Comprehensive Diagnostic Testing Equipment

Storm offers a complete line of performance testing equipment in order to measure and determine the area affecting boiler performance in which maintenance is needed. By coupling performance driven maintenance along with preventative maintenance, results are achieved in performance and reliability of the boiler. Storm can provide a complete package of testing equipment that may be used by the plant to determine opportunities from the pulverizers to the stack.

STORM Capabilities (Field Service and Fabricated Components)

- Complete Annual Service Contracts
- Technical Direction of Outage Repairs
- Complete Testing Programs
- Specialized Testing Equipment
- Airflow Measurement and Control Devices (Design, Fabrication and Calibration)
- Flyash Carbon Reduction Programs
- Combustion Improvement Programs for:
  - Pulverizers
  - Burners
  - Fans
- Testing and Corrective Plans of Action
- Secondary Air Balancing
- Hear Rate Improvements Through Boiler Optimization Programs
- Failure Analysis
- Consulting
- Seminars
- Immediate Technical Responses
- Full Service Fabrication and Machine Shop
- Fast Equipment, Parts or Service Turn-Around Time
- Outstanding Fabrication Quality
- Total Combustion Improvement Programs
- Custom and Proven Pulverizer Performance Modifications Parts and Tuning Services
- Fuel Line Balancing Improvements
- Boiler and Related Firing Equipment Combustion Optimization Inspections
- NO\textsubscript{x} and CO Emission Reduction Tuning
- Fuel Change Evaluations and Improvement Consultation
- Reduction of Furnace Slagging
- Air In-Leakage Determination Through Testing and Inspections
- Air Heater Leakage and Performance Testing and Tuning to Optimize Superheat and Reheat Temperatures to Reduce Spray Flows
- Fuels Flexibility Test Burn

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1. Dirty Air Probe
The STORM dirty air probe is fabricated from 100% stainless steel and proven over many years of use. The dirty air probe is used to measure velocity head differentials in environments that are filled with particulates that could cause plugging in other instruments.

2. Multipoint Probes/Bubbler
Multipoint probes can be utilized at the economizer outlet, air heater inlet and air heater outlet. These probes greatly reduce the labor required from performing a manual traverse. STORM multipoint probes are designed for flue gas and temperature grid measurements. If a composite gas sample from a grid is desired, as with a boiler efficiency test or air heater leakage test, then a bubbler may also be used in conjunction with multipoint probes.

3. Forward-Reverse Pitot Tube
Storm Forward-Reverse Pitot Tubes have evolved from the Staushiebe or "S" type pitot tube. The Forward/Reverse Pitot tube can be used to determine the amount of airflow and velocities in a duct. Each probe is manufactured from 304 Stainless Steel and is designed to be reliable and durable.

4. Boiler Exit
A boiler exit probe is a very versatile probe that can be used downstream of the convection pass of the furnace in temperatures up to 1000°F. The boiler exit probe is used to determine air in leakage, temperature and gas stratifications throughout the system, as well as verify control room indication of the O₂ and CO probes.

5. Dustless Connector
Our dustless connectors are engineered to provide a seal for the dirty air probe, sampling tip and static/temperature probe without the hassle of aspirating air. These are used with the STORM isokinetic coal sampler, but have also been used in process ductwork of high static pressures.

6. Storm Multipoint Emission Sampling System (patent pending)
Storm’s Multipoint Emission Sampling System is a device designed for combustion tuning and optimization. The system is installed on a flue gas duct to be used as a tool to provide an in-line gas sampling grid, temperature grid and flyash sampling grid with minimal labor to operate (on man operation).

7. In-Situ Flyash Sampler Kit
Our In-Situ flyash sampler is a "Near Isokinetic" sampler which allows the user to draw a representative ash sample from the flue gas stream. This kit is recommended for boiler tuning and periodic testing as one person can easily perform the test. Utilizing our flyash sampler in a test grid a representative sample may be taken for carbon in ash/LOI analysis.

8. Heated Dirty Air Probe
The STORM heated dirty air probe is fabricated from 100% stainless steel. The heated Dirty Air Probe is used to measure Velocity head differentials in environments that are filled with particulates that could cause plugging in other instruments.

9. Fecheimer Probe
Storm Fecheimer probe is designed to determine the amount of airflow and velocities in a duct that has turbulent airflow such as testing at a fan inlet or outlet. The Fecheimer probe is a three-hole probe with one impact hole and two static holes to enable the probe to be null balanced and record the angle of flow to correct the velocity head.

10. Chordal Thermocouples
Storm chordal thermocouples are designed to determine boiler fireside tube metal temperature. They are a useful tool for predicting waterwall metal temperature distress. (Picture shown with Nema 4-thermocouple junction box)

11. Isokinetic Flyash Sampling Kit
In some cases, a more accurate flyash sample is needed for contractual specification, compliance testing and/or dust loading. In these cases, an isokinetic flyash sampler is used. It uses a three-hole fecheimer head to measure velocity head and an in-line calibrated square-edged orifice to maintain the required sampling velocities.

12. Isokinetic Coal Sampling Kit
Complete sampling kit with all equipment required to obtain proper isokinetic samples and complete a comprehensive pulverizer test. This kit will allow the user to perform clean air testing, as well as pulverizer in service measurements of static pressure, temperature, dirty air velocity, fuel flow, airflow, and to collect a representative sample to be sieved for fineness results.

13. High Velocity Thermocouple (HVT) Kit
Storm High Velocity Thermocouple (HVT) probes are water cooled probes manufactured from 304 and 316 Stainless Steel to resist high temperatures and corrosion. Our kit includes all the equipment necessary to properly characterize the gas and temperature levels at the furnace exit.