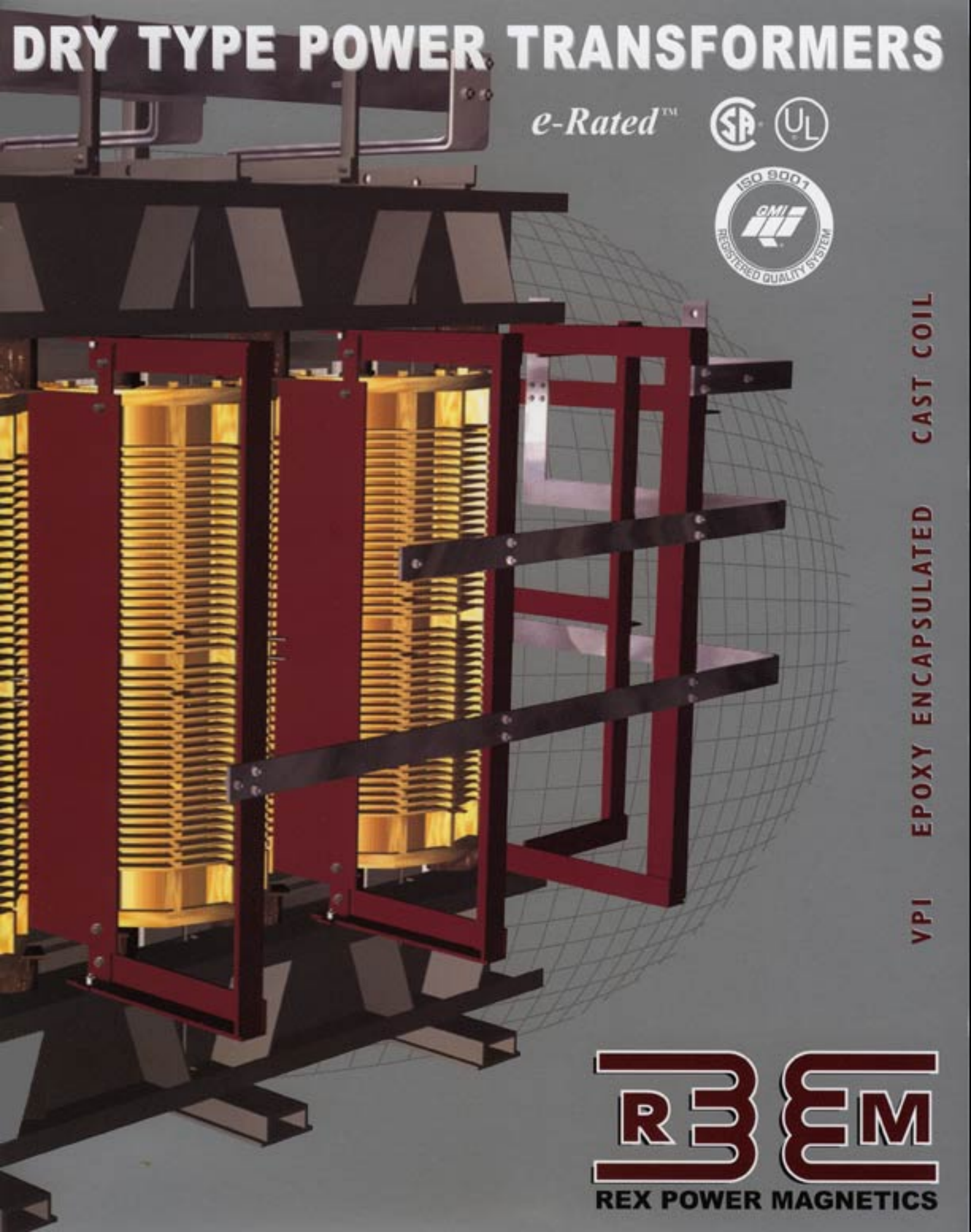
DRY TYPE POWER TRANSFORMERS

e-Rated™



VPI EPOXY ENCAPSULATED CAST COIL

REX POWER MAGNETICS

REX POWER MAGNETICS

Rex Power Magnetic Products, a division of Transfactor Industries Inc., established in 1972 is a CSA certified and UL Listed technology and innovation driven custom transformer manufacturer. With two manufacturing facilities and several warehouses throughout Canada and the United States the company offers one of the broadest ranges of dry type power magnetic products available to markets throughout North America and Internationally.

The Rex product line includes control transformers, machine tool transformers, all specialty type transformers, reactors, auto-transformers, standard distribution type, and high voltage dry type power transformers up to 10 MVA and 35,000 voltage class. Supported by considerable and sustained investment in research and development Rex Power Magnetics continuously expands its product offering and enhances existing products.

To highlight the company's commitment to quality products and excellence in customer service Rex Power Magnetics achieved ISO9001 registration in 1996.

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REX POWER MAGNETICS

APPLICATIONS FOR HIGH VOLTAGE DRY TYPE POWER TRANSFORMERS

Rex dry type power transformers are primarily designed for stepping down high voltages from transmission and distributions systems to utilization voltages in commercial, industrial, institutional or utility applications.
They are ideally suited for both indoor or outdoor applications.

Dry type power transformers require minimum maintenance to provide many years of reliable trouble free service. Unlike liquid filled transformers which are cooled with oil or a fire resistant liquid dielectric, dry type units utilize only environmentally safe, CSA and UL recognized high temperature insulation systems. Every dry type design provides a safe and reliable power source which does not require fire proof vaults, catch basins or the venting of toxic gasses. These important safety factors allow the installation of dry type transformers inside buildings close to the load, which improves overall system regulation and reduces costly secondary line losses.

