

# Ministry of Energy's Notification on prescribing standard values in designing building for energy conservation B.E. 2564

*Unofficial Translation*



## Ministry of Energy's Notification

### Prescribing Standard Values in Designing Building for Energy Conservation B.E. 2564

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By the authority of the particulars in Clause 6, 7, 8 and 9 of the Ministerial Regulation prescribing type or size of buildings and standard, criteria and procedure in designing building for energy conservation B.E. 2563, issued according to the particulars of the Energy Conservation Promotion Act B.E. 2535 as amended by the Energy Conservation Promotion Act (Vol. 2) B.E. 2550, The Minister of Energy, therefore, does hereby issue the following announcement:

**Clause 1:** This Notification is called “Ministry of Energy’s Notification on prescribing standard values for designing building for energy conservation B.E. 2564”.

**Clause 2:** This Notification shall become effective since it is published in the Government Gazette.

**Clause 3:** Repeal the Ministry of Energy’s Notification on prescribing coefficient of minimum performance, coefficient of performance of refrigeration, and ratio of electrical power and cooling capacity of refrigeration installed in building in B.E. 2552.

**Clause 4:** In this Notification

“Maximum Lighting Power Density” means an average value of the installed lighting power density per building area (Watt per square meters). This excludes car parking area.

“Air-Conditioner” means split-type air-conditioner which heat is ventilated by air or water. It is designed for condensing unit and fan-coil unit to work together and uses alternate current with the frequency of 50 Hertz for reducing the temperature and humidity in the air that passes fan-coil unit as identified in this notification.

“Water Cooler for Air-conditioning System” means equipment that lowers the temperature of water in order to be used in the air-conditioning or cooling by using the cooling cycle (vapor compression or absorption).

“Energy Efficiency of Air-Conditioning System” is as coefficient of minimum performance, seasonal energy efficiency ratio and ratio of electrical power per cooling capacity.



“Coefficient of Performance” means ratio of net cooling capacity of air-conditioning system or net heating capacity of water heater (Heat Pump) and electrical power (Watt).

“Coefficient of Minimum Performance” means ratio of level of net cooling capacity of air-conditioning system or net heating capacity of water heater (heat pump) and level of electrical power. This identify as the minimum value for installing in the building.

“Seasonal Energy Efficiency Ratio” means ratio of net cooling capacity of air-conditioning system during season which is divided by electrical power (BTU per hour) and level of electrical capacity (Watt).

“Electrical Power per Ton Refrigeration” means ratio of electrical power (Kilowatt) and net cooling capacity of water cooler (Ton Refrigeration).

“Steam Boiler” means closed container loading 2 liter of water or more. When it is heated by fuel combustion or other thermal energy source, water will change to steam under pressure which is more than 1.5 times of atmospheric pressure at sea level.

“Hot Water Boiler” means closed container having surface area 8 square meter or more is loaded with water for producing hot water.

“Minimum Efficiency” mean ratio of thermal energy of steam and heating value of fuel.

### Section 1:

#### Overall Thermal Transfer Value of Building's Envelope System

**Clause 5:** Overall thermal transfer value of external wall of the building entering into inside the building which install air-conditioning shall not exceed the following value.

Type of Building	Overall Thermal Transfer Value of external wall of the building (Watt/m <sup>2</sup> )
(1) Theatrical Building	40
(2) Hotel	30
(3) Entertainment Service	40
(4) Medical center or hospital	30
(5) Educational Place	50
(6) Office	50
(7) Department Store or Tread Center	40
(8) Condominium	30
(9) Building for congregation	40

**Clause 6:** Roof thermal transfer value passing into an inside of building which install air-conditioning shall not exceed the following value

Type of Building	Overall Roof Thermal Transfer Value (Watt/m <sup>2</sup> )
(1) Theatrical Building	8
(2) Hotel	6
(3) Entertainment Service	8
(4) Medical center or hospital	6
(5) Educational Place	10
(6) Office	10
(7) Department Store or Tread Center	8
(8) Condominium	6
(9) Building for congregation	8



**Clause 7:** Overall Thermal Transfer Value of external wall of the building entering into an inside of each type of building according to Clause 5, and Roof thermal transfer value passing into an inside of building which install air-conditioning according to Clause 6 are summation of the weighted average value of each side according to Ministry of Energy's Notification on criteria, calculation method and certification of inspecting a design for each energy conservation system, an overall energy consumption of the building, and a use of renewable energy B.E. 2564.

## Section 2: Maximum Lighting Power Density

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**Clause 8:** Maximum value of lighting power density of each type of building shall not exceed the following value.

Type of Building	Maximum Lighting Power Density (Watt/m <sup>2</sup> )
(1) Theatrical Building	11
(2) Hotel	12
(3) Entertainment Service	11
(4) Medical center or hospital	12
(5) Educational Place	10
(6) Office	10
(7) Department Store or Tread Center	11
(8) Condominium	12
(9) Building for congregation	11

Maximum value of lighting power density for each type of building shall calculate from its average value per area according to Ministry of Energy's Notification on Criteria, Calculation Methods and Certification in designing building for energy conservation of various system, an overall energy consumption of the buildings, and a use of renewable energy systems B.E. 2564.



### Section 3: Energy Efficiency of Air-Conditioning System

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**Clause 9:** Type and size of each air-conditioning system which is installed in building shall have energy efficiency as follow.

(1) Air-conditioning which is not more than 12,000 Watt shall have seasonal energy efficiency ratio according to current energy efficiency criteria for air-conditioning No. 5 (minimum) developed by the Electricity Generation of Thailand.

(2) Refer to a standard testing which temperature of outlet cooling water is 7.2°C and temperature of water outlet from condenser system is 32.2°C, water cooler for the vapor-compression air-conditioning system shall has an electric power per ton refrigeration no more than the following value.

Type of water cooler for the vapor-compression air-conditioning system		Size of cooling capacity at the full cooling load (ton refrigeration)	Electrical power per ton refrigeration (kilo Watt / tone refrigeration)
Type of Condenser	Type of compressor		
Air-cooled chiller	All types	All sizes	1.12
Water-cooled chiller	Reciprocating	All sizes	0.88
	Rotary or Screw	All sizes	0.70
	Scroll	All sizes	0.89
	Centrifugal pump	Less than or equal 300 More than 300	0.67 0.61

Other parts of air-conditioning system driven by electricity consisting of heat evaporation and condenser system, water cooling system, and cooling fan system shall have electrical power per ton refrigeration of no more than 0.5 Kilowatt per ton refrigeration.

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(3) Absorption Chiller shall have coefficient of minimum performance which shall not exceed the following value.

(A) Identification of rated condition by mentioning temperature and rate of water flow into condenser. It shall not exceed the following value.

Type of Absorption Chiller	Rated condition				Coefficient of minimum performance
	Chilled- Water		Condenser-Cooling Tower		
	Temp. of chilled- water (Inlet)	Temp. of chilled- water (Outlet)	Temp of water flow into condenser	Flow rate of water flow into condenser (liter / second / kilo Watt)	
	(Degree Celsius)				
A. Single stage	12.0	7.0	32.0	0.105	0.65
B. Double stage	12.0	7.0	32.0	0.079	1.10

(B) Identification of rated condition by mentioning temperate of hot water into and from condenser. It shall not exceed the following value.

Type of Absorption Chiller)	Rated condition				Coefficient of minimum performance
	Chilled- Water		Condenser-Cooling Tower		
	Temp. of chilled- water (Inlet)	Temp. of chilled- water (Outlet)	Temp of water flow into condenser	Flow rate of water flow into condenser	
	(Degree Celsius)				
A. Single stage	12.0	7.0	32.0	37.5	0.65
B. Double stage	12.0	7.0	32.0	37.5	1.10

Calculation of the coefficient of performance shall focus only on heating value (excluding electrical power in system). Calculation of seasonal energy efficiency ratio, coefficient of performance, and coefficient of minimum performance of the air-conditioning system installed in the building shall follow the Ministry of Energy's Notification on Criteria, Calculation Methods and Certification in designing building for energy conservation of various system, an overall energy consumption of the buildings, and a use of renewable energy systems B.E. 2564

**Clause 10:** Energy Efficiency of air-conditioning system mentioned in Clause 9 shall not be applied to solar thermal air conditioning).

#### Section 4: Minimum Efficiency and Coefficient of minimum performance for water heater

Clause 11: Minimum efficiency and coefficient of minimum performance for water heater installing in the building shall have value as follows:

(1) Steam boiler and hot water boiler shall have efficiency not less than the following minimum efficiency.

Type of Boiler	Minimum efficiency (%)
A. Oil fired steam boiler	85
B. Oil fired hot water boiler	80
C. Gas fired steam boiler	80
D. Gas fired hot water boiler	80

(2) Air-source heat pump water heater shall have the coefficient of performance not less than the following coefficient of minimum performance

Standard Condition of Performance				Minimum Coefficient of Performance (COP)
Type of design	Temp. of water inflow (°C)	Temp. of water outflow (°C)	Temp of ambient (°C)	
	(Degree Celsius)			
a). Type 1	30.0	50.0	30.0	3.5
b). Type 2	30.0	60.0	30.0	3.0

Minimum efficiency and coefficient of minimum performance of water heater shall calculate according to the Ministry of Energy's Notification on Criteria, Calculation Methods and Certification in designing building for energy conservation of various system, an overall energy consumption of the buildings, and a use of renewable energy systems B.E. 2564

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