

Electricity Specification 400DS1

Issue 1 November 2021

Returnable Wooden Drums and Lifting Spindles used for Storage and Supply of Mains Cables and Conductors



Amendment Summary

ISSUE NO. DATE	DESCRIPTION
<p>Issue 1 November 2021</p>	<p>New Document created in the latest template to replace the following documents which will be archived:</p> <p>ES400C1: Drums used in the Supply of conductors for Wood Pole Overhead Lines ES400C7: Returnable Cable Drums for Mains Cables.conforming.to C P410 Chapter 1 ES400S9: Spindles for Returnable Cable Drums Conforming to Specification 400 C7</p> <p>Prepared by: Philip Howell Approved by: Policy Approval Panel and signed on its behalf by Steve Cox, Engineering and Technical Director</p>

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1 Introduction

This specification covers Electricity North West Limited requirements for returnable drums used to supply and store underground cables and overhead line conductors used on the electricity distribution network (Network) owned by Electricity North West Limited, as Distribution Licensee.

The specification also covers the spindles required when lifting or reeling from the drums.

2 Scope

The purpose of this document is to detail the minimum requirements for a range of wooden cable drums, reels and coils that are used for the supply and storage of mains cables and conductors procured by Electricity North West.

In order to reduce waste, wooden drums should be supplied on a returnable basis such that once empty, they are picked up and returned to the manufacturers base for refurbishment if required, and then re- used for new supply of cable or conductor.

Any materials used for protection should be fully recyclable or re-usable.

Drums and reels should comply with the minimum requirements on all aspects of this specification to ensure consistency and compatibility with any equipment used for handling and transportation of the drums.

Details of standard metal spindle bars are included which must be used when lifting or supporting these drums on stands.

Where cables or conductors are supplied on drums which deviate from this specification, then it shall only be following specific written approval by Electricity North West.

The specification does not cover large steel drums used for transmission cables or small plywood / cardboard reels (<500mm diameter) used for small wiring and service cables.

3 Definitions

Approval	Sanction by the Electricity North West Circuits Policy Manager that specified criteria have been satisfied
Contract	The agreement between Electricity North West and the Contractor for the execution of the Works including therein all documents to which reference may properly be made in order to ascertain the rights and obligations of the parties under the said agreement.
Contractor	The person or person's firm or company, including personal representatives, successors and permitted assigns, who's Tender has been accepted by Electricity North West.
Specification	The Specifications and schedules (if any) agreed by the parties for the purpose of the Contract.

Supplier	Any person or person's firm or company who supplies goods to Electricity North West or to its Contractor.
Tender	An offer in writing to execute work or supply goods at a fixed price.
Tenderer	The person or person's firm or company, including personal representatives, successors and permitted assigns, invited by Electricity North West to submit a Tender.

4 General Requirements for Approvals and Testing

4.1 Product not to be Changed

No change in the product, packaging or labelling shall be made after Approval has been granted without prior notice to the Electricity North West Circuits Policy Manager, and receipt of a written agreement to the proposed change from the Electricity North West Circuits Policy Manager.

4.2 Electricity North West Technical Approval

The Tenderer shall submit, with this Tender, proposals for testing which will demonstrate, to the satisfaction of the Electricity North West Circuits Policy Manager, compliance with this Specification. Such tests shall be carried out without expense to Electricity North West.

Alternatively, technical reports and other data may be submitted that the Tenderer considers will demonstrate, to the satisfaction of the Electricity North West Circuits Policy Manager, compliance with this Specification. Acceptance of this evidence shall be at the discretion of the Electricity North West Circuits Policy Manager but will not be unreasonably withheld.

Approval shall be 'factory specific' and is not transferable to another factory without the written Approval of the Electricity North West Circuits Policy Manager.

The Supplier and product shall comply with all the relevant requirements of Electricity North West document CP311.

4.3 Quality Assurance

The Tenderer shall confirm whether or not Approval is held in accordance with a quality assurance scheme accredited under ISO 9000. If not, the Tenderer shall submit a statement of the quality assurance procedures employed to control the quality of the product, including the performance of Suppliers and Sub-Contractors.

