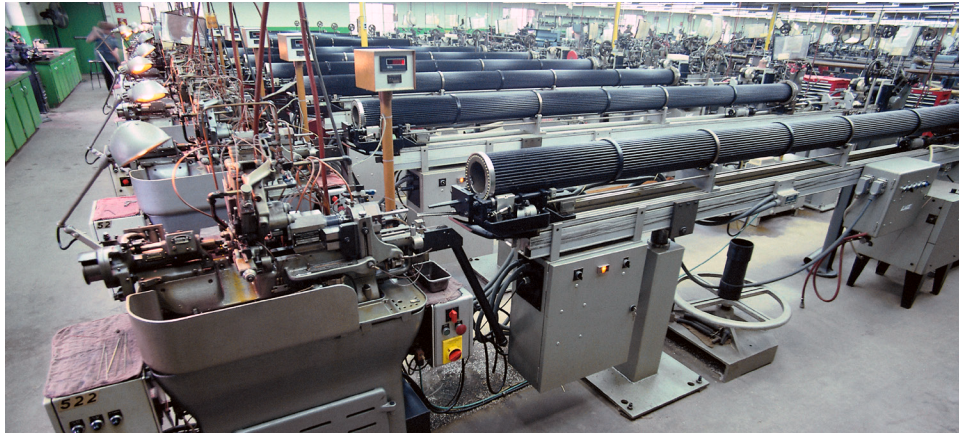


Thermography Testing

Equipment breakdown guide from Liberty Mutual Insurance



Thermography testing, commonly known as infrared scan, is a proactive maintenance technique for inspecting equipment for defective components or connections.

Information contained in this guide is designed to assist the customer in the management of their own activities and should not be construed as legal advice.

Customers should always consult with the equipment manufacturer.

This information does not amend, alter, or otherwise affect the provisions or coverage of any insurance policy.

The following may lower the conductivity or increase the resistance level (friction) of a connection or component:

- Normal wear
- Vibration
- Chemical contamination
- Corrosion
- Fatigue

- Expansion
- Contraction associated with load and temperature changes
- Faulty assembly or installation

This increase in resistance will result in elevated temperatures of the electrical connection or mechanical component. These conditions cannot often be detected by the naked eye. Excessive heat can be readily noted and the temperature rise measured by an infrared camera. Increased temperatures indicate potential trouble spots that could lead to failure of the component. Any noted deficiencies should be rectified immediately by a qualified electrician or mechanic.

Because of these considerations, both the InterNational Electrical Testing Association (NETA) and the National Fire Prevention Association (NFPA) recommends periodic infrared thermographic testing of critical equipment. Testing should always be performed by a certified thermographer knowledgeable with proper arc flash protection in accordance with NFPA 70E.

Benefits

The benefits of a Thermographic Predictive Maintenance Program are:

- Thermographic surveys help minimize maintenance costs and unscheduled outages when used as part of a well-written preventive maintenance program.
- Detection of hot spots which could lead to fires. Early detection can prevent unplanned business interruption.
- Increased production machinery reliability.

An infrared thermographic survey should be performed on a routine basis on the electrical and mechanical equipment.

Thermographic Surveys should be included as part of your overall Preventive Maintenance Program. Some facilities may be required to have the electrical distribution system inspected annually; nevertheless, the frequency should be determined based on regulatory laws, condition of equipment, and findings from last survey.

The survey can include electrical equipment, such as transformers, switchgear, cable, and bus; motors and their controllers; and other electrical devices that will be scanned under load when enclosure covers can be opened or removed safely.

Mechanical equipment such as motors and their associated driven components, multiple bearing transport systems (conveyors), heat exchangers, piping systems, boilers and furnaces, steam traps, valves, gear boxes, vessels, and tanks can also be tested while in operation if testing can be done safely. Records of thermographic surveys should be retained and compared with previous results.

Infrared testing should not take the place of a comprehensive mechanical and electrical preventive/predictive maintenance program but should be used to complement these activities.

General Preparation Requirements

Although no checklist can include all steps necessary to encapsulate all aspects of a thermography inspection, the below information will provide you with some basic general information.

- Thermographic survey on electrical equipment should be conducted under peak load and when possible during summer.
- Prepare a plan and advise key personnel of the testing date and time to avoid any delays. The plan should include a general route outlining a starting point and progressing through the facility in an efficient manner. The goal is to prevent or minimize backtracking which will delay progress.
- Ensure a brief general meeting takes place beforehand to discuss the scope of the inspection and communicate all company safety requirements.
- Often it is required that the facility provide an electrical engineer or electrical engineer assistant who has good knowledge of the electrical distribution system.
- All equipment to be inspected must be under normal load and ready for inspection. Note any door switches with no override and alert personnel to ensure no accidental interruption of equipment operation occurs. Any door switches which cannot be bypassed must be outlined as part of the inspection plan.
- After testing is conducted, ensure an exit meeting takes place and discuss any critical recommendations which should be addressed immediately. At times a critical condition may exist that cannot wait until the report is generated.

Post Inspection

- Once the report is submitted, discuss findings with key personnel and develop a plan to address all recommendations or important items outlined in the report.

- Any questions concerning any portion of the report must be thoroughly discussed with the company who performed the inspection to ensure no unnecessary work or repairs are performed and to ensure recommendations are satisfactorily completed.
- Document all work performed, repairs, and/or replacement, and archive in a secure location. Often the report provided by the company will include an area to document the steps taken to complete the recommendation, date completed, who performed the work, and signature.

Thermographic surveys do not ensure that electrical or mechanical issues will not occur, and there is no guarantee that these surveys will find all problems or prevent them from happening. Nevertheless, it is a very effective tool for identifying many potential problems early.



The illustrations, instructions, and principles contained in the material are general in scope and, to the best of our knowledge, current at the time of publication. Our risk control services are advisory only. We assume no responsibility for: managing or controlling customer safety activities, implementing any recommended corrective measures, or identifying all potential hazards.

No attempt has been made to interpret any referenced codes, standards, or regulations. Please refer to the appropriate government authority for interpretation or clarification.

Insurance underwritten by Liberty Mutual Insurance Co. or its affiliates or subsidiaries.

© 2020 Liberty Mutual Insurance, 175 Berkeley Street, Boston, MA 02116.

<https://www.libertymutualgroup.com/equipment-breakdown>

10/15

EB 1002