Technical Bulletin PRODUCT LINE OVERVIEW

Core Loss testing is one of the most important quality assurance tools in the motor repair industry and is virtually a requirement when rewinding a motor. This proven technology is even more critical in today's competitive market as it predicts motor reliability, helps maintain motor efficiency, and reduces motor repair and warranty costs.

The Industry Standard Since 1982 - LEXSECO has the knowledge and experience of the Originator of Commercial Core Loss Testing Technology.

LEXSECO Core Loss Testers are used around the world by motor repair companies and maintenance shops of motor users such as railroads, armed forces and utilities. Motor manufacturers also use our Testers for quality control during their production process.



Core Loss - Waster of Energy and Destroyer of Motors

Not all power applied to an electric motor is converted to work. Principal sources of waste include winding (I^2R) loss, windage, friction, stray load loss and core loss in the stator, rotor or armature. Core loss is the excess energy required to magnetize the core and is due to eddy currents and hysteresis. All cores experience some inherent loss. Increased loss results from physical damages or overheating of the core. Core Loss, dissipated as heat, increases the operating temperature of the motor which causes more heat and can shorten the winding life. A vicious cycle of increasing inefficiency is established leading to higher operational costs and premature motor failure. In DC armatures, core loss can cause commutator sparking and spotting, impeding motor performance. A relatively small temperature increase in the motor winding can significantly reduce the thermal life of the insulation.

A significant percentage of motors tested have core loss exceeding statistical acceptability. Some special types, such as hermetic refrigeration and traction motors, suffer especially high losses. Moreover, government efficiency mandates make detecting sources of energy loss increasingly important. Preeminent technical authorities have acknowledged the critical importance of core testing. EASA's **Guidelines for Maintaining Motor Efficiency During Rebuilding** indicates Core Loss Testing as a Recommended Practice.

Core Losses Reduce Profits

Studies have shown that core loss is the 1st or 2nd leading cause of energy waste in rewound motors and can account for 25% or more of motor efficiency. Core testing not only identifies motors that should be replaced instead of repaired, but also reveals repairable problems. The increasing costs of electrical energy and energy legislation make it more important than ever that rewound motors maintain the optimum level of efficiency & performance.

LEXSECO Makes Core Loss Testing Easy

Testing occurs with the winding in place or removed. Winding condition, lamination grade and thickness do not significantly affect test results. Core dimensions and meter readings are fed into the MP 7™ software, and calculates watts/lb. (kg) of core loss. With parameters for "bad", "marginal" and "good" cores, the MP 7™ software generates a detailed core condition report. Localized damage is found by increasing the excitation level to reveal hot spots within the core. T**he entire test takes only about 10 minutes!**

TECHNICAL OVERVIEW

LEXSECO Means Quality Equipment

The LEXSECO Core Loss Tester provides high current at low voltage with continuously variable output to simulate operating conditions of the core. Housed in rugged steel cabinets, our Testers are incorporated with surge and overload protection. Every LEXSECO component meets rigid quality standards. Our patented Variable Reactance Transformer is inherently current limiting and will not allow the tester to source more than the rated current. **With machines in service over two decades, we have never experienced a transformer failure, a remarkable quality testament.** When purchased with Cover Plan, the LEXSECO Core Loss Tester comes with a **3-Year Warranty**.

Simple and Efficient to Operate

The LEXSECO Core Loss Testers have a fully automated, auto-ranging metering system. One button is all that is needed to ramp the system up or down. This simple and intuitive operation makes training a breeze.

LEXSECO Flux Meters provides the Highest Metering Accuracy on the Market

The metering system is a key component in most industrial test equipment and should be specifically designed to address the application of the particular equipment. The LEXSECO Flux Metering systems are a result of decades of research in the field of core loss testing and advances in metering technology. The system measures flux, true RMS current, and watts at the highest accuracy level available on the market today.

The system was designed specifically for core loss testing. It provides the most accurate metering available for testing a wide array of HP and frame characteristics. The accuracy specifications are presented as a percentage of the actual meter reading. The system is certified traceable to the requirements of the National Institute of Standards and Technology (NIST).

One of the terms listed in the NIST specification requires additional explanation. The "% *of reading' or % of rdg" is* a very significant term when used in conjunction with instrumentation specifications. It indicates how far the meter's reported reading can vary as a percentage of the reported reading from the actual. The "% of rdg" must be compared to a more standard term "% of full scale " or % of FS" in order to fully understand its significance. The term "% of FS' indicates how far the meter's reported reading can vary as a percentage of the largest reading the meter can display from the actual. Consider the following example of two watt meters (both meters have a five digit display and full scale = 10,000 watts) displaying 180 watts when testing a core:

- Other Meters - (with an accuracy specification of ±0.5%FS) The reading of 180W might actually be between 130 and 230W, a range of 100 watts.
- LEXSECO's Flux Meter - (with accuracy specification of ±0.25% Rdg ±.2) The reading of 180W might actually be between 179.35 and 180.65 a range of only 1.3 watts.

Wattage is the most difficult parameter to represent accurately of all metering issues associated with the Core Loss Tester It is derived from two separate measurements, voltage and current and their observed phase relationship. The example above illustrates how one specification can greatly affect your confidence in the reported results.

