INTERNATIONAL STANDARD

ISO 18434-2

First edition
2019-03

Condition monitoring and diagnostics of machine systems — Thermography —

Part 2: Image interpretation and diagnostics

Surveillance et diagnostic de l'état des systèmes de machines — Thermographie —

Partie 2: Interprétation d'image et diagnostic

Reference number
ISO 18434-2:2019(E)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 108, *Mechanical vibration, shock and condition monitoring*, Subcommittee SC 5, *Condition monitoring and diagnostics of machine systems*.

A list of all parts in the ISO 18434 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document provides specific guidance on the interpretation of infrared thermograms as part of a programme for condition monitoring and diagnostics of machines. Thermography can be used to identify and document anomalies for the purposes of condition monitoring of machines. These anomalies are usually caused by such mechanisms as operation, improper lubrication, misalignment, worn components or mechanical loading anomalies.

Infrared thermography is based on measuring the distribution of radiant thermal energy (heat) emitted from a target surface, and converting this to a map of radiation intensity differences (surface temperature map) or thermogram. The thermographer therefore requires an understanding of heat, temperature and the various types of heat transfer as essential prerequisites when undertaking an IR programme. Thermal energy is present with the operation of all machines. It can be in the form of friction or energy losses, as a property of the process media, produced by the actual process itself or any combination thereof. As a result, temperature can be a key parameter for monitoring the performance of machines, the condition of machines and the diagnostics of machine problems. Infrared thermography is an ideal technology to do this temperature monitoring because it provides complete thermal images of a machine, or a machine component, with no physical attachments (non-intrusive), requires little set-up and provides the results in a very short period of time.

Although extremely useful, IRT has a limitation in that radiometric sensing is susceptible to unacceptable error when used on most low emissivity surfaces.

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Condition monitoring and diagnostics of machine systems — Thermography —

Part 2: Image interpretation and diagnostics

1 Scope

This document provides specific guidance on the interpretation of infrared thermograms as part of a programme for condition monitoring and diagnostics of machine systems.

In addition, IR applications pertaining to machinery performance are addressed.

This document is intended to:

— provide guidance on establishing severity assessment criteria for anomalies identified by IRT;

— outline methods and requirements for carrying out thermography of machine systems, including safety recommendations;

— provide information on image interpretation, assessment criteria and reporting requirements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13372, *Condition monitoring and diagnostics of machines — Vocabulary*

ISO 13373-1, *Condition monitoring and diagnostics of machines — Vibration condition monitoring — Part 1: General procedures*

ISO 13379-1, *Condition monitoring and diagnostics of machines — Data interpretation and diagnostics techniques — Part 1: General guidelines*

ISO 17359, *Condition monitoring and diagnostics of machines — General guidelines*

ISO 18434-1, *Condition monitoring and diagnostics of machines — Thermography — Part 1: General procedures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13372 and ISO 18434-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

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