The right is reserved for the repeat of such tests, from time to time, that the Electricity North West Circuits Policy Manager may deem to be reasonably necessary to demonstrate continued compliance with the Specification.

The Tenderer shall submit, with the Tender, a list of tests and inspections which are carried out on the product prior to despatch which shall demonstrate, to the satisfaction of the Electricity North West Circuits Policy Manager, fitness for installation and service.

The Tenderer shall provide free of charge to Electricity North West such samples as may, in the opinion of the Electricity North West Circuits Policy Manager, be reasonably required for inspection and/or retention as quality control samples. The Electricity North West Circuits Policy Manager will confirm the requirement for samples at the time of Tendering.

The right is reserved for inspections to be made of Tenderer's facilities, from time to time, as deemed reasonably necessary by the Electricity North West Circuits Policy Manager to ensure compliance with this Specification and any Contract of which it forms a part.

The Tenderer shall submit, with the Tender, such details of product packaging disposal, as will enable Electricity North West to comply with the requirements of BS EN ISO 14001 - Environmental Management Systems.

4.4 Formulation

The Tenderer shall submit, with the Tender, such details of the formulation and use of the product and associated substances as will enable Electricity North West to comply with the obligations of the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulations 2002, in the use, storage and disposal of the product. The Tenderer may stipulate, prior to submission of such information, that it is to remain confidential, and the Electricity North West Circuits Policy Manager will, if requested, confirm agreement to this prior to receipt of the information.

4.5 Identification Markings

The Tenderer shall submit, with the Tender, details of markings which it is proposed to apply to the product or packaging to identify manufacturing batches or items. The forms and content of such markings shall be subject to the Approval of the Electricity North West Circuits Policy Manager and shall in all cases include the Electricity North West approved description and commodity code number.

The Tenderer shall submit, with the Tender, such details of marking gross weight on components, assemblies and packages, as will enable Electricity North West to comply with the Health and Safety Manual Handling Operation Regulations 1992, for components, assemblies and packages supplied with a gross weight over 1kg. The forms and content of such markings shall be subject to the Approval of the Electricity North West Circuits Policy Manager.

4.6 Minimum Life Expectancy

The returnable drums are to be supplied by cable/conductor manufacturer as part of their scope of supply and should be robust enough to allow transportation and storage to, and within Electricity North West depots and sites for periods up to 5 years without any significant deterioration which renders them unsafe.

Cable drum spindles should have a minimum service life of 5 years but be inspected annually to ensure fitness for application.

4.7 Product Conformity

Preference will be given to those Suppliers who can provide suitable product conformity certification to a recognised or specified standard, or an equivalent certification.

4.8 Confirmation of Conformance

The Tenderer shall complete the applicable parts of the conformance declaration sheets in [Appendix A](#). Failure to complete these declaration sheets may result in an unacceptable bid.

5 Requirements for Type and Routine Testing

The Electricity North West Circuits Policy Manager shall set out the requirement of the following tests to be carried out by the Supplier at the Supplier's cost.

5.1 Requirement for Type Tests at Suppliers Premises

These are a series of one-off type tests, which are carried out to ensure the satisfactory performance of the product design, under extremes of operating stresses, and of endurance, as may be appropriate, to be determined by the Electricity North West Circuits Policy Manager.

These may or may not be destructive tests.

5.2 Requirement for Routine Tests at the Supplier's Premises

These tests may be required to be carried out on every individual unit or component, as specified, or at some regular frequency to be determined by the Electricity North West Circuits Policy Manager.

The results of these tests may be required to be supplied to Electricity North West with each unit purchased or retained for inspection, at a period to be determined by the Electricity North West Circuits Policy Manager.

6 Returnable Wooden drums

6.1 General Construction

All returnable drums shall be constructed from suitably heat treated and fumigated sawn softwood which fully complies with global phytosanitary measures under ISPM 15 regulations.

The drum construction should be suitably robust and be free from any protrusions such as nails or sharp edges which could cause injury when handling.