Calibration is easily addressed with our flux meter exchange program. *The exchange metering system* **comes complete with traceable Certificate of Compliance certified in conformity with the National Institute of Standards and Technology (NIST).** The Flux Metering System is a self-enclosed modular component, which provides for a quick removal and installation process. **This program should help you conform to ISO 9001, EASA-Q, and other program standards that require regular and traceable calibration while maintaining your Core Loss Testing with little or no interruption.**

Fully Automated Core Loss Testers

Our Automated Testers are computer controlled systems that will reduce testing time and increase accuracy while allowing for the highest level of testing flexibility with an *any-point manual over-ride*. These testers integrate with our **MP 7™** Software to automatically excite the core to target levels, produce test results, and then automatically ramp the power back down with a touch of a button. Hot Spot tests are automatically timed to prevent overheating of the core!

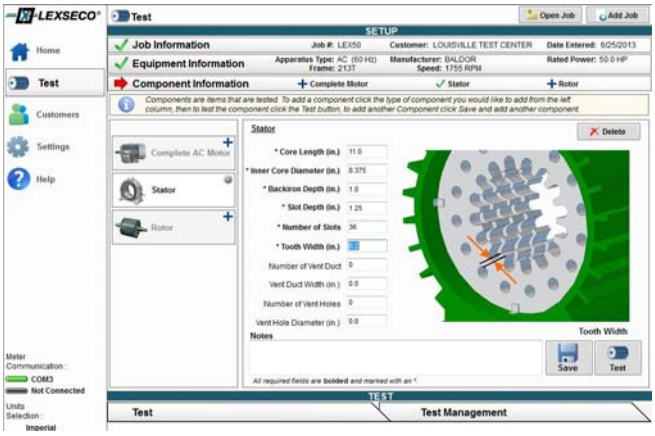
LEXSECO Software is the Standard

The first standardized core loss parameters LEXSECO developed represented an appropriate average of the existing base of motors found in the market. LEXSECO realized, however, that acceptable losses vary with core configuration. To achieve greater accuracy, separate parameters should be determined for each frame type and efficiency type. This recognition lead to the development of the LEXSECO's unique "**Multiparameter,**" or **MP 7™** software.

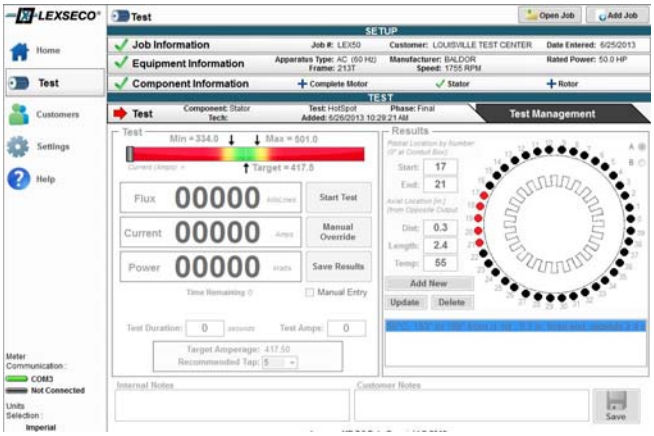
Exceptionally versatile and user friendly, **MP 7™** allows differentiation between NEMA, pre-NEMA, U, T and IEC frames and standard and high efficiencies. Users may also build their own databases with special parameters for the particular equipment they service or manufacture. The **MP 7™'s** Winding Verification program and an array of mechanical and electrical testing fields make our Tester a powerful repair documentation center.

Sample Screens from the MP 7™ Software









LEXSECO

TECHNICAL OVERVIEW

Specifications	Model 1081	Model 2025	Model 2040	Model 2060	Model 2125	Model 2200	Model 3000
KVA	10	25	40	60	125	200	300
HP Range**	to 500	to 1250	to 1750	to 2500	to 5000	to 7500	to 10000
Standard Voltage*	1/60/230 - 460V	1/60/230 - 460V	1/60/460V	1/60/460V	1/60/460V	1/60/460V	1/60/460V
Required Circuit Ampacity	60/230V 30/460V	120/230V 60/460V	100	150	300	550	700
Locking Steel Lid	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Circuit Breaker	Standard	Standard	Standard	Standard	Standard	Standard	N/A
Casters (locking)	Standard	Standard	Standard	Standard	Standard	Standard	N/A
Thermal Overload Protection	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Crated Weight	715lbs	845lbs	1295lbs	1450lbs	2225lbs	2750lbs	3955lbs

* Other voltages available upon request ** HP Range is approximate only

Equipment Upgrade Programs

Our upgrade program proves that buying a LEXSECO Core Loss Tester is a wise investment. Recognizing that the LEXSECO Testers are built to last, we have created upgrade packages to bring earlier generations of the equipment to the latest standards.

A LEXSECO Core Loss Tester is an investment that pays dividends for many years. Continuing R&D, largely conducted in our affiliated EASA member motor service company, produces regular advances that keep LEXSECO users current with cutting edge technology. Some of LEXSECO's earliest clients have been able to upgrade their 1980 vintage Testers to have the latest metering, hardware and software!

When you buy LEXSECO, you gain access to our staff of trained test engineers who ensure you get the most from your LEXSECO Tester. Our engineers consult daily with shop personnel around the world, giving them the benefit of our many years of testing knowledge and experience. We support our products after the purchase, which is one reason LEXSECO clients come back again and again. The knowledge that comes from originating a test equipment concept - an unparalleled quality record - Multiparameter software with regular upgrades - after purchase product support. These are the reasons LEXSECO sets the standard.

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