Rex Power Magnetics provides quality dry type power transformers up to 10 MVA at 35 KV and 150 KV BIL. A sampling of their applications are:

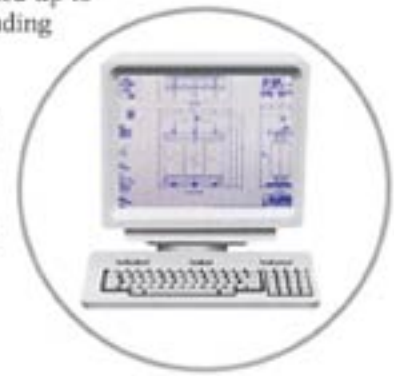
- **POWER DISTRIBUTION**
- **INDOOR OR OUTDOOR PRIMARY AND SECONDARY UNIT SUBSTATIONS**
- **GROUNDING TRANSFORMERS**
- **MINING, PULP AND PAPER APPLICATION TRANSFORMERS**
- **CORROSION RESISTANT TRANSFORMERS FOR MARINE DISTRIBUTION AND POWER**
- **LOW ELECTROMAGNETIC FIELD EMISSION TRANSFORMERS FOR HOSPITAL AND INSTITUTIONAL USE**
- **TRACTION POWER RECTIFIER TRANSFORMERS FOR TRANSIT SYSTEMS**
- **MOTOR STARTING & DRIVE SYSTEM APPLICATIONS**
- **HIGH HARMONIC AND INTERMITTENT LOAD APPLICATIONS**
- **MANY OTHER APPLICATIONS**

REX POWER MAGNETICS TECHNICAL CAPABILITY

Rex Power Magnetics has the engineering capability to design, manufacture and test all standard and specialty dry type transformers, related magnetic products, and power transformers rated up to 10 MVA and 150kv BIL. All Rex products are CSA certified and most are UL listed including power transformers.

Rex Power Magnetics maintains a complete sheet metal fabrication and paint facility to produce its own transformer enclosures, core clamps, brackets and accessories as well as manufacturing custom enclosures for others.

The Rex engineering and design team consists of highly competent and qualified individuals with many years of transformer design experience.



STANDARD REX POWER TRANSFORMER DESIGNS

CAST COIL TRANSFORMERS: The ultimate dry type transformer for use in harsh environments.

DRIVE ISOLATION TRANSFORMERS: Specifically designed to meet the requirments of AC and DC variable speed drives or rectifier units. Available in 6-pulse, 12-pulse, 18-pulse or 24 pulse.

ELECTROSTATICALLY SHIELDED TRANSFORMERS: Protect systems from high frequency transients that occur due to switching and loading on distribution lines.

ENERGY EFFICIENT TRANSFORMERS *e-Rated*™ **:** Designed to perform with lower than standard conductor and total losses which results in greater life expectancy, lower operating costs and significant overload capabilities. Rex *e-Rated*™ transformers are built to meet and exceed CSA C802 and NEMA TP-1 standards.

K - FACTOR RATED: Power transformers for use where harmonic currents are present. Available in all ratings, eg. K-4, K-9, K-13, K-20, K-30 etc.

LOW ELECTROMAGNETIC FIELD EMISSION TRANSFORMERS: Designed to allow very low electro-magnetic field emission outside of the enclosure.

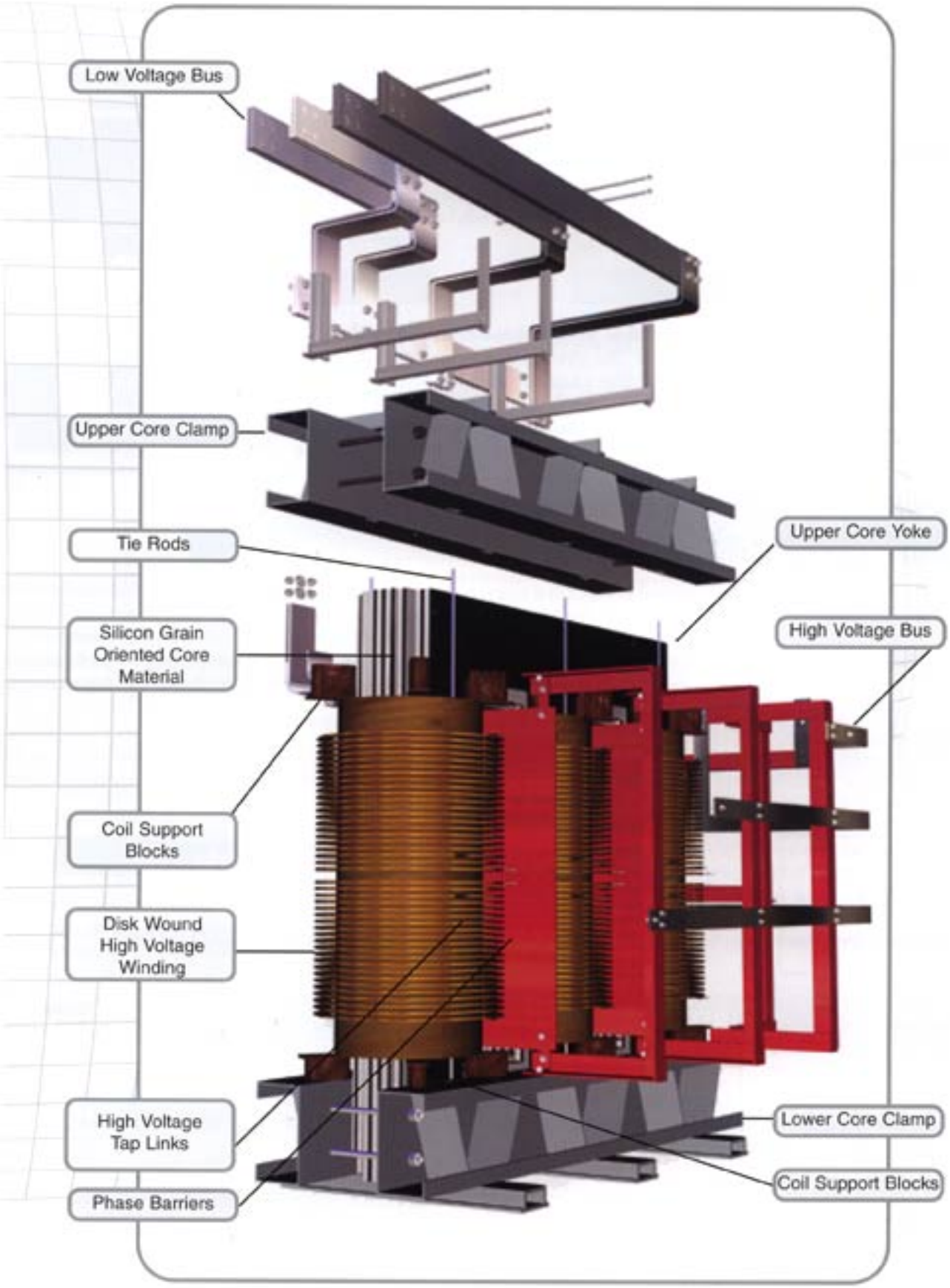
LOW SOUND LEVEL: Transformers designed to emit lower than normal audible hum.

