OIL AND MACHINE CONDITION MONITORING - SGS HERGUTH LABORATORIES
SGS Herguth specializes in lubrication and machine condition monitoring services providing related predictive maintenance programs. Founded in January 1980, the company is based on the premise that high quality testing and rapid turn-around time gives the client a value hard to find in the market place.

SGS Herguth maintains a global client base, receiving and processing samples from around the world. We operate a modern 12,500 square foot facility located in Vallejo, CA and 10,000 square foot facility in Naperville, IL.

**WELCOME TO SGS HERGUTH LABORATORIES**

In 1980, Herguth Laboratories was founded to address what were seen as fundamental problems in the availability of high quality, sophisticated analysis for users in the areas of lubrication analysis, equipment condition monitoring and rapid solutions to tribological problems.

The company was designed from the ground up by challenging industry norms and delivering superior commitment to service and sophistication of analysis and expertise, setting a new standard for lubrication analysis, consulting and technology delivery, and changing the way people resolved lubrication and machine problems.

**TESTING, ANALYSIS AND CONSULTING SERVICES**

- New and used oil analysis
- Tribology studies
- Refrigerant Analysis
- Condition Monitoring Training
- Applied research of lubricants, greases
- Additives and petroleum fuels

**CLIENTS SERVED**

- Agriculture Equipment
- Nuclear Power plants
- Commercial Aviation
- Oil Company Research
- Building Maintenance Companies
- Oil Refineries
- Chemical and Processing Plants
- Petroleum Wholesalers
- Construction Companies
- Fossil Power Generation
- Consultants, Engineers, Labs
- Hydroelectric Plants
- Manufacturing Plants
- Public Works Departments
- Marine Fleets
- Water Treatment Plants
- Mining Operations
- Wind Power Companies

**SUPERIOR ANALYTICAL SERVICES FOR OUR CLIENTS**

Lubrication analysis is generally performed and delivered within the confines of what are called “oil analysis programs.” Since day one, we’ve committed to holding ourselves accountable for all of our clients’ lubrication and tribology needs, not just their oil analysis program. We deliver sophisticated, solution oriented answers to the complex problems our clients face in the areas of lubrication and business operation. To meet this commitment, we created a research associate program drawing expertise from around the nation to resolve our clients’ problems rapidly with the most advanced testing capabilities of any independent oil analysis laboratory in the world today.

**ENDURING VALUES**

We understand that to deliver breakthrough results requires a foundation of enduring values. So we recruited people with a common passion for problem solving and built a culture based on four core values:

- **Client Satisfaction** - through solutions focused delivery and a sense of urgency.
- **Honesty and integrity** - always acting as independent, professional advocates for our clients.
- **Quality** - in facilities, test methods, innovations, equipment and solutions
- **People** - our most important asset are qualified, competent members of our team maintaining a safe, healthy, and environmentally-conscious working environment.

Our clients confirm that we’ve gotten this right. They tell us again and again that our culture and people are significant contributors to the success of their initiatives.
SGS Herguth Laboratories is the leading Oil Condition Monitoring provider in North America, offering both routine, highly automated analysis and equipment condition's diagnostics as well as non-routine consulting services such as lubrication programs audits, root cause and failure analysis. SGS Herguth Laboratories is the one-stop-shop for all your testing needs in North America and for your global operations, offering high level independent Oil Condition Monitoring solutions to our customers in our 29 lab testing facilities throughout the world.

Constant Innovation
Each step we’ve taken since 1980 has been to help our clients achieve breakthrough results. We’ve developed world-class skills and innovative techniques to achieve solutions to lubrication, tribology and related mechanical problems inside their business and throughout the industry. We consistently lead our industry in helping clients use new and existing technologies to find answers to complex lubrication problems.

Staying Focused on Our Promise
Times may change, but our promise to our clients does not: we will do whatever it takes to deliver the right results, on time and on budget. We value the new and enduring relationships we have with our clients.

SGS Oil Condition Monitoring World-Wide Services

When You Need to Be Sure
SGS is the world’s leading inspection, verification, testing and certification company. SGS is recognized as the global benchmark for quality and integrity. With more than 75,000 employees, SGS operates a network of over 1,500 offices and laboratories around the world.

SGS Herguth Laboratories, Inc.
Oil, Gas & Chemicals Services

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Since 1980, SGS Herguth has led the industry in high quality innovative condition monitoring analysis for industrial users. As an active member of leading technical societies SGS Herguth works as an advocate for our clients.

**DECADES OF EXPERIENCE AND INNOVATION**

If a machine contains oil, grease or operates with fuel SGS Herguth is involved with a condition monitoring somewhere on the globe. With 28 condition monitoring laboratories around the world we are the leaders in industry.

