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Air conditioners and liquid chilling packages with evaporatively cooled condenser and with electrically driven compressors for space cooling - Terms, definitions, test conditions, test methods and requirements

Luftkonditionierer und Flüssigkeitskühlsätze mit verdunstungsgekühltem Verflüssiger und elektrisch angetriebenen Verdichtern für die Raumkühlung - Begriffe, Prüfbedingungen, Prüfverfahren und Anforderungen

SIST EN 15218:2007

Climatiseurs et groupes refroidisseurs de liquide a condenseur refroidi par évaporation et compresseur entraîné par moteur électrique pour la réfrigération des locaux - Termes, définitions, conditions d'essai, méthodes d'essai et exigences

**Ta slovenski standard je istoveten z: EN 15218:2006**

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27.200	Hladilna tehnologija	Refrigerating technology
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SIST EN 15218:2007

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English Version

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This European Standard was approved by CEN on 11 September 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This document (EN 15218:2006) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by AENOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2007, and conflicting national standards shall be withdrawn at the latest by April 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive 2002/31/EC, see informative annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## 1 Scope

This standard specifies the terms, definitions, test conditions, test methods and requirements for rating the performance of air conditioners and liquid chilling packages, with electrically driven compressors and with evaporatively cooled condenser when used for space cooling. The evaporatively cooled condenser is cooled by air and by the evaporation of external additional water. This additional external water is fed by a specific water supply circuit or by a water tank.

This standard does not apply to air-to-air and air-to-water air conditioners with a condenser cooled by air and by the evaporation of water condensed on their evaporator.

This standard does not apply to units equipped with a water tank or with a continuous water circuit supply that cannot operate without water feeding.

This standard applies to factory-made units which can be ducted.

This standard applies to factory-made units of either fixed capacity or variable capacity by any means.

Packaged units, single split and multisplit systems are covered by this standard.

With regard to units consisting of several parts, this standard applies only to those designed and supplied as a complete package.

Installations used for industrial processes cooling are not within the scope of this standard.

NOTE All the symbols given in this text should be used regardless of language.

## 2 Normative references

[SIST EN 15218:2007](https://standards.iteh.ai/catalog/standards/sist/c95bb30-abc6-4e7c-ab77-13857348371c/sist-en-15218-2007)

[https://standards.iteh.ai/catalog/standards/sist/c95bb30-abc6-4e7c-ab77-](https://standards.iteh.ai/catalog/standards/sist/c95bb30-abc6-4e7c-ab77-13857348371c/sist-en-15218-2007)

The following referenced documents are indispensable for the application 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.

EN 14511-1:2004, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling - Part 1: Terms and definitions*

EN 14511-2, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Part 2: Test conditions*

EN 14511-3:2004, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Part 3: Test methods*

EN 14511-4:2004, *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling – Part 4: Requirements*

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 14511-1:2004 and the following apply.

#### 3.1

##### **evaporatively cooled condenser**

heat exchanger that condenses refrigerant vapour by rejecting heat to a water and air mixture causing the water to evaporate and increase the enthalpy of air.

NOTE Desuperheating and sub-cooling of the refrigerant may occur as well

#### 3.2

##### **water tank**

tank designed as an integral part of the unit to contain external additional water which is fed to the evaporatively cooled condenser

#### 3.3

##### **continuous supply water circuit**

circuit designed as an integral part of the unit to feed continuously the evaporatively cooled condenser with water from an external water source

#### 3.4

##### **effective power input**

$P_E$

average electrical power input of the unit within a defined interval of time obtained from:

- power input for operating the compressor; EN 15218:2007
- power input for all control and safety devices of the unit; <https://standards.iteh.ai/catalog/standards/sist/c95bb30-abc6-4e7c-ab77-af6700000000/en-15218-2007>
- power input of the circulating pump which provides water to the evaporatively cooled condenser, if any;
- proportional power input of the conveying devices (e.g. fans, pumps) for ensuring the transport of the heat transfer media inside the unit.

Expressed in Watt.

For the purpose of this standard the present definition replaces the one in EN 14511-1:2004 and it shall be used to calculate the EER

#### 3.5

##### **cleaning cycle**

interval of time during which water is sprayed on the evaporatively cooled condenser in order to remove fouling and scale buildup

#### 3.6

##### **functioning cycle**

interval of time elapsed between the start of two successive cleaning cycles for evaporatively cooled condenser units with a continuous water supply

### 4 Classification

If the heat transfer medium for the indoor heat exchanger is water, the unit shall be denominated as evaporatively cooled condenser liquid chilling package.

If the heat transfer medium for the indoor heat exchanger is air, the unit shall be denominated as evaporatively cooled condenser air conditioner.

## 5 Test conditions

### 5.1 Environmental conditions and electrical power supply requirements

The tests shall be carried out under the environmental conditions specified in Table 1 or Table 2 based on the location of the unit.

For all units, electrical power voltage and frequency shall be given by the manufacturer.

**Table 1 — Environmental conditions for units designed for indoor installation**

Type	Measured quantities	Rating test
Evaporatively cooled condenser liquid chilling packages with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Evaporatively cooled condenser liquid chilling packages without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 5 or Table 6
Evaporatively cooled condenser air conditioners with duct connection on the indoor air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Evaporatively cooled condenser air conditioners without duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 3 or Table 4

**Table 2 — Environmental conditions for units designed for outdoor installation**

Type	Measured quantities	Rating test
Evaporatively cooled condenser liquid chilling packages	Dry bulb temperature Wet bulb temperature	As air inlet temperatures, see Table 5 and Table 6
Evaporatively cooled condenser air conditioners with duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	As inlet temperatures, see Table 3 and Table 4



## 5.2 Rating conditions

For the rating tests, the appropriate test conditions apply in accordance with Table 3 and Table 4 for evaporatively cooled condenser air conditioners, or with Table 5 and Table 6 for evaporatively cooled condenser liquid chilling packages.

**Table 3 –Evaporatively cooled condenser air conditioner with continuous water supply circuit**

		Evaporatively cooled condenser			Indoor heat exchanger	
		Air		Water		
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Comfort (outdoor air / recycled air)	35	24	15	27	19
	Comfort (exhaust air / recycled air)	27	19	15	27	19
	Comfort (exhaust air / outdoor air)	27	19	15	35	24
	Single duct	35	24	15	35	24
	Control cabinet	35	24	15	35	24
	Close control	35	24	15	24	17
Application rating conditions	Comfort (outdoor air / recycled air)	27	19	15	21	15
	Single duct	27	19	15	27	19
	Comfort (outdoor air / recycled air)	46	24	15	29	19
	Control cabinet	50	30	15	35	24
	Close control	27	19	15	21	15

The external additional water supply on the evaporatively cooled condenser shall be set as specified in 6.2.2.