12-SDMS-04

Rev.0

SPECIFICATIONS FOR CABLE CLAMPS FOR POWER CABLES

Name	Employee 1 Name	Employee 2 Name	Employee 3 Name	Employee 4 Name	Employee 5 Name
Signature					

12-SDMS-04

Rev.0

SPECIFICATIONS FOR CABLE CLAMPS FOR POWER CABLES

Name	Employee 1 Name	Employee 2 Name	Employee 3 Name	Employee 4 Name	Employee 5 Name
Signature					

Revision History

#	Date	Revision No.	Revised By	Major Revision Description
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Table of Contents

List of Figures

1 Scope

This SEC Distribution Material Specification (SDMS) specifies the minimum technical requirements for design, materials, manufacturing, testing, inspection and performance for Cable Clamps for power cables, to be used in the distribution network of the Saudi Electricity Company (SEC) in Saudi Arabia

2 Cross References

This material standard specification shall be read in conjunction with SEC specification No.01-SDMS-01(latest revision), titled "General Requirements For All Equipment/Materials" which shall be considered as an integral part of this SDMS, also be read in conjunction with SEC purchase order requirements or contract schedules

3 Applicable Codes and Standards

The latest revision of the following codes and standards shall be applicable for the equipment/materials covered in this specification. In case of any deviation, the vendor/manufacturer may propose equipment/material conforming to an alternate code or standard without jeopardizing the requirements of this SDMS. However, the provision of SEC standard shall supersede the provision of these standards in case of any differences

3.1 NFPA-70 National Electrical Code

3.2 IEC 60909 Short-circuit currents in three-phase A.C. systems – Part 0: Calculation of currents

3.3 BS EN 61914 Cable Cleats for Electrical Installations

3.4 BS 7671 IEE Wiring Regulations

3.5 IEC 61914 Cable Cleats for Electrical Installations

3.6 DIN EN 50368 Cable Cleats for Electrical Installations

4 Design and Construction Requirements

4.1 General

4.1.1 The power cable clamps shall be of manufacturer's standard design but shall meet or exceed the requirements of this specification in all respects.

4.1.2 The manufacturer's design drawings, as required in 01-SDMS-01 (latest revision), shall show the outline of the power cable clamps, together with all pertinent dimensions (Typical Clamp for Power Cable drawing is attached at the end). Any variations in these dimensions due to manufacturing tolerances shall be indicated.

4.1.3 The drawings shall have a minimum of two views with an appropriate scale. Following information shall be given on the drawings

a. Type and/or Catalogue number
b. Dimensions (length ,diameter etc.)
c. Mechanical rating
d. Electrical data (basic electrical characteristics of the unit)
e. Cable diameter to be accommodated
f. Details of fittings
g. Type of material/compound used in the clamp
h. Approximate weight of one unit
i. Thickness of zinc coating (where applicable)
j. Marking

4.2 Design Criteria

4.2.1 Cable clamps shall be designed for service conditions specified in 01-SDMS-01 (latest revision).

4.2.2 Mechanical Load, which the clamp is expected to withstand.

4.2.3 The clamp shall be designed for various types of installation such as horizontal runs, vertical runs and complex routes.

4.2.4 Location: indoor, outdoor and/or combined.

4.2.5 Environmental conditions: corrosive, chemicals, etc.

4.2.6 Compatibility: Structure to which clamp shall be fixed i.e. solid base, unis rut, pole, ladder etc.

4.2.7 Cable clamps shall be capable of accommodating the size or range of cable or cable bundle (trefoil) diameter declared by the manufacturer or responsible vendor without cracking or breaking, or stripping screw threads.

4.2.8 Cable clamps shall be resistant to impact at the minimum declared temperature.

4.2.9 Cable clamps shall be capable of withstanding the lateral load at the maximum declared temperature.

4.2.10 Cable clamps shall be capable of withstanding the axial load at the maximum declared temperature.

4.2.11 Cable clamps shall be resistant to electromechanical forces.

4.2.12 The mounting hardware of cable clamps shall be applicable to all supporting structures (steel, concrete, wood, etc.) where the clamps are to be connected and shall be suitable for all site conditions (loading and environmental exposure).

4.3 Ratings

4.3.1 Short circuit rating: Cable clamps shall be well designed to be used for short circuit proof mounting of single or multi core cables in flat or trefoil formation. It should overcome induced magnetic fields creating opposing forces during short circuit cable faults.

4.3.2 Temperature rating: Cable clamps shall be designed to work/function satisfactory at ambient temperature as well as maximum operating temperature of cables

4.4 Materials

4.4.1 Aluminum Cable Clamps

a. Aluminum cable clamps and cleats are designed to fix, retain, hold and support low, medium and high voltage cables, during normal as well as short circuit conditions.
b. The upper half of collar & saddle of aluminum cable clamps shall be made of aluminum, the gasket shall be of rubber and stud /nut/washer/spring shall be of galvanized steel/stainless steel
c. Aluminum cable clamps and cleats can also be made of cast aluminum alloy (plain LM6 aluminum - BS1490) for dry indoor use or outdoor unpolluted areas and can be epoxy coated for harsher environment such as sea air and contaminated conditions.

