



# MGM

## TRANSFORMERS

### BY FORGENT

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#### SPECIALTY PRODUCT BROCHURE

#### MGM Transformers Overview

With over forty years of transformer experience and our long standing commitment to quality and customer service, MGM Transformers will design and build the transformer that is right for your specific application.

MGM provides custom built dry and or liquid filled transformers specifically for the mining industry, designed by industry leading experienced engineers for the unique requirements of mine duty transformers. Our knowledgeable staff, manufacturing standards and experience will provide a reliable, cost-effective transformer that will provide years of trouble free service.



#### Application

The mining industry requires many different types of Power Transformers; the need for high power in a compact robust transformer make these units unique to the industry. Examples Include:

- Above/Below Ground Application
- Haulage Equipment
- Mining Distribution
- Low Profile Power Centers
- Multiple Input and/or Output Voltages
- Power Distribution
- Continuous Miners
- Low Profile Mining Transformers
- Longwall Transformers
- Special Environmental

# MINING TRANSFORMER

## **Advantages with MGM**

Our in house, highly experienced and trained engineering staff for the design and manufacturing of standard and highly specialized products is one of the primary advantages of MGM Transformer Company.

- Product offerings in both dry type and liquid filled to meet your specific demands.
- 220°C Nomex insulation for Dry-Type Transformers
- Self-Cooled or Forced Air Cooled
- Low Voltage and Medium Voltage solutions.
- All processes done in-house at our own UL, CUL, CSA and ISO 9001-2008 certified facilities.
- Shortest lead times in the industry.
- Every process is done under roof

## **Our Capabilities**

- 10 KVA – 5 MVA, single phase transformers
- Dry type or Liquid filled
- 10 KVA – 10 MVA, three-phase transformers
- 120 volt – 34,500 volt range
- 10 KV – 150 KV Basic Impulse Level (BIL)
- Neutral deriving zigzag transformers

## **Features**

- Custom built low profile transformers per customer specified voltage, KVA and temperature rise.
- Low loss designs: When specified, transformers are designed with low losses for reduced operating cost and heat generation.
- Coil construction: Coils are wound with copper or aluminum windings. Coils are insulated with 220C Nomex insulation for proven dielectric protection.
- Cores: Precision cut Butt lap or Step lap miter cores to reduce losses caused by core gaps. Low profile 5-legged cores are also available and allow for higher KVA transformers in low ceiling environments
- Environmental protection: The assembly is sealed from moisture with standard or optional double dip and bake in polyester varnish.
- Testing: each transformer is tested per IEEE C57.12.91 to insure a quality product with maximum life expectancy.
- K-Factor: K Rated transformers are available for non-sinusoidal loading with high harmonic content.
- Electro-static shielding: When specified, electro-static shielding is available for electrical noise mitigation.
- Emergency replacement or fast turn-around repairs reduce down time

## Coils

MGM's winding machines are equipped for both wire and foil conductors. As a standard procedure, we use only 220°C insulation (including Nomex® Aramid paper) to withstand high temperature rises for longer transformer life. Coil construction, ducting, and bracing assures proper ventilation and maximum strength.. The high voltage coils are wound directly over the low voltage coils to form a complete assembly. The coil assembly is completely insulated and mechanically braced to pass all IEEE standard tests.



## Transformer BIL

Higher BIL's are available to fully protect these transformers which are designed in accordance with IEEE C57.12.01 and C57.12.91. Where the mining company is particularly concerned with having the highest possible BIL withstand, we encourage the specifications to include a production line impulse test from which the manufacturer will then be required to furnish the resulting oscillograms. If the transformer is designed properly, the production line impulse test is not a destructive test, nor a design limit test, but rather another quality assurance activity performed at the factory to enhance the reliability of the transformer in the field.

## Vacuum Pressure Impregnate (VPI)

To provide maximum protection for the transformers, MGM Transformer vacuum pressure impregnates our coils to 40 psi and then dips and bakes the entire core and coil assembly as our standard procedure.

MGM's vacuum pressure impregnated system combines a performance proven dry-type transformer design with the environmental protection of an impregnated polyester coil .

This combination ensures reliable transformer operation in hostile environments containing moisture, dust, dirt, chemicals and other

The VPI process fully penetrates and seals the coils into a high strength composite unit for complete environmental protection.

The advantages of our Vacuum Pressure Impregnation (VPI) process are:

- Superior penetration of varnish for maximum protection against moisture and contaminants
- Improved heat dissipation to help eliminate hot spots and extend transformer life

## **Benefits**

*MGM's VPI vs. Cast Coil*

- Lower initial cost
- Flexibility of design
- Elimination of cracking concerns
- Higher thermal overload available

Cast = 17% @ 80 / 115° C rise

VPI = 30% @ 80 / 150° C rise

- Less weight for easier handling and installation
- Smaller dimensions to save valuable floor space
- Outstanding environmental protection

## **Core**

As our manufacturing standard, transformers built by MGM Transformer are made with thin laminations of grain oriented core steel to reduce core losses, transformer size, sound level, and to increase efficiency. Our use of grain oriented core steel stacked in a butt-lap or step lapped construction produces a high quality dependable transformer that has been the workhorse of mining, industrial, and utility applications for many years. As a leader in transformer design and construction, MGM Transformer has responded to the ever increasing demand for energy efficiency by now offering low loss, high efficiency transformers. By using a step-lap mitre construction in the core and more efficient grades of core steel, we can reduce the core losses of a transformer by more than 50%, thereby greatly increasing the efficiency and reducing energy costs. Although mining transformers are not included in the Department of Energy mandate for higher efficiency transformers by January 1, 2010, many customers are already evaluating the long-term benefits of higher efficiency transformers in the face of increasing energy costs.

## **Testing and Quality Control**

MGM Transformer tests every transformer to satisfy the standards required by IEEE C57.12.01 (General Requirements for Dry Type Transformers). Our testing equipment ensures the highest quality transformers that meet all IEEE, and NEMA standards. We also offer customer witness testing on individual transformers. We also have the capability of providing a range of design tests and optional tests such as impulse, partial discharge, temperature rise, sound level, and others.

## **THE BETTER CHOICE!**

MGM is a leader in the transformer industry and a premiere manufacturer capable of fulfilling the most demanding applications. **No one can provide a wider range of outstanding products and solutions than MGM!**