SPECIAL FREQUENCY DESIGNS: To operate at frequencies other than 60 hz.

VPI & EPOXY DIPPED WINDINGS: All Rex power transformer windings are vacuum pressure impregnated in polyester resin. For applications with harsh operating conditions or where airborne contaminants are present an epoxy resin coating can be added to the polyester impregnated coils.

OPTIONAL ACCESSORIES:

- PROVISIONS FOR FUTURE FANS OR FAN PACKAGES COMPLETELY INSTALLED WITH OR WITHOUT CONTROL POWER
- BUS COORDINATION WITH PRIMARY AND SECONDARY SWITCHGEAR
- DIAL TYPE OR DIGITAL THERMOMETERS TO MONITOR WINDING TEMPERATURES
- NEUTRAL GROUNDING RESISTORS AND MONITORS
- STRIP HEATERS TO AVOID CONDENSATION WHEN THE TRANSFORMER IS NOT ENERGIZED
- GROUND FAULT RELAYS
- ANTI - VIBRATION MOUNTINGS TO REDUCE TRANSFORMER HUM
- PROVISION FOR SEISMIC MOUNTING OR COMPLETE SEISMIC SNUBBERS AND RESTRAINTS
- LIGHTNING ARRESTORS: DISTRIBUTION, INTERMEDIATE OR STATION CLASS
- PROVISIONS FOR ROLLING, SKIDDING AND LIFTING
- PROVISIONS FOR BUS DUCT ENTRY
- MIMIC BUS
- KEY INTERLOCK SYSTEMS
- FULLY INSULATED BUS
- SPECIAL ENCLOSURES, NEMA 1, NEMA 3R (WITH OR WITHOUT FILTERS), NEMA 4, NEMA 12


Low Voltage Bus
Upper Core Clamp
Tie Rods
Silicon Grain Oriented Core Material
Coil Support Blocks
Disk Wound High Voltage Winding
High Voltage Tap Links
Phase Barriers
Upper Core Yoke
High Voltage Bus
Lower Core Clamp
Coil Support Blocks

COIL CONSTRUCTION

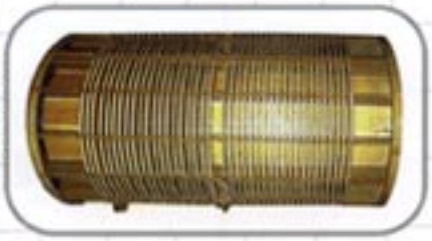
Rex power transformers utilize either barrel or disk wound coil construction. Winding type selection is determined by the design which will provide the optimum combination of short circuit strength, impulse distribution and dielectric withstand characteristics. All windings are insulated to withstand surge voltages and basic impulse level. Primary windings are manufactured of high quality Nomex wrapped copper or aluminum conductor.

Low voltage windings may be strip or foil wound and are constructed to be electrically balanced to reduce axial short circuit forces.

BARREL WINDINGS:

This winding is constructed by progressively winding turns of magnet wire from one end of the coil to the other. Layers are electrically insulated by solid sheet insulation and cooling ducts.

DISC WINDINGS:



This winding construction method is achieved by winding the conductor into slotted spacers (combs) that are arranged around the circumference of the coil. The continuous series connected disc winding provides a high capacitance which improves the distribution of the impulse wave through the winding. Cooling efficiency is also maximized by exposing a large surface area of the conductor to the air.

VACUUM PRESSURE IMPREGNATION (VPI)

Subjecting coil windings to the VPI treatment ensures that Rex power transformers have outstanding electrical, thermal and mechanical properties.

At the conclusion of the winding process, the completed transformer coil is prepared for impregnation by preheating to reduce moisture. The drying process is completed when the coil is subjected to full vacuum in a vacuum chamber removing all the moisture absorbed by the insulation from the atmosphere.

A clear, low viscosity high temperature resin (Class 220° C) is introduced into the tank under vacuum, illiminating any air bubbles in the resin. When the winding is completely submerged pressure is applied forcing the resin into all winding spaces and voids in the turn to turn and layer to layer insulation.

The vacuum/pressurization cycle is repeated four times to achieve full resin penetration. The coil is then removed from the chamber and placed in a baking oven to cure the resin. The entire vacuum impregnation process is repeated twice, to ensure a uniform protective, hard and impermeable coating is formed on all exposed surfaces of the winding.

As an option and for greater protection the coil can be coated with a high viscosity epoxy resin and heat cured.

INSULATION

The life span of the insulation is the main determinant in the life span of the transformer. The working temperature of the transformer affects the life of the insulation. This working temperature is a combination of the units temperature rise, the ambient temperature and the hot spot temperature.

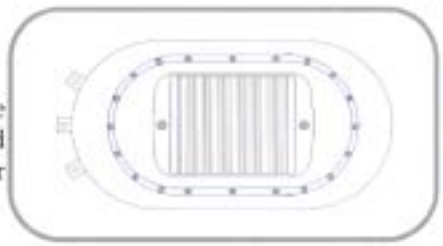
Rex power transformers are manufactured with class 220° C. insulation materials. Only high temperature resistant materials of the best quality are used including Nomex Aramid papers, silicone or polyester coated fiberglass, Nomex sleeving, glass tapes and polyester/glass duct sticks.

CORE CONSTRUCTION

Every Rex power transformer core is constructed from electrical grade, cold rolled grain oriented silicon steel of M5 grade or better. Grain oriented steel is utilized for its superior magnetic permeability, low hysteresis and eddy current losses. Steel is cut into individual laminations on automated cutting machines to ensure precise and consistent dimensions.

Core laminations are meticulously stacked on specially designed jig tables. The individual laminations of the core are then clamped together by structural grade steel core clamps.

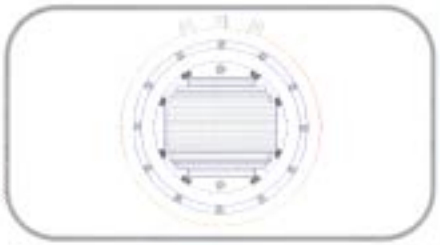
Once the core is complete an epoxy coating is applied to guard against corrosion.



Rex constructs cores with either a rectangular or cruciform configuration. The core configuration is chosen to provide the most efficient unit with the best weight and dimension factors. Both configurations may utilize either the Butt & Lap stacking method or the Full Miter cut stacking method.