4.4.2 Metallic Cable Clamps

a. Metallic clamps shall be made of non-magnetic/non ferromagnetic metals.
b. Stainless Steel shall contain at least 16% chromium to have high resistance to corrosion.
c. Corrosion protection can also be provided by adequate layer of Zinc on metallic clamps
d. Screws shall also be protected by anti-corrosion coating (Zinc).
e. Metal parts shall be made of the best commercial grade material and galvanized (where applicable) in accordance with the Specification 01SDM S-01 (latest revision).
f. Metallic clamps shall have adequate resistance to corrosion.
g. The multi strap stainless steel clamps shall be capable of withstanding mechanical forces due to fault currents carried by cables to be supported. The clamps shall consist of corrosion resistant base with a stainless steel strap for securing either single cables or cables in trefoil arrangement

Note: Cast Iron & Malleable Iron/Mild Steel are magnetic material. Hence, these materials for clamps for single core cables installed in flat formation are not acceptable.

4.4.3 Non Metallic/Composite Cable Clamps

a. The nonmetallic cable Clamps shall be made of 30% fiberglass-reinforced polyamide (PA) which shall be of high mechanical strength and heat resistance. The clamps shall meet the most stringent requirements for short circuit proof mounting of low, medium and high voltage cables.
b. The Polyamide fiberglass-reinforced clamps shall be flame resistant, free of halogen and shall have special protection against ultraviolet rays & resistant to a wide range of chemicals.
c. Both indoor & outdoor clamps shall have resistance to ageing, ozone and ultraviolet rays.
d. No alteration in strength with in the temperature range specified in 01-SDMS-01 (latest revision).
e. The fastening of the cable clamps can be adopted in all local conditions. The clamping area shall be wide to reduce the mechanical stress on cable. All cable clamps shall be easily and securely mountable.
f. The mounting hardware shall be galvanized or stainless steel.
g. The clamps made from light-weight UV resistant glass fiber reinforced polyamide material shall be suitable for single or trefoil LV, MV, HV, & EHV and indoor as well as outdoor installations.
h. The fiberglass reinforced composite cable clamps shall support single or trefoil MV, HV, & EHV cables.

4.5 Fabrication

4.5.1 The surface of all clamps shall be free from sharp edges, burrs, flash, etc. that is likely to damage cables or inflict injury to the installer or user.

4.5.2 There shall be no alteration in strength with in the temperature range as specified in 01-TMSS-01 (latest revision) and suitable for emergency operations of XLPE insulated cables.

4.5.3 The clamp shall be wide to reduce the mechanical pressure on cables.

4.5.4 Fiberglass-Reinforced Polyamide

a. The fiberglass-reinforced polyamide shall be of high mechanical strength and heat resistance.
b. The clamps have resistance to ageing, ozone and ultraviolet rays

4.6 Mounting

4.6.1 The clamps shall be designed for channel mounting or surface mounting. 4.6.2 The clamps can be single cable clamp or trefoil (multiple) cables clamp.

4.6.2 The clamps shall be designed to fit into standard channels and have a single bolt locking and support system or two bolts fixing system.

4.6.3 The high strength anti corrosion aluminum alloy cable clamps with rubber pad shall have springs on the fixed clamp to keep clamping force under the state of expanding and returning to the original. The clamps can be fixed on cable bracket or bridge with bolt.

4.6.4 The fastening of cable clamps shall be adopted to all site conditions (steel, concrete, wood, etc.).

4.6.5 The Minimum distance between two consecutive clamps shall be 500mm and maximum distance between two consecutive clamps shall be 1000m

4.7 Markings

All the individual clamps and crates shall be provided with the markings as detailed below:

4.7.1 Clamps Markings

Each clamp shall bear a permanent marking. All the characters shall be legible to normal or corrected vision. Marking shall be durable and permanently marked as follows. The use of labels shall not be permitted:

a. Manufacturer's Name, logo, or trademark.
b. Year of Manufacture and serial number.
c. Country of Origin.
d. Product identification or type (code, part number etc.)

4.7.2 Crate Markings

Each crate shall be marked with the following identifications:

a. Clamp Type and number of clamps.
b. SEC Purchase Order Number/Contract Number.
c. 12-SDMS-03.
d. Manufacturer is Catalog No.
e. The markings shall be legible and durable.

5 TESTS

All test results including type tests shall be provided for review and acceptance by SEC.

5.1 Cable clamps (along with mounting hardware) shall be subjected to following tests:-

5.1.1 Test for resistant to electromechanical forces withstanding one short circuit (1 sec.).

5.1.2 Test for resistant to electromechanical forces withstanding more than one short circuit (when specified).

5.1.3 Impact Test

5.1.4 Lateral Load Test

5.1.5 Axial Load Test

DATA SCHEDULE

CABLE CLAMPS FOR POWER CABLES (Sheet 1 of 2)

SEC Enquiry No. _____ Item No: _____

Clause	DESCRIPTION	SEC SPECIFIED VALUES	VENDOR PROPOSED VALUES
4 - DESIGN AND CONSTRUCTION REQUIREMENTS			
4.1	Type of Cable Clamp	Aluminum (If not specified)	
	Dimension (Diameter & Length) of Cable Clamp, mm		
	Cable diameter to be accommodated, mm		
	Type of material used in the clamp	Aluminum/ Aluminum Alloy (If not specified)	
	Weight of the unit, g		
	Thickness of Zinc coating (Where applicable)		
4.2	Mechanical Load which the clamp is expected to withstand, kN		
4.3	Ratings		
4.3.1	Short Circuit withstand rating, kA/sec		
4.4	Materials		
4.4.1	Material of gasket	Rubber	
	Material of stud/nut/washer/spring etc	Galvanized Steel / Stainless Steel	
5 - TESTS			
5.1	Test for resistance to electromechanical forces/short circuit	Yes	

DATA SCHEDULE

CABLE CLAMPS FOR POWER CABLES (Sheet 2 of 2)

SEC Enquiry No. _____ Item No: _____

A. Additional technical information or features specified by SEC:

B. Additional supplementary data or features proposed by vendor/supplier:

C. Other particulars to be filled up by vendor/supplier: (use separate sheet if needed)

Address	Manufacturer	Vendor/Supplier
Name of Company		
Location and Office Address		
Authorized Name and Signature		
Date		
Official seal / stamp		

Table 1: Technical Data Schedule 2.

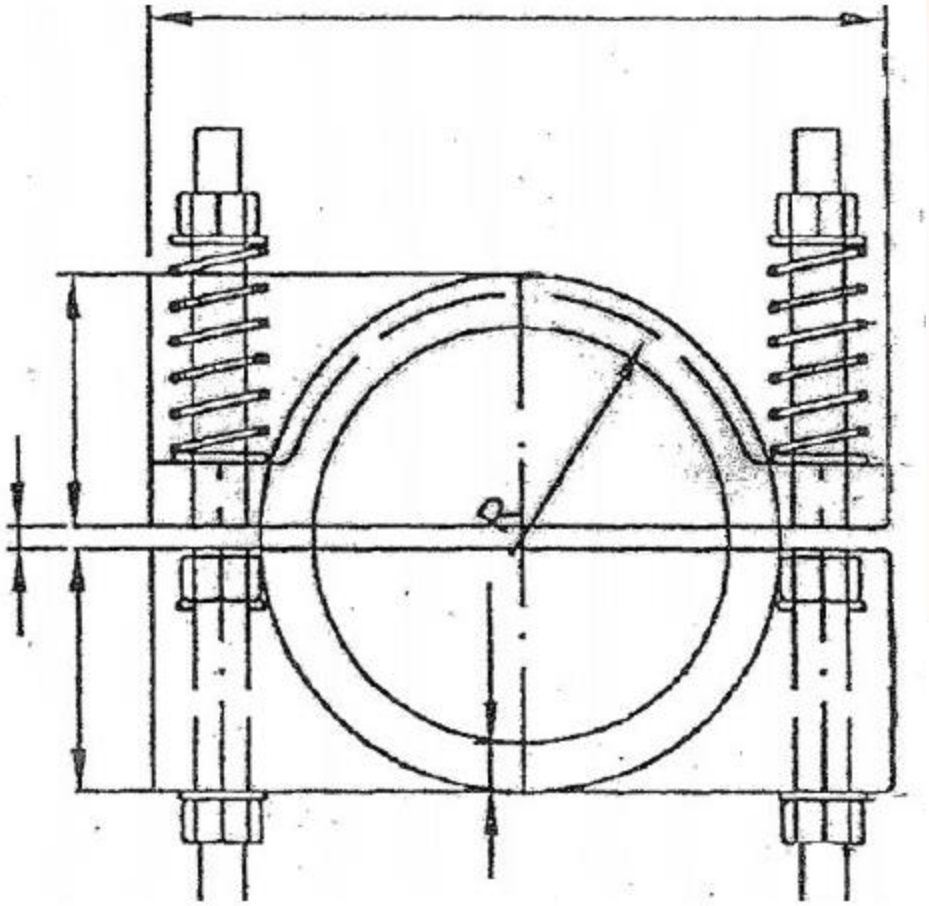

Figure 1: Typical Clamps for Power Cable

NOTE:-

1) Please see clause # 4.1.2 & 4.1.3 for detail.