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# **Guidance on Industry Standard for Synchronous Motors (API 546)**

**GIS 12-206**

**BP GROUP**  
**ENGINEERING TECHNICAL PRACTICES**

## Foreword

This is the first issue of Engineering Technical Practice (ETP) GIS 12-206. This Guidance on Industry Standard (GIS) is based on parts of heritage documents from the merged BP companies as follows:

### Amoco

A EL-MT-546-P      Electrical—Motors—Synchronous—Supply Specification

### Arco

ES 403-91      Form-Wound Brushless Synchronous Motors 500 Horsepower and Larger



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## Scope

This GIS provides guidance on industry standard for the design, materials, fabrication, inspection, testing, documentation, and preparation for shipment of synchronous motors based on API Standard 546, *Brushless Synchronous Machines—500 kVa and Larger, Second Edition, June 1997*. Numbering of the following sections and paragraphs corresponds to section and paragraph numbering of API 546 and reflects additions, deletions, and revisions. Requirements of API 546 that are not revised remain applicable.

## Section 1 – General

### 1.1 Scope

#### 1.1.2 Revise to read:

Motors are special purpose. Paragraphs that begin with square bullets shall apply.

### 1.6 Referenced publications

#### Add to ASME:

B17.1 Keys and Keyseats

B106.1M Design of Transmission Shafting

#### Add to IEEE:

1043 Recommended Practice for Voltage Endurance Testing of Form-Wound Bars and Coils

#### Add to NEMA:

MG 3 Sound Level Prediction for Installed Rotating Electrical Machines

## Section 2 - Basic design

### 2.1 General

#### 2.1.3 Revise to read:

Maximum permissible sound pressure level for closed machines shall not exceed 85 dBA at a distance of 3 feet from motor enclosure.

a. Measuring and reporting of sound-level data shall be per IEEE 85.

b. Sound pressure level shall be determined per NEMA MG 3.

### 2.2 Electrical design

#### 2.2.2 Stator windings

#### Add:

##### 2.2.2.3 End winding bracing rings shall be provided as follows:

|           | <u>End Head Overhang Length (From core)</u> |                    |
|-----------|---------------------------------------------|--------------------|
|           | <u>Standard Duty</u>                        | <u>Severe Duty</u> |
| No rings  | < 8 in                                      | < 8 in             |
| One ring  | ≥ 8 in < 15 in                              | ≥ 8 in < 12 in     |
| Two rings | ≥ 15 in                                     | ≥ 12 in            |

##### 2.2.2.4 Duty level shall be obtained from Company.

