deleted and reference to BS EN 14229 Clause 5.3 inserted.</p> <p>Clause 5.4 (Issue 5, Clause 5.3): References corrected. New paragraph added which requires values for modulus of elasticity and modulus of strength to conform to BS EN 14229 Annex E as a minimum.</p> <p>Clause 5.5 (Issue 5, Clause 5.2): This Clause including all sub-clauses 5.5.1 to 5.5.15 has been restructured and aligned to BS EN 14229. This includes a new Clause 5.5.3 for 'Heartwood', new Clause 5.5.4 for 'Rate of growth', a new Clause 5.5.12 for 'Sapwood' (the minimum sapwood requirements for 'medium stout' poles has also been added) and a new Clause 5.5.15 for 'Compression wood'.</p> <p>Clause 6.2.1 (Issue 5, Clause 6.2.1): Clause has been subject to major rewording, restructuring and amendment of references to improve clarity of moisture content testing. Moisture test procedure now in accordance with BS EN 13183-2. Borings method now in accordance with BS EN 14229.</p> <p>Clause 6.2.2 (Issue 5, Clause 6.2.5): Clause has been improved to clarify requirements and reference to BS EN 13183-1 for the oven dry test method has been added.</p> <p>Clause 7: New clause added to include reference to BS EN 14229 Clause 7 'Evaluation of conformity'. This clause sets out the requirements for type testing and conformity evaluation. Control for preservative treated poles retains the controls used in Issue 5. The inspection and general requirements for production control now reference BS EN 14229.</p> <p>Clause 8: New clause added to clarify marking requirements and to align with BS EN 14229. A new sub-clause 8.2 includes requirements for CE marking which references BS EN 14229 Annex ZA.</p> <p>New Clause 9.2 added to describe preparation of Douglas Fir when required by the purchaser.</p> <p>Clause 9.6 (Issue 5, Clause 7.5): Clause amended to reference new Clause 8 for marking requirements and to include option for displaying marking on a metal plate.</p> <p>Issue 5, Clause 7.6: Clause has been deleted as it is now covered by the new Clause 8.</p> <p>Clause 10 (Issue 5, Clause 8):</p> <p>Clause has been subject to a number of amendments to align with latest standards.</p> <p>Clause 10.1: Reference to BS 144 Annex 1 added and new requirement for all poles in a charge to of a similar size i.e. groupings defined.</p> <p>Clause 10.2: New option added for timber incising in accordance with BS 144 prior to treatment.</p> <p>Clause 10.3: Reference to treatment cycle has been changed to BS 144.</p> <p>Clause 10.5.2: Penetration class updated to the latest terminology in BS EN 351-1. Extraction of test borings referenced to BS EN 351-2. Title added to Table 3 and references updated.</p>
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		<p>Clause 10.5.3: Borings method to test retention is referenced to BS EN 351-2. Note added to explain the term 'safe relationship'.</p> <p>Clause 10.6: New requirement for bleeding poles to be stored for a minimum of 3 months following retreatment.</p> <p>Clause 10.7: New clause added to include a requirement to test for delamination.</p> <p>Clause 11 (Issue 5, Clause 9): Clause has been subject to a major restructure and amendment in order to improve consistency with Clause 10 and to update Standards referenced.</p> <p>Clause 11.1: Updated to reference BS 8417 and new requirement added to treat poles of similar size in a charge i.e. groupings defined.</p> <p>Clause 11.2: New requirements added, consistent with Clause 10.2, to ensure moisture content, fabrication and surface temperature are satisfied prior to treatment. Option for timber incising prior to treatment added.</p> <p>Clause 11.3: Requirements removed and replaced with reference to BS EN 14229.</p> <p>Clause 11.4: New clause title and sub-clauses 11.4.1 and 11.4.2 restructured and reworded to clarify the penetration and retention requirements consistent with Clause 10.5.</p> <p>Clause 11.5: New requirement added to check moisture content does not exceed 28% following treatment.</p> <p>Clause 13.1: Penetration classes updated in accordance with BS EN 350-1 Table 1.</p> <p>Clause 14.1: Determination of natural durability now referenced to BS EN 350-1 and BS EN 350-2.</p> <p>Clause 14.2: Penetration classes updated in accordance with BS EN 350-1 Table 1.</p> <p>Issue 5, Clause 13: Clause has been deleted as quality control requirements are covered by Clause 7.</p> <p>Issue 5, Clause 14: Clause has been deleted as the recording of documentation has been captured in a new Annex H.</p> <p>Annex A (Issue 5, Appendix A): New column added for 'Medium Stout' poles and values inserted from an ENAMC specification.</p> <p>Annex B (Issue 5, Appendix B): New column added for 'Medium Stout' poles (values to be added).</p> <p>Annex C (Issue 5, Appendix C): Creosote treatment of plugs now referenced to BS 144 and reference to BS 4072 has been deleted as this is no longer relevant.</p> <p>Annex D (Issue 5, Appendix D): Two new diagrams added to Annex D to indicate typical layout details for markings applied by 'gouging/branding/routing' and markings applied by use of a 'label disc'.</p> <p>Annex E (Issue 5, Appendix E): Reference to BS 144 deleted in Method 1.</p> <p>Annex G (Issue 5, Appendix G): The previous information relating to The Biocidal Product Directive has been deleted. The use of copper/chromium/arsenic (CCA) is now illegal and been deleted. A new explanation of the Biocidal Product Directive timelines and the REACH Regulations has been added.</p>
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		<p>Annex H (Issue 5, Appendix H): The previous flow chart has been deleted. A new declaration conformity schedule has been added to capture the manufacturer's evaluation of all requirements satisfied. The recording requirements have also been included with the new schedules.</p> <p>Bibliography: New clause added to capture Standards not referenced in TS 43-88 which could be relevant to the reader.</p> <p>Details of all other technical, general and editorial amendments are included in the associated Document Amendment Summary for this Issue (available on request from the Operations Directorate of ENA).</p>
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Foreword

This Technical Specification (TS) is published by the Energy Networks Association (ENA) and comes into effect from the date of publication. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this engineering document is “ENA TS 43-88”.

