

# T.I.P.S.

## TECHNICAL INFORMATION AND PRODUCT SHEETS

### MOTOR EFFICIENCY VERIFICATION PROGRAM

The Coordinated Utility efficiency verification program is in place to ensure that data published in the motor database is accurate. Each year, approximately 90 motors listed in the database are tested to CSA Standard C390-M93, "Energy Efficiency Test Method for Three-Phase Induction Motors." Since 1993, all motor testing has been conducted at LTEE labs in Quebec as it is the only Canadian test lab recognized by NVLAP. Previously, testing had been conducted at three sites: Powertech Labs in B.C. tested 1-20 HP motors, ORTECH Labs in Ontario tested 25-200 HP motors, and LTEE tested 250-500 HP motors.

Motors selection is based on market share, performance and availability. A total of 360

motors from 20 different manufacturers have been tested to date – the actual number per manufacturer ranges from as low as three to as high as forty-six. The majority of the motors tested are four pole (1800 rpm) machines from 1-200 HP.

### TEST RESULTS ARE COMPARED TO NAMEPLATE EFFICIENCY

Dynamometer test results are compared to the motor nameplate data to ensure that the manufacturer's efficiency claims are accurate. Under CSA C390-M93 and NEMA MG-1, a 20% tolerance in losses is permitted between nominal and minimum guaranteed efficiencies (this allows for statistical variation in a population of motors). So, although manufacturers can quote the nominal (expected)

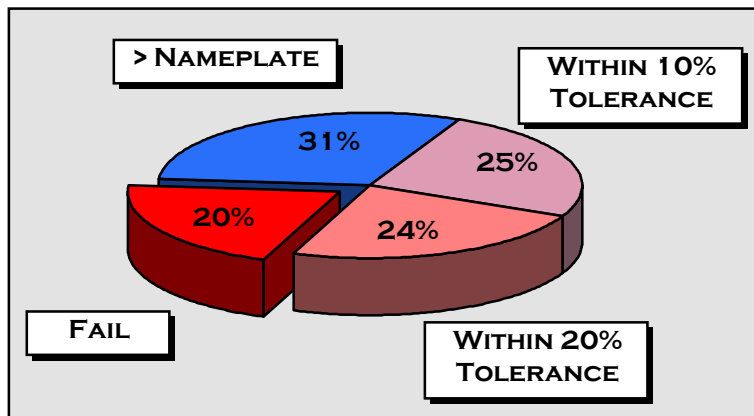
efficiency of a motor, it is tested to the minimum guaranteed efficiency, which represents 20% higher losses.

Of the 360 motors tested to date, nameplate data was unavailable for 43 machines. Of the remaining motors, 18% tested lower than the allowable 20% tolerance as shown in the figure below left. The chart includes a category for 10% tolerance value because there has been some discussion about decreasing tolerance from 20% to 10%.

### DATABASE ENTRIES DE-RATED AS A RESULT OF TESTING

Nominal efficiencies should represent the statistical mean for a population of motors. If the tested efficiencies are constantly lower than the nominal value quoted on the nameplate, it indicates that the manufacturer could be overstating the performance of the motor. In these cases, the manufacturer's data published in the database will be de-rated accordingly.

Seventeen motors from two manufacturers were de-rated in July of 1994 due to consistently poor test results. In addition, one manufacturer was completely de-listed from the database in 1990 after making inaccurate efficiency claims.



Comparison of efficiency test results with nameplate data. Test results outside the 20% tolerance on losses are deemed to have failed.