

General Motor Knowledge
Part 24

Insulation Class 'B2'

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The insulation system in a Morrill motor, does three things. It provides electrical separation between the energized windings and the outside housing of the motor, the endbell. The insulation system isolates one winding turn from another. The third function is to provide a means of support for the windings and connections to the windings of leads or thermal protectors. This support is necessary to prevent these energized parts from moving during use and contacting normally unenergized parts such as the endbell.

For more than two decades our insulation system has consisted of an epoxy coating on the stator, magnet wire coating with the addition of a varnish impregnation of the wound coils, various connection boards to aid in connecting wires of one type to another, pins, tubing, sleeves, wedges, tapes and various lead wire insulations. This is the simplest, most cost effective and longest lived insulation system for our motors. All of these components were tested together under Underwriters Laboratories, Standard for Safety UL1446 "Systems of Insulating Materials", as a system designed and required to have a life expectancy of 20 years when operated at 130°C (266°F). We have over 20 years of field experience with this system and UL's methods do work. The industry classification for an insulation system that operates at 130°C is "CLASS 130(B)". We were allowed some discretion as to how this was designated on our nameplate. We chose to designate our insulation system as simply "CLASS B".

Our PSC motors have special challenges such as smaller poles on which to wind more turns of finer magnet wire and more wires to route internally from one coil to another. We studied the motor industry and chose a plastic material to replace our epoxy stator coating. This plastic has been used for many years in motors similar to ours. It too, has been proven to be a "CLASS 130(B)" material. It is a more expensive material. But, one that can be molded with convenient holdback tabs, wire channels and shields. Things that make our PSC motor easier and more cost effective to manufacture and most important, less likely to have problems during the next couple of decades. This plastic is molded in two identical parts that snap into and around the slots of an uninsulated PSC stator. Internally we call this our "Snap In" insulation system. On our motor nameplate we designate this insulation system as "CLASS B2".