SGS Herguth provides custom or tailored testing packages and special analytical services designed for your plant or application.

**PREVENTIVE MAINTENANCE**

In machinery, the beginnings of breakdown occur hundreds of operating hours before the breakdown itself. When components are misaligned, out of balance, or running with dirty or inadequate lubricant, minute particles of metal are generated as the moving parts start to be in contact.

Oil analysis will detect these microscopic wear particles long before your equipment starts to vibrate, heat up, or show observable signs of wear. Analysis also evaluates the oil’s ability to seal, cool, clean, and lubricate as well as detect contamination by water, coolant, other fluids, or particulates.

**ORGANIZATION MEMBERSHIPS**

- Society of Tribologist and Lubrication Engineers (STLE)
- American Society of Testing and Materials (ASTM)
- International Organization of Standards (ISO)
- National Lubricating Grease Institute (NLGI)
- American Wind Energy Association (AWEA)

SGS Herguth has maintained a very high level of quality assurance programs to protect your interests. These programs are kept up to date by internal audits and external audits provided by third party vendors.

**QUALITY ASSURANCE CERTIFICATIONS**

- ISO/IEC 17025 - Testing and Calibration Laboratories
- ISO 9001 – Quality Management Standard
- 10CFR50 Appendix “B” – Quality Assurance for Nuclear Power Plants
- ASTM - Test Procedures
- Radioactive Materials - Handling License
- ANSI - Nuclear Quality Assurance
- MIL - Q9858A Military Quality Program

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**IT’S WHAT WE DO WITH THE DATA THAT COUNTS**

Signing on with SGS Herguth will give you access to one of the world’s most experienced oil and grease testing laboratories. Our decades of experience and hundreds of thousands of data points available for every possible machine and lubricant combination are used to support your condition monitoring program. Backed up by iLAMPtm our proprietary web based software program, we can pinpoint adverse trend in your equipment and proactively take steps to minimize your costs.

**ADVANCED TESTING, FAILURE ANALYSIS AND CONSULTING**

Unlike other oil analysis laboratories SGS Herguth is the single source for all of your testing and analysis needs. Hundreds of companies rely on our in-depth testing and research capabilities. Identifying the fundamental source of lubrication related problems quickly and accurately saves our clients million of dollars in needless downtime and expenses.

- Lubricant Life and Serviceability Evaluations for Oil and Grease
- Acidity and Viscosity
- Remaining Antioxidant Level
- Flender Foam and Air Entrainment Tester
- ASTM Foam and Air Release Testing
- Grease Evaluations

**STATE OF THE ART TEST METHODS**

- Wear Debris & Contamination Analysis for Oil and Grease
- Plasma Spectroscopy on Acid Dissolved Metals
- Filter Debris Analysis
- Direct Reading and Analytical Ferrography
- Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS)
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TRIBOLOGY STUDIES LUBRICATION & MATERIALS

Tribology is defined as, “The science of the mechanisms of friction, lubrication, and wear of interacting surfaces that are in relative motion.” A great deal of tribological research is being conducted throughout the world in universities and in private, government, and industrial laboratories. Virtually unheard of twenty years ago, there have been thousands of Tribology papers published since 1990 and the knowledge is disseminated through many technical societies. The reliability of machines steadily improves because of this research.

SGS Herguth Laboratories, Inc. and our Research Associates are committed to maintaining our edge in tribology. Wear, or the undesirable removal of material due to relative motion, is a large consumer of materials, and shortens the life and reduces the reliability of machines. Friction and wear cost the economies of the world billions of dollars per year.

SGS HERGUTH LABORATORIES PROVIDES

- Failures analysis of machine parts
- Analysis of Lubricants, Fuels and Deposits
- Wear Particle Analysis

LEADERSHIP SGS Herguth Laboratories, Inc. takes an active leadership role in applying research to many specialized projects. Called upon by oil company majors, we pursue each case with innovation and initiation, always focused on the ultimate solution.

FAILURE ANALYSIS OF LUBRICATED COMPONENTS

SGS Herguth has complete resources available for Optical or Scanning Electron Microscopy, Photomicrography, Chemical Testing and Analysis by ICP, FT-IR, SEM/EDX, XRD or AES. We provide specific recommendations to help you solve your tribology problems.

Beyond the oil company projects and our tribological studies, SGS Herguth’s research and development arm is often called upon to set test programs to determine lubricant and grease specifications, including amounts of additives and other variables that have an operational impact on equipment and machinery. Our applied research team can set up and implement procedures to meet your specific requirements and program goals.

