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AMENDMENT 1
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**Air-cooled air conditioners and air-
to-air heat pumps — Testing and
calculating methods for seasonal
performance factors —**

Part 1:

Cooling seasonal performance factor

AMENDMENT 1

*Climatiseurs à condenseur à air et pompes à chaleur air/air — Essais
et méthodes de calcul des coefficients de performance saisonniers —*

*Partie 1: Coefficient de performance saisonnier de refroidissement
(COPSR)*

[ISO 16358-1:2013/Amd.1:2019](https://standards.iso.org/iso/16358-1-2013/Amd.1:2019)

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This document was prepared by Technical Committee ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 6, *Testing and rating of air-conditioners and heat pumps*.

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Air-cooled air conditioners and air-to-air heat pumps — Testing and calculating methods for seasonal performance factors —

Part 1: Cooling seasonal performance factor

AMENDMENT 1

Page 1, 1.2

Add “ and T3” after the words “the rating conditions are those specified under T1”.

Page 3, 3.13

Add “ or T3” after the words “cooling capacity at T1”.

Page 3, 3.14

Add “ or T3” after the words “electric power input at T1”.

Page 3, 3.15

Add “ or T3” after the words “capacity which is 50 % of cooling full capacity at T1”.

Page 3, 3.16

Add “ or T3” after the words “electric power input when operated at 50 % of cooling full capacity at T1”.

Page 3, 3.17

Add “ or T3” after the words “capacity at T1”.

Page 3, 3.18

Add “ or T3” electric power input at T1”.

Page 3, after 3.22

Add 3.23 and 3.24

3.23

T1 climate

standardized range of climate conditions for a moderate climate

3.24

T3 climate

standardized range of climate conditions for a hot climate

Page 3, Clause 4 Symbols

Add the following row after C_{CSE} row

C_D degradation coefficient

Add the following row after $P_{ful}(t_j)$ row

$P_{ful}(46)$ cooling full power input at T3 temperature condition W

Add the following row after $P_{haf}(t_j)$ row

$P_{haf}(46)$ cooling half power input at T3 temperature condition W

Add the following row after $P_{min}(t_j)$ row

$P_{min}(46)$ cooling minimum power input at T1 temperature condition W

Add the following row after $\phi_{ful}(t_j)$ row

$\phi_{ful}(46)$ cooling full capacity at T3 temperature condition W

Add the following row after $\phi_{haf}(t_j)$ row

$\phi_{haf}(46)$ cooling half capacity at T3 temperature condition W

Add the following row after $\phi_{min}(t_j)$ row

$\phi_{min}(46)$ cooling minimum capacity at T3 temperature condition W

Page 5, 5.2 Test conditions

Add

“for units rated for T1 climate and Table F.1 in Annex F for units rated for T3 climate”

after

“for calculation shall be as specified in Table 1”

Page 6, 5.3.2 Low temperature cooling capacity tests

Add

“for T1 climate or Table F.1 for T3 climate”

after

“default values as given in Table 1”

Page 7, 5.3.3 Low humidity cooling test and cyclic cooling test

Add

“for T1 climate or Table F.1 for T3 climate”

after

“default values as given in Table 1”

Page 7, Clause 6 Calculations

Add the following sentences and Table after the first sentence:

For units rated for T1 climate, calculations shall be made according to Clause 6 and for units rated for T3 climate, calculations shall be made according to F.2.

NOTE A calculation tool (spreadsheet) is available to perform all the calculations of Clause 6, given the individual test input. It is available at <https://standards.iso.org/iso/16358/-1/ed-1/en/amd/1>. The issuer is permitted to use the calculation tool in its original format without any modifications for the purpose specified in this document.

Table 2 shows the formulae used for T1 climate and T3 climate in order to read this document more easily.

Table 2 — Formulae used to calculate CSPF and FCSP for T1 climate and T3 climate

		T1 climate	T3 climate
	CSPF, FCSP	(1) and Annex B	(1) and Annex B
	Cooling load $L_c(t_j)$	(2) with $t_0 = 20\text{ °C}$ and $t_{100} = 35\text{ °C}$	(2) with $t_0 = 20\text{ °C}$ and $t_{100} = 46\text{ °C}$
Fixed	$\phi_{ful}(t_j)$	(3)	(F.1), (F.2)
	$P_{ful}(t_j)$	(4)	(F.3), (F.4)
	(CSTL), L_{CST}	(5)	(5)
	(CSEC), C_{CSE}	(6), (7), (8)	(6), (7), (8)
Two-stage	$\phi_{ful}(t_j)$	(3)	(F.1), (F.2)
	$\phi_{min}(t_j)$	(9)	(F.5), (F.6)
	$P_{ful}(t_j)$	(4)	(F.3), (F.4)
	$P_{min}(t_j)$	(10)	(F.7), (F.8)
	(CSTL), L_{CST}	(5)	(5)
	(CSEC), C_{CSE}	(11), (7), (12), (13), (4)	(11), (7), (12), (13), (4)
Multi-stage	$\phi_{ful}(t_j)$	(3)	(F.1), (F.2)
	$\Phi_{haf}(t_j)$	(14)	(F.9), (F.10)
	$\phi_{min}(t_j)$	(9)	(F.5), (F.6)
	$P_{ful}(t_j)$	(4)	(F.3), (F.4)
	$P_{haf}(t_j)$	(15)	(F.11), (F.12)
	$P_{min}(t_j)$	(10)	(F.7), (F.8)
	(CSTL), L_{CST}	(5)	(5)
	(CSEC), C_{CSE} when minimum capacity available	(16), (7), (17), (18), (19), (20), (4) (Annex E)	(16), (7), (17), (18), (19), (20), (4) (Annex E)
(CSEC), C_{CSE} when minimum capacity not available	(21), (7), (19), (20), (4) (Annex E)	(21), (7), (19), (20), (4) (Annex E)	

Table 2 (continued)

		T1 climate	T3 climate
Variable	$\phi_{ful}(t_j)$	(3)	(F.1), (F.2)
	$\Phi_{haf}(t_j)$	(14)	(F.9), (F.10)
	$\phi_{min}(t_j)$	(9)	(F.5), (F.6)
	$P_{ful}(t_j)$	(4)	(F.3), (F.4)
	$P_{haf}(t_j)$	(15)	(F.11), (F.12)
	$P_{min}(t_j)$	(10)	(F.7), (F.8)
	(CSTL), L_{CST}	(5)	(5)
	(CSEC), C_{CSE} when minimum capacity available	(16), (7), (22), (23), (24), (25), (26),(27),(4) (Annex E)	(16), (7), (22), (23), (24), (25), (26),(27),(4) (F.13), (F.14), (F.15), (F.16), (F.17), (F.18)
	(CSEC), C_{CSE} when minimum capacity is not available	(21), (7), (24), (25), (26),(27),(4) (Annex E)	(21), (7), (24), (25), (26),(27),(4) (F.15), (F.16), (F.17), (F.18)

Page 7, 6.2

Replace “Table 2 — Defined cooling load”

with

“Table 3 — Defined cooling load”

Page 7, 6.3

Replace

“Table 3 — Reference outdoor temperature bin distribution for T1 climate”

with “Table 4 — Reference outdoor temperature bin distribution for T1 climate”

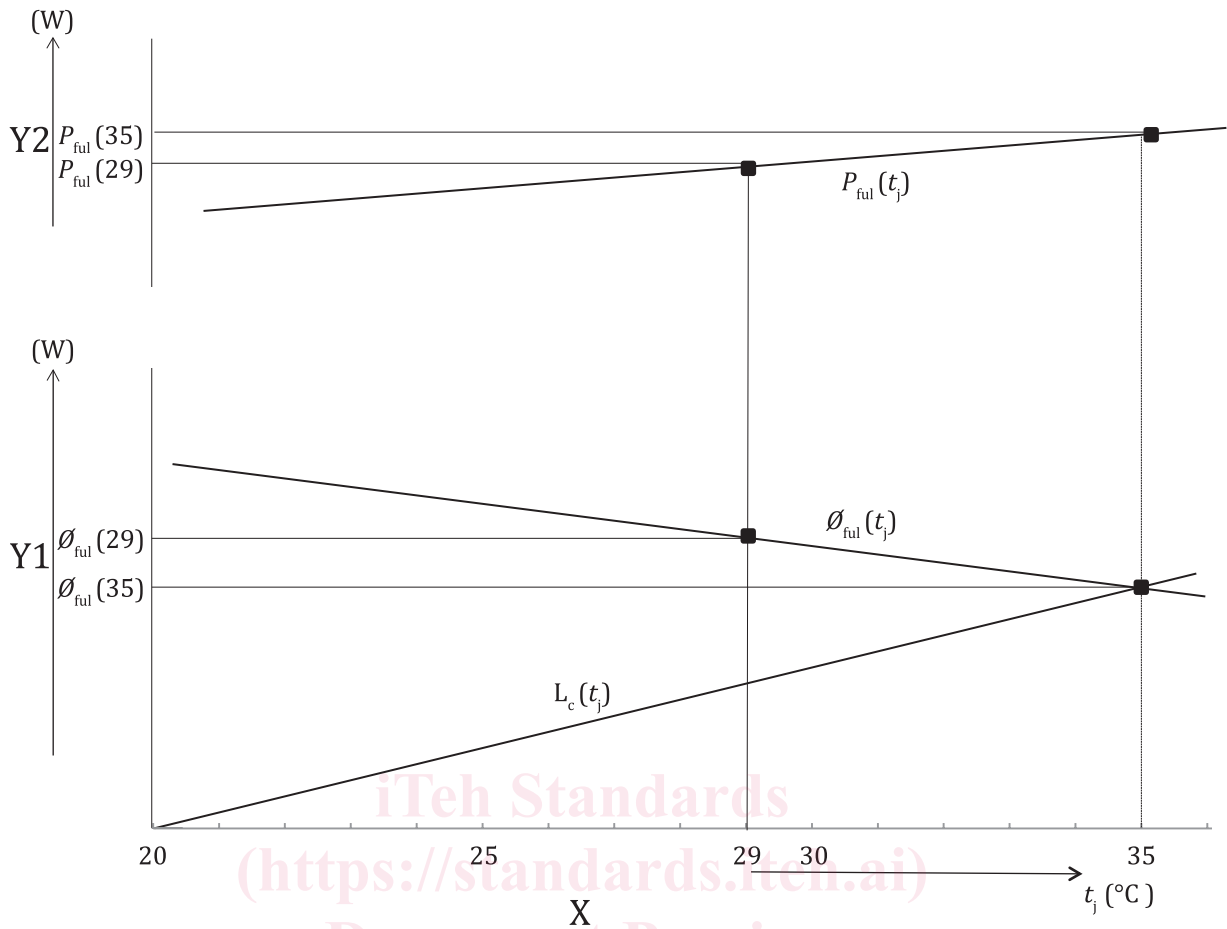
Page 13, Clause 7 Test report

Add the following sentence at the end of the last sentence of the Clause.

“It shall be specified whether the CSPF is for T1 climate, T3 climate or a location specific temperature bin distribution.”

Annex A

Replace Figure A.1 — Cooling capacity, power input and cooling load for fixed capacity units, by the following figure:



Key

X outdoor temperature

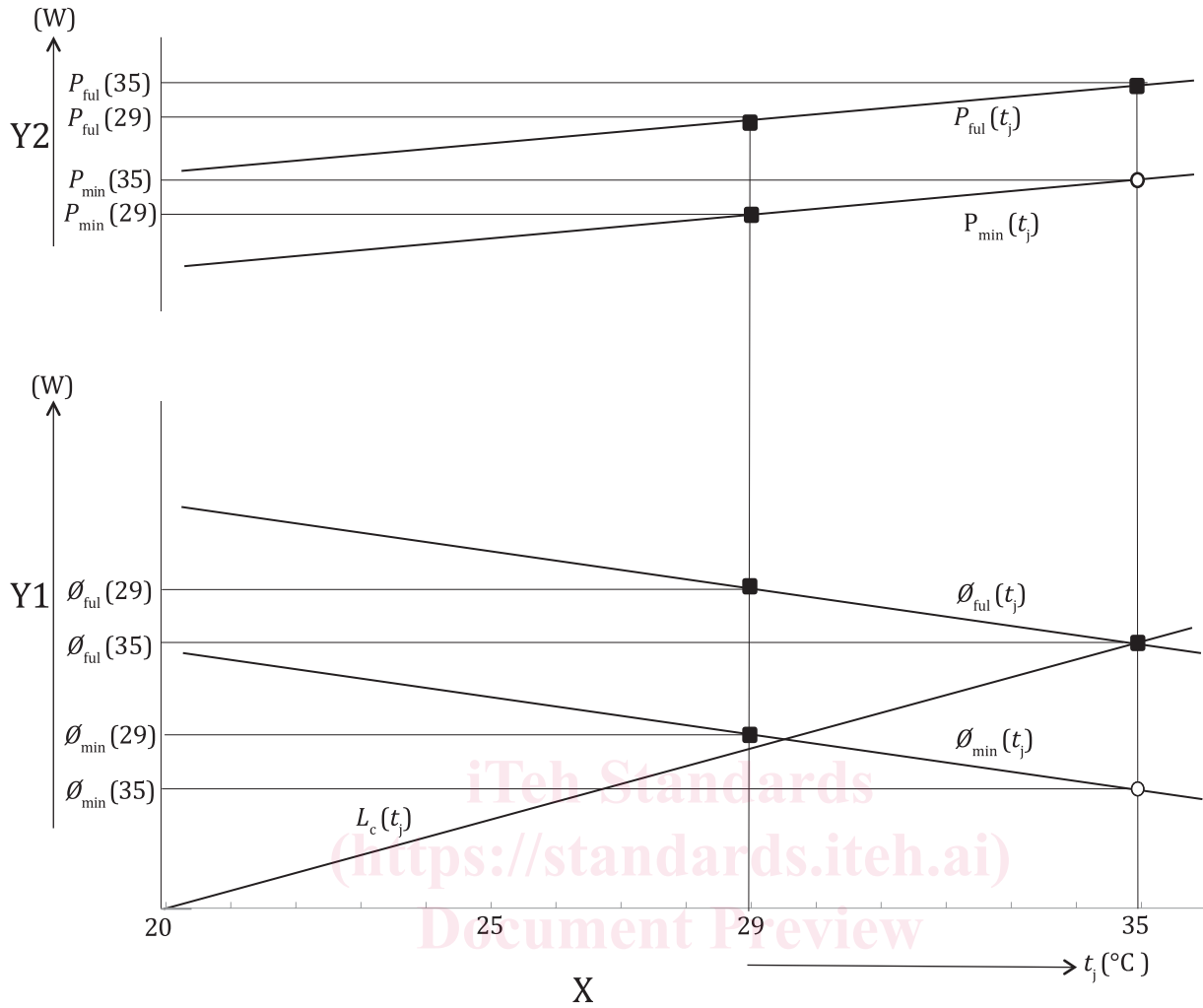
Y1 capacity or load

Y2 power input

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Figure A.1 — Cooling capacity, power input and cooling load for fixed capacity units

Replace Figure A.2 — Cooling capacity, power input and cooling load for two-stage capacity units, by the following figure:



Key

- X outdoor temperature
- Y1 capacity or load
- Y2 power input

Figure A.2 — Cooling capacity, power input and cooling load for two-stage capacity units

Replace Figure A.3 — Cooling capacity, power input and cooling load for multi-stage capacity units, by the following figure: