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Solar thermal electric plants – Part 2-1: Thermal energy storage systems – Characterization of active, sensible systems for direct and indirect configurations

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SOLAR THERMAL ELECTRIC PLANTS –

Part 2-1: Thermal energy storage systems – Characterization of active, sensible systems for direct and indirect configurations

FOREWORD

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IEC TS 62862-2-1 has been prepared by IEC technical committee 117: Solar thermal electric plants. It is a Technical Specification.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
117/119/DTS	117/127/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 62862 series, published under the general title *Solar thermal electric plants*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

IEC TC 117 prepares International Standards (and other types of documents) for systems of solar thermal electric (STE) plants for the conversion of solar thermal energy into electrical energy and for all the elements (including all sub-systems and components) in the entire STE energy system. These documents would cover all current different types of systems in the STE field, as follows:

- Parabolic trough
- Solar tower
- Linear fresnel collectors
- Parabolic dish
- Any other type of system using thermal storage that is not connected to the grid.

The documents define terminology, design and installation requirements, performance measurement techniques and test methods, safety requirements, and "power quality" issues for each of the above systems.

In addition to those systems, there are several major components that require standardization, such as the storage media (oil, molten salt, ceramic, concrete, etc.).

SOLAR THERMAL ELECTRIC PLANTS –

Part 2-1: Thermal energy storage systems – Characterization of active, sensible systems for direct and indirect configurations

1 Scope

This document defines the requirements and the test methods for the characterization of thermal energy storage (TES) systems.

This document contains the information necessary for determining the performance and functional characteristics of active direct and indirect thermal energy storage systems based on sensible heat in solar thermal power plants using parabolic-trough collector, Fresnel collector or tower central receiver technology with liquid storage media.

This document includes characterization procedures for testing energy storage system charge and discharge, as well as reporting the results. Test performance requirements are given and the instrumentation necessary for them, as well as data acquisition and processing methods and methods for calculating the results and their uncertainties.

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.

IEC TS 62862-1-1:2018, *Solar thermal electric plants – Part 1-1: Terminology*

IEC 60584-1:2013, *Thermocouples – Part 1: EMF specifications and tolerances*

IEC 60751:2008, *Industrial platinum resistance thermometers and platinum temperature sensors*

ISO 5725-3, *Accuracy (trueness and precision) of measurement methods and results – Part 3: Intermediate measures of the precision of a standard measurement method*

ISO 5725-6, *Accuracy (trueness and precision) of measurement methods and results – Part 6: Use in practice of accuracy values*