All returnable drums shall be suitable for transporting and storage of relevant lengths of cable or conductor safely and above the specified minimum bending radius and be capable of being stored outdoors for prolonged periods of time in the expected climate conditions for the United Kingdom.

The drums shall be designed to take a round spindle as specified in [Section 9](#) of this document for lifting and supporting the drum on stands.

Each drum shall bear a unique identification number, either heat branded or neatly chiselled on the outside of one flange. An arrow indicating the direction of rolling shall also be marked on at least one flange.

The inner end of the cable or conductor shall project from the drum through an angled hole level with the drum barrel, such that it exits through the flanges and can be strapped parallel to the flange without excessive bending to avoid damage.

Metal Rims on the flange edges are not required unless specified in Project Specific Contracts or Purchase Orders.

The use of protective lagging around the drum is normally not required unless specified within the packaging requirements of the product specification or any Project Specific Contracts.

Where protective lagging is required, the drums shall be lagged using weatherproof wood fibreboard (e.g. Nolcoflex) to provide suitable protection against mechanical damage to the conductor. Lagging shall be secured by a circumferential banding system with a minimum of two bands around the drum.

Drums with wooden battens nailed to the flange edges are not acceptable.

Conductors shall not be covered by any secondary protection system such as water-resistant paper.

All returnable drums shall be designed to be re-usable. Suppliers are expected to collect empty drums and reels from Electricity North West normal delivery points and inspect, repair if necessary, and then re-use.

The commercial arrangements for provision of returnable drums, the allowable time before becoming chargeable and credits for drums returned shall be agreed and specified for each supply agreement or individual purchase order.

All returnable drums shall be supplied with a weatherproof / UV resistant plasticised label on one flange.

The label should contain the information relating to the cable/conductor type and size, together with batch traceability numbers – the exact information that needs to be supplied is detailed in the relevant cable and conductor specification documents.

Details of the returnable drums, reels and coils to be used for overhead line conductors and underground mains cable are given in following sections.

7 Requirements for Overhead Line Conductors

All overhead-line conductors defined in Electricity North West Specification ES400C3 shall be supplied using one of the following methods:

7.1 Returnable Drum for ABC (ABCRD)

- Used for carrying Aerial Bundled Conductor only.
- Maximum Gross Weight = 230 kg.
- See drawing [ES400DS1-D001](#) for details

7.2 Returnable Drum (RD)

- Generally used for carrying conductor lengths of 500m and 1000m.
- Maximum Gross Weight = 170 kg.
- See drawing [ES400DS1-D001](#) for details

7.3 Reel (R)

- Generally used for carrying conductor lengths of up to 250 m.
- Reels shall be constructed from good quality birch plywood. Medium Density Fibreboard (MDF) or hardboard is not allowed.
- Maximum Gross Weight = 120 kg.
- See drawing [ES400DS1-D001](#) for details
- All empty reels that appear to be suitable for re-use shall be returned to the stores for collection by Supplier. Reels and returnable drums for re-use shall be collected by the Supplier at the same time.

7.4 Coil (C)

- A coil length shall be 100 metres or less as detailed in the specific price schedule.
- The coil shall be secured by suitable cable ties at regular intervals around the coil.
- The coil diameter shall be such that the conductor shall be coiled greater than its minimum bending radius.

7.5 Catchweight Coil (CWC)

- A catch weight coil comprises deliverable length of conductor as defined by its total weight.
- The coil shall be secured by suitable cable ties at regular intervals around the coil.

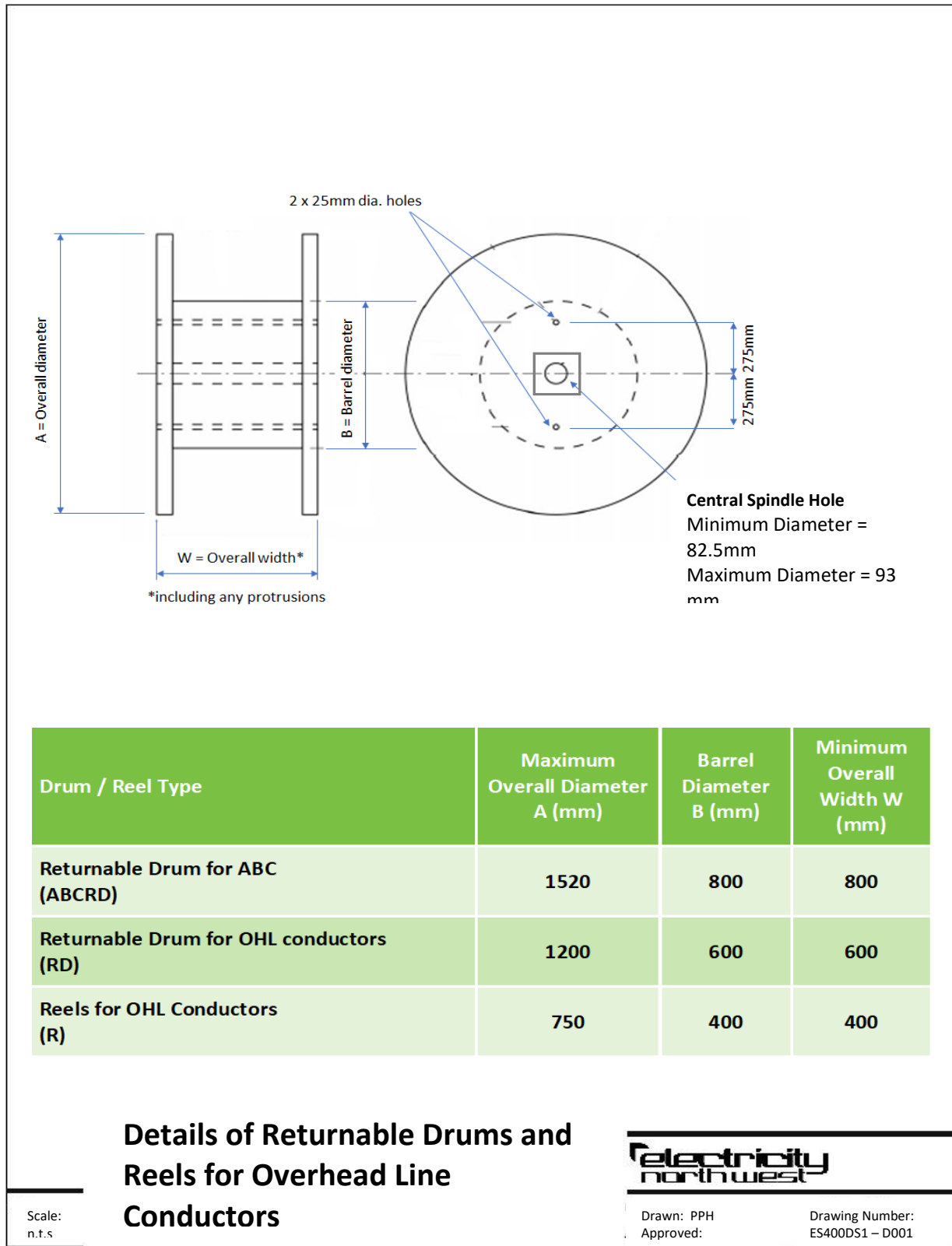
- The maximum allowable weight to be delivered on a catchweight coil is 20kg.

7.6 Ordered-As-Required (OAR)

- Comprises of undefined conductor lengths for maintenance or repair, or to suit section length. The conductor shall be packaged using one of the above methods depending on conductor length.
- The drum dimensions for OAR materials should use drum dimensions in accordance with drawing [ES400DS1-D001](#) where possible. In any event, the drum diameter should be not less than 600mm and the spindle hole diameter should be as per drawing [ES400DS1-D001](#)

The above method(s) shall be specified on any price schedule by the abbreviations ABCRD or RD R, C or CWC, respectively

7.7 Drawing ES400DS1-D001 –Returnable Drums and Reels for Overhead Line Conductors



8 Requirements for Underground Cables

All underground cables covered by the following Electricity North West specification documents shall be delivered on returnable wooden drums according to drawing [ES400DS1 – D002](#):

- ES400C9 : 11 kV Distribution Cables
- ES400C10 : 33 kV Distribution Cables
- ES400C11 : LV Mains Cables

The minimum barrel dimension for each cable type is detailed in section 8.1 below.