RECTANGULAR CORE:

This configuration is used mainly for smaller units constructed with layer wound coils.



CRUCIFORM CORE:

This configuration is utilized mainly for large round windings. The core shape is stepped to give as close as possible coupling with the round coils. This type of design inherently has higher short circuit capability.

POWER TRANSFORMER LOSSES

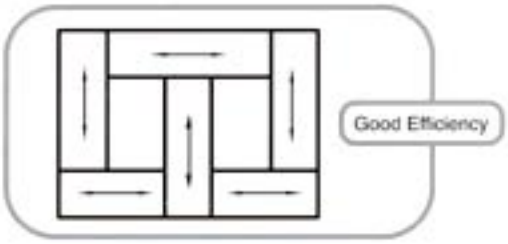
Losses of a transformer consist mainly of:
1. Conductor losses which are proportional to the load and vary with loading.
2. Core losses which are constant and are present as long as the transformer is energized.
Since most transformers are energized at all times regardless of the loading it is therefore evident that reducing the core losses will result in significant energy and cost savings.

CORE STACKING METHODS

The following illustrates the various core cutting and stacking arrangements in order of efficiency provided.

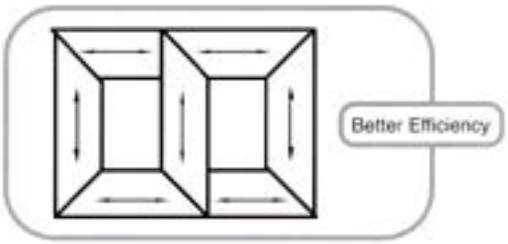
BUTT LAP CUT:

Consists of rectangular pieces of core steel arranged in such a way so that the grain orientation of the steel is along the flux path except in the corners where the flux path changes direction from the legs to the yolk members.



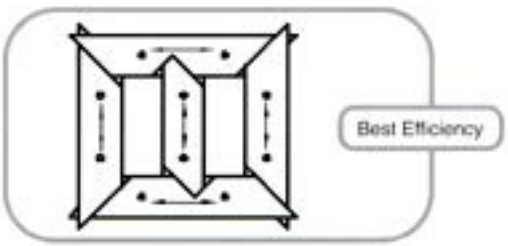
SCRAP-LESS MITRE-CUT:

Scrap-less mitering, where the steel is cut at 45 degree angles and arranged such that the grain orientation is maintained in line with the flux path, even in the corners of the transformer core thus reducing the core losses.



FULL AND STEP LAP MITRE:

This type of core cutting and stacking ensures that the overlapping of the joints in the corners are mitered and staggered so that the best possible grain orientation and flux transition is achieved. By avoiding crowding of the flux lines the least core losses are achieved and therefore the best efficiencies.



CAST COIL DRY TYPE TRANSFORMERS

The unique design and manufacturing process of cast coil type transformers offers several key advantages over liquid filled or conventional dry type transformers. Specifically cast coil type transformers are environmentally safe units which provides long uninterrupted service in the most demanding applications and under the most severe operating conditions.

The most important distinguishing feature of the cast coil transformer design is that the primary and (optionally) the secondary coils are solidly vacuum cast in epoxy resin. The casting process effectively locks the windings in a very strong, high dielectric resin which protects the transformer from extremely severe environments and electrical demands. During the casting process the coil windings which are layered with absorbent fiberglass are fully and completely impregnated with the epoxy resin. The result is a coil construction which provides the following key features.

SUITABILITY FOR INSTALLATION IN HARSH ENVIRONMENTS:

Cast coil type transformers offer the greatest degree of protection against the presence of moisture and atmospheric pollutants effecting the performance and life expectancy of dry type transformers.

HIGH SHORT CIRCUIT STRENGTH:

The fibreglass reinforced solid cast construction provides superior mechanical strength with the highest short circuit withstand capability of all transformer types including that of liquid filled units.

HIGH OVERLOAD CAPABILITY:

Due to the longer thermal time-constant of cast coils in comparison with conventional ventilated dry type transformers, higher short time overload capabilities are possible.

ENVIRONMENTALLY FRIENDLY:

Cast coil transformers contain only chemically non hazardous materials.

SAFETY:

Cast coil type transformers are self extinguishing which virtually eliminates the possibility for fire or explosion. Installations do not require special fire protection systems.

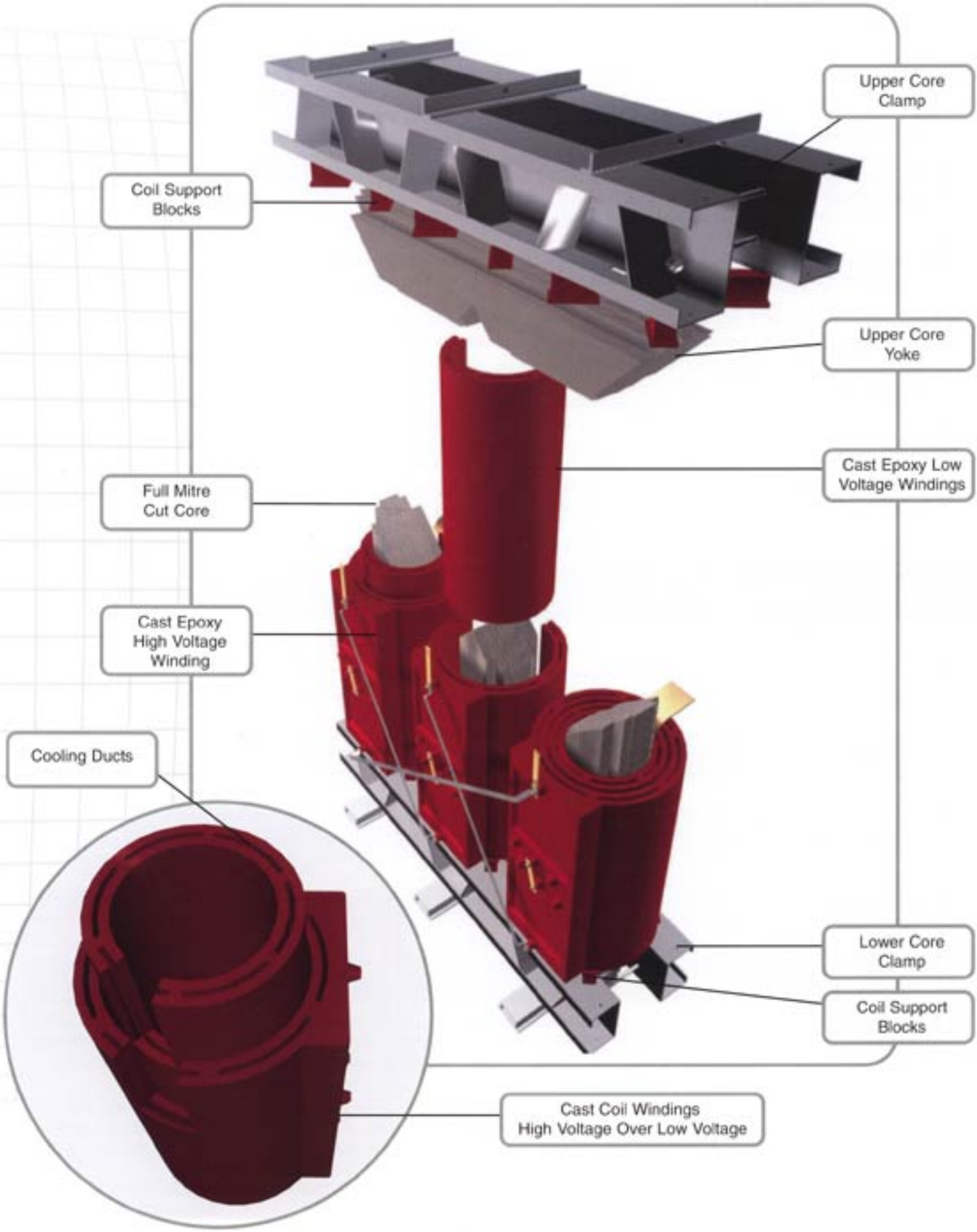
HIGH IMPULSE VOLTAGE STRENGTH:

The impulse voltage withstand capability of cast coil transformers is higher than conventional dry types and is comparable to liquid filled units.

MAINTENANCE:

Cast coil type transformers are virtually maintenance free due to the smooth crevice free construction of the coils. With proper precautions cast coil units can be installed at ambient temperatures as low as -50 Deg. C. and can be energized from cold start at full rating.

TYPICAL CONSTRUCTION OF A CAST COIL TRANSFORMER



DESIGN AND CONSTRUCTION FEATURES OF CAST COIL TRANSFORMERS:

1. The primary and secondary windings are magnetically and electrically balanced to minimize mechanical stresses due to short circuits and momentary overloads, especially those due to axial forces.

2. Unique coil construction techniques are used to reduce the dielectric stresses due to uneven distribution during impulse. The dielectric stresses are such that partial discharges are virtually non existent at 120% over voltage. The basic construction of the cast resin unit has high permittivity material in the series capacitance paths. The result is a more linear distribution of transient voltages.

3. The epoxy used in casting the coils is a two part very low viscosity resin with excellent penetration capabilities and supperior thermal shock performance. Extensive use of fibreglass reinforcement wraps during coil construction enhances the strength and crack resistance of the finished coils.

4. Conductor and inter-layer insulation used during coil construction are aramid paper (Nomex) and the casting epoxy resin is approved for use in 180 Deg. C. systems.

5. Each coil is preheated in its casting mould which must be specifically designed to withstand vacuum. The preheated mixed epoxy is then introduced under high vacuum into the mould. The procedure of pulling vacuum directly into the mould ensures the greatest penetration and most void free casting possible. The filled mould is then subjected to a programmed pre bake, bake and post bake cycles which can last from 16 to 30 hours to relieve the casting of all residual stresses before removing the finished coil from the mould.

6. The primary and secondary coils are cast separately and assembled on the core. Special axial clamping techniques are used to give uniform pressure while allowing for thermal expansion and ensuring maximum creepage distance between the coils. This type of assembly also provides better isolation between the coils by reducing the number of creepage paths and increasing the length of these paths where they exist.

COMPARISON WITH OTHER TRANSFORMER TYPES:

1. Cast coil transformers are ideal for use in installations where environmental restrictions discourage the use of liquid filled units.

2. Cast coil units require very little maintenance in comparison to liquid filled transformers which require regular maintenance to check gauge levels and periodical sampling and testing of cooling fluids. Low maintenance type transformers are preferable for installations in harsh environments where regular maintenance routines are difficult or incorvienient to perform.

3. The initial equipment cost of cast coil type transformers is comparable to silicon filled units and is higher than the cost of conventional ventilated dry types. Although the equipment cost is marginally higher, the installation cost of cast coil transformers are similar to that of conventional dry type units and significantly lower than liquid filled transformers.

4. Cast coil transformers are as adaptable as conventional ventilated dry type transformers allowing for easier coordination with other equipment compared to liquid fill units.

5. Cast coil transformers are designed with a long thermal time-constant. This results in a transformer with superior short term overload capabilities.

6. The solid epoxy, fibreglass reinforced cast construction produces coils that have outstanding mechanical strength which results in unparalleled short circuit withstand capability. This high short circuit withstand and the short term overload capabilities of cast coil transformers make them ideal for heavy industrial installations such as automotive manufacturing and rapid transit, traction power applications.

7. When specifying transformers there are many different types and many different options to consider. All types of transformers when installed and maintained properly will provide many years of satisfactory service. However, cast coil type transformers offer a long life with practically maintenance free operation in nearly any environment.

APPLICATION: As energy prices continue to rise, it is desirable to reduce the operating costs of electrical systems.The losses of a transformer are a very small percentage of the total power that flows through it. However, all transformers have losses that appear in the form of heat. Transformers designed with temperature rises of 80 Deg.C or 115 Deg. C and with special core materials and assemblies, are designed with lower than normal losses and therefore have greater life expectancy, lower operating cost and significant overload capabilities.

HOW ARE NEMA TP-1 AND CSA C802 QUALIFIED TRANSFORMERS MORE EFFICEINT?: Transformers lose energy in two components; the steel core and the surrounding copper, or aluminum windings. Energized 24 hours a day, the core loses energy at a fixed rate that is independent of the transformer load. Winding energy loss varies with transformer load. To comply with NEMA TP-1 and CSA C802 transfomer efficiency standards, transformer cores are made of higher grade silicon steel and constructed with special miter cut arrangements which produce lower losses than conventional cores.

