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IEEE Recommended Practice for Specifying Electric Submersible Pump Cable—Ethylene-Propylene Rubber Insulation

IEEE Industry Applications Society

Sponsored by the
Petroleum and Chemical Industry Committee

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USA

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Approved 6 March 2013

IEEE-SA Standards Board

Abstract: Minimum requirements for the design, construction, manufacturing, testing, purchasing, and application of electric submersible pump (ESP) cable are presented. The cable is round or flat, with ethylene–propylene rubber insulation, nitrile jacket, ethylene–propylene diene monomer (EPDM) jacket or lead sheath, and armor. These cables are for voltages not exceeding 3 kV or 5 kV (phase to phase) and conductor temperatures not exceeding 140 ºC (284 ºF) for nitrile or a maximum of 232 ºC (450 ºF) for EPDM jacket or lead sheath cable. Conductors, insulation, barrier (optional), assembly with or without jacket, armor, requirements for testing by the manufacturer, and cable ampacity are all covered in the document.

Keywords: ampacity ratings, assembly, cable construction, cable testing, EPDM, EPR, field testing, IEEE 1018™, submersible pump cable

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Introduction

This introduction is not part of IEEE Std 1018™-2013, IEEE Recommended Practice for Specifying Electric Submersible Pump Cable—Ethylene-Propylene Rubber Insulation.

This recommended practice, under the jurisdiction of the Petroleum and Chemical Industry Committee of the IEEE Industry Applications Society, presents the minimum requirements for the construction, manufacturing, purchasing, and application of electric submersible pump cable. The configuration of the cable is either round or flat, with ethylene-propylene rubber insulation, with a nitrile jacket, EPDM jacket, or lead sheath and armor.

Anyone desiring to use this recommended practice may do so. It is presented as minimum criteria for construction of this class of submersible cable. It is not intended to restrict innovation or to limit development of improvements in cable design. Every effort has been made to assure the accuracy and reliability of the data contained herein; however, the committee makes no representation, warranty, or guarantee in connection with the publication of this specification and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use; for any violation of any federal, state, or municipal regulation with which it may conflict; or for the infringement of any patent resulting from the use of this document.

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1. Overview

1.1 Scope

This recommended practice establishes recommendations for three-conductor round and flat oil-well cables used in supplying three-phase ac electric power to submersible pump motors. The three major cables by components are as follows:

a) Cables with copper conductors, ethylene-propylene diene monomer (EPDM) insulation, nitrile jacket, and metallic armor

b) Cables with copper conductors, EPDM insulation, EPDM jacket, and metallic armor

c) Cables with copper conductors, EPDM insulation, lead sheath, and metallic armor

1.2 Specifications and standards

Cables meeting the requirements of the recommended practice should be rated for voltages not exceeding 3 kV or 5 kV (phase to phase).