

15055 MOTORS

Part 1: General

- 1.01 The Motor Construction Guideline is provided as an aid to designers and to indicate minimum standards.
- 1.02 The following guidelines shall apply to the selection of motors from one half (1/2) to 500 horsepower with nominal voltage rating 600 volts or less.
- 1.03 It is the goal of NC State University to have all motors selected to provide a long service life and which are installed for ease of maintenance.
- 1.04 Motor manufacturers shall be a member of the NEMA Premium™ Efficiency Electric Motor Program.

Part 2: Design Guidelines

- 2.01 Motors shall be designed and specifically wound for the voltage and phase characteristics specified on the drawings and shall be rated for continuous duty. Motors ½ horsepower or larger shall be three phase unless restricted by system voltage characteristics.
- 2.02 Motors shall be NEMA Design B, Normal Torque, Normal Starting Current unless specified otherwise or if higher starting or running torque is required by the application.
- 2.03 All motors shall have proper starting, accelerating, and running torque for the load requirements.
- 2.04 Motors for equipment shall be sized so that the driving requirements shall not exceed 95% rated horsepower of the motor. However, excessive over sizing shall be avoided.
- 2.05 Motors for pumps shall be sized so that under any conditions of loading over the complete range of the head-capacity curve of the pump, the motor shall not be loaded to more than 95% its rated horsepower. However, excessive over sizing shall be avoided.
- 2.06 Single-phase motors shall be provided with built-in thermal protection.
- 2.07 All motors, regardless of application, shall meet the NEMA Premium (TM) efficiency standards.
- 2.08 Three phase motors shall have 1.15 service factor. Single-phase motors shall have 1.35 service factor.
- 2.09 Each motor shall be provided with an NEC approved disconnecting device.
- 2.10 Bases for motors for belt driven equipment shall be adjustable slide base and base plate type with not less than two adjusting screws to maintain belt tension.
- 2.11 Motors that are required to cycle on and off automatically under control of a device shall be capable of making starts as frequently as the device may demand. Other motors shall be capable of being started a minimum of four (4) times per hour without damage.
- 2.12 Each motor used with a variable frequency drive shall be rated for the application.
- 2.13 The mechanical designer shall include a separate specification section for all motors and drives to be supplied by the mechanical contractor.

- 2.14 The mechanical designer shall include within the Testing and Balancing specification language requiring the TAB contractor to verify proper overload protection is installed and that the motor is operating within nameplate voltage and current over the full range of operating conditions.