Fluorescent Lamps
Starters

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GTE Sylvania

Throughout the world, the word "Sylvania" has the same meaning... Sylvania means light.

Sylvania means light to live by, light to work by, light to play by. People everywhere recognise the Sylvania brand because they use so many Sylvania products in their everyday lives. They work under Sylvania fluorescent lamps, drive home at night along roads illuminated by Sylvania discharge lamps, admire monuments floodlit with Sylvania tungsten-halogen lamps, stop at Sylvania traffic lights, read the evening paper by Sylvania incandescent bulbs and even take pictures with Sylvania flashbulbs.

Light from Sylvania means a choice of more than 6,000 different lamp types:

Fluorescent Lamps – As short as 6 inches, as long as 8 feet, from 4 watts to 215 watts, in over a dozen different colours and in various shapes;

Display Lamps – Reflector lamps, crown-silvered lamps, globe lamps... for exciting and dramatic lighting effects in shops, department stores or in the home;

Tungsten-Halogen Lamps – Powerful lamps for flood-lighting, small lamps for projectors, special lamps for photo-copying machines, airports... in a large variety of wattages, voltages, bulb shapes and sizes;

Incandescent Lamps – Household bulbs, candles, round bulbs, coloured lamps, industrial lamps... in innumerable finishes, voltages and caps;

Discharge Lamps – For street lighting, industrial lighting, stadium lighting... an extensive range of mercury lamps, space-age high pressure sodium lamps, energy-saving low pressure sodium lamps;

Flashbulbs – From the inventor of the Flashcube and the Magicube and the world's largest manufacturer of flashbulbs;

Projector Lamps – The most complete range of projector lamps from the world's market leader;

Advanced Technology Lamps – Highly technical light sources, including tubular metal halide lamps for print curing, pulsed xenon arc tubes, ultra-violet cells and many more... for applications extending from medicine to space ships.

Sylvania is a pioneer and innovator in lighting. Scientists and engineers at the central research establishment and manufacturing companies throughout the world are constantly working on new innovations and product improvements. Long before the "energy crisis", Sylvania's engineers were concerned with energy conservation. High efficacy Sylvania "Tri-Phosphor" fluorescent and plug-in high pressure sodium lamps are proof of Sylvania's far-sighted and innovative approach to lamp development.

Some 90% of the Sylvania lamps sold in Europe are made in Europe in our own factories. Sylvania's capability in designing and building high-speed, automatic lamp-making machines has been of fundamental importance to its success in the lighting business. To illustrate: at our 400,000 square foot plant in Erlangen, West Germany, each one of our "horizontal" fluorescent machines produces lamps at a rate faster than one per second – more than 3,600 lamps per hour.

The total production process of the 250 foot long machines, includes a quality test after every stage being monitored and controlled electronically using computer-type techniques.

Also at Erlangen are the most up-to-date rotating – bending and exhaust machines for circular fluorescent lamps and equipment for making tungsten-halogen and discharge lamps.

In Yorkshire, England the company has two factories which house Sylvania's largest miniature fluorescent lamp production line, as well as machines for special fluorescent and a wide range of display lamps.

Flashcubes, Magicubes and other advanced flash arrays are produced by the hundred million at our factory in Tienen, Belgium.

Large-volume household incandescent lamps are produced on new, high-speed "Twin-Head" machines in the Sylvania incandescent lamp factory in Belgium. While millions of other incandescent lamp types are made in Vicenza, Italy and the United Kingdom.

Sylvania's research and development, investment in modern manufacturing plants and wide range of products all have one aim – to serve our customers. To Sylvania, service means... a local company with local people fully-stocked warehouses throughout Europe... sales offices... technical advisors... a fleet of delivery vans... and, most important of all, the spirit and enthusiasm which puts Sylvania service into action!

GTE Sylvania is part of the General Telephone and Electronics group, one of the largest industrial companies in the world with sales exceeding 7 billion dollars.

The wide range of GTE's business interests includes lamps, lighting products, radio and television sets, colour and black-and-white picture tubes, microwave and data transmission systems, satellite communications, data processing and operating companies serving some 13 million telephones.

Almost 200,000 people throughout the world are making lamps... building communications systems... working in laboratories to develop new light sources... designing new, high-quality home entertainment products... probing the unknown in research centres to discover new products and techniques for the future. GTE is an organisation dedicated to providing advanced products and unrivalled service to the most important people of all... our customers.

Functional Packaging

Colour-Coded Labels

Sylvania fluorescent lamps are produced in a wide range of colours, each being clearly identified by its own colour code. Each label shows exactly what is inside the carton in terms of lamp type... wattage... colour, etc.

Service Pack

Sylvania fluorescent lamps are also available in Service Packs to save time and effort during bulk replacement. The lamps stand upright for easy handling and the top of the carton becomes a container for used lamps.

Functional Packaging

Sylvania fluorescent packaging protects the lamps from damage during transport, while our unique colour coding assists handling.

Quality First

Sylvania fluorescent lamps far exceed, in many aspects, the requirements of the International Electrotechnical Commission (IEC) and the British Standards Institution (BSI).
The Sylvania brand on a lamp is an assurance of quality.

Sylvania quality is built on the sound foundations of quality materials... quality manufacturing techniques... and quality control, each being subject to stringent tests which assure reliability.
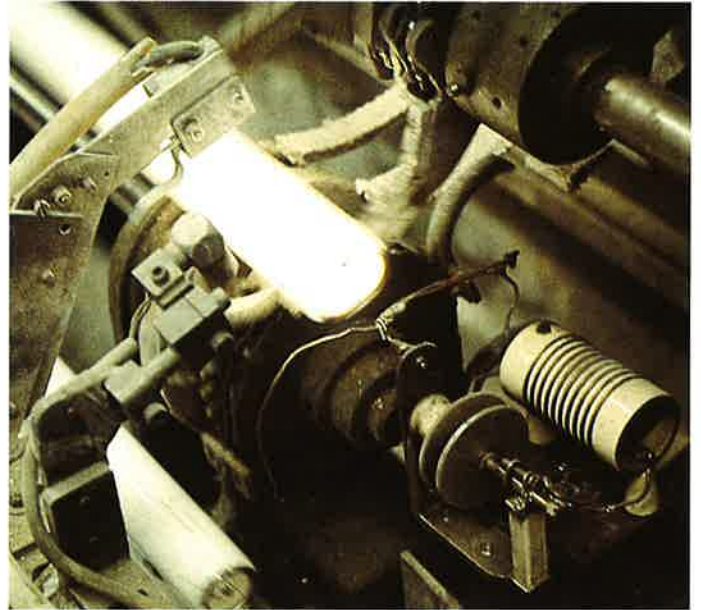
High Emission Cathodes
The performance of Sylvania fluorescent lamps depends to a large degree on the design and quality of the cathodes. Sylvania fluorescent lamps have special high emission cathodes capable of producing the electrons required to start and reliably operate a lamp for thousands of hours.
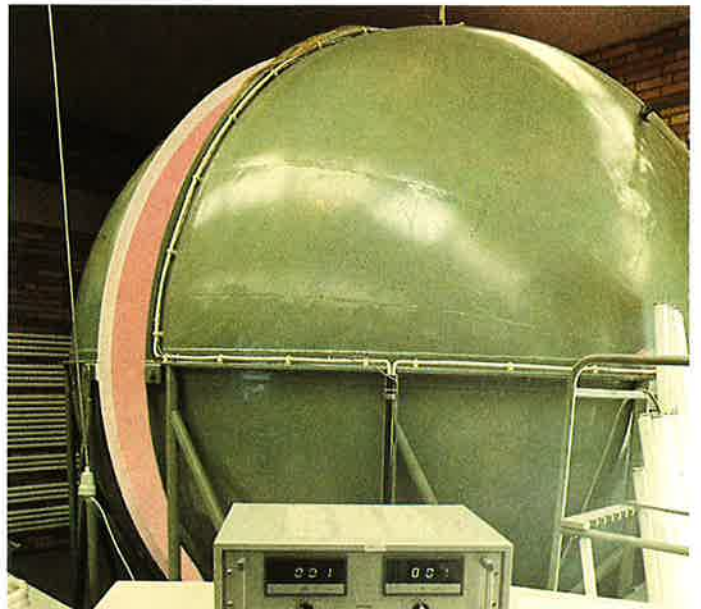

High Precision, High Purity Gas Filling
The crucial factor influencing the light output and life of a fluorescent lamp is the purity of its gas filling.
Sylvania's unique manufacturing process controls the gas mixture and filling pressure extremely accurately. Every lamp is automatically tested during the manufacturing process to ensure correct filling.