In addition, wherever possible, any other cable such as telecommunication or special design cables shall be supplied using returnable drums complying to the requirements and dimensions detailed in this specification. At all times, cable should be supplied on drums which have barrel diameters greater than the manufacturers stated minimum dynamic bending radius for the cable.

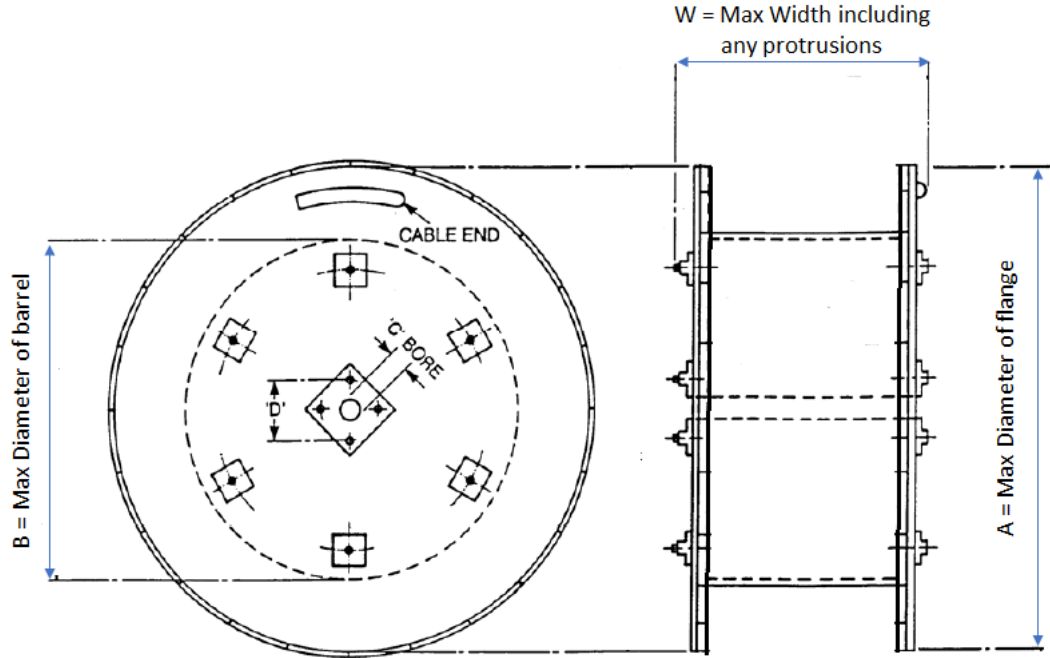
8.1 Minimum Drum Barrel Diameter

Cable Rated voltage (Volts)	Type	No of Cores / Size C x (mm ²)	Minimum Barrel Diameter (Dimension B on Drawing ES400SD1-D002) (mm)
LV (<1000v)	Waveform	3 x 95AL	1000
		3 x 185AL	1200
		3 x 300AL	1370
		4 x 95AL	1000
		4 x 185AL	1370
		4 x 300AL	1370
HV (11,000v)	Triplex	3 x 1 x 95AL	1200
		3 x 1 x 185AL	1200
		3 x 1 x 300AL	1370
		3 x 1 x 400AL	1370
	Single Core	1 x 400CU or AL	1000

Cable Rated voltage (Volts)	Type	No of Cores / Size C x (mm ²)	Minimum Barrel Diameter (Dimension B on Drawing ES400SD1-D002) (mm)
33,000v	Single Core	1 x 185CU	1000
		1 x 240CU	1000
		1 x 300CU or AL	1200
		1 x 400CU or AL	1200
		1 x 500CU or AL	1200
		1 x 630CU or AL	1370
		1 x 800CU or AL	1370
		1 x 1000CU or AL	1370

Any deviation to the requirements within this specification shall only be accepted following written confirmation from Electricity North West.

