



Energy
saving

**EXAMPLE OF ENERGY-SAVING
RELIGHTING
OF LAWYER'S OFFICES
IN NICOSIA**

EUROPEAN STANDARD EN12464-1 : 2011

“LIGHT AND LIGHTING OF WORK PLACES”

THE EUROPEAN STANDARD EN12464-1 : 2011 “LIGHT AND LIGHTING OF WORK PLACES” STIPULATES THE MINIMUM LIGHTING REQUIREMENTS FOR WORK PLACES IN ACCORDANCE WITH THE TASKS AND INTENSITY OF WORK

Table 5.26 — Offices

Ref. no.	Type of area, task or activity	\bar{E}_m lx	UGR_L —	U_o —	R_a —	Specific requirements
5.26.1	Filing, copying, etc.	300	19	0,40	80	
5.26.2	Writing, typing, reading, data processing	500	19	0,60	80	DSE-work, see 4.9.
5.26.3	Technical drawing	750	16	0,70	80	
5.26.4	CAD work stations	500	19	0,60	80	DSE-work, see 4.9.
5.26.5	Conference and meeting rooms	500	19	0,60	80	Lighting should be controllable.
5.26.6	Reception desk	300	22	0,60	80	
5.26.7	Archives	200	25	0,40	80	

\bar{E}_m = Median light level on the work surface

UGR =Universal Glare Ratio

U_o = Uniformity av/min

R_a = Colour Rendering Index

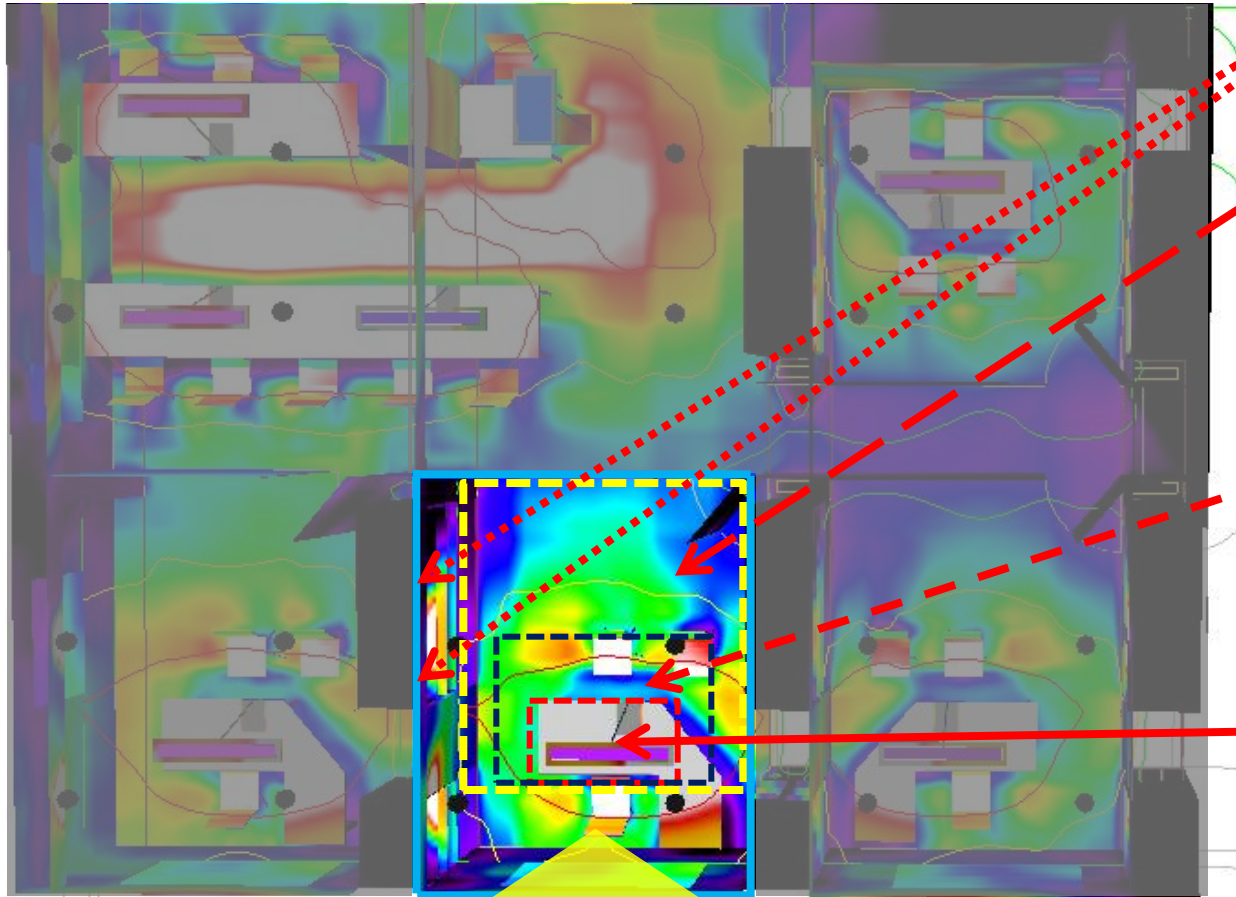


general surfaces
 $\bar{E}_m > 75 \text{ lx}$ with $U_o \geq 0,10$ walls
 $\bar{E}_m > 50 \text{ lx}$ with $U_o \geq 0,10$ ceiling

background area
 $\bar{E}_m > 100 \text{ lx}$
 $U_o \geq 0,10$

immediate surrounding area
 $\bar{E}_m > 300 \text{ lx}$
 $U_o \geq 0,40$

task area
 $\bar{E}_m > 500 \text{ lx}$
 $U_o \geq 0,60$



THE ADDITIONAL BENEFITS OF DAYLIGHT CAN COMPENSATE FOR THE LACK OF UNIFORMITY!!

EXISTING LIGHTING SCHEME OF TYPICAL OFFICE AREA

EXAMPLE LEGAL OFFICES



Lighting load: 2298W
Electricity cost: € 1288,00 p.a.*



*200 days x 10 hrs= 2000 hrs per year @ € 0.28/kwhr

PROPOSED ENERGY-SAVING LIGHTING OF TYPICAL OFFICE AREA



Lighting load: 696W
Electricity cost: €389,80 p.a*

>70% REDUCTION
OF ELECTRICAL CONSUMPTION
AND COST !



*200 days x 10 hrs= 2000 hrs per year @ € 0.28/kwhr

EXISTING LIGHTING SCHEME OF TYPICAL OFFICE AREA

DIALux

14.11.2013

J N Christofides Trading Ltd (Lighting Division)
C:\Documents and Settings\nicolaso\Desktop\JNC GREY logo.jpg
P.O.Box 21093
1501, Nicosia-CYPRUS

Operator: Nicholas Christofides
Telephone: 22 813043
Fax: 22 813046
e-Mail: nicolaso@jnc.co.cy

DIALux 4.11

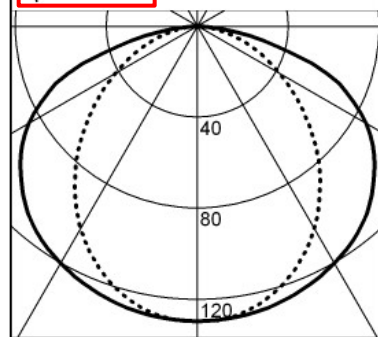


2x55W

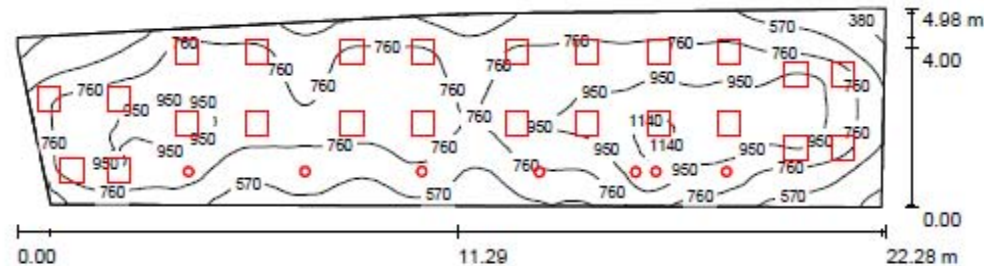
$\eta = 40\%$

A40

cd / klm



TYPICAL OFFICE AREA ORIGINAL / Summary



Height of Room: 2.800 m, Maintenance factor: 0.80

Values in Lux, Scale 1:160

Surface	ρ [%]	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	$u0$
Workplane	/	775	292	1222	0.378
Floor	20	686	349	980	0.509
Ceiling	70	149	98	286	0.659
Walls (6)	50	332	112	1311	/

Workplane:

Height: 0.850 m
Grid: 128 x 64 Points
Boundary Zone: 0.000 m

Luminaire Parts List

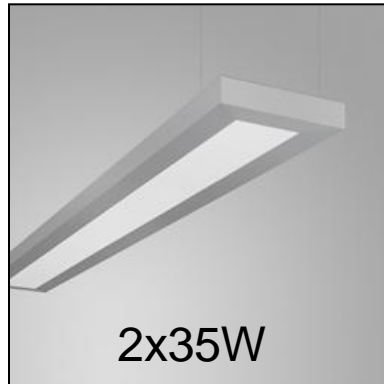
No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	7		2313	3500	54.0
2	24		3780	5400	80.0
Total:			106912	154100	2298.0

*Modified Technical Specifications

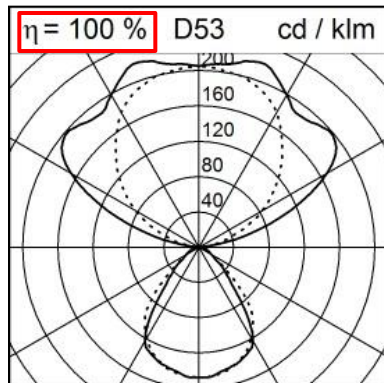
Specific connected load: $22.38 \text{ W/m}^2 = 2.89 \text{ W/m}^2/100 \text{ lx}$ (Ground area: 102.69 m^2)

EXAMPLE LEGAL OFFICES

PROPOSED LIGHTING SCHEME OF TYPICAL OFFICE AREA



2x35W



J N Christofides Trading Ltd (Lighting Division)
C:\Documents and Settings\nicolasc\Desktop\JNC GREY logo.jpg
P.o.Box 21093
1501, Nicosia-CYPRUS

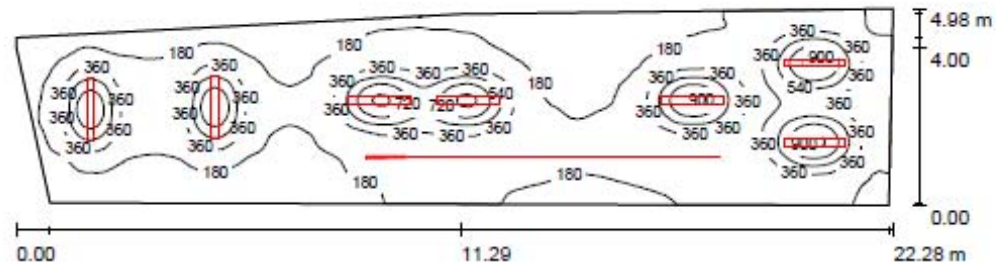
Operator: Nicholas Christofides
Telephone: 22 813043
Fax: 22 813046
e-Mail: nicolasco@jnc.co.cy

DIALux

14.11.2013

DIALux 4.11

TYPICAL OFFICE AREA PROPOSED SCHEME / Summary



Height of Room: 2.800 m, Maintenance factor: 0.80

Values in Lux, Scale 1:160

Surface	ρ [%]	E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0
Workplane	/	290	105	960	0.363
Floor	20	260	123	489	0.472
Ceiling	70	313	74	1011	0.235
Walls (6)	50	151	85	581	/

Workplane:

Height: 0.850 m
Grid: 128 x 64 Points
Boundary Zone: 0.000 m

Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	Φ (Luminaire) [lm]	Φ (Lamps) [lm]	P [W]
1	9	MACROLUX 1324.0127.. MX1_27 19.2w mt (1.000)	398	900	19.0
2	7	Regent 78W04.D15.7 ITEM (1.000)	6997	6600	75.0
Total:			52566	54300	696.0

Specific connected load: 6.78 W/m² = 2.34 W/m²/100 lx (Ground area: 102.69 m²)

Spreadsheet for assessing the cost-effectiveness of lighting systems

Project references

Project name

NEW BANK BRANCH - COMPARATIVE LIGHTING PROPOSAL

General data

Average electricity price	Euro / kWh	€ 0,25	assumed current rates
Electricity price inflation rate	%	0%	
Maintenance labour cost	Euro / hour	€ 25,00	assumed current rates
Labour cost inflation rate	%	0%	
Light source cost inflation rate	%	0%	
Disposal cost inflation rate	%	0%	
Discount rate	%	0%	
System lifetime	Year	15	
Time to replace one lamp:			
in the case of spot maintenance	Minute	10	
in the case of group maintenance	Minute	5	
Time to clean one luminaire	Minute	5	

Lighting systems' characteristics

DESCRIPTION OF LIGHTING SYSTEM		Bank's standard system	Proposed system
		Modular 600x600	Modular 600x600 high perf
Lamp			
Lamp Designation		T26 18W/840	T5 14W/840
Rated wattage of one lamp	Watt	18,00	14,00
Rated lifetime	Hour	12.000,00	15.000,00
Unit price	Euro / unit	€ 1,85	€ 3,95
Connecting device			
Power losses per connecting device (BALLAST LOSSES)	Watt	electronic ballast 8,00	electronic ballast 3,90
Unit price	Euro / unit	0,00	0,00
Luminaire assembly			
Make/model		standard 4X18W	3x14W High performance
Number of lamps per luminaire		4	3
Number of connecting device per luminaire (ballast)		1	1
Unit price of luminaire without lamp	Euro / unit	€ 35,00	€ 194,90
Unit price of luminaire with lamp(s) inside	Euro / unit	€ 42,40	€ 206,75
Power per luminaire (w/ lamps inside)	Watt	80,00	45,90
Control system			
Type of control system		nil	Daylight sensor
Estimated energy savings	%	0,00	35%
Unit price		€ 0,00	€ 42,30
Lighting system			
Number of luminaires		173	88
Number of control systems		nil	50
Total wattage of lighting system	Watt	13.840,00	4.039,20
Cost of cables for wiring the lighting system Euro 30,00/lum		€ 5.190,00	€ 2.850,00
Other equipment cost		0,00	0,00
Cost of equipment		€ 7.335,20	€ 20.309,00
total system cost		€ 7.335,20	€ 20.309,00

SAMPLE PAGE 1/2

Installation			
Cost for installing the lighting system Euro 10,00/luminaire		€ 1.730,00	€ 880,00
Cost of commissioning		€ 0,00	€ 0,00
Other cost(s) wiring at Euro 30,00 per lumin		€ 5.190,00	€ 2.850,00
Cost of installation		€ 6.920,00	€ 3.730,00
INITIAL COST		sum:	€ 14.255,20
		TOTAL INITIAL COST	€ 14.255,20
Operation			
Energy use			
Daily burning time (average)	Hour	10	10
Number of operating days per year		250	250
Yearly operating hours	Hour	2.500,00	2.500,00
Yearly energy consumption	kWh / year	34.600,00	6.563,70
Yearly energy cost	Euro	€ 8.650,00	€ 1.640,93
Lamp replacement		system total	€ 8.650,00
Type of lamp replacement		group	group
Number of minutes to replace one lamp	Minute	10,00	10,00
Disposal cost per lamp		€ 0,05	€ 0,05
Number of times one lamp is replaced during system's lifetime		3,13	2,20
Yearly cost for purchasing new lamps		€ 266,71	€ 152,94
Yearly cost for disposing old lamps		€ 7,21	€ 1,94
Yearly cost for installing new lamps		€ 600,69	€ 161,33
Yearly cost for lamp replacement		€ 874,61	€ 316,21
Luminaire cleaning		system total	€ 874,61
Time laps between two cleanings	Year	annual	annual
Number of times one luminaire is cleaned during system's lifetime		€ 5,00	€ 5,00
Yearly cost for luminaire cleaning		€ 120,14	€ 61,11
Total yearly maintenance cost		€ 994,75	€ 377,32
		system total	€ 994,75
		sum:	€ 10.519,36
		TOTAL YEARLY RUNNING COST	€ 10.519,36
Profitability			
Payback Time		Type of comparison	Proposed Upgrade vs Standard Lighting Installation
Savings		Years	1,20
Running costs		Months	14,34
Reduction in internal heat gains*		kWh / year	-28.036,30
Emissions		Euro / year	-€ 8.184,90
Economics over systems' lifetime -15 years		kwh/year	to be calculated
Running cost excluding inflation		Ton of CO2 / year	-14,02
percentage			
		€ 157.790,42	€ 35.016,94
		100%	22%
		SAVINGS OVER SYSTEMS LIFETIME	0,00
			-€ 122.773,48



Energy
saving

J N CHRISTOFIDES LIGHTING LTD

P.O.BOX 21093,
NICOSIA-1501,
CYPRUS

TEL. 22 813043

FAX. 22 813046

WWW.JNC.COM.CY