WHAT IS CORE LOSS? Core loss is the electrical loss in a transformer caused by magnetization of the core. They sometimes are referred to as no load losses because they exist whenever the primary side of the transformer is energized, regardless of whether there is a load on the transformer.

WHAT IS LOAD LOSS? Winding loss is the loss associated with the flow of electricity through the windings of the transformer. It is directly proportional to the amount of energy flowing in the windings which, in turn, is dependent on the load.

WHAT HAS A GREATER EFFECT ON THE TOTAL LOSS? THE CORE LOSSES OR THE WINDING LOSSES: In most cases the core loss has the greater effect on total losses. Core losses are present at all times the transformer is energized while winding losses proportional to the transformer load.

Total Transformer Loss= Core Loss + (% loads^2 X Winding Loss)

REX POWER MAGNETICS ENERGY EFFICIENT TRANSFORMERS UTILIZE M5 OR BETTER HIGH GRADE SILICON GRAIN ORIENTED CORE STEEL AND MITER CUT CORE ASSEMBLY, (SEE PAGE 5), THAT RESULT IN SIGNIFICANTLY LOWER CORE LOSSES. WINDING LOSSES ARE ALSO REDUCED BY DESIGNING THE TRANSFORMERS WITH LOWER TEMPERATURE RISES.

EFFICIENCY RECOMMENDATION:

KVA RATING	RECOMMENDED LEVEL
750 KVA	98.8 %
1000 KVA	98.9 %
1500 KVA	99.0 %
2000 KVA	99.0 %
2500 KVA	99.1 %

TYPICAL TRANSFORMER COST-EFFECTIVENESS EXAMPLE: 1500 KVA THREE PHASE MEDIUM VOLTAGE

PERFORMANCE	BASE MODEL	REX *e-Rated*™ EFF.
Efficiency	98.6 %	99.0 %
Annual Energy Loss	91,380 kWh	66,360 kWh
Annual Energy Loss Cost	$5,480	$3,980
Lifetime Energy Loss Cost	$81,300	$59,000
Lifetime Energy Cost Savings		$22,300

NOTE: Annual energy loss is based on 50% of nameplate load. Lifetime cost savings is based on average usage and an assumed transformer life of 25 years.The assumed electricity price is 6 cents per kWh.

USING THE COST-EFFECTIVENESS TABLE: In the example shown above, a 1500 kVa, three phase, medium voltage transformer at the recommended efficeiency level of 99 % is cost effective if its purchase price is no more than $22,300.00 above the price of the Base Model. **Contact REX for free software to calculate cost saving and payback period.**

REX POWER MAGNETICS ENERGY EFFICIENT POWER TRANSFORMERS MEET OR EXCEED THE GUIDELINES SET OUT IN CSA C802 AND NEMA TP1 STANDARDS.

LOW E.M.F. SHIELDED TRANSFORMERS

APPLICATION: Power frequency electromagnetic fields from electrical distribution systems are virtually omnipresent. The closer to a source, the higher the field intensity, be it a transformer, feeder run or switchgear.

To prevent interference with sensitve electronic equipment, monitors and computers, as well as to satisfy possible health concerns, major magnetic field "polluters" can be located in remote areas of a building. However, this is not always possible or practical and may add additional costs and limit the useful space.

Solution: The installation of electrical equipment designed with low electromagnetic field emissions.

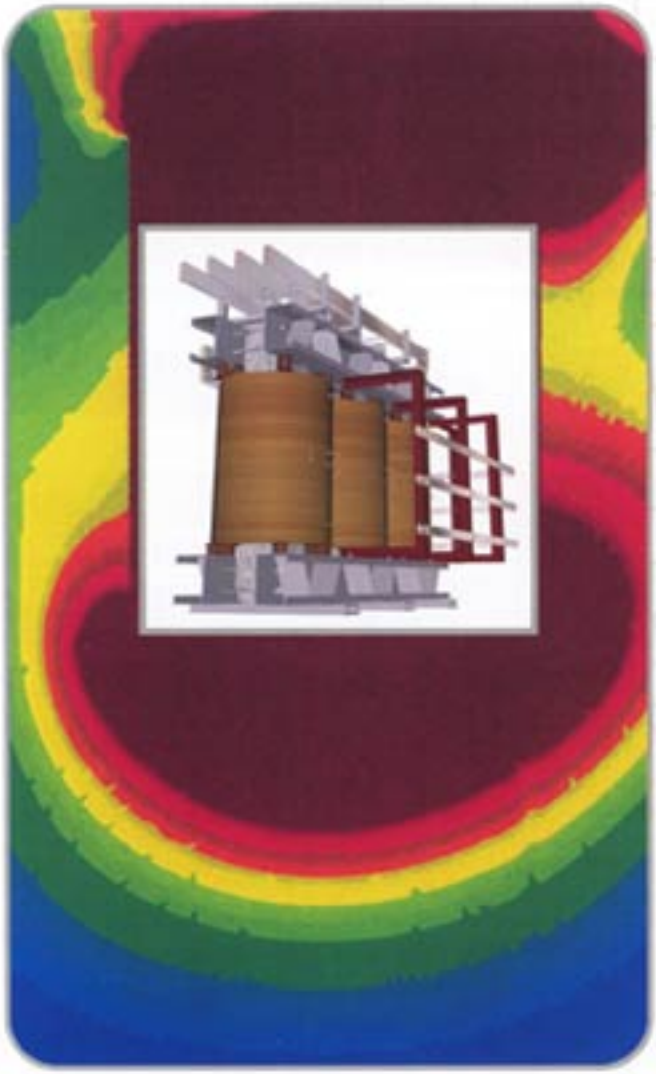
Rex Power Magnetics has developed a complete line of Low Emission power and distribution transformers that have the external stray flux attenuated by 95% or better than the standard transformer field emmision.

Unshielded transformers 300 - 3000 KVA produce electromagnetic fields in the order of 100 - 500 milligauss in the immediate vicinity of the unit. Rex specially designed shielded transformers can lower these emissions by a factor of 10 or better depending on the specification.

This allows for the transfomers to be located at practically any location in a building without any restrictions due to intrusive magnetic fields.

Image 1: Shows graphical representation of the intensity level of the electromagnetic fields outside of the enclosure of a typical non-shielded transformer.

Image 2: Shows the intensity level of the electromagnetic fields outside of the enclosure of a shielded transformer. Due to magnetic shielding of the enclosure most of the field emmision is contained within the transformer enclosure.