Manufacturing Leadership

In the 1930's Sylvania was one of the first companies in the world to manufacture fluorescent lamps on a large scale. Since that time Sylvania has taken advantage of its world leadership to continually improve lamp designs, search for new raw materials and develop more efficient manufacturing processes and equipment. An excellent example of Sylvania's leadership in technology was the introduction during the early 1940's of the first "horizontal" fluorescent lamp making machine.
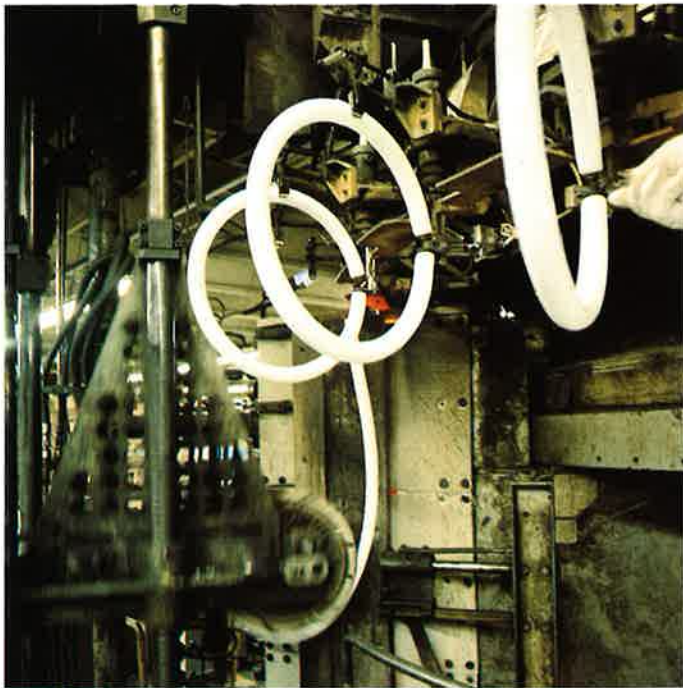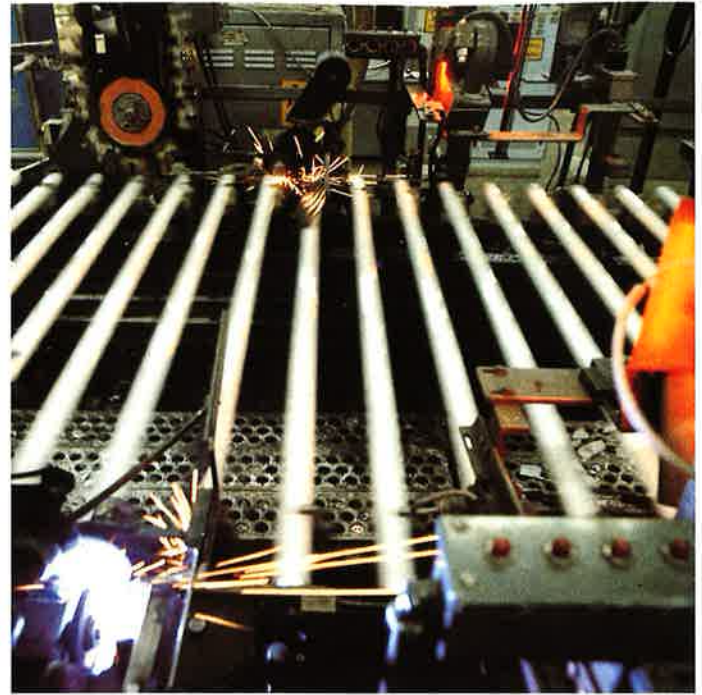
Circular fluorescent lamps are made on one of Sylvania's most advanced pieces of equipment. Straight tubes, previously phosphor coated, are automatically heated and bent. Special phosphors have been carefully selected to ensure that their performance characteristics are unaffected by the high temperature required for the bending process.
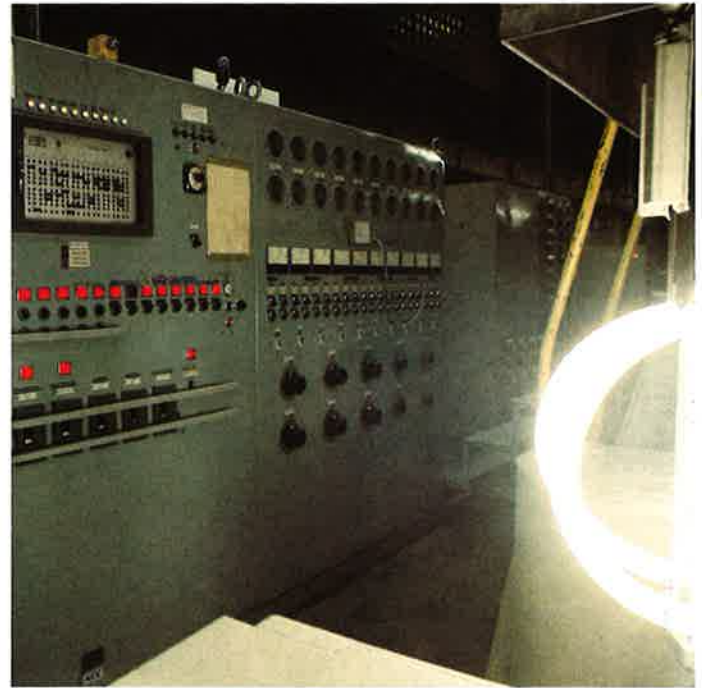
Sylvania's fully automated manufacturing process is tightly controlled and supervised from the control unit: from coating processes and cathode assemblies to lamp packaging, all operations are carried out by a series of fully synchronized machines with warning devices which indicate any malfunction thus preventing components passing to another stage after missing the previous one. Each lamp is lit to stabilize its operating characteristics; any lamp which fails to work normally is automatically rejected.
Sylvania's unique manufacturing capabilities guarantee the highest standards of quality.
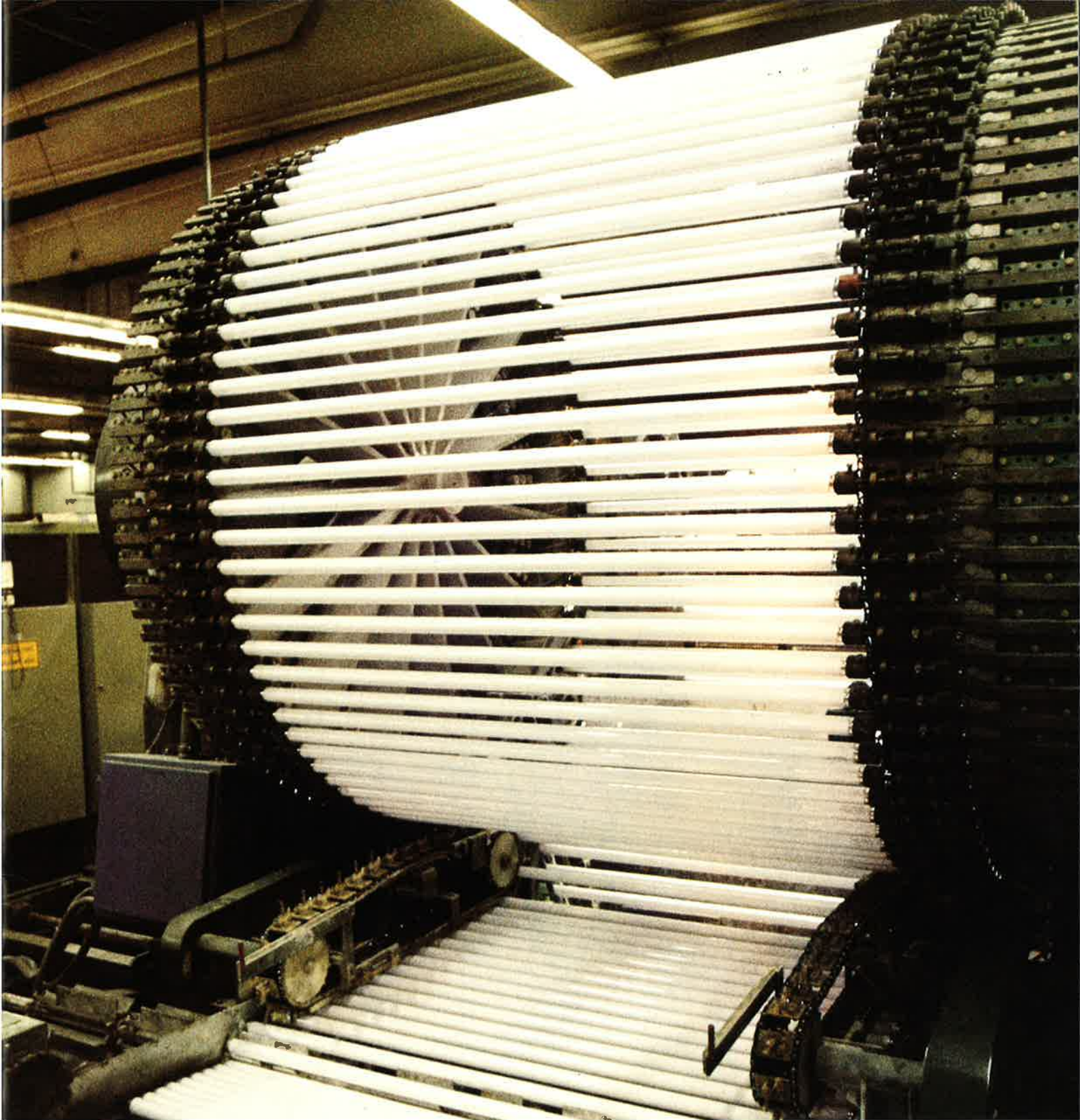
Sylvania High-Speed Machinery

Sylvania's high speed fluorescent lamp making machine was the first to actually combine efficient productivity with reliable quality.

Sylvania's unique "horizontal" manufacturing process has made it possible to manufacture lamps at rates exceeding one per second and at the same time to dramatically improve quality: a flush-through technique forces argon gas into one end of the tube and draws air and impurities from the other.

This technique guarantees uniformity and assures continuity in quality and dependability.

Multiply by 0.01 for Watts/nm

F40W/IF
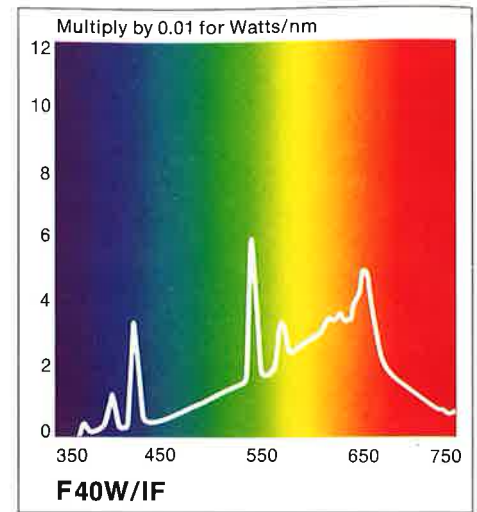
Lamp Colours and Applications

Sylvania fluorescent lamps are available in a wide range of colours.

Incandescent-Fluorescent lamps create a much warmer appearance, making them suitable for domestic and commercial applications where a decorative effect is required.

Multiply by 0.01 for Watts/nm

F40W/WWX
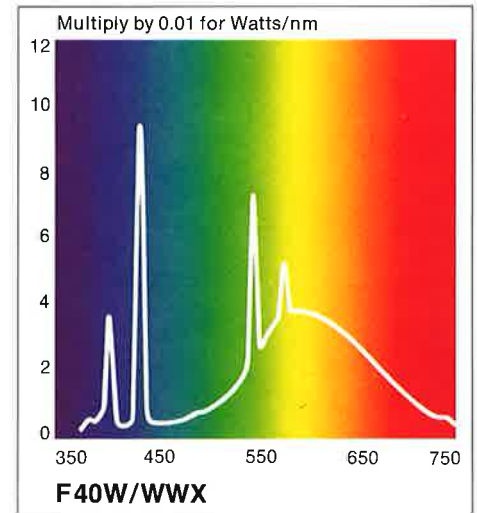
Warm White Deluxe fluorescent lamps create a rich atmosphere, suitable for prestige applications.

Multiply by 0.01 for Watts/nm

F40W/WW
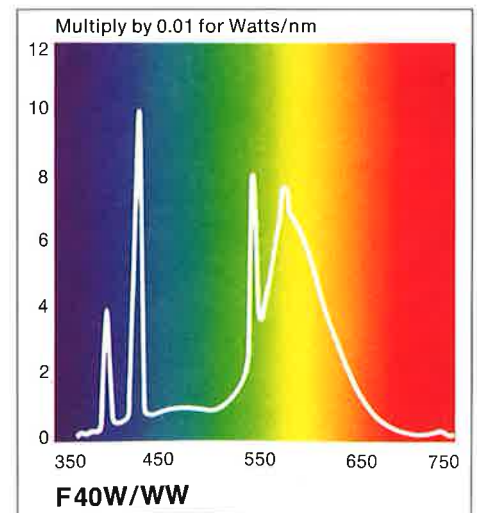
Warm White fluorescent lamps are of a higher efficiency with a warm colour appearance making them suitable for general illumination.

Multiply by 0.01 for Watts/nm

F40W/W

White fluorescent lamps are high efficiency, general purpose lamps, used where lighting levels are important.

Multiply by 0.01 for Watts/nm

F40W/CWX
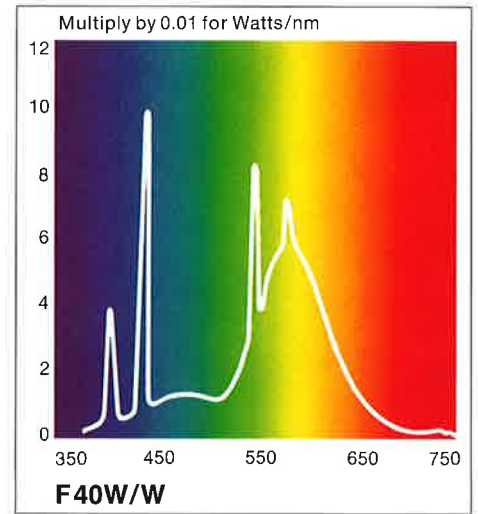
Cool White Deluxe fluorescent lamps create a more luxurious atmosphere, making them ideal for department stores, etc.

Multiply by 0.01 for Watts/nm

F40W/UW
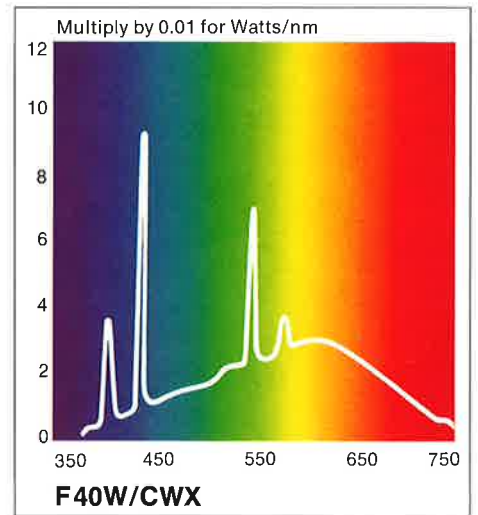
Universal White fluorescent lamps provide an intermediate colour appearance, and are suitable for general illumination in offices and schools.

Multiply by 0.01 for Watts/nm

F40W/CW
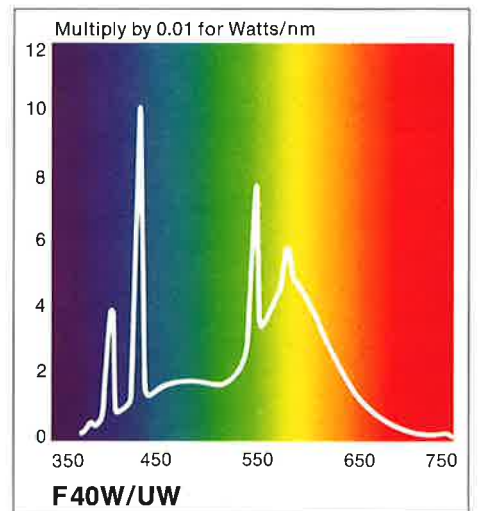
Cool White (Daylight UK) fluorescent lamps blend well with Natural Daylight, giving a cool appearance suitable for industrial applications.

Multiply by 0.01 for Watts/nm

F40W/N
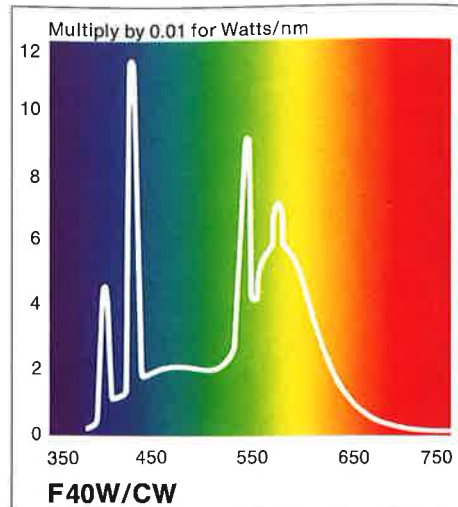
Natural fluorescent lamps enhance the red colours and are typically used in butchers' shops to display meat products to their full advantage.

Multiply by 0.01 for Watts/nm

F40W/D
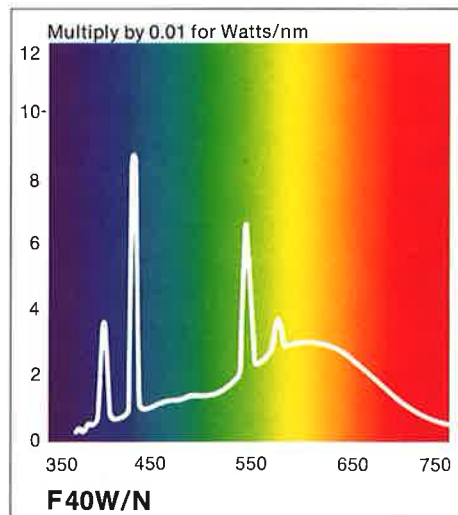
Daylight 6500K fluorescent lamps produce a cool, bluish atmosphere, and are often used in tropical climates.

Index of Lamp Types

Colour Descriptions and Abbreviations

W	White	GRO	Gro-Lux®	
WW	Warm White	GRO-WS	Gro-Lux® Wide Spectrum	
WWX	Warm White Deluxe	BL	Blacklight	
CW	Cool White	BLB	Blacklight-Blue	
CWX	Cool White Deluxe	B	Blue	
D	Daylight	GO	Gold	
UW	Universal White	G	Green	
N	Natural	PK	Pink	
IF	Incandescent-Fluorescent	R	Red	

Tri-Phosphor Lamps

A new generation of fluorescent lamps from Sylvania featuring high light output, efficacy and excellent colour rendering. 50% more light than from Standard Deluxe colour lamps.

Colour Description:
Cool White Deluxe 84
Correlated Colour
Temperature: 4000° K
Chromaticity
Coordinates: x = 0.382
y = 0.382

Colour Description:
Warm White Deluxe 83
Correlated Colour
Temperature: 3000° K
Chromaticity
Coordinates: x = 0.435
y = 0.405
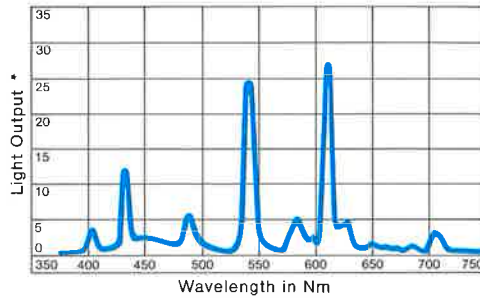
'Spectral Energy Distribution of Lamp Colour CWX 84'
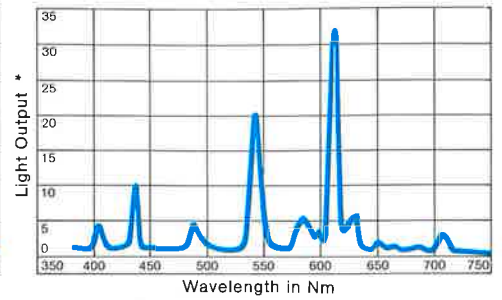
'Spectral Energy Distribution of Lamp Colour WWX 83'

* Multiply with 0.01 to obtain Watt/nm for a 40 W lamp

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ø	L	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
40	F40W/CWX84	Cool White Deluxe 84	00862	25	38	1200	G13	3200	80
40	F40W/WWX83	Warm White Deluxe 83	00863	25	38	1200	G13	3200	80
65	F65W/CWX84	Cool White Deluxe 84	00864	25	38	1500	G13	5100	80
65	F65W/WWX83	Warm White Deluxe 83	00865	25	38	1500	G13	5100	80

Reflector Lamps (235° REFL.)
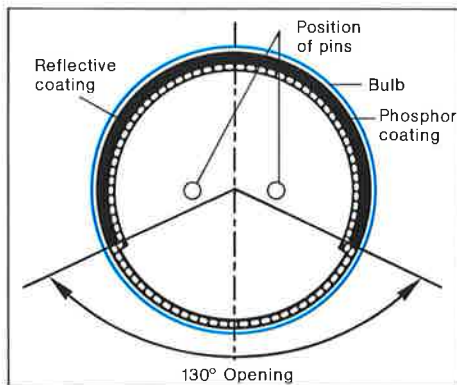
Cross Section of Lamp. Indication of opening, description of pin position, reflective coating, phosphor
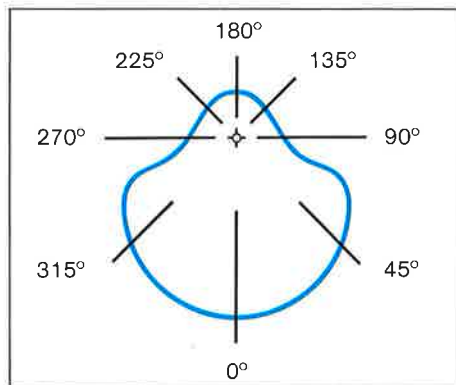
Polar Intensity Diagram

Sylvania reflector lamps are equipped with a highly reflective coating ensuring that the major part of the light produced is directed through the open, phosphor coated section. The opposite diagram gives a typical distribution of light emission.

Applications are in strip fixtures on ceilings with poor reflectance, industrial fixtures in dusty locations, installations with high lighting points.

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ø	L	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
40	FR40W/W	White	00189	25	38	1200	G13	2700	67
40	FR40W/CW	Cool White	00190	25	38	1200	G13	2700	67
65	FR65W/W	White	00416	25	38	1500	G13	4400	68
65	FR65W/CW	Cool White	00417	25	38	1500	G13	4400	68

Standard Fluorescent Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
					∅	Nom.	Max.			
20	F20W/W	White	00102	25	38	600	590	G13	1250	62
20	F20W/CW	Cool White	00103	25	38	600	590	G13	1250	62
20	F20W/WW	Warm White	00104	25	38	600	590	G13	1250	62
20	F20W/D	Daylight	00101	25	38	600	590	G13	950	47
20	F20W/UW	Universal White	00107	25	38	600	590	G13	1080	54
20	F20W/CWX	Cool White Deluxe	00106	25	38	600	590	G13	850	42
20	F20W/WWX	Warm White Deluxe	00105	25	38	600	590	G13	850	42
25	F25W/W/1M	White	00392	25	38	1M	970	G13	1800	72
25	F25W/CW/1M	Cool White	00393	25	38	1M	970	G13	1800	72
25	F25W/WW/1M	Warm White	00394	25	38	1M	970	G13	1800	72
25	F25W/D/1M	Daylight	00391	25	38	1M	970	G13	1450	58
25	F25W/UW/1M	Universal White	00517	25	38	1M	970	G13	1500	60
25	F25W/CWX/1M	Cool White Deluxe	00396	25	38	1M	970	G13	1200	48
25	F25W/WWX/1M	Warm White Deluxe	00395	25	38	1M	970	G13	1200	48
40	F40W/W	White	00171	25	38	−	1200	G13	3200	80
40	F40W/CW	Cool White	00172	25	38	−	1200	G13	3200	80
40	F40W/WW	Warm White	00173	25	38	−	1200	G13	3200	80
40	F40W/D	Daylight	00170	25	38	−	1200	G13	2500	63
40	F40W/UW	Universal White	00176	25	38	−	1200	G13	2500	63
40	F40W/CWX	Cool White Deluxe	00175	25	38	−	1200	G13	2000	50
40	F40W/WWX	Warm White Deluxe	00174	25	38	−	1200	G13	2000	50
40	F40W/W/1M	White	00398	25	38	1M	970	G13	2800	70
40	F40W/CW/1M	Cool White	00399	25	38	1M	970	G13	2800	70
40	F40W/WW/1M	Warm White	00400	25	38	1M	970	G13	2800	70
40	F40W/UW/1M	Universal White	00403	25	38	1M	970	G13	2300	58
65	F65W/W	White	00405	25	38	−	1500	G13	5100	79
65	F65W/CW	Cool White	00406	25	38	−	1500	G13	5100	79
65	F65W/WW	Warm White	00407	25	38	−	1500	G13	5100	79
65	F65W/D	Daylight	00404	25	38	−	1500	G13	3900	60
65	F65W/UW	Universal White	00410	25	38	−	1500	G13	4000	62
65	F65W/CWX	Cool White Deluxe	00409	25	38	−	1500	G13	3300	51

Natural-Colour Lamps

This lamp colour with increased red ratio creates a particularly appealing aspect of meat products, vegetable and flowers, by giving them a fresh and natural colour.

A Sylvania lamp for highest display standards in food stores, butchers' shops, flower shops etc.

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ø	Length Nom.	Max.	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
14	F14W/N	Natural	00053	24	38	–	360	G13	460	33
15	F15W/N	Natural	00087	24	38	–	437	G13	500	33
20	F20W/N	Natural	00109	25	38	600	590	G13	720	36
30	F30W/T8/N	Natural	00149	25	26	900	895	G13	1500	50
40	F40W/N	Natural	00178	25	38	–	1200	G13	1860	47
65	F65W/N	Natural	00413	25	38	–	1500	G13	2800	43

Very High Output (VHO) Lamps

Sylvania HO and VHO high per-formance lamps are characterized by higher power loading and conse-quently higher light output than same size standard lamps. Special pressure control centers at each end of the lamp maintain efficient operating conditions in the lamp. As the respective diagrams are showing, HO and VHO lamps reach their maximum light output already at lower ambient temperatures than standard lamps which makes them particularly efficient light sources in localities with low average ambient temperatures.
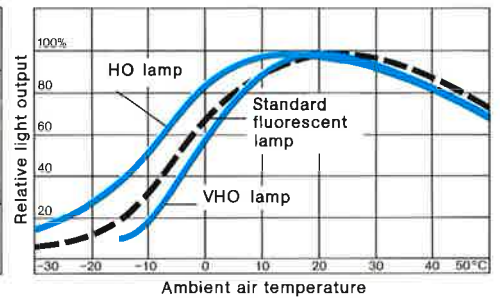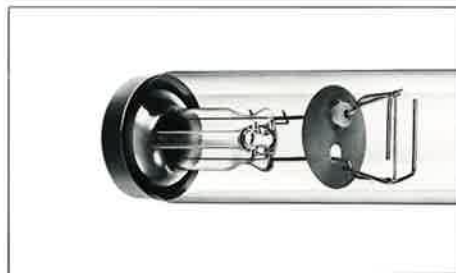
The Pressure Control Center of HO and VHO Lamps

Relative Light Output versus Ambient Temperature

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ø	Length Nom.	Max.	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
115	F48T12/W/VHO	White	00223	24	38	48″	1166	R17d	6400	56
115	F48T12/CW/VHO	Cool White	00224	24	38	48″	1166	R17d	6750	59
115	F42T12/WW/VHO	Warm White	00225	24	38	48″	1166	R17d	6400	56
115	F48T12/D/VHO	Daylight	00222	24	38	48″	1166	R17d	5600	49
115	F48T12/CWX/VHO	Cool White Deluxe	00227	24	38	48″	1166	R17d	5000	43
135	F60T12/CW/VHO	Cool White	00344	24	38	60″	1471	R17d	9000	67
160	F72T12/W/VHO	White	00268	12	38	72″	1776	R17d	10300	64
160	F72T12/CW/VHO	Cool White	00269	12	38	72″	1776	R17d	10900	68
160	F72T12/WW/VHO	Warm White	00270	12	38	72″	1776	R17d	10300	64
160	F72T12/D/VHO	Daylight	00267	12	38	72″	1776	R17d	9400	59
215	F96T12/W/VHO	White	00306	12	38	96″	2385	R17d	14000	65
215	F96T12/CW/VHO	Cool White	00307	12	38	96″	2385	R17d	15000	70
215	F96T12/WW/VHO	Warm White	00308	12	38	96″	2385	R17d	14000	65
215	F96T12/D/VHO	Daylight	00305	12	38	96″	2385	R17d	12400	58
215	F96T12/CWX/VHO	Cool White Deluxe	00310	12	38	96″	2385	R17d	11000	51
215	FR96T12/CW/VHO/135*	Cool White	00387	12	38	96″	2385	R17d	14500	67
215	FR96T12/CW/VHO/235*/1	Cool White	00348	12	38	96″	2385	R17d	12500	58

