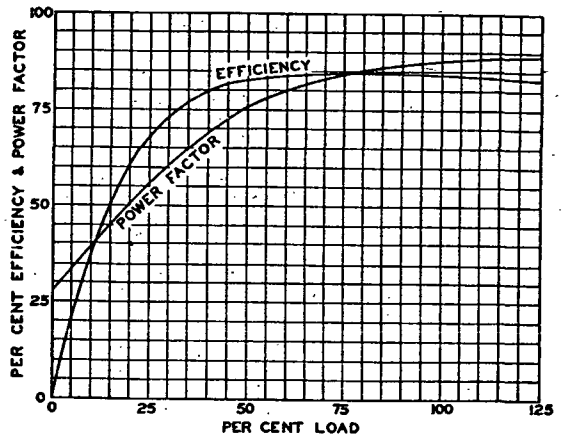

FIG. 6. VARIATION OF EFFICIENCY AND POWER FACTOR WITH LOAD FOR A TYPICAL 5 HP, 4 POLE 60 CYCLE, CLASS B, SQUIRREL-CAGE MOTOR

in each winding. Motors can be provided in constant torque, varying torque or constant horsepower ratings. The constant horsepower type of motor is considerably larger than the constant torque motor due to the fact that the same horsepower must be developed at either reduced speed or high speed.

In selecting two-speed motors for fan, pump, blower, or compressor applications, it is usually found that two winding motors are more expensive than the single winding type. The control cost for two-speed, two winding motors, however, is more economical, and therefore the combined price of both motor and control for the two winding motor is only slightly higher. Because of the improved performance of the two

TYPE OF SQUIRREL CAGE MOTOR	STARTING TORQUE % OF FULL LOAD TORQUE	STARTING CURRENT % OF FULL LOAD CURRENT	MAXIMUM TORQUE % OF FULL LOAD TORQUE	EFFICIENCY AT FULL LOAD - %	POWER FACTOR AT FULL LOAD - %	SLIP AT FULL LOAD - %
CLASS A	100 200 300	200 400 600 800	100 200 300	80 85 90	80 85 90	2 4 6 8 10
CLASS B	100 200 300	200 400 600 800	100 200 300	80 85 90	80 85 90	2 4 6 8 10
CLASS C	100 200 300	200 400 600 800	100 200 300	80 85 90	80 85 90	2 4 6 8 10
CLASS D	100 200 300	200 400 600 800	*	*	80 85 90	2 4 6 8 10

* SAME AS STARTING

FIG. 7. COMPARATIVE PERFORMANCE OF SQUIRREL-CAGE MOTORS OF 30 HP AND SMALLER SIZES

winding motors and because of the factor of safety provided by two independent windings, the increased cost is frequently worth the difference.

Single Phase Motors

Single phase induction motors inherently develop no starting torque and are provided with auxiliary windings and devices for starting pur-

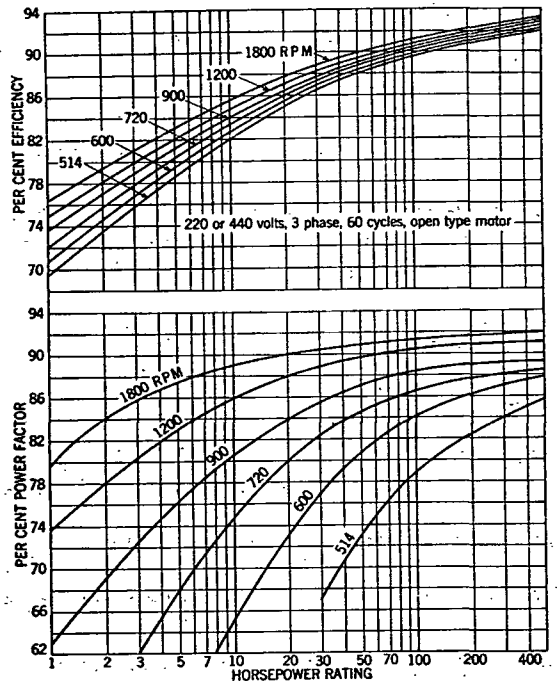

FIG. 8. EFFICIENCIES AND POWER FACTORS FOR SQUIRREL-CAGE INDUCTION MOTORS

poses. The motors are classified as to the type of auxiliary winding provided.

Capacitor Start-Induction Run motors develop high starting torque with low starting current and are used for all types of constant speed heavy duty drives such as compressors, pumps, and stokers. During the starting period, a winding with a capacitor in series is connected in the motor armature circuit and when the motor comes up to speed a centrifugal switch cuts the capacitor and second winding out of the circuit.

Capacitor motors, which are ideally suited for small fan drives, are similar to the capacitor start-induction run type except that the capacitor is not cut out when running.

Repulsion Start-Induction Run motors develop extremely high starting torque. They are supplied with a short-circuiting switch which cuts out