Singapore Standards Council

SS 582 : Part 1 : 2013
(ICS 11.040.55)

SINGAPORE STANDARD

# Specification for thermal imagers for human temperature screening

## – Part 1 : Requirements and test methods

(Formerly TR 15 : Part 1)

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– Part 1 : Requirements and test methods



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The Working Group on Thermal Imagers, appointed by the Biomedical Standards Committee to assist in the preparation of this standard, comprises the following experts who contribute in their *individual capacity*:

| | | Name |
|---|---|---|
| **Co-Convenors** | : | Mr Chua Hock Ann |
| | | Assoc Prof Eddie Ng Yin Kwee |
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| | | Mr Yeo Chin Yong |

The organisations in which the experts of the Working Group are involved are:

*ALX Pte Ltd*
*Defence Science & Technology Agency*
*Health Sciences Authority*
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*National Metrology Centre*
*Nanyang Technological University*
*Omnisense Systems Pte Ltd*
*Parkway Shenton Pte Ltd*
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## Foreword

This Singapore Standard was prepared by the Work Group on Thermal Imagers under the direction of the Biomedical Standards Committee.

SS 582 which comprises the following two parts under the general title, 'Specification for thermal imagers for human temperature screening', resulted from the review of the Technical Reference, TR 15 : Parts 1 and 2, of the same titles:

– Part 1: Requirements and test methods – serves as a reference and guide for manufacturers to evaluate the performance of thermal imagers.

– Part 2: Implementation guidelines – provides user guidelines for effective and efficient deployment of thermal imagers for human temperature screening.

The purpose of Part 1 is to establish a set of basic specifications and their test methods by which both manufacturers and end users may apply to establish the suitability of their thermal imagers for non-invasive human temperature screening of large groups of individuals in an indoor environment. The test results would serve as general performance criteria for evaluating thermal imagers for this application.

This part addresses general requirements for the thermal imager to be used for this specific application, regardless of the model and configuration (e.g. using either internal or external temperature reference, with or without temperature readings, etc.). The performance requirements and the test methods are developed based on practical application requirements and studies carried out by various organisations.

To enable the characterisation test results to be reproduced, the critical performance parameters are given under specific reference conditions using a blackbody source as a known temperature reference. Users of this standard need to be aware that there are other effects on the critical parameters, particularly, the effect of actual environmental conditions, which will impact the use and characterisation of the thermal imagers.

The 'NOTES' in the standard are for information only and are not to be construed as an addition to or modification of a requirement.

The standard is not intended to qualify an individual to set up a temperature screening operation, to use a thermal imager to conduct screening of human temperature, or analyse the data. The use of this standard does not preclude users from potential errors and misinterpretations of the data derived from thermal imagers. It is therefore necessary that users establish a set of operational procedures. Users may refer to SS 582, Part 2 on Specification for thermal imagers for human temperature screening – Implementation guidelines.

In preparing this standard, reference was made to the following standards / publications:

- ASTM E1965-1998(2009) – Standard specification for infrared thermometers for intermittent determination of patient temperature

- American College of Clinical Thermology Position Paper - Recommended screening protocol for the efficient, rapid recognition of hyperthermic individuals with SARS using clinical digital infrared thermal imaging in public places, 2003

- ISO/IEC 80601-2-59:2008 – Medical electrical equipment, Part 2-59 : Particular requirements for the basic safety and essential performance of screening thermographs for human febrile temperature screening

- ISO Guide to the expression of uncertainty in measurement (GUM), 1998-3 : 2008
- ISO International vocabulary of metrology – Basic and general concepts and associated terms (VIM), third edition; JCGM 200:2008

Acknowledgement is made for the use of information from the above references.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

**NOTE**

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions.*

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# Specification for thermal imagers for human temperature screening – Part 1: Requirements and test methods

## 1 Scope

This Singapore Standard (SS) specifies the performance requirements and test methods for characterising thermal imagers used for non-invasive human temperature screening of large groups of individuals under indoor environmental conditions.

NOTE 1 – The performance requirements stated in this SS are for the configuration of a thermal imager for general temperature screening operations. These specifications set laboratory characterisation test limits for the thermal imagers and require the determination and disclosure of the evaluation results, including evaluation for performance on human temperature screening, for its intended application.

NOTE 2 – A thermal imager screens a human body and allows the user to quantify and visualise the skin temperature profile only. Since the skin temperature greatly depends on both the skin blood perfusion and environmental conditions, thermal imagers need to be used in a stable indoor environment with minimum environmental interference in order to satisfy the performance requirements and to produce reliable results.

NOTE 3 – The application of thermal imagers stated in this SS is intended for screening and detection of human subjects with elevated skin temperature. A raised temperature needs to be confirmed by temperature measurement using a clinical thermometer.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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|---|---|
| ISO/IEC 80601-2-59 : 2008 | Medical electrical equipment - Part 2-59 : Particular requirements for the basic safety and essential performance of screening thermographs for human febrile temperature screening |
| ASTM E1965-1998 (2009) | Standard specification for infrared thermometers for intermittent determination of patient temperature – American Society for Testing and Materials |

American College of Clinical Thermology Position Paper: Recommended screening protocol for the efficient, rapid recognition of hyperthermic individuals with SARS using clinical digital infrared thermal imaging in public places, 2003.

ISO Guide to the expression of uncertainty in measurement (GUM).

ISO International vocabulary of basic and general terms in metrology (VIM).

ISO/IEC Guide 2 : 2004, Standardisation and related activities – General vocabulary

ISO/IEC Directives, Part 1 Amendment, ISO 3166, Codes for the representation of names of countries