*see schema under Reflector Lamps page 11

High Output (HO) Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
					∅	Length Nom.	Max.			
32	F24T12/CW/HO	Cool White	00130	24	38	24″	557	R17d	1700	53
32	F24T12/WW/HO	Warm White	00131	24	38	24″	557	R17d	1700	53
32	F24T12/D/HO	Daylight	00129	24	38	24″	557	R17d	1400	44
44	F36T12/CW/HO	Cool White	00331	24	38	36″	861	R17d	2900	66
60	F48T12/W/HO	White	00217	24	38	48″	1166	R17d	4300	72
60	F48T12/CW/HO	Cool White	00218	24	38	48″	1166	R17d	4300	72
60	F48T12/WW/HO	Warm White	00219	24	38	48″	1166	R17d	4300	72
60	F48T12/D/HO	Daylight	00216	24	38	48″	1166	R17d	3600	60
60	F48T12/CWX/HO	Cool White Deluxe	00221	24	38	48″	1166	R17d	3050	51
70	F60T12/CW/HO	Cool White	00334	24	38	60″	1471	R17d	5400	77
70	F60T12/D/HO	Daylight	00333	24	38	60″	1471	R17d	4600	66
76	F64T12/CW/HO	Cool White	00336	24	38	64″	1573	R17d	5800	76
76	F64T12/D/HO	Daylight	00335	24	38	64″	1573	R17d	4900	64
85	F72T12/W/HO	White	00262	12	38	72″	1776	R17d	6475	76
85	F72T12/CW/HO	Cool White	00263	12	38	72″	1776	R17d	6650	78
85	F72T12/WW/HO	Warm White	00264	12	38	72″	1776	R17d	6475	76
85	F72T12/D/HO	Daylight	00261	12	38	72″	1776	R17d	5450	64
85	F72T12/CWX/HO	Cool White Deluxe	00266	12	38	72″	1776	R17d	6650	78
85	F72T12/WWX/HO	Warm White Deluxe	00265	12	38	72″	1776	R17d	4550	54
95	F84T12/CW/HO	Cool White	00339	12	38	84″	2081	R17d	7800	82
95	F84T12/D/HO	Daylight	00338	12	38	84″	2081	R17d	6600	69
100	F100T12/CW/HO	Cool White	00340	12	38	72″	1786	G20	6950	70
110	F96T12/W/HO	White	00299	12	38	96″	2385	R17d	9200	84
110	F96T12/CW/HO	Cool White	00300	12	38	96″	2385	R17d	9050	82
110	F96T12/WW/HO	Warm White	00301	12	38	96″	2385	R17d	9200	84
110	F96T12/D/HO	Daylight	00298	12	38	96″	2385	R17d	7800	71
110	F96T12/CWX/HO	Cool White Deluxe	00303	12	38	96″	2385	R17d	6400	58
110	F96T12/WWX/HO	Warm White Deluxe	00302	12	38	96″	2385	R17d	6400	58

Incandescent-Fluorescent (IF) Lamps

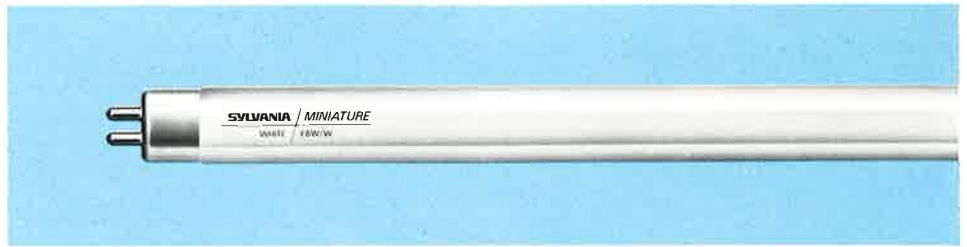| Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
					∅	Length Nom.	Max.			
14	F14W/IF	Inc/Fluo	00056	24	38	−	360	G13	350	25
20	F20W/IF	Inc/Fluo	00111	24	38	600	590	G13	675	34
30	F30W/T8/IF	Inc/Fluo	00151	24	26	900	895	G13	1200	40
40	F40W/IF	Inc/Fluo	00179	24	38	−	1200	G13	1750	44

Special Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
					⌀	Length Nom.	Max.			
14	F14W/W	White	00047	24	38	—	360	G13	700	50
14	F14W/CW	Cool White	00048	24	38	—	360	G13	675	48
14	F14W/T8/CW	Cool White	00039	24	26	—	360	G13	750	54
14	F14W/WW	Warm White	00049	24	38	—	360	G13	700	50
14	F14W/D	Daylight	00046	24	38	—	360	G13	585	42
15	F15W/T8/W	White	00063	25	26	—	437	G13	900	60
15	F15W/T8/CW	Cool White	00064	25	26	—	437	G13	880	59
15	F15W/T8/WW	Warm White	00065	25	26	—	437	G13	900	60
15	F15W/T8/D	Daylight	00062	25	26	—	437	G13	750	50
15	F15W/T8/CWX	Cool White Deluxe	00067	24	26	—	437	G13	620	41
15	F15W/T8/WWX	Warm White Deluxe	00066	25	26	—	437	G13	640	43
15	F15W/W	White	00081	24	38	—	437	G13	800	53
15	F15W/CW	Cool White	00082	24	38	—	437	G13	780	52
15	F15W/WW	Warm White	00083	24	38	—	437	G13	800	53
15	F15W/D	Daylight	00080	24	38	—	437	G13	650	43
18	F18W/T8/CW/K24"	Cool White	00093	24	26	24"	590	G13	1175	65
18	F18W/T8/CW/K26"	Cool White	00095	24	26	26"	641	G13	1275	71
18	F18W/T8/CW/K28"	Cool White	00097	24	26	28"	691	G13	1350	75
18	F18W/T8/CW/K30"	Cool White	00099	24	26	30"	742	G13	1400	78
25	F25W/CW/28"	Cool White	00133	24	38	28"	691	G13	1700	68
25	F25W/CW/30"	Cool White	00136	25	38	30"	742	G13	1800	72
25	F25W/CW/33"	Cool White	00139	24	38	33"	818	G13	1820	73
25	F25W/WW/30"	Warm White	00374	25	38	30"	742	G13	1800	72
30	F30W/T8/W	White	00143	25	26	900	895	G13	2230	74
30	F30W/T8/CW	Cool White	00144	25	26	900	895	G13	2200	73
30	F30W/T8/WW	Warm White	00145	25	26	900	895	G13	2230	74
30	F30W/T8/D	Daylight	00142	25	26	900	895	G13	1900	63
30	F30W/T8/WWX	Warm White Deluxe	00146	25	26	900	895	G13	1580	53
30	F30W/T8/CWX	Cool White Deluxe	00147	25	26	900	895	G13	1580	53
30	F30W/WW/RS	Warm White	00169	24	38	900	895	G13	2360	79
30	F30W/D/RS	Daylight	00165	24	38	900	895	G13	1700	57
42	F42W/CW	Cool White	00366	25	38	—	1047	G13	3200	76
42	F42W/UW	Universal White	00466	25	38	—	1047	G13	2500	60

Miniature Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ∅	Length Nom.	Length Max.	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
4	F4W/D	Daylight	00001	25	16	150	136	G5	115	29
4	F4W/W	White	00002	25	16	150	136	G5	130	33
4	F4W/CW	Cool White	00003	25	16	150	136	G5	140	35
6	F6W/D	Daylight	00011	25	16	225	212	G5	220	37
6	F6W/W	White	00012	25	16	225	212	G5	280	47
6	F6W/CW	Cool White	00013	25	16	225	212	G5	280	47
6	F6W/WW	Warm White	00014	25	16	225	212	G5	280	47
8	F8W/D	Daylight	00019	25	16	300	288	G5	340	43
8	F8W/W	White	00020	25	16	300	288	G5	440	55
8	F8W/CW	Cool White	00021	25	16	300	288	G5	440	55
8	F8W/WW	Warm White	00382	25	16	300	288	G5	440	55
13	F13W/D	Daylight	00029	25	16	525	517	G5	700	54
13	F13W/W	White	00030	25	16	525	517	G5	880	68
13	F13W/CW	Cool White	00031	25	16	525	517	G5	880	68
13	F13W/WW	Warm White	00032	25	16	525	517	G5	880	68

Germicidal Lamps
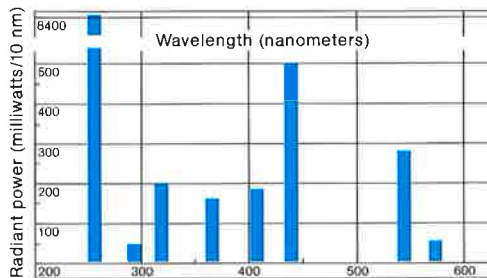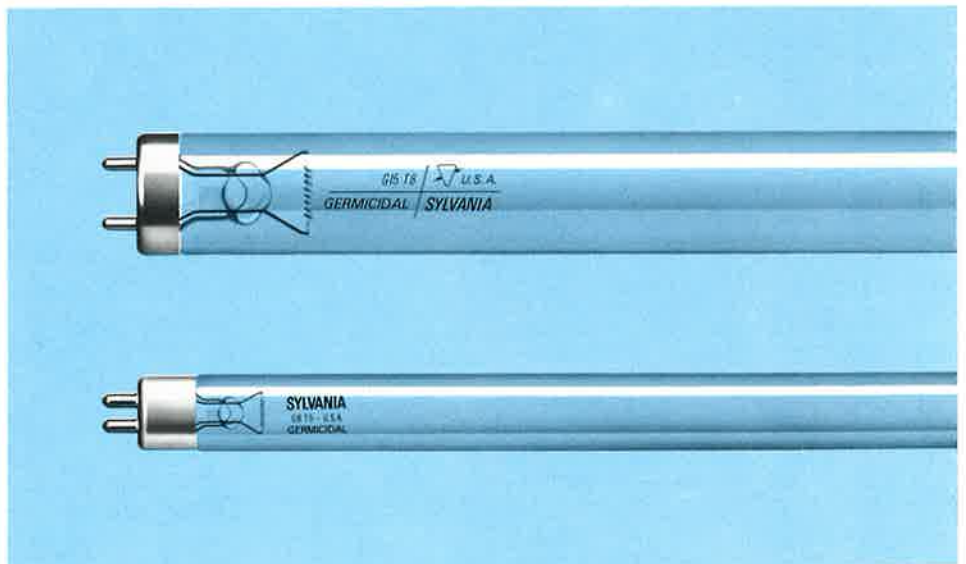
Typical Radiant Power Distribution of A G30T8 Lamp

Sylvania germicidal lamps radiate more than 85% of their energy at a wavelength of 253.7 nm in the ultra-violet spectrum, a radiation which kills bacteria and other micro-organism. Little radiation is emitted at 184.9 nm producing small amounts of ozone which is deodorant and, in the presence of water vapour is bactericidal and fungicidal.

Sylvania germicidal lamps are used for sterilization (and desodorization) of air, gases, liquids and surfaces of solids as for i.e. in air conditioning systems, hospitals, food processing industries, breweries etc.

Safety Precautions: The emitted radiation is harmful to skin and eyes. Direct exposure must be avoided.

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ∅	Length Nom.	Length Max.	Cap	Ultra-violet radiation Output at 253,7 nm (W)	Power density at 1 M (mW/cm²)
8	G8T5	Germicidal	00501	24	16	300	288	G5	1,4	15
15	G15T8	Germicidal	00502	24	26	–	437	G13	3,3	35
30	G30T8	Germicidal	00503	24	26	900	895	G13	8,4	80

Slimline Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ø	Length Nom.	Length Max.	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
21	F24T12/CW	Cool White	00127	24	38	24″	541	Fa8	1190	57
21	F24T12/D	Daylight	00125	24	38	24″	541	Fa8	1030	49
25	F42T6/W	White	00198	24	19	42″	998	Fa8	1900	76
25	F42T6/CW	Cool White	00199	24	19	42″	998	Fa8	1850	74
25	F42T6/WW	Warm White	00200	24	19	42″	998	Fa8	1900	76
25	F42T6/D	Daylight	00197	24	19	42″	998	Fa8	1570	63
25	F42T6/CWX	Cool White Deluxe	00202	24	19	42″	998	Fa8	1250	50
25	F42T6/WWX	Warm White Deluxe	00201	24	19	42″	998	Fa8	1250	50
36	F42T12/CW	Cool White	00880	24	38	42″	998	Fa8	2450	68
36	F42T12/WW	Warm White	00881	24	38	42″	998	Fa8	2500	69
38	F64T6/W	White	00234	24	19	64″	1557	Fa8	3050	80
38	F64T6/CW	Cool White	00235	24	19	64″	1557	Fa8	3000	79
38	F64T6/WW	Warm White	00236	24	19	64″	1557	Fa8	3050	80
38	F64T6/D	Daylight	00233	24	19	64″	1557	Fa8	2550	67
38	F64T6/CWX	Cool White Deluxe	00238	24	19	64″	1557	Fa8	2100	55
38	F64T6/WWX	Warm White Deluxe	00237	24	19	64″	1557	Fa8	2100	55
38	F72T8/W	White	00247	24	26	72″	1760	Fa8	3050	80
38	F72T8/CW	Cool White	00248	24	26	72″	1760	Fa8	3090	81
38	F72T8/WW	Warm White	00249	24	26	72″	1760	Fa8	3050	80
38	F72T8/D	Daylight	00246	24	26	72″	1760	Fa8	2650	70
39	F48T12/W	White	00205	24	38	48″	1151	Fa8	3000	77
39	F48T12/CW	Cool White	00206	24	38	48″	1151	Fa8	3000	77
39	F48T12/WW	Warm White	00207	24	38	48″	1151	Fa8	3000	77
39	F48T12/D	Daylight	00204	24	38	48″	1151	Fa8	2500	64
39	F48T12/CWX	Cool White Deluxe	00209	24	38	48″	1151	Fa8	2050	53
39	F48T12/WWX	Warm White Deluxe	00208	24	38	48″	1151	Fa8	2050	53
51	F96T8/W	White	00281	24	26	96″	2370	Fa8	4250	83
51	F96T8/CW	Cool White	00282	24	26	96″	2370	Fa8	4200	82
51	F96T8/WW	Warm White	00283	24	26	96″	2370	Fa8	4250	83
51	F96T8/D	Daylight	00280	24	26	96″	2370	Fa8	3600	71
51	F96T8/CWX	Cool White Deluxe	00285	24	26	96″	2370	Fa8	2850	56
51	F96T8/WWX	Warm White Deluxe	00284	24	26	96″	2370	Fa8	2850	56
52	F64T12/CW	Cool White	00242	24	38	64″	1557	Fa8	3900	75
52	F64T12/WW	Warm White	00243	24	38	64″	1557	Fa8	3950	76
52	F64T12/D	Daylight	00240	24	38	64″	1557	Fa8	3300	63
55	F72T12/W	White	00254	12	38	72″	1760	Fa8	4600	84
55	F72T12/CW	Cool White	00255	12	38	72″	1760	Fa8	4550	83
55	F72T12/WW	Warm White	00256	12	38	72″	1760	Fa8	4600	84
55	F72T12/D	Daylight	00253	12	38	72″	1760	Fa8	3800	69
55	F72T12/CWX	Cool White Deluxe	00258	12	38	72″	1760	Fa8	3100	56
55	F72T12/WWX	Warm White Deluxe	00257	12	38	72″	1760	Fa8	3100	56
75	F96T12/W	White	00290	12	38	96″	2370	Fa8	6300	84
75	F96T12/CW	Cool White	00291	12	38	96″	2370	Fa8	6300	84
75	F96T12/WW	Warm White	00292	12	38	96″	2370	Fa8	6300	84
75	F96T12/D	Daylight	00289	12	38	96″	2370	Fa8	5350	71
75	F96T12/CWX	Cool White Deluxe	00294	12	38	96″	2370	Fa8	4400	59
75	F96T12/WWX	Warm White Deluxe	00293	12	38	96″	2370	Fa8	4400	59

