

**IEEE Standard for Petroleum and  
Chemical Industry—  
Premium-Efficiency, Severe-Duty,  
Totally Enclosed Squirrel Cage  
Induction Motors from  
0.75 kW to 370 kW (1 hp to 500 hp)**

IEEE Industry Applications Society

Developed by the  
Petroleum and Chemical Industry Committee

**IEEE Std 841™-2021**  
(Revision of IEEE Std 841-2009)

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**Petroleum and Chemical Industry Committee**  
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**Abstract:** This standard applies to premium-efficiency, totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

**Keywords:** IEEE 841™, NEMA frame motors, polyphase induction motor, severe duty motors, squirrel cage motors, totally enclosed fan-cooled (TEFC) motors, totally enclosed air over (TEAO) motors, totally enclosed nonventilated (TENV) motors

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## Introduction

This introduction is not part of IEEE Std 841-2021, IEEE Standard for Petroleum and Chemical Industry—Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp).

This standard applies to premium-efficiency, severe-duty, totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

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# IEEE Standard for Petroleum and Chemical Industry— Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp)

## 1. Overview

### 1.1 Scope

This standard applies to premium-efficiency totally enclosed fan-cooled (TEFC) and totally enclosed non-ventilated (TENV), horizontal and vertical, single-speed, squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), and up to 4000 V nominal, in National Electrical Manufacturers Association (NEMA) frame sizes 143T and larger, for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Excluded from the scope of this standard are motors with sleeve bearings and additional specific features required for explosion-proof motors.

### 1.2 Purpose

The purpose of this standard is to define a specification that deals with mechanical and electrical performance, electrical insulation systems, corrosion protection, and electrical and mechanical testing for severe-duty totally enclosed squirrel cage polyphase induction motors, 0.75 kW to 370 kW (1 hp to 500 hp), for petroleum, chemical, and other severe-duty applications (commonly referred to as premium-efficiency severe-duty motors). Many of the specified materials and components in this standard stem from experience with severely corrosive atmospheres and the necessity for safe, quiet, reliable, premium-efficiency motors.

### 1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).<sup>1,2</sup>

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<sup>1</sup>The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.

<sup>2</sup>The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.