Table 2. NEMA Torque Designs For Three-Phase Motors

NEMA Design	Locked Rotor Torque	Breakdown Torque	Locked Rotor Current	Percent Slip	Relative Efficiency
B	70 - 275%*	175 - 300%*	600 - 700%	0.5-5%	Medium or High
	Applications: Fans, blowers, centrifugal pumps and compressors, motor-generator sets, etc., where starting torque requirements are relatively low.				
C	200 - 250%*	190 - 225%*	600 - 700%	1-5%	Medium
	Applications: Conveyors, crushers, stirring machines, agitators, reciprocating pumps and compressors, etc., where starting under load is required.				
D	275%	275%	600 - 700%	5 - 8% 8 - 13% 15 - 25%	Medium
	Applications: High peak loads with or without flywheels, such as punch presses, shears, elevators, extractors winches, hoists, oil-well pumping, and wire-drawing machines.				

Based on NEMA Standards MG 10, Table 2-1. NEMA Design A is a variation of Design B having higher locked-rotor current.

*Higher values are for motors having lower horsepower ratings.

■ **Continuous Duty Motors.** Continuous duty motors should not be used in applications that require frequent starting or reversing unless special provisions are made. These motors must be allowed to run long enough after each start to dissipate the heat that builds up as about six to eight times rated full-load current passes through the windings during the starting period.

■ **Allowable Number Of Motor Starts.** The inertia of the load, motor horsepower and speed (poles) determine the allowable number of times per hour a motor may be started (NEMA MG 1-1998, 12.55). Table 3 (Page 11) indicates the number of starts per hour and the minimum rest or "off time" between starts for a number of common motor ratings. It is based on starting at rated voltage and frequency, with a load Wk^2 and torque within limits shown in Table 4 (Page 12).