HIGH

LOW

Image 1

Image 2

Every power transformer produced by Rex Power Magnetics receives the following standard production tests.

Resistance measurement: Measures the DC resistance of the windings to insure integrity.

Ratio Test: Determines that the ratio of the turns in the primary winding to the turns in the secondary winding is correct.

Polarity and Phase Relation Test: Compares the instantaneous direction of the current and voltage in the primary relative to the secondary to determine the angular displacement and phase sequence. Determining the polarity is particularly important when paralleling or banking two or more transformers.

No-Load Loss and Excitation Current Test: Measures the losses in a transformer operating at rated voltage and frequency under no load conditions. These losses include core loss, dielectric losses and I R losses from no-load current flow in the primary winding.

Load Loss Test: Measures losses in the windings resulting from full load current flow and stray losses due to magnetic leakage to the core clamps and other structural members.

Impedance Test: Measures the voltage required to circulate rated current through the windings.

Applied Potential Test: Determines the dielectric strength of the insulation between windings and between the windings and ground.

Induced Potential Test: Checks the dielectric strength and integrity of the turn to turn and layer to layer insulation.

Optional Power Transformer Tests: (type tests and design tests)

Basic Impulse Insulation Level (BIL): A dielectric test consisting of a high frequency instantaneous impulse voltage applied to the windings to determine the ability of the unit to withstand overvoltage surges.

Temperature Rise Test: The transformer is tested under loading conditions that give losses as near as possible to the nameplate rating to ensure its ability to operate within its designed temperature limit.

Partial Discharge Test (Corona): An induced voltage is applied to the transformer to determine corona. Corona is a type of localized discharge resulting from transient gaseous ionization in the insulation system under voltage stress.

Sound Level Test: Measures the level of sound (Transformer hum) emitted by the transformer.

AVERAGE AUDIBLE SOUND LEVEL

VENTILATED SELF COOLED

KVA RATING	LINE TO LINE VOLTAGE CLASS UP TO 15 KV 95 KV BIL	ABOVE 15 KV VOLTAGE CLASS UP TO 125 KV BIL
300-500	60db	62db
501-750	62db	64db
751-1000	64db	66db
1001-1500	65db	67db
1501-2000	66db	68db
2001-3000	68db	70db
3001-4000	70db	72db
4001-5000	72db	74db

STANDARD IMPEDANCE RANGE

VOTAGE CLASS	UP TO 2000 KVA	OVER 2000 KVA
5.0 KV	4.0-6.0 %	6.0-7.0 %
8.7 KV	4.5-6.5 %	6.0-8.0 %
15.0 KV	5.5-7.0 %	6.5-8.0 %
25.0 KV	6.5-7.5 %	7.0-8.5 %
35.0 KV		

BASIC IMPULSE LEVELS (BIL)

BIL FULL AND CHOPPED WAVE KV CREST

VOLTAGE CLASS (KV)	CSA STANDARD	REX MFG STD.
2.5 KV	20	30
5 KV	30	30
8.7 KV	45	60
15 KV	60	95
18 KV	95	110 or 125
25 KV	125	125
35 KV	150	150

REX STANDARD ENCLOSURES

Rex power transformer enclosures are designed and quality constructed to protect against accidental contact with the transformer enclosed within them and to protect the transformer core and coil from a variety of different operating conditions.

NEMA 1:

A general purpose indoor ventilated enclosure designed to provide a limited degree of protection against falling dirt particals. It is commonly utilized indoors for commercial and industrial applications.

NEMA 1

NEMA 2:

A general purpose indoor ventilated enclosure designed to provide a degree of protection against dripping and light splashing of noncorrosive liquids and falling dirt particals.

NEMA 3R:

A general purpose ventilated enclosure for either indoor or outdoor use, designed to provide a degree of protection against rain, sprinklered water and snow. Ideal for sprinklered commercial applications, severe industrial environments and outdoor applications.
Note: For outdoor applications Rex reccommends the installation of optional ventilation filters.

NEMA 3R with Filters

NEMA 4:

A non-ventillated enclosure for either indoor or outdoor use, constructed to provide a degree of protection against windblown rain, snow and dust, splashing water, hose-directed water, and to be undamaged by the formation of ice externally. Ideal for industrial and commercial applications in harsh environments or where severe weather conditions are likely.

NEMA 4X:

A non-ventillated enclosue the same as NEMA 4 but it is corrosion resistant. Ideal for industrial applications such as food processing, refineries and mines.

NEMA 12:

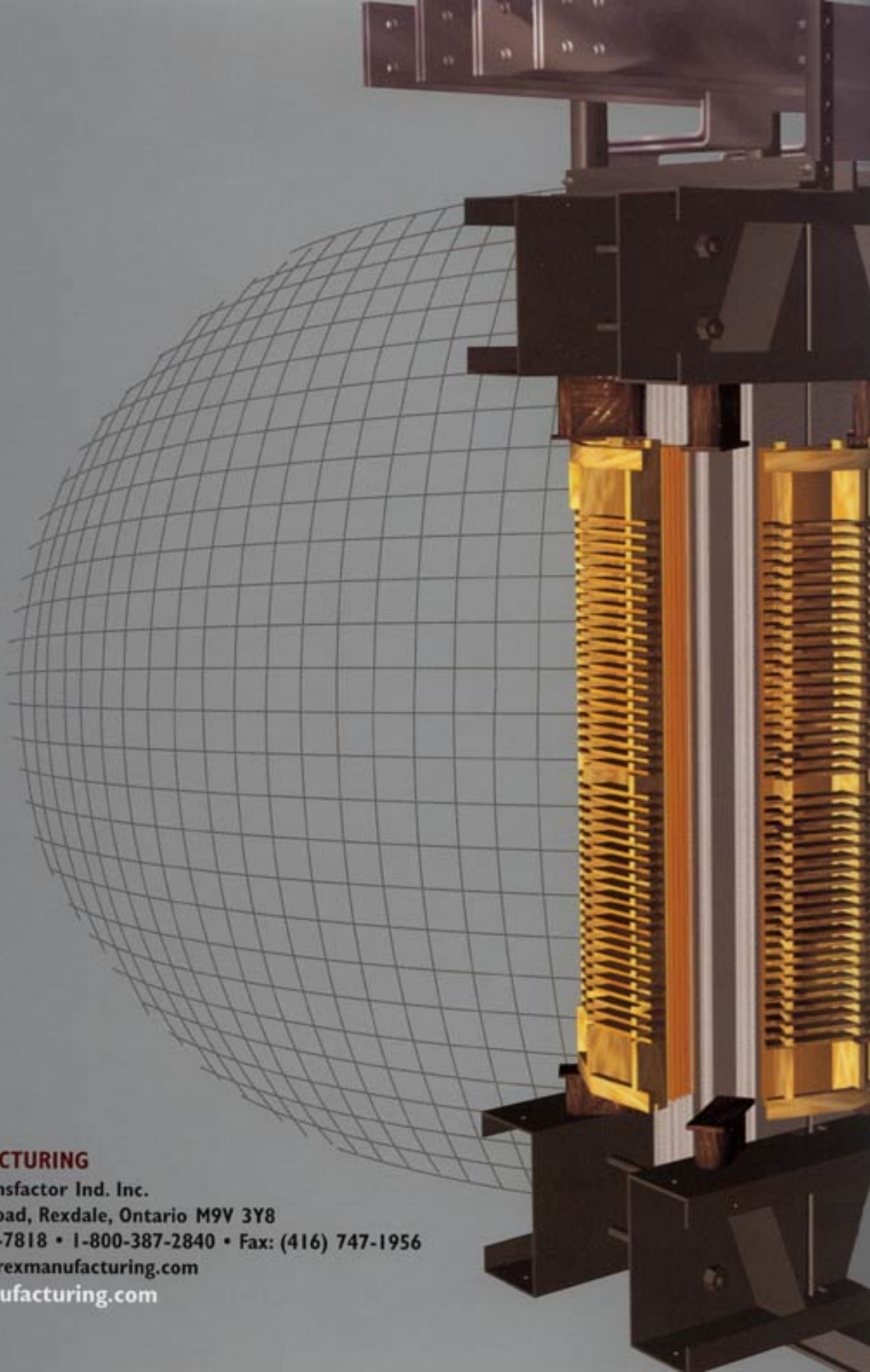
An indoor non-ventillated enclosure constructed to provide a degree of protection against circulating dust, lint, fibres, and flyings. It also provides protection against dripping and light splashing of noncorrosive liquids. Ideal for industrial applications such as mills, refineries or mines.

Sprinkler Proof

DIMENSIONS AND WEIGHT
THREE PHASE POWER TRANSFORMERS

KVA	DIMENSIONS FOR CORE AND COIL ASSY CLASS 220°C INSULATION (150°C RISE)				ENCLOSURE DIMENSIONS STUBS-UP PADS ARRANGEMENT				
	WIDTH	DEPTH	HEIGHT	WEIGHT	WIDTH	DEPTH	HEIGHT	WEIGHT	TOT. WT.
	DIMENSIONS IN INCHES			LBS	DIMENSIONS IN INCHES			LBS	LBS
5 KV (30 KV. B.I.L.)									
300	41.00	30.00	39.00	1900	46.00	40.00	60.00	500	2400
500	51.00	30.00	46.00	2800	60.00	45.00	70.00	700	3500
750	60.00	35.00	60.00	3200	72.00	45.00	80.00	850	4050
1000	62.00	35.00	62.00	4000	72.00	45.00	80.00	850	4850
1500	66.00	45.00	66.00	7000	80.00	48.00	91.50	1050	8050
2000	70.00	45.00	70.00	8400	90.00	60.00	91.50	1250	9650
8.5 KV (45 KV. B.I.L.)									
500	60.00	36.00	54.00	3300	72.00	45.00	80.00	850	4150
750	62.00	42.00	62.00	4500	72.00	45.00	80.00	850	5350
1000	66.00	42.00	64.00	5000	80.00	48.00	91.50	1050	6050
1500	70.00	44.00	66.00	6000	80.00	48.00	91.50	1050	7050
2000	72.00	44.00	68.00	8900	90.00	60.00	91.50	1250	10150
2500	76.00	50.00	74.00	9700	90.00	60.00	91.50	1250	10950
3000	80.00	50.00	78.00	11000	90.00	60.00	100.00	1300	12300
15 KV (60 KV. B.I.L.)									
750	66.00	42.00	62.00	5000	80.00	48.00	91.50	1050	6050
1000	68.00	42.00	64.00	6200	80.00	48.00	91.50	1050	7250
1500	72.00	44.00	68.00	8000	90.00	60.00	91.50	1250	9250
2000	75.00	44.00	72.00	9500	90.00	60.00	91.50	1250	10750
2500	78.00	50.00	77.00	10500	100.00	60.00	110.00	1450	11950
3000	84.00	50.00	80.00	12100	100.00	60.00	110.00	1450	13550
3750	90.00	55.00	84.00	17000	110.00	72.00	110.00	1600	18600
5000	100.00	55.00	96.00	19500	120.00	72.00	120.00	1900	21400
18 KV (95 KV. B.I.L.)									
750	72.00	45.00	64.00	6200	90.00	60.00	91.50	1250	7450
1000	78.00	45.00	70.00	6800	100.00	60.00	91.50	1300	8100
1500	80.00	45.00	76.00	8200	100.00	60.00	110.00	1450	9650
2000	80.00	45.00	80.00	9600	100.00	60.00	110.00	1450	11050
2500	87.00	50.00	82.00	10800	110.00	60.00	110.00	1550	12350
3000	95.00	50.00	86.00	13000	110.00	60.00	110.00	1550	14550
3750	98.00	60.00	88.00	17700	120.00	72.00	120.00	1900	19600
5000	100.00	60.00	92.00	20500	120.00	72.00	120.00	1900	22400
25 KV (125 KV. B.I.L.)									
1000	80.00	48.00	80.00	7200	100.00	60.00	110.00	1450	8650
1500	84.00	48.00	82.00	8500	110.00	60.00	110.00	1550	10050
2000	90.00	50.00	85.00	9800	110.00	60.00	110.00	1550	11350
2500	92.00	50.00	90.00	11000	110.00	60.00	120.00	1600	12600
3000	95.00	50.00	95.00	14000	120.00	60.00	120.00	1900	15900
3750	98.00	55.00	108.00	18500	120.00	72.00	132.00	2100	20600
5000	100.00	60.00	118.00	21000	130.00	72.00	130.00	2500	23500

NOTE: Dimensions may change if units are co-ordinated with switchgear. Dimensions are estimates. For firm dimensions contact factory.



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