This document specifies the selection and treatment of wood poles and associated timber components for use on overhead lines. It unifies the requirements of the Electricity Industry with regard to quality, species of timber and preservative treatments. This document supersedes ENA TS 43-88 Issue 5 2010.

Wood poles and associated timber components covered by this Technical Specification are intended to conform with the International and British Standards listed in Clause 2. BS EN 14229 is the harmonised European Standard for wood poles, which provides conformity requirements and determines characteristic values for wood poles. This Technical Specification amplifies and/or clarifies the requirements of BS EN 14229 and is intended to be read in conjunction with the Standard. A specific clause/table/annex referenced in this document is preceded by the applicable Standard, otherwise, where a clause/table/annex is referenced without a preceding Standard number, it is applicable to this Technical Specification. In the event of conflicting requirements, preference shall be in the following order.

- a) Purchaser’s specific requirements.
- b) Appropriate European or National Standard.
- c) ENA TS 43-88.

Within the European Union, regulations provide for strict control of the use of creosote preservatives. Primarily, product evaluation is encompassed by the Biocidal Products Directive 98/8/EC, and their end use by the REACH Regulations. A timeline of requirements must be satisfied by Member States to ensure the continued use of creosote as a preservative for wood poles. Annex G provides an explanation of the current situation.

As a consequence of the increasing legislative restrictions placed on creosote wood preservatives, alternative water soluble preservatives and creosote distillations are now commercially available. It is likely these preservatives will be offered by the wood pole industry and as such this Technical Specification provides technical criteria for their use.

Where the term “shall” or “must” is used in this document it means the requirement is mandatory. The term “should” is used to express a recommendation. The term “may” is used to express permission. Where the term “shall” is used in this document it expresses a requirement. The term “may” is used to express permission.

NOTE: Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

1 Scope

This Technical Specification covers imported timber for poles, stay blocks, and other ancillary timbers.

2 Normative references

The following referenced documents, in whole or part, 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.

Standards publications

IEEE 1217–2001, *IEEE Guide for preservative treatment of wood distribution and transmission line structures*

BS 144, *Specification for coal tar creosote for wood preservation*

BS 4978, *Visual strength grading of softwood. Specification*

BS 8417, *Preservation of wood. Code of practice*

BS 6001-1/ISO 2859-1, *Sampling procedures for inspection by attributes – Part 1. Sampling schemes indexed by acceptable quality limit (AQL) for lot-by-lot inspection*

BS EN 350-1, *Durability of wood and wood-based products. Natural durability of solid wood – Part 1. Guide to the principles of testing and classification of natural durability of wood*

BS EN 350-2, *Durability of wood and wood-based products. Natural durability of solid wood – Part 2. Guide to natural durability and treatability of selected wood species of importance in Europe*

BS EN 351-1, *Durability of wood and wood based products. Preservative treated solid wood – Part 1. Classification of preservative penetration and retention*

BS EN 351-2, *Durability of wood and wood based products. Preservative treated solid wood – Part 2. Guidance on sampling for the analysis of preservative treated wood*

BS EN 12490, *Durability of wood and wood-based products. Preservative-treated solid wood. Determination of the penetration and retention of creosote in treated wood*

BS EN 13183-1, *Moisture content of a piece of sawn timber – Part 1. Determination by oven dry method*

BS EN 13183-2, *Moisture content of a piece of sawn timber – Part 2. Estimation by electrical resistance method*

BS EN 13991, *Derivatives from coal pyrolysis. Coal tar base oils. Creosotes. Specifications and test methods*

BS EN 14229, *Structural timber. Wood poles for overhead lines*

Other publications

[N1] ENA TS 43-91, *Stay strands and stay fittings for overhead lines*

3 Terms and definitions

For the purposes of this document, Clause 3 of BS EN 14229 shall apply as supplemented with the following terms and definitions.

3.1

batch

clearly identifiable collection of units of preservative-treated wood manufactured to conform to the same defined penetration and retention requirements

[BS EN 351-2, Clause 3.3]

NOTE: A batch may be part of a charge or a combination of several charges

3.2

bleeding

exudation of liquid preservative from the surface of a treated pole

3.3

blue stain

discolouration of timber resulting from the growth of certain fungi that derive their nourishment from the cell contents but do not cause decomposition of the timber

NOTE: Blue stain is principally confined to the sapwood.

3.4

compression wood

reaction wood formed typically on the lower sides of branches and of leaning or crooked stems of softwood trees

NOTE: Compression wood is usually denser and darker and is normally accompanied with a butt sweep.

3.5

Dean and Stark method

method to determine retention of creosote in treated wood

NOTE: The Dean and Stark method is described in BS EN 12490 Clause 6

3.6

delamination

separation of timber along the fibre direction that usually extends across the rings of annual growth, commonly resulting from stress set up in the wood during the seasoning and preservative process

3.7

FPC

factory production control