AVAILABLE TRIBOMETER TEST MACHINES AND METHODS

| ASTM G-99 PIN-ON-DISK - STANDARD TEST METHOD FOR WEAR TESTING WITH A PIN-ON-DISK APPARATUS. |
| HIGH FREQUENCY RECIPROCATING RIG (HFRR) |
| PIN ON VEE BLOCK |

The pin-on-disk tribometer is a laboratory apparatus for measuring the friction and wear properties of materials and lubricants under desired conditions of load, speed and temperature. The results provide information about the coefficient of friction, wear and scuff properties of a lubricant or coated surface. The operating conditions can be made to simulate, as far as possible, those in a practical machine. The pure sliding in this test causes boundary lubrication, where surface-to-surface contact occurs and the lubricant additive chemistry and friction can be measured.

The High Frequency Reciprocating Rig (HFRR) is a reciprocating friction and wear test system which provides repeatable assessment of the performance of fuels and lubricants. It is particularly suitable for wear testing diesel fuels and for boundary friction measurements of engine oils, greases and other compounds. It conforms to ASTM D6079, ASTM D7688, CEC F:06-A, ISO 12156, EN 590, JPI-SS-50 and IP 450.

The Pin On Vee Block machine allows you to evaluate friction, wear and Extreme Pressure properties of lubricants and materials. It is capable of testing materials, dry film bonded lubricant coatings, surface hardening coatings, fluid lubricants and additive packages.

As a historical leading provider of innovative services for the Nuclear Industry, SGS Herguth is dedicated to propose and implement programs that will provide a peace of mind to the Nuclear Power stations as well as the general public, allowing constant monitoring of the quality of their lubricants and lubricated equipments across the plants.

Since 1986, SGS Herguth has been working with United States nuclear power generation stations, providing the most stringent quality systems in the industry, thus anticipating the Electric Power Research Institute (EPRI) and Nuclear Research Committee (NRC) guidelines that followed in 1988-1989 to reinforce lubricant dedication programs. We were the first commercial lubricant testing laboratory in the United States to provide a Nuclear Quality Assurance program to address these issues. Still today, SGS Herguth provides 10CFR50 Appendix “B” quality testing services for new product dedication and used lubricating oils / grease analysis.

PRODUCT DEDICATION

United States nuclear power generation stations have relied on SGS Herguth Laboratories for over 25 years. We have provided 10CFR50 quality testing services for new product dedication.

• Greases
• Diesel Fuels
• Lubricating Oils
• Markers, Tapes and Sealants

RADIOLOGICAL LICENSE AND IN-SERVICE MONITORING

Once SGS Herguth has verified the integrity of the delivered products we go on to monitor lubrication and diesel fuels throughout the plants from BWR’s to PWR’s. Licensed to receive and testing radioactive material SGS Herguth is prepared to meet all of your testing needs.

• Emergency Diesel Generators
• Pump Oils and Grease
• MOV Greases
• Snubber Oil
• Turbine Oils

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• Lubrication Performance and Compatibility Studies
• Filter Debris and Deposit Characterizations
• Tribology Studies
• Root Cause Failure Analysis
WIND POWER ENERGY – THE EARLY YEARS

In 1985 about half of the wind power energy generated in the United States was generated from the Altamont Pass in Northern California\(^1\). Our first laboratory, founded in 1980, was located 50 miles from “The Altamont Pass.” From the beginning, SGS Herguth was there!

The wind industry was held together by dedicated wind farm technicians and supported by SGS Herguth. Without these dedicated technicians and support of knowledgeable gear experts the wind industry may have not grown to the level it is today.

Early on SGS Herguth has been a contributor to the “ANSI/AGMA/AWEA Standard 6006-a03, Standard for Design and Specification of Gearboxes for Wind Turbines,” Approved - January 9, 2004. This standard being constantly updated to represent the technical evolutions of modern turbine systems, SGS Herguth, as a proud member and contributor of the National Renewable Energy Laboratory, Gearbox Reliability Collaborative (NREL/GRC), drives the continuous modernization of its lubricant analysis part to reflect the latest technological developments in the industry.

STATE-OF-THE-ART TESTING

In the early days of wind energy development, wear debris and contamination were measured in terms of handfuls of debris as opposed to part-per-million (ppm). Following the increase in size and sophistication of gearboxes, the analysis and interpretation tools became more accurate and precise. State-of-the-art test methods of testing and analysis are now employed at SGS Herguth to ensure early identification of wear debris and contaminants:

- Wear Debris & Contamination Analysis for Oil and Grease
- Plasma Spectroscopy on Acid Dissolved Metals
- Filter Debris Analysis
- Direct Reading and Analytical Ferrography
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