OUR MISSION

To be the leading global full-service provider of insulation systems, diagnostic solutions, and supply chain services that result in improved overall reliability of the electrical grid.
WEIDMANN ELECTRICAL TECHNOLOGY

Major Market Segments we serve:

• Transformer Insulation Products and Services
  Transformerboard, custom insulation components, design services

• Supply Chain Services
  Complementary components, warehousing, sourcing, logistics services.

• Integrated Engineering Services
  Grid power flow analysis, power electronics, EMF modeling, condition assessment, transformer upgrades

• Diagnostic Services and Monitoring
  Oil testing analysis, Progressive Diagnostics, fleet assessment, on-line monitoring systems and software
WEIDMANN

WICOR WORLDWIDE

WEIDMANN production and sales site
WEIDMANN diagnostic lab site
OUR DIAGNOSTICS MISSION

To provide our customers with actionable information that can be used to better manage the overall life-cycle of their critical electrical assets in a manner that is convenient, easy to understand, and assists in critical decision making.
DIAGNOSTICS PORTFOLIO in the Americas

Three Major Product/Service Business Categories:

- **Progressive Diagnostics** –
  Core products ranging from basic lab test report to diagnostic programs to diagnostic evaluations to engineering services

- **Monitoring** –
  InsuLogix® brand sensors, monitors, software, and integrated systems

- **Information Management** –
  Web Site and Customer Information Portal
  Education offerings – conferences, training, seminars
14 Diagnostic Service Centers in North America, Mexico, China

Continued global Expansion in Europe, Middle East, and Asia Pacific.
WEIDMANN DIAGNOSTIC SOLUTIONS

What sets us apart from our competition

- Accredits competency of a laboratory to perform tests to industry standards: IEEE, IEC, ASTM.
- Rigorous requirements on employee competence, mgmt systems, equipment calibrations, laboratory physical environment, verification standard testing.
- Assure customers that laboratories follow standard exactly.
- Annual audits by 3rd party auditors
- Only testing laboratories in US to have accreditation
WEIDMANN

WEIDMANN DIAGNOSTIC SOLUTIONS

WHAT SETS US APART

- Network of Diagnostic Service Centers, engineering technical support and industry leading database
- World Class Quality Management Systems
- Development Center and global engineering expertise
- We know your transformers from the inside out
ENGINEERING SERVICES
Our Engineers can help assist your staff to…

✓ Find the “Red Transformers”
✓ Optimize equipment performance
✓ Leverage equipment life-cycle options or “enhanced capacity” candidates to meet future system needs
✓ Pin-point maintenance and replacement projects that maximize value of existing assets
✓ Internal inspection and failure analysis
MONITORING

AN INSULATION MANUFACTURER'S APPROACH

• Insulation system condition is THE primary indicator of equipment health and remaining life

• WEIDMANN is recognized around the world as the leader in high-voltage insulation

• This expertise drives our diagnostics
  • Laboratory Testing
  • Engineering Support
  • On-line Monitoring
Today’s Functions:
• Monitoring (on- and off-line) of particular parameters to ‘triangulate’ the condition of the windings
• Status indication
• Limited modeling (e.g. aging)
• Control of other assemblies (e.g. coolers)

Development trends:
• Monitoring the condition of the windings directly
• Sophisticated software modeling towards Dynamic Loading
• Connection via WLAN
WHICH PARAMETERS SHOULD BE MONITORED?
FROM AN INSULATION MANUFACTURER’S PERSPECTIVE

- Temperature
- Moisture

‘Normal’ Cellulose degradation

- Insulation mechanical strength diminished → DP difficult to measure
- Insulation electrical strength (water retention) diminished → Insulation integrity off-line periodic testing

Vibration, faults, overloading, partial discharge

Results in loosening of the winding:
Clamping Force → Loosening of the winding

TMF = Temperature, Moisture, Force & Gases → TMFG
DIRECT MONITORING of TEMPERATURE, MOISTURE, FORCE
TMF - The Transformer “KILLERS”

Withstand Level As New

Spontaneous Loss of Life with \( T \)

Loss of Life with \( TM \)

Life (and Death) with random TMF Events

Sudden End of Life!

All Combined Stresses

Life of Insulation System and Transformer
SMART INSULATION™ T,M,F – DIRECT MONITORING APPROACH

Insulation System with Embedded Sensors

Winding Cylinder

SmartSpacer® Sensor Assemblies

Fiber Optic Probes

Temperature Moisture in Insulation Clamping Force

Typical Key Spacer

SmartSpacer® “T”

Smart Spacer® “M” and “F” sensors in development
Components Integrated with Embedded Probes and Sensors for Direct Monitoring of:

- Winding (hotspot) Temperatures
- Direct Moisture in Solid Insulation
- Clamping Force of winding

and Monitoring Devices for:

- Dissolved Gas and Moisture in Oil
- Bushing Power Factor
- Oil Dielectric Strength

that are fully integrated with Specialized Software in a Complete Package.
MONITOR PORTFOLIO / InsuLogix® - GROWING FAMILY
FOR OPTIMUM PERFORMANCE MONITORING

- Sensors and Monitors
  - B - Bushing
  - T Mi F - Smart Insulation™
  - H HM G - Dissolved Gases and Moisture
  - D - Dielectric Strength

- Integrator Platform

- Software
  - eNamePlate® (T)
  - AccuLife™ (T, Mp)
  - OptiLoad™ (T, Mi, F)
TRANSFORMER SIMULATION
NEW TESTING LAB IN ST. JOHNSBURY

• New test laboratory in St. Johnsbury, USA

• Specialized facility to validate sensors, insulation components, monitoring devices as well as diagnostic software.

• Allows for simulation of dynamic operating conditions within a power transformer
WEIDMANN

INCLUDE … WEIDMANN EXPERTISE ON YOUR TEAM

www.weidmann-electrical.com
THANK YOU!