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Code of practice for energy efficiency standard for building services and equipment

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		Er. Joseph Toh	*Institution of Engineers, Singapore*
Co-opted Members	:	Mr K Ramanathan	*Individual Capacity*
		Er. Yeow Mei Leng	*Individual Capacity*

The Working Group, appointed by the Technical Committee to assist in the preparation of this standard, comprises the following experts who contributed in their *individual capacity*:

		Name
Co-Convenors	:	Mr Jeffery Neng
		Mr Vincent Low
Members	:	Prof Chandra Sekhar
		Mr Cheng Chin Hsien
		Dr Gao Chun Ping
		Mr Hadi Wijaya
		Mr Lam Kwok Ho
		Mr Lee Boon Woei

Members	:	Ms Cherlyn Leong Mr Leow Yock Keng Er. Joseph Toh Dr Uma Maheswaran Prof Wong Yew Wah Mr Yong Siew Onn

The organisations in which the experts are involved are:

ASHRAE (Singapore Chapter)
Building and Construction Authority
Institution of Engineers, Singapore
JTC Corporation
As amended, Dec 18 *Land Transport Authority*
Nanyang Technological University
National Environment Agency
National University of Singapore
Ngee Ann Polytechnic
Singapore Green Building Council
Sustainable Energy Association of Singapore

Contents

Tables

Foreword

This code of practice was prepared by a Working Group appointed by the Technical Committee on Building Maintenance and Management which is under the purview of the Building and Construction Standards Committee.

The Inter-Ministerial Committee on Sustainable Development (IMCSD) has set a long term goal to have "at least 80% of the buildings in Singapore to be green by 2030". In Singapore's densely built-up urban development, with limited land and few natural resources, making buildings green and energy efficient underpin our efforts to reduce our energy and carbon footprint and contribute to the global fight against climate change. Having higher minimum requirements for energy efficient building services and equipment push the boundaries of building performance to create a better and greener built environment for all.

This is a revision of SS 530 : 2006 – 'Code of practice for energy efficiency standard for building services and equipment'. The purpose of this revision is to keep abreast of international standards in energy efficiency for building services and equipment.

The changes include:

(a) raising the energy efficiency requirements in accordance with international standards for air-conditioning equipment, water heaters, electric motors and lighting power density stated in this Code.

(b) new methods to determine efficiency for water chilling packages and lighting power density.

(c) new inclusion of efficiency standards for buildings with high-capacity service water-heating systems, distribution transformers and lifts and escalators.

In preparing this specification, reference was made to the following overseas publications:

(1) ANSI/ASHRAE/IES Standard 90.1 : 2013 Energy standard for buildings except low-rise residential buildings

(2) IEC 60034-30-1 : 2014 Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)

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

At the time of publication of this Code, it continued to serve as a reference for the Building and Construction Authority's Building Control Regulations.

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.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations*

Code of practice for energy efficiency standard for building services and equipment

1 Scope

1.1 This code provides:

(a) minimum energy-efficiency requirements for:

(i) new installation of systems and equipment in buildings;

(ii) replacement of systems and equipment in buildings; and

(iii) replacement of components of systems and equipment in buildings.

(b) criteria for determining compliance with these requirements.

1.2 The provisions of this code apply to the following systems and equipment used in conjunction with buildings:

(i) air-conditioning equipment ; [1]

(ii) heat rejection equipment;

(iii) water heaters;

(iv) motor drives, and

(v) high efficiency lighting. [2]

(vi) distribution transformers

(vii) lifts and escalators

1.3 This code shall not prevail over any safety, health or environmental requirements.

NOTE 1 – For related matters on energy conservation in air-conditioning systems, reference is to be made to Singapore Standard SS 553 'Code of practice for air-conditioning and mechanical ventilation in buildings'.

NOTE 2 – For guidance on the illuminances recommended for different applications, reference is to be made to Singapore Standard SS 531 'Code of practice for lighting of work places'.

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.

ANSI Z21.10.3	Gas-fired water heaters, volume III, storage water heaters with input ratings above 75,000 Btu per hour, circulating and instantaneous
ANSI/AHRI 210/240	Unitary air-conditioning and air-source heat pump equipment

ANSI/AHRI 340/360	Commercial and industrial unitary air-conditioning and heat pump equipment
ANSI/AHRI 365	Commercial and industrial unitary air-conditioning condensing units
ANSI/AHRI 560	Absorption water chilling and water heating packages
ANSI/AHRI 1230	Performance rating of variable refrigerant flow (VRF) multi-split air-conditioning and heat pump equipment
ANSI/AHRI 551/591	Performance rating of water-chilling and heat pump water-heating packages using the vapor compression cycle
CTI ATC-105	Acceptance test code for water cooling towers
10 CFR Part 430	Energy conservation program for consumer products
10 CFR Part 431	Energy efficiency program for certain commercial and industrial equipment
IEC 60034-2-1	Rotating electrical machines – Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)
IEC 60034-30-1	Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)
ISO 5151	Non-ducted air-conditioners and heat pumps – Testing and rating for performance
JIS B 8615-1	Non-ducted air-conditioners and heat pumps – Testing and rating for performance
JIS B 8615-2	Ducted air-conditioners and air-to-air heat pumps – Testing And rating For performance
SS 531 standard series	Code of practice for lighting of work places