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Commission Regulation (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council (Text with EEA relevance)

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ANNEX III

Ecodesign requirements for fluorescent and high intensity discharge lamps and ballasts and luminaires able to operate such lamps

For each ecodesign requirement, the moment from which it applies is specified below. Unless a requirement is superseded or this is otherwise specified, it shall continue to apply together with the requirements introduced at later stages.

1. REQUIREMENTS FOR FLUORESCENT LAMPS WITHOUT INTEGRATED BALLAST AND FOR HIGH INTENSITY DISCHARGE LAMPS

1.1. Lamp efficacy requirements

A. First stage requirements

One year after the entry into force of this Regulation:

Double capped fluorescent lamps of 16 mm and 26 mm diameter (T5 and T8 lamps) shall have at least the rated luminous efficacies as specified in Table 1 at 25 °C.

[^{F1}Spiral-shaped double capped fluorescent lamps of all diameters equal to or larger than 16 mm (T5) shall comply with the requirements set out in Table 5 for T9 circular lamps.]

Textual Amendments

F1 Inserted by Commission Regulation (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps (Text with EEA relevance).

TABLE 1

Rated minimum efficacy values for T8 and T5 lamps

T8 (26 mm Ø)		T5 (16 mm Ø)High Efficiency		T5 (16 mm Ø)High Output	
Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value
15	63	14	86	24	73
18	75	21	90	39	79
25	76	28	93	49	88
30	80	35	94	54	82
36	93			80	77
38	87				
58	90				
70	89				

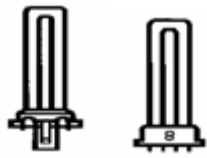
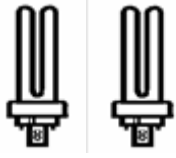
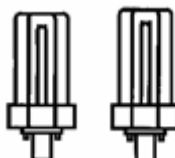
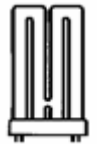
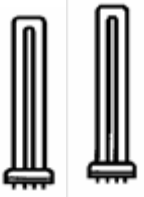
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Single capped fluorescent lamps shall have the following rated luminous efficacies at 25 °C.

In case the nominal wattages or lamp shapes are different from those listed in tables 2 to 5: lamps must reach the luminous efficacy of the nearest equivalent in terms of wattage and shape. If the nominal wattage is at equal distance from two wattages in the table, it shall conform to the higher efficacy of the two. If the nominal wattage is higher than the highest wattage in the table, it shall conform to the efficacy of that highest wattage.

I^{F2} TABLE 2

Rated minimum efficacy values for single capped fluorescent lamps working on electromagnetic and electronic ballast

Small single parallel tube, lamp cap G23 (2 pin) or 2G7 (4 pin)		Double parallel tubes, lamp cap G24d (2 pin) or G24q (4 pin)		Triple parallel tubes, lamp cap GX24d (2 pin) or GX24q (4 pin)	
					
Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value
5	48	10	60	13	62
7	57	13	69	18	67
9	67	18	67	26	66
11	76	26	66		
4 legs in one plane, lamp cap 2G10(4 pin)		Long single parallel tube, lamp cap 2G11(4 pin)			
					
Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value		
18	61	18	67		
24	71	24	75		
36	78	34	82		

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	36	81]
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Textual Amendments

- F2** Substituted by Commission Regulation (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps (Text with EEA relevance).

^{F2}TABLE 3

Rated minimum efficacy values for single capped fluorescent lamps, working only on electronic ballast

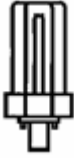
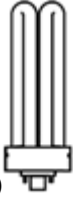
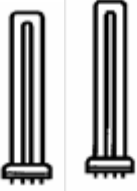

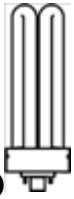
Triple parallel tubes, lamp cap GX24q(4 pin) 		Four parallel tubes, lamp cap GX24q(4 pin) 		Long single parallel tube, lamp cap 2G11(4 pin) 	
Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage(W)	Rated luminous efficacy (lm/W), 100 h initial value
32	75	57	75	40	83
42	74	70	74	55	82
57	75			80	75
70	74]			

TABLE 4

Rated minimum efficacy values for single capped fluorescent lamps with square shape or (very) high output


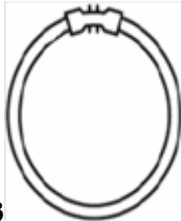
Single flat plane tube, lamp cap GR8 (2 pin), GR10q (4 pin) or GRY10q3 (4 pin) 		Four or three parallel T5 tubes, lamp cap 2G8 (4 pin) 	
Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value
10	65	60	67

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16	66	82	75
21	64	85	71
28	73	120	75
38	71		
55	71		

TABLE 5

Rated minimum efficacy values for T9 and T5 Circular lamps

T9 Circular, tube diameter 29 mm with  base G10q		T5 Circular, tube diameter 16 mm with  base 2GX13	
Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value	Nominal wattage (W)	Rated luminous efficacy (lm/W), 100 h initial value
22	52	22	77
32	64	40	78
40	70	55	75
60	60	60	80

Corrections applicable to both single and double capped fluorescent lamps

The required luminous efficacy at 25 °C may be lower than required in the tables above in the following cases:

TABLE 6

Deduction percentages for rated minimum efficacy values for fluorescent lamps with high colour temperature and/or high colour rendering and/or second lamp envelope and/or long life

Lamp parameter	Deduction from luminous efficacy at 25 °C
$T_c \geq 5\,000\text{ K}$	-10 %
$95 \geq Ra > 90$	-20 %
$Ra > 95$	-30 %
Second lamp envelope	-10 %
Lamp Survival Factor $\geq 0,50$ after 40 000 burning hours	-5 %]

The indicated deductions are cumulative.

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Single and double capped fluorescent lamps that do not have their optimum temperature at 25 °C must still comply at their optimum temperature with the luminous efficacy requirements as set out in the tables above.

B. Second stage requirements

Three years after the entry into force of this Regulation, the following efficacy requirements shall apply to fluorescent lamps without integrated ballast and high-intensity discharge lamps.
Double capped fluorescent lamps

The requirements applicable to double capped fluorescent lamps 26 mm in diameter (T8) during the first stage shall apply to all double capped fluorescent lamps of other diameters than those covered in the first stage.

These lamps must conform to the minimum efficacy of the T8 lamp which is their nearest equivalent with regards to wattage. If the nominal wattage is higher than the highest wattage in the table, it shall conform to the efficacy of that highest wattage.

[^{F2}The corrections (Table 6) and the specific requirements for spiral-shaped double capped fluorescent lamps defined for the first stage shall continue to apply.]

High-intensity discharge lamps

Lamps with $T_c \geq 5\,000$ K or equipped with a second lamp envelope shall fulfil at least 90 % of the applicable lamp efficacy requirements in tables 7, 8 and 9.

High Pressure Sodium lamps with $R_a \leq 60$ shall have at least the rated luminous efficacies in Table 7:

^{F2}TABLE 7

Rated minimum efficacy values for high pressure sodium lamps with $R_a \leq 60$

Nominal Lamp wattage [W]	Rated Lamp Efficacy [lm/W] — Clear lamps	Rated Lamp Efficacy [lm/W] — Not clear lamps
$W \leq 45$	≥ 60	≥ 60
$45 < W \leq 55$	≥ 80	≥ 70
$55 < W \leq 75$	≥ 90	≥ 80
$75 < W \leq 105$	≥ 100	≥ 95
$105 < W \leq 155$	≥ 110	≥ 105
$155 < W \leq 255$	≥ 125	≥ 115
$255 < W \leq 605$	≥ 135	≥ 130

The requirements in Table 7 shall apply to high pressure sodium retrofit lamps designed to operate on high pressure mercury vapour lamp control gear only 6 years after the entry into force of this Regulation.

Metal halide lamps with $R_a \leq 80$ and high pressure sodium lamps with $R_a > 60$ shall have at least the rated luminous efficacies in Table 8:

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^[F2]TABLE 8

Rated minimum efficacy values for Metal Halide Lamps with $R_a \leq 80$ and for high pressure sodium lamps with $R_a > 60$]

Nominal Lamp Wattage [W]	Rated Lamp Efficacy [lm/W] — Clear lamps	Rated Lamp Efficacy [lm/W] — Not clear lamps
$W \leq 55$	≥ 60	≥ 60
$55 < W \leq 75$	≥ 75	≥ 70
$75 < W \leq 105$	≥ 80	≥ 75
$105 < W \leq 155$	≥ 80	≥ 75
$155 < W \leq 255$	≥ 80	≥ 75
$255 < W \leq 405$	≥ 85	≥ 75

Six years after the entry into force of this Regulation, other high intensity discharge lamps shall have at least the rated luminous efficacies in Table 9:

TABLE 9

Rated minimum efficacy values for other high intensity discharge lamps

Nominal Lamp wattage [W]	Rated Lamp Efficacy [lm/W]
$W \leq 40$	50
$40 < W \leq 50$	55
$50 < W \leq 70$	65
$70 < W \leq 125$	70
$125 < W$	75

C. Third stage requirements

Eight years after the entry into force of this Regulation:

[^{F2}Fluorescent lamps without integrated ballast shall be able to operate with ballasts of energy efficiency class A2 or more efficient ballasts in accordance with point 2.2 of Annex III. In addition they may also operate with ballasts of less efficient classes than A2.]

Metal halide lamps shall have at least the rated luminous efficacies in Table 10:

TABLE 10

Rated minimum efficacy values for metal halide lamps (third stage)

Nominal Lamp wattage (W)	Rated Lamp Efficacy (lm/W) — Clear lamps	Rated Lamp Efficacy (lm/W) — Not clear lamps
$W \leq 55$	≥ 70	≥ 65
$55 < W \leq 75$	≥ 80	≥ 75
$75 < W \leq 105$	≥ 85	≥ 80

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$105 < W \leq 155$	≥ 85	≥ 80
$155 < W \leq 255$	≥ 85	≥ 80
$255 < W \leq 405$	≥ 90	≥ 85

Lamps equipped with $T_c \geq 5\,000$ K or with a second lamp envelope shall fulfil at least 90 % of the applicable lamp efficacy requirements.

1.2. Lamp performance requirements

A. First stage requirements

One year after the entry into force of this Regulation:

Fluorescent lamps without integrated ballast covered by the requirements of Annex III.1.1.A shall have a colour rendering index (Ra) of at least 80.

B. Second stage requirements

Three years after the entry into force of this Regulation:

Fluorescent lamps without integrated ballast shall have a colour rendering index (Ra) of at least 80. They shall have at least the lamp lumen maintenance factors in Table 11:

[²TABLE 11

Lamp lumen maintenance factors for single and double capped fluorescent lamps — Stage 2

Lamp lumen maintenance factor	Burning hours			
	Lamp types	2 000	4 000	8 000
Double-Capped Fluorescent lamps operating on non-high frequency ballasts	0,95	0,92	0,9	—
T8 Double-Capped Fluorescent lamps on high frequency ballast with warmstart	0,96	0,92	0,91	0,9
Other Double-Capped Fluorescent lamps on high frequency ballast with warmstart	0,95	0,92	0,9	0,9
Circular Single-Capped	0,8	0,74	—	—
	0,72 at 5 000 burning hours			

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Fluorescent lamps operating on non-high frequency ballasts, T8 U-shaped double-capped fluorescent lamps and spiral-shaped double capped fluorescent lamps of all diameters equal to or larger than 16 mm (T5)				
Circular Single-Capped Fluorescent lamps operating on high frequency ballasts	0,85	0,83	0,8	—
	0,75 at 12 000 burning hours			
Other Single-Capped Fluorescent lamps operating on non-high frequency ballasts	0,85	0,78	0,75	—
Other Single-Capped Fluorescent lamps on high frequency ballast with warmstart	0,9	0,84	0,81	0,78]

[^{F1}The following cumulative deductions shall be applied to the values in Table 11:

TABLE IIA

Deduction percentages for fluorescent lamp lumen maintenance requirements

Lamp parameter	Deduction from lamp lumen maintenance requirement
Lamps with $95 \geq Ra > 90$	At burning hours $\leq 8\ 000$ h: – 5 % At burning hours $> 8\ 000$ h: – 10 %
Lamps with $Ra > 95$	At burning hours $\leq 4\ 000$ h: – 10 % At burning hours $> 4\ 000$ h: – 15 %
Lamps with a colour temperature $\geq 5\ 000$ K	–10 %]

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Fluorescent lamps without integrated ballast shall have at least the lamp survival factors in Table 12:

[^{F2}TABLE 12

Lamp survival factors for single and double capped fluorescent lamps — Stage 2

Lamp survival factor	Burning hours			
	2 000	4 000	8 000	16 000
Double-Capped Fluorescent lamps operating on non-high frequency ballasts	0,99	0,97	0,9	—
Double-Capped Fluorescent lamps on high frequency ballast with warmstart	0,99	0,97	0,92	0,9
Circular Single-Capped Fluorescent lamps operating on non-high frequency ballasts, T8 U-shaped double-capped fluorescent lamps and spiral-shaped double capped fluorescent lamps of all diameters equal to or larger than 16 mm (T5)	0,98	0,77	—	—
	0,50 at 5 000 burning hours			
Circular Single-Capped Fluorescent lamps operating on high frequency ballasts	0,99	0,97	0,85	—
	0,50 at 12 000 burning hours			
Other Single-Capped Fluorescent lamps operating on non-high	0,98	0,9	0,5	—

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frequency ballasts				
Other Single-Capped Fluorescent lamps on high frequency ballast with warmstart	0,99	0,98	0,88	—]

[^{F3}High pressure sodium lamps with lamp efficacy requirements shall have at least the lamp lumen maintenance factors and lamp survival factors in Table 13:

Textual Amendments

F3 Substituted by [Commission Regulation \(EU\) 2015/1428 of 25 August 2015 amending Commission Regulation \(EC\) No 244/2009 with regard to ecodesign requirements for non-directional household lamps and Commission Regulation \(EC\) No 245/2009 with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps and repealing Directive 2000/55/EC of the European Parliament and of the Council and Commission Regulation \(EU\) No 1194/2012 with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment \(Text with EEA relevance\).](#)

TABLE 13

Lamp lumen maintenance factors & lamp survival factors for high pressure sodium lamps — Stage 2

High pressure sodium lamp category and burning hours for measurement	Lamp lumen maintenance factor	Lamp survival factor
P ≤ 75 W LLMF and LSF measured at 12 000 burning hours	Ra ≤ 60	> 0,80
	Ra > 60	> 0,75
	all retrofit lamps designed to operate on high pressure mercury vapour lamp ballast	> 0,75
P > 75 W ≤ 605 W LLMF and LSF measured at 16 000 burning hours	Ra ≤ 60	> 0,85
	Ra > 60	> 0,70
	all retrofit lamps designed to operate on high pressure mercury vapour lamp ballast	> 0,75

The requirements in Table 13 for retrofit lamps designed to operate on high pressure mercury vapour lamp ballast shall be applicable until 6 years after the entry into force of this Regulation.]

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[^{F3}C. Third stage requirements

Eight years after the entry into force of this Regulation:

Metal halide lamps with lamp efficacy requirements shall have at least the lamp lumen maintenance factors and lamp survival factors in Table 14:

TABLE 14

Lamp lumen maintenance factors and lamp survival factors for metal halide lamps — Stage 3

Burning Hours	Lamp lumen maintenance factor	Lamp survival factor
12 000	> 0,80	> 0,80]

1.3. Product information requirements on lamps

One year after the entry into force of this Regulation, manufacturers shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their fluorescent lamps without integrated ballast and each of their high intensity discharge lamps. That information shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2005/32/EC.

- (a) Nominal and rated lamp wattage.
- (b) Nominal and rated lamp luminous flux.
- (c) Rated lamp efficacy at 100 h in standard conditions (25 °C, for T5 lamps at 35 °C). For fluorescent lamps both at 50 Hz (mains frequency) operation (where applicable) and at High Frequency (> 50 Hz) operation (where applicable) for the same rated luminous flux in all cases, indicating for High Frequency operation the calibration current of the test conditions and/or the rated voltage of the HF generator with the resistance. It shall be stated in a conspicuous manner that the power dissipated by auxiliary equipment such as ballasts is not included in the power consumed by the source.
- (d) Rated lamp Lumen Maintenance Factor at 2 000 h, 4 000 h, 6 000 h, 8 000 h, 12 000 h, 16 000 h and 20 000 h (up to 8 000 h only for new lamps on the market where no data is yet available), indicating which operation mode of the lamp was used for the test if both 50 Hz and High Frequency operation are possible.
- (e) Rated lamp Survival Factor at 2 000 h, 4 000 h, 6 000 h, 8 000 h, 12 000 h, 16 000 h and 20 000 h (up to 8 000 h only for new lamps on the market where no data is yet available), indicating which operation mode of the lamp was used for the test if both 50 Hz and High Frequency operation are possible.
- (f) lamp mercury content as X.X mg.
- (g) Colour Rendering Index (Ra) of the lamp.
- (h) Colour temperature of the lamp.
- (i) [^{F2}Ambient temperature inside the luminaire at which the lamp was designed to maximise its luminous flux. If this temperature is equal to or lower than 0 °C or equal to or higher than 50 °C, it shall be stated that the lamp is not suitable for indoor use at standard room temperatures.]

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(j) [F¹For fluorescent lamps without integrated ballast, the energy efficiency index(es) of ballasts as defined in Table 17 with which the lamp can operate.]

2. REQUIREMENTS ON BALLASTS FOR FLUORESCENT LAMPS WITHOUT INTEGRATED BALLAST AND BALLASTS FOR HIGH INTENSITY DISCHARGE LAMPS

2.1. Ballast energy performance requirements

Multiwattage ballasts shall comply with the requirements below according to each wattage on which they operate.

A. First stage requirements

One year after this Regulation comes into force:

The minimum energy efficiency index class shall be B2 for ballasts covered by table 17 in Annex III.2.2, A3 for the ballasts covered by table 18, and A1 for dimmable ballasts covered by table 19.

At the dimming position corresponding to 25 % of the lumen output of the operated lamp, the input power (P_{in}) of the lamp-ballast circuit shall not exceed:

$$P_{in} < 50 \% * P_{Lrated} / \eta_{ballast}$$

Where P_{Lrated} is the rated lamp power and $\eta_{ballast}$ is the minimum energy efficiency limit of the respective EEI class.

The power consumption of the fluorescent lamp ballasts shall not exceed 1,0 W when operated lamps do not emit any light in normal operating conditions and when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

B. Second stage requirements

Three years after the implementing measure comes into force:

Ballasts for high intensity discharge lamps shall have the efficiency described in Table 15.

TABLE 15

Minimum efficiency for ballasts for high intensity discharge lamps — Stage 2

Nominal lamp wattage (P)W	Minimum ballast efficiency ($\eta_{ballast}$)%
$P \leq 30$	65
$30 < P \leq 75$	75
$75 < P \leq 105$	80
$105 < P \leq 405$	85
$P > 405$	90

The power consumption of ballasts used with fluorescent lamps without integrated ballast shall not exceed 0,5 W when operated lamps do not emit any light in normal operating conditions. This requirement shall apply to ballasts when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

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C. Third stage requirements

Eight years after this Regulation comes into force:

Ballasts for fluorescent lamps without integrated ballast shall have the efficiency:

$$\eta_{\text{ballast}} \geq \text{EBbFL}$$

where EBbFL is defined in Annex II.3.g

Ballasts for high intensity discharge lamps shall have the efficiency described in Table 16.

TABLE 16

Minimum efficiency for ballasts for high intensity discharge lamps — Stage 3

Nominal lamp wattage (P)W	Minimum ballast efficiency (η_{ballast})%
$P \leq 30$	78
$30 < P \leq 75$	85
$75 < P \leq 105$	87
$105 < P \leq 405$	90
$P > 405$	92

2.2. Product information requirements on ballasts

Manufacturers of ballasts shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their ballast models. That information shall also be affixed in a distinct and durable form to the ballast. It shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2005/32/EC.

A. First stage requirements

One year after the entry into force of this Regulation:

for ballasts for fluorescent lamps, an energy efficiency index (EEI) class shall be provided as defined below.

‘Energy efficiency index’ (EEI) means a classification system of ballasts for fluorescent lamps without integrated ballasts in classes according to efficiency limit values. The classes for non-dimmable ballasts are (in descending order of efficiency) A2 BAT, A2, A3, B1, B2 and for dimmable ballasts A1 BAT and A1.

Table 17 contains the EEI classes for ballasts which are designed to operate the lamps mentioned in the table or other lamps which are designed to be operated by the same ballasts as the lamps mentioned in the table (meaning that the data of the reference ballast is equal).

^[F2]TABLE 17

Energy efficiency index requirements for non-dimmable ballasts for fluorescent lamps

LAMP DATA	BALLAST EFFICIENCY (Plamp/ Pinput)
	Non-dimmable

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Lamp type	Nominal Wattage	ILCOS CODE	Rated/typical wattage		A2 BAT	A2	A3	B1	B2
			50 Hz	HF					
			W	W					
T8	15	FD-15-E-G13-26/450	15	13,5	87,8 %	84,4 %	75,0 %	67,9 %	62,0 %
T8	18	FD-18-E-G13-26/600	18	16	87,7 %	84,2 %	76,2 %	71,3 %	65,8 %
T8	30	FD-30-E-G13-26/900	30	24	82,1 %	77,4 %	72,7 %	79,2 %	75,0 %
T8	36	FD-36-E-G13-26/1200	36	32	91,4 %	88,9 %	84,2 %	83,4 %	79,5 %
T8	38	FD-38-E-G13-26/1050	38,5	32	87,7 %	84,2 %	80,0 %	84,1 %	80,4 %
T8	58	FD-58-E-G13-26/1500	58	50	93,0 %	90,9 %	84,7 %	86,1 %	82,2 %
T8	70	FD-70-E-G13-26/1800	69,5	60	90,9 %	88,2 %	83,3 %	86,3 %	83,1 %
TC-L	18	FSD-18-E-2G11	18	16	87,7 %	84,2 %	76,2 %	71,3 %	65,8 %
TC-L	24	FSD-24-E-2G11	24	22	90,7 %	88,0 %	81,5 %	76,0 %	71,3 %
TC-L	36	FSD-36-E-2G11	36	32	91,4 %	88,9 %	84,2 %	83,4 %	79,5 %
TCF	18	FSS-18-E-2G10	18	16	87,7 %	84,2 %	76,2 %	71,3 %	65,8 %
TCF	24	FSS-24-E-2G10	24	22	90,7 %	88,0 %	81,5 %	76,0 %	71,3 %
TCF	36	FSS-36-E-2G10	36	32	91,4 %	88,9 %	84,2 %	83,4 %	79,5 %
TC-D / DE	10	FSQ-10-E-G24q=1 FSQ-10-I-G24d=1	10	9,5	89,4 %	86,4 %	73,1 %	67,9 %	59,4 %

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TC-D / DE	13	FSQ-13-E-G24q=1 FSQ-13-I-G24d=1	13	12,5	91,7 %	89,3 %	78,1 %	72,6 %	65,0 %
TC-D / DE	18	FSQ-18-E-G24q=2 FSQ-18-I-G24d=2	18	16,5	89,8 %	86,8 %	78,6 %	71,3 %	65,8 %
TC-D / DE	26	FSQ-26-E-G24q=3 FSQ-26-I-G24d=3	26	24	91,4 %	88,9 %	82,8 %	77,2 %	72,6 %
TC-T / TE	13	FSM-13-E-GX24q=1 FSM-13-I-GX24d=1	13	12,5	91,7 %	89,3 %	78,1 %	72,6 %	65,0 %
TC-T / TE	18	FSM-18-E-GX24q=2 FSM-18-I-GX24d=2	18	16,5	89,8 %	86,8 %	78,6 %	71,3 %	65,8 %
TC-T / TC-TE	26	FSM-26-E-GX24q=3 FSM-26-I-GX24d=3	26,5	24	91,4 %	88,9 %	82,8 %	77,5 %	73,0 %
TC-DD / DDE	10	FSS-10-E-GR10q FSS-10-L/P/H-GR10q	10,5	9,5	86,4 %	82,6 %	70,4 %	68,8 %	60,5 %
TC-DD / DDE	16	FSS-16-E-GR10q FSS-16-I-GR8	16	15	87,0 %	83,3 %	75,0 %	72,4 %	66,1 %

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		FSS-16-L/P/H-GR10q							
TC-DD / DDE	21	FSS-21-E-GR10q FSS-21-L/P/H-GR10q	21	19,5	89,7 %	86,7 %	78,0 %	73,9 %	68,8 %
TC-DD / DDE	28	FSS-28-E-GR10q FSS-28-I-GR8 FSS-28-L/P/H-GR10q	28	24,5	89,1 %	86,0 %	80,3 %	78,2 %	73,9 %
TC-DD / DDE	38	FSS-38-E-GR10q FSS-38-L/P/H-GR10q	38,5	34,5	92,0 %	89,6 %	85,2 %	84,1 %	80,4 %
TC	5	FSD-5-I-G23 FSD-5-E-2G7	5,4	5	72,7 %	66,7 %	58,8 %	49,3 %	41,4 %
TC	7	FSD-7-I-G23 FSD-7-E-2G7	7,1	6,5	77,6 %	72,2 %	65,0 %	55,7 %	47,8 %
TC	9	FSD-9-I-G23 FSD-9-E-2G7	8,7	8	78,0 %	72,7 %	66,7 %	60,3 %	52,6 %
TC	11	FSD-11-I-G23 FSD-11-E-2G7	11,8	11	83,0 %	78,6 %	73,3 %	66,7 %	59,6 %
T5	4	FD-4-E-G5-16/150	4,5	3,6	64,9 %	58,1 %	50,0 %	45,0 %	37,2 %
T5	6	FD-6-E-G5-16/225	6	5,4	71,3 %	65,1 %	58,1 %	51,8 %	43,8 %

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T5	8	FD-8-E-G5-16/300	7,1	7,5	69,9 %	63,6 %	58,6 %	48,9 %	42,7 %
T5	13	FD-13-E-G5-16/525	13	12,8	84,2 %	80,0 %	75,3 %	72,6 %	65,0 %
T9-C	22	FSC-22-E-G10q-29/200	22	19	89,4 %	86,4 %	79,2 %	74,6 %	69,7 %
T9-C	32	FSC-32-E-G10q-29/300	32	30	88,9 %	85,7 %	81,1 %	80,0 %	76,0 %
T9-C	40	FSC-40-E-G10q-29/400	40	32	89,5 %	86,5 %	82,1 %	82,6 %	79,2 %
T2	6	FDH-6-L/P-W4,3x8,5d-7/220		5	72,7 %	66,7 %	58,8 %		
T2	8	FDH-8-L/P-W4,3x8,5d-7/320		7,8	76,5 %	70,9 %	65,0 %		
T2	11	FDH-11-L/P-W4,3x8,5d-7/420		10,8	81,8 %	77,1 %	72,0 %		
T2	13	FDH-13-L/P-W4,3x8,5d-7/520		13,3	84,7 %	80,6 %	76,0 %		
T2	21	FDH-21-L/P-W4,3x8,5d-7/		21	88,9 %	85,7 %	79,2 %		
T2	23	FDH-23-L/P-W4,3x8,5d-7/		23	89,8 %	86,8 %	80,7 %		
T5-E	14	FDH-14-G5-L/P-16/550		13,7	84,7 %	80,6 %	72,1 %		
T5-E	21	FDH-21-G5-L/P-16/850		20,7	89,3 %	86,3 %	79,6 %		
T5-E	24	FDH-24-G5-L/P-16/550		22,5	89,6 %	86,5 %	80,4 %		
T5-E	28	FDH-28-G5-L/P-16/1150		27,8	89,8 %	86,9 %	81,8 %		

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T5-E	35	FDH-35- G5-L/ P-16/1450	34,7	91,5 %	89,0 %	82,6 %		
T5-E	39	FDH-39- G5-L/ P-16/850	38	91,0 %	88,4 %	82,6 %		
T5-E	49	FDH-49- G5-L/ P-16/1450	49,3	91,6 %	89,2 %	84,6 %		
T5-E	54	FDH-54- G5-L/ P-16/1150	53,8	92,0 %	89,7 %	85,4 %		
T5-E	80	FDH-80- G5-L/ P-16/1150	80	93,0 %	90,9 %	87,0 %		
T5-E	95	FDH-95- G5-L/ P-16/1150	95	92,7 %	90,5 %	84,1 %		
T5-E	120	FDH-120- G5-L/ P-16/1450	120	92,5 %	90,2 %	84,5 %		
T5-C	22	FSCH-22- L/ P-2GX13-16/225	22,3	88,1 %	84,8 %	78,8 %		
T5-C	40	FSCH-40- L/ P-2GX13-16/300	39,9	91,4 %	88,9 %	83,3 %		
T5-C	55	FSCH-55- L/ P-2GX13-16/300	55	92,4 %	90,2 %	84,6 %		
T5-C	60	FSCH-60- L/ P-2GX13-16/375	60	93,0 %	90,9 %	85,7 %		
TC-LE	40	FSDH-40- L/ P-2G11	40	91,4 %	88,9 %	83,3 %		
TC-LE	55	FSDH-55- L/ P-2G11	55	92,4 %	90,2 %	84,6 %		
TC-LE	80	FSDH-80- L/ P-2G11	80	93,0 %	90,9 %	87,0 %		
TC-TE	32	FSMH-32- L/ P-2GX24q=3	32	91,4 %	88,9 %	82,1 %		

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TC-TE	42	FSMH-42- L/ P-2GX24q=4	43	93,5 %	91,5 %	86,0 %		
TC-TE	57	FSM6H-57- L/ P-2GX24q=5 FSM8H-57- L/ P-2GX24q=5	56	91,4 %	88,9 %	83,6 %		
TC-TE	70	FSM6H-70- L/ P-2GX24q=6 FSM8H-70- L/ P-2GX24q=6	70	93,0 %	90,9 %	85,4 %		
TC-TE	60	FSM6H-60- L/ P-2G8=1	63	92,3 %	90,0 %	84,0 %		
TC-TE	62	FSM8H-62- L/ P-2G8=2	62	92,2 %	89,9 %	83,8 %		
TC-TE	82	FSM8H-82- L/ P-2G8=2	82	92,4 %	90,1 %	83,7 %		
TC-TE	85	FSM6H-85- L/ P-2G8=1	87	92,8 %	90,6 %	84,5 %		
TC-TE	120	FSM6H-120- L/ P-2G8=1 FSM8H-120- L/ P-2G8=1	122	92,6 %	90,4 %	84,7 %		
TC-DD	55	FSSH-55- L/P- GRY10q3	55	92,4 %	90,2 %	84,6 %]

In addition, non-dimmable ballasts not included in table 17 shall be assigned an EEI depending on their efficiency as described in Table 18:

TABLE 18

Energy efficiency index requirements for non-dimmable ballasts for fluorescent lamps not included in Table 17

η_{ballast}	Energy Efficiency Index
$\geq 0,94 * \text{EBb}_{\text{FL}}$	A3

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$\geq \text{EBb}_{\text{FL}}$	A2
$\geq 1-0,75*(1-\text{EBb}_{\text{FL}})$	A2 BAT

Where EBb_{FL} is defined in Annex II.3.g.

Furthermore, dimmable fluorescent lamp ballasts receive EEI classes according to the class into which the ballast would fall when it is operated at the 100 % lumen output, as described in Table 19.

TABLE 19

Energy efficiency index requirements for dimmable ballasts for fluorescent lamps

Complied class at 100 % lumen output	Energy Efficiency Index of dimmable ballast
A3	A1
A2	A1 BAT

Multi-wattage ballasts shall either be classified according to their efficiency under the lowest (worst) efficiency, or a relevant class shall be indicated for each operated lamp.

B. Second stage requirements

Three years after the entry into force of this Regulation:

for ballasts for high intensity discharge lamps, the efficiency of the ballast as defined in Annex II.1.d shall be indicated.

3. REQUIREMENTS FOR LUMINAIRES FOR FLUORESCENT LAMPS WITHOUT INTEGRATED BALLAST AND FOR LUMINAIRES FOR HIGH INTENSITY DISCHARGE LAMPS

3.1. Luminaire energy performance requirements

A. First stage requirements

One year after this Regulation comes into force:

the power consumption of luminaires for fluorescent lamps without integrated ballast shall not exceed the sum of the power consumption of the incorporated ballasts when the lamps they are normally operating do not emit any light when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

B. Second stage requirements

Three years after this Regulation comes into force:

Luminaires for fluorescent lamps without integrated ballast and for high intensity discharge lamps shall be compatible with ballasts complying with the third stage requirements, except luminaires with ingress protection grade at least IP4X.

The power consumption of luminaires for high intensity discharge lamps shall not exceed the sum of the power consumption of the incorporated ballasts when the lamps they are normally operating do not emit any light when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

Changes to legislation: There are outstanding changes not yet made to Commission Regulation (EC) No 245/2009. Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) View outstanding changes

C. Third stage requirements

Eight years after this Regulation comes into force:

All luminaires for fluorescent lamps without integrated ballast and for high intensity discharge lamps shall be compatible with ballasts complying with the third stage requirements.

3.2. Product information requirements on luminaires

A. First stage requirements

18 months after this Regulation comes into force:

Manufacturers of luminaires for fluorescent lamps without integrated ballast with total lamp lumen above 2 000 lumen shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their luminaire models. That information shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2005/32/EC:

- (a) if the luminaire is placed on the market together with the ballast, information on the efficiency of the ballast according to Annex III.2.2, in accordance with the ballast manufacturer's data;
- (b) if the luminaire is placed on the market together with the lamp, lamp efficacy (lm/W) of the lamp, in accordance with the lamp manufacturer's data;
- (c) if the ballast or the lamp are not placed on the market together with the luminaire, references used in manufacturers' catalogues must be provided on the types of lamps or ballasts compatible with the luminaire (e.g. ILCOS code for the lamps);
- (d) maintenance instructions to ensure that the luminaire maintains, as far as possible, its original quality throughout its lifetime;
- (e) disassembly instructions.

B. Second stage requirements

Three years after this Regulation comes into force:

the information provision requirements of the first stage shall also apply to luminaires for high intensity discharge lamps with total lamp lumen above 2 000 lumen. In addition, all luminaires for high intensity discharge lamps shall indicate that they are designed for either clear and/or coated lamps within the meaning of Annex II.

Changes to legislation:

There are outstanding changes not yet made to Commission Regulation (EC) No 245/2009. Any changes that have already been made to the legislation appear in the content and are referenced with annotations.

[View outstanding changes](#)

Changes and effects yet to be applied to :

- Regulation revoked by [S.I. 2021/1095 reg. 19\(b\)](#)

Changes and effects yet to be applied to the whole legislation item and associated provisions

- Annex 1 para. 2(b) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(b\)](#)
- Annex 1 para. 2(c) substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(c\)](#)
- Annex 1 para. 2(e)(f) substituted for Annex 1 para. 2(e) by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(d\)](#)
- Annex 1 para. 1 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(6\)\(a\)](#)
- Annex 1 para. 2(b) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(b\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(c) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(c\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(e) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 1 para. 2(f) words substituted in earlier amending provision [S.I. 2019/539, Sch. 2 para. 4\(6\)\(d\)](#) by [S.I. 2020/1528 reg. 4](#)
- Annex 3 para. 1.3 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(a\)](#)
- Annex 3 para. 2.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(b\)](#)
- Annex 3 para. 3.2 words substituted by [S.I. 2019/539 Sch. 2 para. 4\(7\)\(c\)](#)