



**NOMEX®**  
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## CASE HISTORY

### The goal of WEG Motors: To find the safest, most reliable product for its customers.

One of the world's largest motor manufacturers has an impressive 40-year history as leader in the electrical industry. To meet the new trends and demands of the global motor market, WEG uses insulation materials made with laminate of DuPont™ NOMEX® (known as NMN) for phase and slot insulation in its new W21 motor line. The company produces more than 6 million motors a year.

### “Hard work and discipline multiplied by three.”

“Hard work and discipline multiplied by three” was WEG's motto and greatest asset in 1961 when Werner Ricardo Voigt, Eggon João da Silva and Geraldo Werninghaus began producing electric motors in Jaraguá do Sul, Brazil. Back then, producing electric motors in a small town in the state of Santa Catarina did not look promising. The early years were spent doing a great deal of hard work promoting the company's name and proving the quality of its products.

In spite of the early challenges, WEG quickly grew. Production jumped from a mere 146 pieces in 1961 to 4,085 the following year. WEG then started to expand its activities in the 80s from its initial focus of producing electric motors to the production of generators, electroelectronic components, industrial automation systems, power and distribution transformers, liquid and powdered paints, and electroinsulating varnishes.

Today, WEG is acknowledged as the largest manufacturer of electric motors in Latin America, with facilities in more than 50 countries on five continents. The company incorporates the latest technology into its product manufacturing processes to conform to the highest and most demanding total quality control standards required by its customers. Most importantly, WEG's greatest asset today is the same as it was in 1961: Hard work and discipline multiplied by each of their employees' commitment to ultimate customer satisfaction.

### Temperature resistance is critical

Engineers specializing in the design of electrical machines rely on insulation materials with high

temperature resistance. That's why, with increasing frequency, they depend on paper insulation of NOMEX®. Its 220°C thermal class, high mechanical strength, outstanding electrical properties and superior thermal resistance make it an excellent choice in these demanding applications.

Laminate materials based of NOMEX® are frequently used in machines with insulation system thermal classes between 155°C to 180°C. The most common are NM and NMN, which are respective combinations of one and two plies of NOMEX® paper (N) covering one or two faces of a polyester film (M). At WEG, 40% of the DMD (a three-ply structure based on polyester fibre mats and film) laminate used for slot and phase insulation was replaced by NMN laminate. The major quantity of NMN currently being used by WEG is in its new W21 motor line.

According to José Reinaldo Cardoso, Material Development Analyst of WEG Industrias S.A. – Motors Division, the switch to NOMEX® was performed due to WEG's need for higher thermal protection.

“NMN supports a thermal stress three times higher than the material that we used before. The

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polyester film inside the laminate assures a high dielectric strength and NOMEX®, in addition to its excellent thermal resistance, has good saturability and impregnation properties with the resin and varnishes that are used. This allows us to reduce the air voids inside the insulation material that could lead to premature failures.”

Should the polyester component in a NMN laminate fail because of overheating, the NOMEX® layers remain intact and continue to act as a physical barrier and electrical insulation material, which prevent the total failure of the system. When DMD laminate is used, the same behavior cannot be expected. Since DMD is composed of polyester-based materials, the laminate degradation can accelerate – especially at temperatures higher than 155°C.

Motor manufacturers know that re-work during production, or the need to perform warranty repairs, will strongly impact both the company’s image and brand, as well as increase its production costs.

By using NOMEX® brand insulation, WEG is able to provide more reliable and safer equipment to its customers. And, even with the incremental motor cost increase that is incurred, WEG’s equipment is still considered a profitable investment that ensures higher quality, less repair work, and an extra safety margin just in case the equipment is not properly operated.

WEG and DuPont are committed to working together to match the quality of products made with NOMEX® thermal technology with the quality of WEG’s products and focusing on new product development that will allow WEG to get the maximum performance from their motors.



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**Product safety information is available upon request.**

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