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ENG. ELETRICA

Informação de Aplicação

Cálculo de Iluminação Interna

Método fácil e prático para calcular iluminação

Agora, o cálculo da quantidade de luminárias e lâmpadas necessárias para a iluminação de áreas internas tornou-se mais fácil e preciso, devido às tabelas de fator de utilização elaboradas pela Philips com o emprego de computadores. Graças a este novo processo de cálculo, foi possível preparar uma tabela exata de fatores para cada luminária, que permite cálculos mais precisos para toda a linha de produtos.

PHILIPS DO BRASIL LTDA
 PROJETO: ILUMINACAO DE GALPAO PARA CALCADOS
 DISTR. DE LUMINARIAS
 DADOS DO AMBIENTE
 COD. PROJETO 10136101
 VM READ

LUM (LARG) = 8
 LUM (COMP) = 13
 DIST. LUM. (LARG) = 3.75
 DIST. LUM. (COMP) = 3.46
 QDE. LFD. TOT. = 416
 QDE. LUM. TOT. = 104
 VM READ

05 LUMINARIAS TCK 427 COM 4 LAMPADAS FLUORESCENTES DE 65W COR 33 h.= 5,50 m.
 2 LUMINARIAS TCK 426 COM 2 LAMPADAS FLUORESCENTES DE 65W COR 33 h.= 5,30 m.
 5 LUMINARIAS TCS 663 COM 2 LAMPADAS FLUORESCENTES DE 65W COR 33 h.= 3,50 m.
 1 LUMINARIAS TMS 426 COM 2 LAMPADAS FLUORESCENTES DE 65W COR 33 h.= 3,50 m.

Philips Lighting

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PHILIPS

multiplicar $L \times C = A$

$\frac{100}{300}$

Descontado 2500 =

Exemplo de Cálculo de Iluminação

Admitindo-se que você queira saber quantas luminárias TCS 029, com duas lâmpadas fluorescentes de 32W, Branca Comfort serão necessárias num escritório com 18 metros de comprimento por 9 metros de largura e 3 metros de pé direito. O raciocínio a observar é o seguinte:

A. Escolha do nível de iluminação (E):

Sua primeira providência será a de escolher o nível médio de iluminação em função do tipo de atividade visual a ser exercido no local. Baseando-se nas orientações da tabela "Escolha do nível de Iluminação", considere que o valor escolhido seja de $E = 500$ Lux.

B. Fator do local (K):

A segunda providência será calcular o fator do local, que depende das dimensões do recinto. Para as luminárias Philips você pode empregar a fórmula:

$$K = \frac{C \times L}{(C + L) \times A}$$

onde C = comprimento do local (18 m)

L = largura do local (9 m)

A = altura da luminária ao plano de trabalho (2,2 m, pressupondo mesas de 0,80 m).

Portanto

$$K = \frac{18 \times 9}{(18 + 9) \times 2,2} \cong 2,7$$

C. Fator de utilização (η)

Para determinar o fator de utilização da luminária tipo TCS 029 (duas lâmpadas), conforme tabela ao lado, admita para K um valor mais próximo do calculado no item anterior (portanto $K = 2,5$) e avalie as reflexões médias do teto, das paredes e piso, as quais estão representadas pelos 3 algarismos que estão no início de cada coluna das tabelas de fator de utilização ao lado.

Considere que o primeiro algarismo representa a reflexão do teto, o segundo a reflexão da parede e o terceiro do piso.

Os índices 1, 3, 5, 7 correspondem a 10, 30, 50 e 70 por cento de reflexão nas superfícies escuras, médias, claras e brancas respectivamente. Considerando que o local tenha teto e parede claros e piso escuro, você obtém, portanto, 551 ou seja = 0,53, conforme a tabela correspondente da luminária.

D. Agora você pode determinar o fluxo total (Φ) pela fórmula:

$$\Phi = \frac{S \times E}{\eta \times d}$$

sendo $S = 18 \times 9 = 162 \text{ m}^2$

$E = 500$ Lux (nível de iluminação desejado)

$d = 0,85$ (veja na tabela de Fator de Depreciação, considerando o período de manutenção de 5.000 hs e ambiente normal).

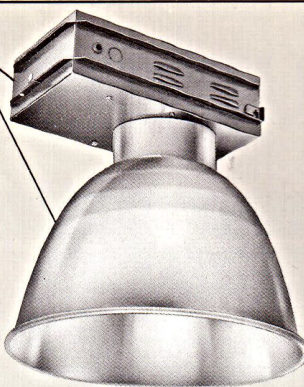
Portanto:

$$\Phi = \frac{18 \times 9 \times 500}{0,53 \times 0,85} \cong 179.800 \text{ lúmens}$$

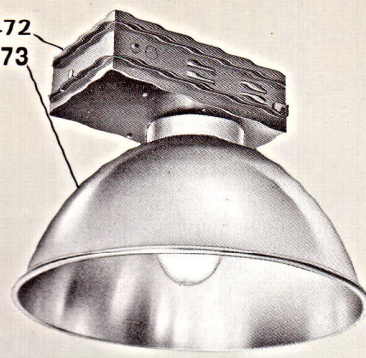
Sabendo que cada lâmpada fluorescente de 32W, cor Branca Comfort (TLDRS 32/64) fornece 2.500 lúmens (veja a tabela de fluxos de lâmpadas), você deduz que cada luminária TCS 029 com duas lâmpadas emite 5.000 lúmens. Como o fluxo total necessário é de 179.800 lúmens e cada luminária fornece 5.000 lúmens, torna-se fácil para você concluir que a quantidade necessária é de

$$\frac{179.800}{5.000} \cong 36 \text{ luminárias}$$

HDK 472
ZDK 472



HDK 472
ZDK 473



HDK 472 c/ ZDK 472 - HPL-N 250W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.47	.43	.40	.46	.42	.40	.42	.40	.38
0,80		.54	.50	.47	.53	.49	.47	.49	.46	.45
1,00		.59	.55	.53	.58	.55	.52	.54	.52	.51
1,25		.64	.60	.58	.63	.60	.57	.59	.57	.56
1,50		.67	.64	.61	.66	.63	.61	.62	.60	.59
2,00		.71	.69	.67	.70	.68	.66	.67	.66	.64
2,50		.74	.72	.70	.72	.71	.69	.70	.69	.67
3,00		.75	.74	.72	.74	.73	.71	.72	.71	.69
4,00		.77	.76	.74	.76	.74	.73	.73	.72	.71
5,00		.78	.77	.76	.76	.75	.75	.74	.74	.72

HDK 472 c/ ZDK 473 - HPL-N 400W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.50	.46	.42	.50	.45	.42	.45	.42	.41
0,80		.58	.53	.49	.57	.52	.49	.52	.49	.48
1,00		.63	.59	.56	.62	.58	.55	.58	.55	.54
1,25		.68	.64	.61	.67	.63	.61	.63	.60	.59
1,50		.72	.68	.65	.70	.67	.65	.66	.64	.63
2,00		.77	.74	.71	.75	.73	.71	.72	.70	.68
2,50		.80	.77	.75	.78	.76	.74	.75	.74	.72
3,00		.82	.80	.78	.80	.79	.77	.77	.76	.74
4,00		.84	.82	.81	.82	.81	.80	.80	.79	.77
5,00		.85	.84	.83	.83	.82	.81	.81	.80	.78

HDK 472 c/ ZDK 472 - HPL-N 400W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.39	.35	.33	.39	.35	.33	.35	.32	.31
0,80		.46	.42	.39	.45	.42	.39	.41	.39	.38
1,00		.51	.47	.45	.50	.47	.44	.46	.44	.43
1,25		.55	.52	.49	.54	.51	.49	.51	.49	.48
1,50		.58	.55	.53	.57	.55	.52	.54	.52	.51
2,00		.62	.60	.58	.61	.59	.57	.58	.57	.56
2,50		.65	.63	.61	.64	.62	.60	.61	.60	.58
3,00		.66	.65	.63	.65	.64	.63	.63	.62	.60
4,00		.68	.67	.66	.67	.66	.65	.65	.64	.62
5,00		.69	.68	.67	.68	.67	.66	.66	.65	.63

SDK 472 c/ ZDK 473 - SON 150W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.52	.48	.45	.51	.48	.45	.47	.45	.44
0,80		.58	.54	.51	.57	.53	.51	.53	.51	.50
1,00		.62	.59	.56	.61	.58	.56	.58	.56	.54
1,25		.66	.63	.61	.65	.62	.60	.62	.60	.59
1,50		.69	.66	.64	.68	.65	.63	.65	.63	.62
2,00		.73	.71	.69	.72	.70	.68	.69	.68	.66
2,50		.76	.74	.72	.74	.73	.71	.72	.71	.69
3,00		.77	.76	.74	.76	.75	.74	.74	.73	.71
4,00		.79	.78	.77	.77	.77	.76	.75	.75	.73
5,00		.80	.79	.78	.78	.78	.77	.76	.76	.74

SDK 472 c/ ZDK 472 - SON 150W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.47	.43	.40	.46	.43	.40	.43	.40	.39
0,80		.53	.49	.47	.52	.49	.47	.49	.46	.45
1,00		.58	.55	.52	.57	.54	.52	.54	.52	.50
1,25		.62	.59	.57	.61	.59	.56	.58	.56	.55
1,50		.65	.62	.60	.64	.62	.60	.61	.59	.58
2,00		.69	.67	.65	.68	.66	.64	.65	.64	.62
2,50		.71	.70	.68	.70	.69	.67	.68	.67	.65
3,00		.73	.71	.70	.72	.70	.69	.69	.68	.67
4,00		.74	.73	.72	.73	.72	.71	.71	.70	.69
5,00		.75	.74	.73	.74	.73	.72	.72	.71	.69

SDK 472 c/ ZDK 473 - SON 250W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.53	.49	.47	.53	.49	.47	.49	.46	.45
0,80		.59	.55	.53	.58	.55	.52	.54	.52	.51
1,00		.64	.60	.58	.63	.60	.57	.59	.57	.56
1,25		.68	.65	.62	.67	.64	.62	.64	.62	.60
1,50		.71	.68	.66	.70	.67	.65	.66	.65	.63
2,00		.75	.73	.71	.74	.72	.70	.71	.70	.68
2,50		.78	.76	.74	.76	.75	.73	.74	.73	.71
3,00		.79	.78	.76	.78	.77	.75	.76	.75	.73
4,00		.81	.80	.79	.79	.78	.78	.77	.77	.75
5,00		.82	.81	.80	.80	.80	.79	.78	.78	.76

SDK 472 c/ ZDK 472 - SON 400W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.39	.35	.32	.39	.35	.32	.35	.32	.31
0,80		.46	.42	.39	.45	.42	.39	.41	.39	.38
1,00		.51	.47	.45	.50	.47	.44	.46	.44	.43
1,25		.56	.52	.50	.55	.52	.49	.51	.49	.48
1,50		.59	.56	.53	.58	.55	.53	.54	.52	.51
2,00		.63	.61	.59	.62	.60	.58	.59	.57	.56
2,50		.65	.63	.62	.64	.62	.61	.62	.60	.59
3,00		.67	.65	.64	.64	.63	.63	.62	.61	.60
4,00		.69	.67	.66	.67	.66	.65	.65	.64	.63
5,00		.70	.68	.67	.68	.67	.66	.66	.65	.64

SDK 472 c/ ZDK 473 - SON 400W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.45	.41	.38	.44	.40	.37	.40	.37	.36
0,80		.51	.47	.44	.50	.47	.44	.46	.44	.42
1,00		.56	.53	.50	.55	.52	.49	.51	.49	.48
1,25		.61	.57	.55	.60	.57	.54	.56	.54	.52
1,50		.64	.61	.58	.63	.60	.58	.59	.57	.56
2,00		.69	.66	.64	.67	.65	.63	.64	.63	.61
2,50		.71	.69	.67	.70	.68	.67	.67	.66	.64
3,00		.73	.71	.70	.72	.70	.69	.69	.68	.66
4,00		.75	.74	.72	.74	.72	.71	.71	.70	.69
5,00		.76	.75	.74	.75	.74	.73	.72	.72	.70

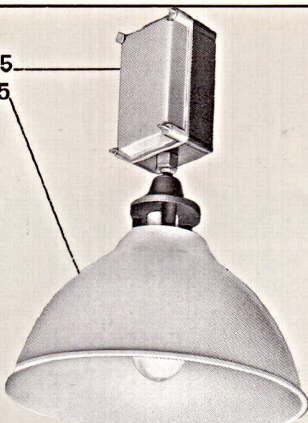
HDK 472 c/ ZDK 473 - HPL-N 250W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.51	.47	.44	.50	.47	.44	.46	.44	.43
0,80		.57	.53	.50	.57	.53	.50	.52	.50	.49
1,00		.62	.59	.56	.61	.58	.56	.58	.55	.54
1,25		.67	.63	.61	.66	.63	.60	.62	.60	.59
1,50		.70	.67	.64	.69	.66	.64	.65	.63	.62
2,00		.74	.72	.70	.73	.71	.69	.70	.68	.67
2,50		.77	.75	.73	.76	.74	.72	.73	.72	.70
3,00		.79	.77	.76	.77	.76	.75	.75	.74	.72
4,00		.81	.79	.78	.79	.78	.77	.77	.76	.74
5,00		.82	.81	.80	.80	.79	.78	.78	.77	.75

HDK 475 c/ ZDK 475 - HPL-N 250W

ROOM INDEX K	REFLECTANCES :	751	731	711	551	531	511	331	311	000
0,60		.34	.29	.25	.34	.28	.25	.28	.25	.23
0,80		.42	.36	.32	.41	.36	.32	.35	.32	.30
1,00		.48	.43	.38	.47	.42	.38	.41	.38	.36
1,25		.54	.48	.44	.52	.48	.44	.47	.44	.42
1,50		.58	.53	.49	.56	.52	.49	.51	.48	.46
2,00		.63	.59	.56	.62	.58	.55	.57	.55	.53
2,50		.67	.64	.61	.65	.62	.60	.61	.59	.57
3,00		.70	.66	.64	.68	.65	.63	.64	.62	.60
4,00		.72	.70	.68	.71	.69	.67	.67	.66	.64
5,00		.74	.72	.70	.72	.71	.69	.69	.68	.66

HDK 475
ZDK 475



HDK 475 c/ ZDK 475 - HPL-N 400W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.33	.27	.23	.32	.27	.23	.26	.23	.22
0.80		.40	.34	.30	.39	.34	.30	.33	.30	.28
1.00		.46	.40	.36	.44	.40	.36	.39	.36	.34
1.25		.51	.46	.42	.50	.45	.42	.44	.41	.40
1.50		.55	.50	.46	.53	.49	.46	.49	.46	.44
2.00		.60	.57	.53	.59	.56	.53	.55	.52	.50
2.50		.64	.61	.58	.62	.60	.57	.58	.56	.54
3.00		.66	.63	.61	.65	.62	.60	.61	.59	.57
4.00		.69	.67	.65	.68	.66	.64	.65	.63	.61
5.00		.71	.69	.67	.70	.68	.66	.67	.65	.63

HDK 475 c/ ZDK 475 - SON250W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.36	.30	.26	.35	.29	.25	.29	.25	.24
0.80		.44	.38	.33	.42	.37	.33	.37	.33	.31
1.00		.50	.44	.40	.49	.43	.39	.43	.39	.37
1.25		.56	.50	.46	.54	.49	.46	.49	.45	.43
1.50		.60	.55	.51	.58	.54	.50	.53	.50	.48
2.00		.66	.62	.58	.64	.61	.57	.59	.57	.55
2.50		.70	.66	.63	.68	.65	.62	.64	.61	.59
3.00		.72	.69	.66	.70	.68	.65	.66	.64	.62
4.00		.75	.73	.70	.73	.71	.69	.70	.68	.66
5.00		.77	.75	.73	.75	.73	.72	.72	.70	.68

HDK 475 c/ ZDK 475 - SON400W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.34	.28	.24	.33	.28	.24	.28	.24	.23
0.80		.42	.36	.32	.41	.36	.32	.35	.31	.30
1.00		.48	.42	.38	.47	.42	.38	.41	.37	.36
1.25		.54	.48	.44	.52	.48	.44	.47	.43	.42
1.50		.58	.53	.49	.56	.52	.48	.51	.48	.46
2.00		.64	.60	.56	.62	.59	.56	.58	.55	.53
2.50		.68	.64	.61	.66	.63	.60	.62	.59	.57
3.00		.70	.67	.64	.69	.66	.63	.65	.63	.61
4.00		.73	.71	.68	.72	.69	.67	.68	.66	.64
5.00		.75	.73	.71	.74	.72	.70	.70	.69	.67

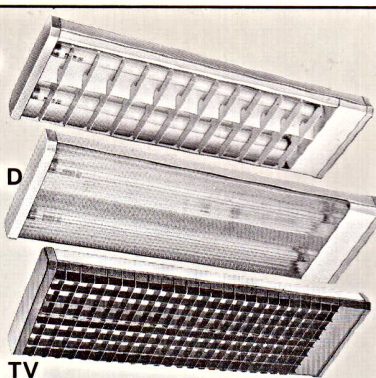
TCS029 - 2 TLD 16W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.31	.26	.23	.30	.26	.23	.26	.23	.21
0.80		.37	.32	.29	.36	.32	.29	.32	.29	.27
1.00		.42	.37	.34	.41	.37	.34	.36	.34	.32
1.25		.46	.42	.39	.45	.42	.39	.41	.38	.37
1.50		.50	.46	.43	.49	.45	.42	.44	.42	.41
2.00		.55	.51	.49	.53	.50	.48	.50	.48	.46
2.50		.57	.55	.52	.56	.54	.52	.53	.51	.50
3.00		.60	.57	.55	.58	.56	.54	.55	.54	.52
4.00		.62	.60	.58	.61	.59	.57	.58	.57	.55
5.00		.63	.62	.60	.62	.61	.59	.59	.58	.57

TCS029 - 2 TLD 32W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.29	.24	.21	.28	.24	.21	.24	.21	.20
0.80		.34	.30	.27	.34	.30	.27	.29	.26	.25
1.00		.39	.35	.32	.38	.34	.31	.34	.31	.30
1.25		.43	.39	.36	.42	.39	.36	.38	.36	.34
1.50		.46	.43	.40	.45	.42	.39	.41	.39	.38
2.00		.51	.48	.45	.50	.47	.45	.46	.44	.43
2.50		.54	.51	.49	.53	.50	.48	.49	.48	.46
3.00		.56	.53	.51	.54	.52	.51	.52	.50	.49
4.00		.58	.56	.54	.57	.55	.54	.54	.53	.51
5.00		.59	.58	.56	.58	.57	.55	.56	.55	.53

TCS029



TCS029 D

TCS029 TV

TCS029-D - 2 TLD 16W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.27	.23	.20	.26	.22	.19	.22	.19	.18
0.80		.33	.28	.25	.32	.28	.25	.27	.24	.23
1.00		.37	.33	.30	.36	.32	.29	.32	.29	.27
1.25		.41	.37	.34	.40	.37	.34	.36	.33	.32
1.50		.45	.41	.38	.43	.40	.37	.39	.37	.35
2.00		.49	.46	.43	.48	.45	.42	.44	.42	.40
2.50		.52	.49	.47	.50	.48	.46	.47	.45	.43
3.00		.54	.51	.49	.52	.50	.48	.49	.47	.46
4.00		.56	.54	.52	.55	.53	.51	.52	.50	.48
5.00		.58	.56	.54	.56	.55	.53	.53	.52	.50

TCS029 D - 2 TLD 32W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.29	.24	.21	.28	.24	.21	.23	.20	.19
0.80		.35	.30	.27	.34	.30	.26	.29	.26	.25
1.00		.40	.35	.32	.39	.34	.31	.34	.31	.29
1.25		.44	.40	.37	.43	.39	.36	.38	.36	.34
1.50		.48	.44	.40	.46	.43	.40	.42	.39	.37
2.00		.52	.49	.46	.51	.48	.45	.47	.45	.43
2.50		.55	.52	.50	.54	.51	.49	.50	.48	.46
3.00		.58	.55	.53	.56	.54	.52	.52	.51	.49
4.00		.60	.58	.56	.58	.57	.55	.55	.54	.52
5.00		.62	.60	.58	.60	.58	.57	.57	.56	.54

TCS029 TV - 2 TLD 16W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.13	.12	.12	.13	.12	.12	.12	.12	.11
0.80		.15	.14	.13	.15	.14	.13	.14	.13	.13
1.00		.16	.15	.15	.16	.15	.15	.15	.14	.14
1.25		.17	.16	.16	.17	.16	.16	.16	.16	.15
1.50		.18	.17	.17	.17	.17	.16	.17	.16	.16
2.00		.19	.18	.18	.18	.18	.18	.18	.17	.17
2.50		.19	.19	.19	.19	.19	.18	.18	.18	.18
3.00		.20	.19	.19	.19	.19	.19	.19	.19	.19
4.00		.20	.20	.20	.20	.20	.19	.19	.19	.19
5.00		.20	.20	.20	.20	.20	.20	.20	.19	.19

FCS029 - 2 PL* 11W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.30	.26	.23	.30	.26	.23	.25	.23	.22
0.80		.36	.32	.29	.35	.31	.29	.31	.28	.27
1.00		.41	.37	.33	.40	.36	.33	.35	.33	.32
1.25		.45	.41	.38	.44	.40	.38	.40	.37	.36
1.50		.48	.44	.42	.47	.44	.41	.43	.41	.39
2.00		.52	.49	.47	.51	.48	.46	.48	.46	.44
2.50		.55	.52	.50	.54	.51	.50	.51	.49	.48
3.00		.57	.55	.53	.55	.54	.52	.53	.51	.50
4.00		.59	.57	.55	.58	.56	.55	.55	.54	.52
5.00		.60	.59	.57	.59	.57	.56	.56	.55	.54

FCS029 - 2 PL* 13W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.30	.26	.23	.30	.26	.23	.25	.23	.22
0.80		.36	.32	.29	.35	.32	.29	.31	.29	.27
1.00		.41	.37	.34	.40	.36	.34	.36	.33	.32
1.25		.45	.41	.38	.44	.41	.38	.40	.38	.36
1.50		.48	.45	.42	.47	.44	.42	.43	.41	.40
2.00		.53	.50	.47	.52	.49	.47	.48	.46	.45
2.50		.55	.53	.51	.54	.52	.50	.51	.49	.48
3.00		.57	.55	.53	.56	.54	.52	.53	.52	.50
4.00		.59	.58	.56	.58	.57	.55	.56	.54	.53
5.00		.61	.59	.58	.59	.58	.57	.57	.56	.54

FCS029



FBN801

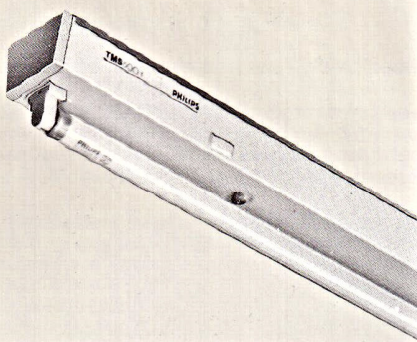
FBN801 - 1 PL* 13W

ROOM INDEX K	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60		.32	.27	.24	.31	.27	.24	.27	.24	.22
0.80		.39	.34	.30	.38	.33	.30	.33	.30	.28
1.00		.44	.39	.36	.43	.39	.35	.38	.35	.34
1.25		.49	.44	.41	.47	.44	.40	.43	.40	.39
1.50		.52	.48	.45	.51	.47	.44	.47	.44	.42
2.00		.57	.54	.51	.56	.53	.50	.52	.50	.48
2.50		.60	.57	.55	.59	.56	.54	.55	.54	.52
3.00		.62	.60	.58	.61	.59	.57	.58	.56	.55
4.00		.65	.63	.61	.63	.62	.60	.61	.59	.58
5.00		.66	.65	.63	.65	.63	.62	.62	.61	.59

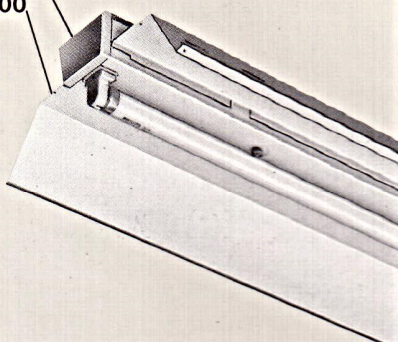
TMS500 - 1 TL20W

ROOM INDEX K	REFLECTANCES									
	751	731	711	551	531	511	331	311	000	
0.60	.31	.24	.19	.28	.22	.18	.20	.16	.13	
0.80	.38	.31	.26	.35	.28	.24	.26	.22	.17	
1.00	.44	.37	.31	.40	.34	.29	.30	.26	.21	
1.25	.50	.43	.37	.45	.39	.34	.35	.31	.26	
1.50	.54	.47	.42	.49	.43	.38	.39	.35	.29	
2.00	.61	.54	.49	.55	.50	.45	.45	.41	.35	
2.50	.65	.59	.54	.59	.54	.50	.49	.46	.39	
3.00	.68	.63	.58	.62	.58	.54	.52	.49	.42	
4.00	.72	.68	.64	.66	.62	.59	.57	.54	.46	
5.00	.75	.71	.68	.68	.65	.62	.60	.57	.48	

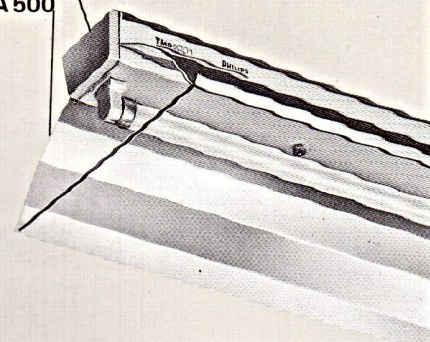
TMS 500



TMS 500 RN 500



TMS 500 RA 500



TMS 500 - 1 TL 65W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.32	.25	.20	.29	.22	.18	.20	.17	.13	
0.80	.39	.31	.26	.35	.29	.24	.26	.22	.18	
1.00	.45	.37	.32	.40	.34	.29	.31	.27	.22	
1.25	.50	.43	.37	.45	.39	.34	.36	.32	.26	
1.50	.55	.48	.42	.49	.44	.39	.40	.36	.29	
2.00	.61	.55	.50	.56	.50	.46	.46	.42	.35	
2.50	.66	.60	.55	.60	.55	.51	.50	.47	.39	
3.00	.69	.64	.59	.63	.58	.55	.53	.50	.42	
4.00	.73	.69	.65	.67	.63	.60	.57	.55	.47	
5.00	.76	.72	.69	.69	.66	.63	.60	.58	.49	

TMS 500 c/ RN 500 - 1 TL 65W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.33	.27	.22	.32	.26	.22	.26	.22	.20	
0.80	.41	.34	.29	.40	.34	.29	.33	.29	.27	
1.00	.47	.40	.35	.46	.40	.35	.39	.35	.33	
1.25	.53	.47	.42	.52	.46	.41	.45	.41	.39	
1.50	.58	.52	.47	.56	.51	.46	.50	.46	.43	
2.00	.65	.59	.55	.63	.58	.54	.57	.53	.51	
2.50	.69	.65	.61	.67	.63	.60	.62	.59	.57	
3.00	.72	.68	.65	.70	.67	.64	.66	.63	.60	
4.00	.77	.73	.70	.75	.72	.69	.70	.68	.66	
5.00	.79	.76	.74	.77	.75	.72	.73	.71	.69	

TMS 500 - 2 TL 40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.32	.25	.21	.28	.22	.19	.19	.16	.12	
0.80	.39	.32	.28	.34	.28	.24	.25	.21	.16	
1.00	.45	.38	.33	.39	.33	.29	.29	.26	.19	
1.25	.50	.44	.39	.43	.38	.34	.33	.30	.22	
1.50	.54	.48	.44	.47	.42	.38	.36	.33	.25	
2.00	.60	.55	.51	.52	.48	.45	.41	.39	.29	
2.50	.64	.60	.56	.56	.52	.49	.45	.42	.32	
3.00	.67	.63	.59	.58	.55	.52	.47	.45	.34	
4.00	.71	.67	.64	.62	.59	.56	.51	.49	.37	
5.00	.73	.70	.67	.64	.61	.59	.53	.51	.39	

TMS 500 c/ RN 500 - 1 TL 20W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.33	.26	.21	.32	.26	.21	.25	.21	.19	
0.80	.40	.33	.28	.39	.33	.28	.32	.28	.26	
1.00	.46	.39	.34	.45	.39	.34	.38	.34	.31	
1.25	.52	.46	.41	.50	.45	.40	.44	.40	.37	
1.50	.57	.51	.46	.55	.49	.45	.48	.44	.42	
2.00	.63	.58	.54	.61	.57	.53	.56	.52	.50	
2.50	.68	.63	.59	.66	.62	.58	.60	.57	.55	
3.00	.71	.67	.63	.69	.65	.62	.64	.61	.59	
4.00	.75	.72	.69	.73	.70	.67	.68	.66	.64	
5.00	.78	.75	.72	.75	.73	.71	.71	.69	.67	

TMS 500 c/ RA 500 - 1 TLD 32W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.44	.38	.34	.43	.38	.34	.38	.34	.33	
0.80	.52	.46	.42	.51	.46	.42	.45	.42	.40	
1.00	.59	.53	.49	.57	.52	.49	.52	.48	.46	
1.25	.64	.59	.55	.63	.58	.55	.58	.54	.52	
1.50	.69	.64	.60	.67	.63	.59	.62	.59	.57	
2.00	.75	.71	.67	.73	.70	.67	.69	.66	.64	
2.50	.79	.75	.72	.77	.74	.71	.73	.71	.69	
3.00	.81	.78	.76	.79	.77	.75	.76	.74	.72	
4.00	.84	.82	.80	.82	.80	.79	.79	.78	.75	
5.00	.86	.84	.82	.84	.82	.81	.81	.80	.77	

TMS 500 - 2 TLD 32W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.31	.25	.20	.27	.22	.18	.19	.16	.11	
0.80	.38	.32	.27	.33	.28	.24	.24	.21	.15	
1.00	.44	.37	.32	.38	.33	.29	.29	.26	.18	
1.25	.49	.43	.38	.43	.37	.34	.32	.29	.22	
1.50	.53	.47	.43	.46	.41	.37	.35	.32	.24	
2.00	.59	.54	.50	.51	.47	.44	.40	.38	.28	
2.50	.63	.58	.54	.55	.51	.48	.44	.41	.31	
3.00	.66	.62	.58	.57	.54	.51	.46	.44	.34	
4.00	.69	.66	.63	.60	.58	.55	.50	.48	.36	
5.00	.72	.69	.66	.62	.60	.58	.52	.50	.38	

TMS 500 c/ RN 500 - 1 TLD 16W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.34	.27	.22	.33	.27	.22	.26	.22	.20	
0.80	.41	.35	.29	.40	.34	.29	.33	.29	.27	
1.00	.48	.41	.36	.46	.40	.35	.39	.35	.33	
1.25	.54	.47	.42	.52	.46	.41	.45	.41	.39	
1.50	.58	.52	.47	.56	.51	.47	.50	.46	.44	
2.00	.65	.60	.55	.63	.58	.54	.57	.54	.51	
2.50	.70	.65	.61	.68	.64	.60	.62	.59	.57	
3.00	.73	.69	.65	.71	.67	.64	.66	.63	.60	
4.00	.77	.74	.71	.75	.72	.69	.70	.68	.65	
5.00	.80	.77	.74	.77	.75	.73	.73	.71	.69	

TMS 500 c/ RF 500 - 1 TLD 32W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.45	.38	.34	.44	.38	.34	.38	.34	.32	
0.80	.53	.47	.42	.52	.46	.42	.45	.41	.39	
1.00	.60	.54	.49	.59	.53	.48	.52	.48	.46	
1.25	.66	.60	.56	.65	.59	.55	.58	.55	.53	
1.50	.71	.65	.61	.69	.64	.60	.63	.60	.58	
2.00	.78	.73	.69	.76	.72	.68	.71	.68	.66	
2.50	.82	.78	.75	.80	.77	.74	.76	.73	.71	
3.00	.85	.82	.79	.84	.81	.78	.79	.77	.75	
4.00	.89	.86	.84	.87	.85	.83	.83	.82	.79	
5.00	.91	.89	.87	.89	.88	.86	.86	.84	.82	

TMS 500 - 2 TL 65W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.31	.25	.20	.27	.22	.18	.19	.16	.12	
0.80	.38	.32	.27	.33	.28	.24	.24	.21	.15	
1.00	.43	.37	.32	.38	.33	.29	.29	.26	.18	
1.25	.49	.43	.38	.42	.37	.34	.32	.29	.22	
1.50	.53	.47	.42	.46	.41	.37	.35	.32	.24	
2.00	.59	.54	.49	.51	.47	.43	.40	.38	.28	
2.50	.63	.58	.54	.55	.51	.48	.44	.41	.31	
3.00	.65	.61	.58	.57	.54	.51	.46	.44	.33	
4.00	.69	.66	.62	.60	.57	.55	.49	.47	.36	
5.00	.71	.68	.66	.62	.60	.58	.51	.50	.38	

TMS 500 c/ RN 500 - 1 TL 40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.32	.26	.22	.32	.26	.21	.25	.21	.20	
0.80	.40	.33	.29	.39	.33	.28	.32	.28	.26	
1.00	.46	.40	.35	.45	.39	.34	.38	.34	.32	
1.25	.52	.46	.41	.50	.45	.40	.44	.40	.38	
1.50	.56	.51	.46	.55	.50	.45	.49	.45	.43	
2.00	.63	.58	.54	.61	.57	.53	.56	.53	.50	
2.50	.67	.63	.59	.66	.62	.59	.61	.58	.55	
3.00	.71	.67	.63	.69	.65	.62	.64	.61	.59	
4.00	.74	.71	.69	.72	.70	.67	.68	.66	.64	
5.00	.77	.74	.72	.75	.73	.71	.71	.69	.67	

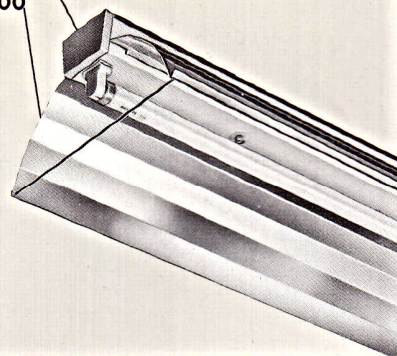
TMS 500 - 2 TL 20W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.31	.25	.21	.27	.22	.18	.19	.16	.12	
0.80	.38	.32	.27	.33	.28	.24	.24	.21	.15	
1.00	.44	.37	.33	.39	.33	.29	.29	.25	.19	
1.25	.49	.43	.38	.43	.38	.34	.32	.29	.22	
1.50	.53	.47	.43	.46	.41	.38	.36	.33	.24	
2.00	.59	.54	.50	.51	.47	.44	.41	.38	.29	
2.50	.63	.59	.55	.55	.51	.48	.44	.42	.32	
3.00	.66	.62	.58	.57	.54	.51	.47	.44	.34	
4.00	.70	.66	.63	.61	.58	.55	.50	.48	.37	
5.00	.72	.69	.66	.63	.60	.58	.52	.50	.38	

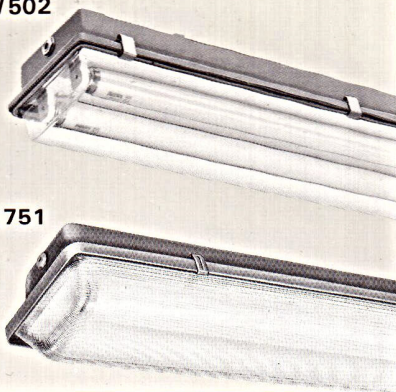
TMS 500 c/ RN 500 - 2 TL 20W

ROOM INDEX	REFLECTANCES									
	751	731	711	551	531	511	331	311	000	
0.60	.31	.26	.22	.30	.26	.22	.25	.22	.21	
0.80	.38	.32	.29	.37	.32	.28	.32	.28	.27	
1.00	.43	.38	.34	.42	.37	.34	.37	.34	.32	
1.25	.48	.43	.39	.47	.42	.39	.42	.39	.37	
1.50	.52	.47	.44	.50	.46	.43	.46	.43	.41	
2.00	.57	.53	.50	.56	.52	.49	.51	.49	.47	
2.50	.60	.57	.54	.59	.56	.53	.55	.53	.51	
3.00	.63	.60	.57	.61	.59	.56	.58	.56	.54	
4.00	.66	.63	.61	.64	.62	.60	.61	.59	.57	
5.00	.67	.65	.63	.66	.64	.62	.63	.61	.59	

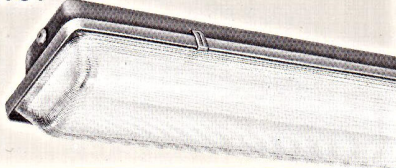
TMS 500
RF 500



TCW 502



TCH 751



TMS 500 c/ RN 500 - 2 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.30	.25	.22	.29	.25	.22	.25	.21	.20	
0.80	.37	.32	.28	.36	.31	.28	.31	.27	.26	
1.00	.42	.37	.33	.41	.36	.33	.36	.33	.31	
1.25	.47	.42	.38	.45	.41	.38	.41	.38	.36	
1.50	.50	.46	.42	.49	.45	.42	.44	.42	.40	
2.00	.55	.52	.49	.54	.51	.48	.50	.47	.46	
2.50	.59	.55	.53	.57	.54	.52	.53	.51	.50	
3.00	.61	.58	.56	.59	.57	.55	.56	.54	.52	
4.00	.64	.61	.59	.62	.60	.58	.59	.58	.56	
5.00	.65	.63	.62	.64	.62	.61	.61	.60	.58	

TCW 502 - 2 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.23	.19	.15	.22	.18	.15	.17	.14	.13	
0.80	.29	.24	.20	.27	.23	.19	.22	.19	.17	
1.00	.33	.28	.24	.31	.27	.23	.26	.23	.20	
1.25	.37	.32	.28	.35	.31	.28	.30	.27	.24	
1.50	.40	.36	.32	.38	.34	.31	.33	.30	.27	
2.00	.45	.41	.37	.43	.39	.36	.38	.35	.32	
2.50	.48	.45	.41	.46	.43	.40	.41	.39	.36	
3.00	.51	.47	.44	.48	.45	.43	.43	.41	.38	
4.00	.53	.51	.48	.51	.49	.46	.46	.45	.42	
5.00	.55	.53	.51	.53	.51	.49	.49	.47	.44	

TMS 500 c/ RN 500 - 2 TLD 32W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.31	.26	.22	.30	.25	.22	.25	.22	.21	
0.80	.37	.32	.29	.37	.32	.28	.31	.28	.27	
1.00	.43	.38	.34	.42	.37	.34	.37	.34	.32	
1.25	.48	.43	.39	.46	.42	.39	.42	.39	.37	
1.50	.51	.47	.43	.50	.46	.43	.45	.43	.41	
2.00	.57	.53	.50	.55	.52	.49	.51	.49	.47	
2.50	.60	.57	.54	.58	.55	.53	.55	.53	.51	
3.00	.62	.59	.57	.61	.58	.56	.57	.55	.54	
4.00	.65	.63	.61	.63	.61	.60	.60	.59	.57	
5.00	.66	.65	.63	.65	.63	.62	.62	.61	.59	

TCH 751 - 2 TL20W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.28	.22	.18	.27	.22	.18	.21	.18	.16	
0.80	.34	.29	.24	.33	.28	.24	.27	.23	.22	
1.00	.40	.34	.29	.38	.33	.29	.32	.28	.26	
1.25	.44	.39	.34	.43	.38	.34	.37	.33	.31	
1.50	.48	.43	.38	.46	.42	.38	.40	.37	.35	
2.00	.54	.49	.45	.52	.48	.44	.46	.43	.41	
2.50	.57	.53	.50	.55	.52	.48	.50	.47	.45	
3.00	.60	.56	.53	.58	.55	.52	.53	.50	.48	
4.00	.63	.60	.57	.61	.58	.56	.57	.55	.52	
5.00	.66	.63	.60	.63	.61	.59	.59	.57	.54	

TMS 500 c/ RN 500 - 2 TL65W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.29	.25	.21	.29	.24	.21	.24	.21	.20	
0.80	.36	.31	.27	.35	.30	.27	.30	.27	.25	
1.00	.41	.36	.32	.40	.35	.32	.35	.32	.30	
1.25	.45	.41	.37	.44	.40	.37	.39	.37	.35	
1.50	.49	.44	.41	.47	.44	.41	.43	.40	.39	
2.00	.54	.50	.47	.52	.49	.47	.48	.46	.44	
2.50	.57	.54	.51	.55	.53	.50	.52	.50	.48	
3.00	.59	.56	.54	.58	.55	.53	.54	.53	.51	
4.00	.62	.59	.57	.60	.58	.57	.57	.56	.54	
5.00	.63	.61	.60	.62	.60	.59	.59	.58	.56	

TCH 751 - 1 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.28	.22	.18	.27	.21	.17	.20	.16	.14	
0.80	.35	.28	.23	.33	.27	.22	.25	.22	.19	
1.00	.40	.33	.28	.38	.32	.27	.30	.26	.23	
1.25	.45	.39	.34	.42	.37	.32	.35	.31	.27	
1.50	.49	.43	.38	.46	.41	.36	.38	.35	.31	
2.00	.55	.49	.45	.52	.47	.43	.44	.41	.37	
2.50	.59	.54	.49	.55	.51	.47	.48	.45	.41	
3.00	.62	.57	.53	.58	.54	.51	.51	.48	.44	
4.00	.66	.62	.58	.62	.59	.56	.56	.53	.48	
5.00	.68	.65	.61	.64	.61	.59	.58	.56	.51	

TMS 500 c/ RA 500 - 2 TLD 32W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.37	.33	.29	.37	.32	.29	.32	.29	.28	
0.80	.44	.39	.36	.43	.39	.36	.38	.35	.34	
1.00	.50	.45	.41	.49	.44	.41	.44	.41	.39	
1.25	.55	.50	.47	.53	.50	.46	.49	.46	.45	
1.50	.58	.54	.51	.57	.53	.50	.53	.50	.48	
2.00	.63	.60	.57	.62	.59	.57	.58	.56	.54	
2.50	.67	.64	.61	.65	.63	.61	.62	.60	.58	
3.00	.69	.66	.64	.67	.65	.63	.64	.63	.61	
4.00	.71	.69	.68	.70	.68	.67	.67	.66	.64	
5.00	.73	.71	.70	.71	.70	.69	.69	.68	.66	

TCH 751 - 2 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.27	.21	.17	.26	.21	.17	.20	.17	.15	
0.80	.33	.27	.23	.31	.26	.22	.25	.22	.20	
1.00	.37	.32	.28	.36	.31	.27	.30	.26	.24	
1.25	.42	.37	.32	.40	.35	.32	.34	.31	.29	
1.50	.46	.41	.36	.44	.39	.35	.38	.35	.32	
2.00	.51	.46	.43	.49	.45	.41	.43	.40	.38	
2.50	.55	.50	.47	.52	.49	.46	.47	.44	.42	
3.00	.57	.53	.50	.55	.51	.49	.50	.47	.44	
4.00	.60	.57	.54	.58	.55	.53	.53	.51	.48	
5.00	.62	.60	.57	.60	.58	.55	.56	.54	.51	

TCW 501 - 1 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.27	.21	.17	.25	.20	.16	.19	.15	.13	
0.80	.33	.26	.22	.31	.25	.21	.24	.20	.17	
1.00	.38	.31	.26	.35	.30	.25	.28	.24	.21	
1.25	.42	.36	.31	.40	.34	.30	.32	.29	.25	
1.50	.46	.40	.35	.43	.38	.34	.36	.32	.29	
2.00	.52	.46	.42	.48	.44	.40	.41	.38	.34	
2.50	.55	.51	.46	.52	.48	.44	.45	.42	.38	
3.00	.58	.54	.50	.55	.51	.48	.48	.45	.41	
4.00	.62	.58	.55	.58	.55	.52	.52	.50	.45	
5.00	.64	.61	.58	.61	.58	.55	.55	.53	.48	

TCH 751 - 4 TL40W

ROOM INDEX	REFLECTANCES	751	731	711	551	531	511	331	311	000
0.60	.24	.19	.16	.23	.19	.16	.18	.16	.14	
0.80	.29	.24	.21	.28	.24	.21	.23	.20	.19	
1.00	.33	.29	.25	.32	.29	.25	.27	.24	.23	
1.25	.37	.33	.30	.36	.32	.29	.31	.28	.27	
1.50	.40	.36	.33	.39	.35	.32	.34	.32	.30	
2.00	.45	.41	.38	.43	.40	.37	.39	.37	.34	
2.50	.48	.45	.42	.46	.43	.41	.42	.40	.38	
3.00	.50	.47	.44	.48	.46	.43	.44	.42	.40	
4.00	.52	.50	.48	.50	.48	.47	.47	.45	.43	
5.00	.54	.52	.50	.52	.50	.49	.49	.47	.45	

Escolha do Nível de Iluminação

A escolha do nível de iluminação poderá obedecer a tabela abaixo, onde os valores do lado direito são indicados como mínimos e os do lado esquerdo como desejáveis ou bons.

Mínimo para ambiente de trabalho	150 lux
Tarefas visuais simples e variadas (trabalho bruto)	500-250 lux
Observações contínuas de detalhes médios e finos (trabalho normal)	1000-500 lux
Tarefas visuais contínuas e precisas (trabalho fino, por ex. desenho)	2000-1000 lux
Trabalho muito fino (geralmente iluminação local, ex. conserto de relógio)	acima de 2000 lux

Fator de Depreciação (d)

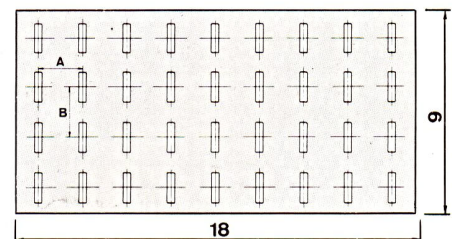
Com o tempo, paredes e teto ficarão sujos. Os equipamentos de iluminação acumularão poeira.

As lâmpadas fornecerão menor quantidade de luz. Alguns desses fatores poderão ser eliminados por meio de manutenção. Na prática, para amenizarmos o efeito desses fatores, admitindo-se uma boa manutenção periódica, podemos adotar os valores seguintes de fator de depreciação.

AMBIENTE	PERÍODO DE MANUTENÇÃO		
	2.500 hs	5.000 hs	7.500 hs
Limpo	0,95	0,91	0,88
Normal	0,91	0,85	0,80
Sujo	0,80	0,66	0,57

Distribuição das Luminárias

O espaçamento entre as luminárias depende de sua altura ao plano de trabalho (altura útil) e da sua distribuição de luz. Esse valor situa-se, geralmente, entre 1 a 1,5 vez a altura útil, em ambas as direções. O espaçamento até as paredes deverá corresponder à metade desse valor. Em nosso exemplo, você poderá distribuir as 36 luminárias do seguinte modo:



$$A = 18/9 = 2,0 \text{ m}$$

$$B = 9/4 = 2,25 \text{ m}$$

Mas, além da solução aqui apresentada, eventuais distribuições tendo A e B menores que 3,3 metros (1,5 vezes a altura útil), serão igualmente aceitáveis.

Fluxo Luminoso das Lâmpadas

LÂMPADAS FLUORESCENTES	
Código Comercial	Fluxo Luminoso (lm)
TLDRS HF Electronic	
TLDRS 16/64	1.020
TLDRS 16/84	1.250
TLDRS 32/64	2.500
TLDRS 32/84	2.900
TLD e TLRS	
TLD 15/75	840
TLD 30/75	2.000
TLRS 20/27	650
TLRS 20/34	760
TLRS 20/37	650
TLRS 20/75	1.060
TLRS 40/27	1.700
TLRS 40/34	2.020
TLRS 40/37	1.700
TLRS 40/75	2.700
TLRS 65/27	2.800
TLRS 65/34	3.200
TLRS 65/37	2.850
TLRS 65/75	4.500
TLRS 110/75	8.300

LÂMPADAS A VAPOR DE MERCÚRIO	
Código Comercial	Fluxo Luminoso (lm)
HPL-N 80	3.600
HPL-N 125	6.000
HPL-N 250	12.600
HPL-N 400	22.000
HPL-N 700	38.500
HPL-N 1.000	56.000

LÂMPADAS DE LUZ MISTA	
Código Comercial	Fluxo Luminoso (lm)
ML 160	3.000
ML 250	5.500
ML 500	13.500

LÂMPADAS A VAPOR METÁLICO	
Código Comercial	Fluxo Luminoso (lm)
HPI 400	27.600
HPI/T 400	31.500
HPI/T 1.000	81.000
HPI/T 2.000	183.000
HPI/T 2.000 U	189.000

LÂMPADAS A VAPOR DE SÓDIO DE ALTA PRESSÃO	
Código Comercial	Fluxo Luminoso (lm)
SON 70	5.800
SON 150	13.500
SON 250	25.000
SON 400	47.000
SON/T 250	27.000
SON/T 400	47.000
SON/T 1.000	130.000

LÂMPADAS DE HALOGÊNIO	
Código Comercial	Fluxo Luminoso (lm)
HA 300	5.100
HA 500	9.500
HA 1.000	22.000
HA 2.000	44.000
HAD 500/2	10.000
HAD 1.000	24.000

A Philips Iluminação mantém uma equipe técnica para prestar qualquer esclarecimento e, inclusive, elaborar o seu projeto de iluminação.

Tendo em vista a constante atualização tecnológica dos equipamentos Philips, eventuais modificações poderão ser efetuadas sem prévio aviso.

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