8.2 Drawing ES400SD1-D002 –Returnable Drums for Underground Mains Cables



Maximum Drum diameter A (mm)	Maximum Drum width W (mm)	Minimum P.C.D of Spindle flange D (mm)	Max / Min diameter of Spindle hole C (mm)	Minimum Barrel Diameter B (mm)
2440	1220	250	93 – 82.5	See Table 8.1 for individual cable types

Details of Returnable Drums for Underground Cables

9 Spindles for use with Returnable Wooden Drums and Reels

9.1 Spindle Material and Safe Working Load

Spindles are to be manufactured from BS970 – 080M40 Carbon Steel and be of 1.5 metre length. They must be able to comply with the requirements of the following table

Maximum Safe Working Load (SWL) based on clearance dimension A (see Figure 1)				
A = 76mm (3 inch)	A = 152mm (6 inch)	A = 229mm (9 inch)	Diameter of Spindle Ø B	Minimum Diameter of Spindle Hole in drum Ø C
13,209 kg	6,604 kg	4,572 kg	76.2mm (3 inch)	82.5mm (3 ¼ inch)

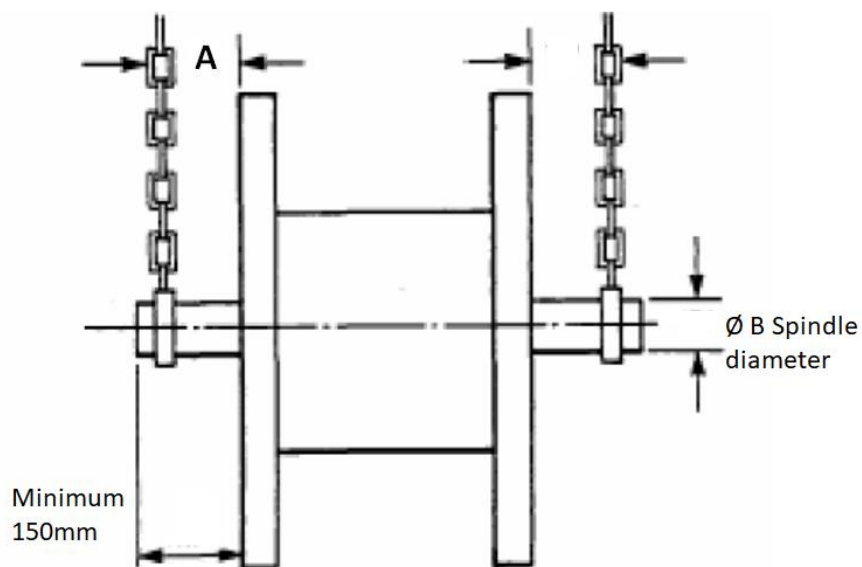


Figure 1 – Drum lifting clearances of lifting chain or harness

Spindles must always extend a minimum of 150mm (6") from each drum flange as shown in Figure 1 above.

9.2 Spindle Marking

The end of the spindle is to be marked with the Electricity North West Equipment Number, Safe Working Load and spindle mass by a means that will remain legible for a minimum period of 12 months, as shown in Figure 2 below.



Figure 2 – Detail of marking on end of spindle

9.3 Spindle Locking Collars

Two collars must be supplied with the spindle to enable the spindle to be clamped in position when inserted through the cable drum, as shown in Figure 3. The collars must be lockable without the use of special tools or appliances.

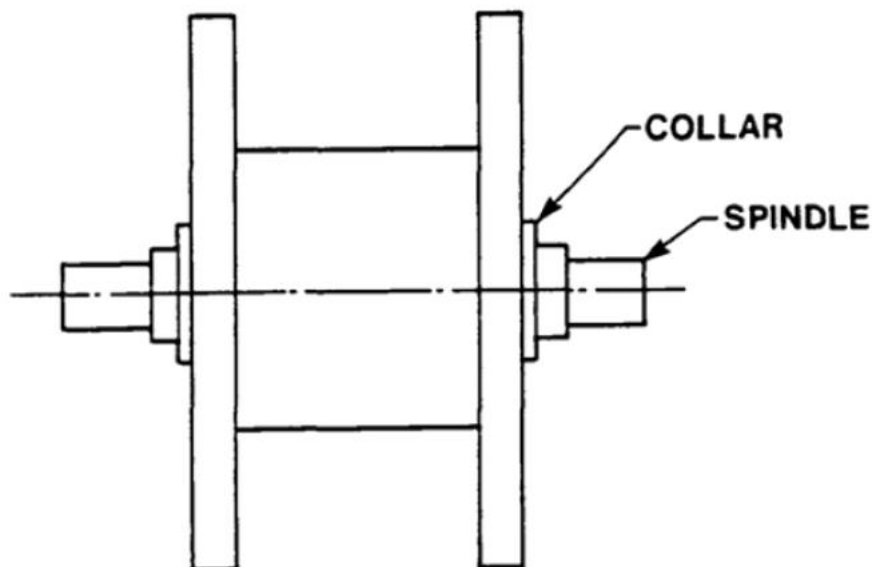


Figure 3 – Spindle Locking Collar in position

10 Documents Referenced

All references to documents listed below are to the latest versions, unless stated otherwise.

DOCUMENTS REFERENCED	
Health and Safety at Work Etc Act 1974.	
Control of Substances Hazardous to Health Regulations 2002.	
Manual Handling Operations Regulation 1992.	
BS EN ISO 9000	Quality management systems.
BS EN ISO 14001: 2004	Environmental Management Systems.
BS 970: 1991	Specification for Wrought Steels for Mechanical and Allied Engineering Purposes
ISBM15	International Standards for Phytosanitary Measures No. 15: Regulation of wood packaging material in international trade
ES400C3	Specification Wood Pole Overhead Line Conductors
ES400C9	Specification for 11 kV Distribution Cables
ES400C10	Specification for 33 kV Distribution Cables
ES400C11	Specification for LV Mains Cables
CP311	Equipment Approval Policy and Process

11 Keywords

Drums, Reels, Returnable, Spindles

Appendix A – Conformance Declaration

SECTION-BY-SECTION CONFORMANCE WITH SPECIFICATION

The Tenderer shall declare conformance or otherwise for each product/service or range of products/services, section-by-section, using the following Conformance Declaration Codes.

Conformance Declaration Codes:

N/A =	Clause is not applicable/appropriate to the product/service.
C1 =	The product/service conforms fully with the requirements of this clause.
C2 =	The product/service conforms partially with the requirements of this clause.
C3 =	The product/service does not conform to the requirements of this clause.
C4 =	The product/service does not currently conform to the requirements of this clause, but the manufacturer proposes to modify and test the product in order to conform.

Manufacturer:

Product/Service Description:

Product/Service Reference:

Name:

Company:

Signature:

SECTION-BY-SECTION CONFORMANCE

Section	Section Topic	Conformance Declaration Code	Remarks * (must be completed if code is not C1)
1	Introduction		
2	Scope		
4.1	Product not to be Changed		
4.2	Electricity North West Technical Approval		
4.3	Quality Assurance		
4.4	Formulation		
4.5	Identification Markings		
4.6	Minimum Life Expectancy		
4.7	Product Conformity		
4.8	Confirmation of Conformance		
5.1	Requirements for Type Tests at the Supplier's Premises		
5.2	Requirement for Routine Tests at the Supplier's Premises		
6.1	General Construction		
7	Requirements for Overhead Line Conductors		
8	Requirements for underground cables		

9.1	Spindle Material and Safe Working Load		
9.2	Spindle Marking		
9.3	Spindle Locking Collars		

* Applicable specifications shall be stated in the Remarks column where alternatives are quoted within a section. The Remarks column shall also be used to indicate cases where the products or services exceed the quoted specifications.

Additional Notes: