*** This is a contract excerpt. To see the entire contract, choose the file listed next to the Entire Contract header.

CEGS
****
DEPARTMENT OF THE ARMY CEGS-16221 (November 1992)
U.S. ARMY CORPS OF ENGINEERS ----------
CECW-ED Superseding
CWGS-15170 (November 1992)
GUIDE SPECIFICATION FOR CONSTRUCTION
Includes Special Change (Submittal Paragraph)(June 2000)
Includes Special Change to convert CWGS-15170 to one CEGS system and to renumber the specifications in accordance with the 1995 CSI MASTERFORMAT. (September 1998) This is not a Technical Update.
Includes Text Adjustment (December 1998)
Includes Text Adjustment (March 1999)
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SECTION TABLE OF CONTENTS
DIVISION 16 - ELECTRICAL
SECTION 16221
ELECTRIC MOTORS, 3-PHASE VERTICAL INDUCTION TYPE
11/92

PART 1 GENERAL

1.4 SUBMITTALS
SD-01 Data
Motor Design Curves.
[Six] [_____] copies of motor design (characteristic) curves or tabulated data (test or calculated), indicating the speed, power factor, efficiency, current, and kilowatt input, all plotted or tabulated against torque or percent load as abscissa. The base value shall be given whether ANSI or IEEE standard system is used. The maximum allowable reverse rotation speed for the motor shall also be provided.

SD-09 Reports
Factory Tests.
c. Performance Test. Torque or percent load as abscissa versus efficiency, power factor, amperes, watts, and RPM or percent slip as ordinates.

SD-13 Certificates
Power Factor and Efficiency; [_].
****
NOTE: See Additional Note M.
****
Certification of guaranteed value of power factor and efficiency for full load, 3/4 full load, and 1/2 full load.
Factory Tests; [_].
[Six] [_____] certified copies of the results of a "Complete Test" for duplicate equipment will be accepted in lieu of the "Complete Test" as specified in the paragraph FACTORY TESTS, subparagraph COMPLETE TEST, for equipment of the respective rating and type. No substitute will be

accepted for the "Check Test."

PART 2 PRODUCTS

2.1 MOTORS
2.1.2 Operating Characteristics

2.1.2.2 Locked-Rotor Current
****
NOTE: The locked-rotor current will increase with a power factor or lower than rated load. This information shall be taken into account when the designer is specifying the motor. When inrush current is particularly critical, due to system limitations on voltage dip or current, the designer shall obtain limits from the local utility and supply this information in this paragraph. The requirements for locked-rotor current (inrush) shall be coordinated with power factor and efficiency requirements of for power factor efficiency specified below..
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2.1.2.7 Power Factor and Efficiency
****
NOTE: List power factor and efficiency for each size. See Additional Note M.
****
The power factor and efficiency at full load, 3/4 full load, and 1/2 full load shall be not less than [_____], [_____], [_____] and [_____], [_____], [_____], respectively. Motors will be rejected if factory tests specified in paragraph FACTORY TESTS do not demonstrate that these values will be met or exceeded.

NOTE M. Motor efficiencies are not standardized and vary with manufacturer. Efficiency and its associated power factor are primarily a function of load, horsepower rating, and speed. Some general guidelines are as follows:
Operation below - Decreased efficiency, rated load lower power factor
Higher horsepower - Increased efficiency, higher power factor
Higher speeds - Increased efficiency, higher power factor
For motors above 100 hp, efficiency and power factor may not be a consideration since most motors of this size have a rated efficiency of around 90 percent and a power factor of greater than 0.8. When this is the case, delete power factor efficiency requirements from paragraph MOTORS, and the

certification requirement in paragraph SUBMITTALS. The designer should consult manufacturer's literature and individual applications for efficiencies and power factor to specify. The designer should also weigh the cost of a more efficient motor vs a larger motor with increased efficiency due to size. Generic motor data are available which may be used if manufacturer's data are not available.