International Rapid Start (IRS)
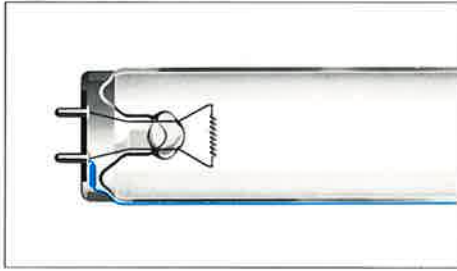
Sylvania I.R.S. lamps feature silicon coating and an external metal strip as starting aid for reliable, flicker free and instant starting, even at low temperatures and in moist atmospheres, particularly when operated on semi-resonant ballasts.

The picture shows how the metal strip is connected at one end over a high resistance to the electrode.

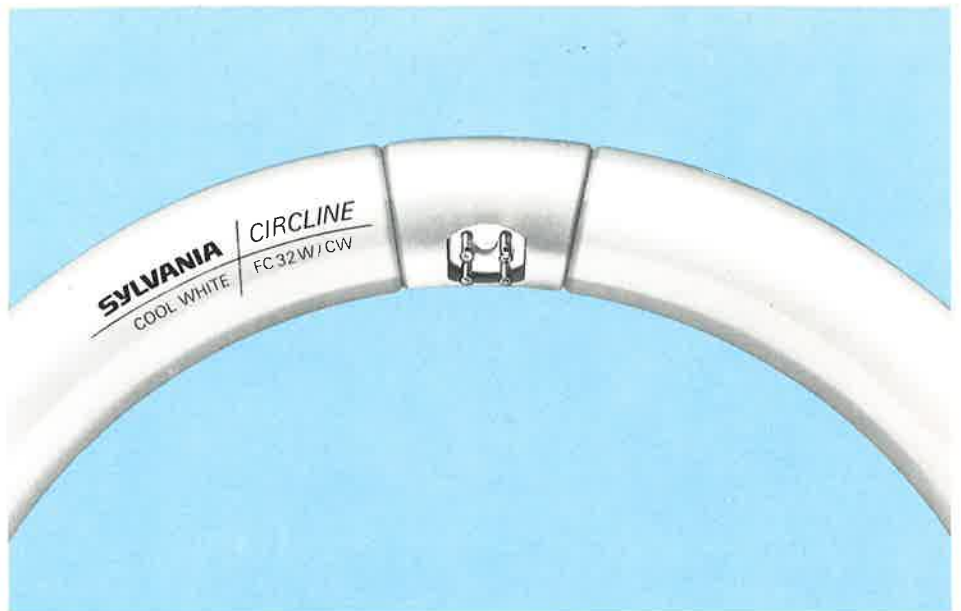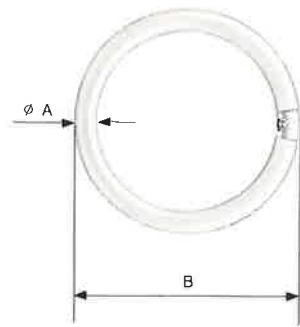This Sylvania lamp is also your choice for dimming installations.

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
					∅	Length Nom.	Max.			
20	F20W/CW/IRS	Cool White	00423	25	38	600	590	G13	1250	63
20	F20W/D/IRS	Daylight	00421	25	38	600	590	G13	950	48
20	F20W/CWX/IRS	Cool White Deluxe	00426	25	38	600	590	G13	850	43
40	F40W/CW/IRS	Cool White	00430	25	38	−	1200	G13	3200	80
40	F40W/D/IRS	Daylight	00428	25	38	−	1200	G13	2500	63
40	F40W/CWX/IRS	Cool White Deluxe	00433	25	38	−	1200	G13	2000	50
65	F65W/CW/IRS	Cool White	00438	25	38	−	1500	G13	5100	79
65	F65W/D/IRS	Daylight	00436	25	38	−	1500	G13	3900	60
65	F65W/CWX/IRS	Cool White Deluxe	00441	25	38	−	1500	G13	3300	51

Coloured Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions			Cap
					∅	Length Nom.	Max.	
20	F20W/GO	Gold	00114	6	38	600	590	G13
20	F20W/B	Blue	00113	6	38	600	590	G13
20	F20W/G	Green	00116	6	38	600	590	G13
20	F20W/PK	Pink	00115	6	38	600	590	G13
20	F20W/R	Red	00117	6	38	600	590	G13
40	F40W/GO	Gold	00181	6	38	−	1200	G13
40	F40W/B	Blue	00180	6	38	−	1200	G13
40	F40W/G	Green	00183	6	38	−	1200	G13
40	F40W/PK	Pink	00182	6	38	−	1200	G13
40	F40W/R	Red	00184	6	38	−	1200	G13

Circline Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions Ø A	Dimensions Ø B	Cap	Initial light output −100 h (lm)	Efficacy (lm/W)
22	FC22W/W	White	00473	12	29	216	G10 q	1150	52
22	FC22W/CW	Cool White	00474	12	29	216	G10 q	1150	52
22	FC22W/WW	Warm White	00475	12	29	216	G10 q	1150	52
22	FC22W/D	Daylight	00472	12	29	216	G10 q	1000	45
22	FC22W/UW	Universal White	00478	12	29	216	G10 q	1000	45
32	FC32W/W	White	00483	12	32	311	G10 q	2050	64
32	FC32W/CW	Cool White	00484	12	32	311	G10 q	2050	64
32	FC32W/WW	Warm White	00485	12	32	311	G10 q	2050	64
32	FC32W/D	Daylight	00482	12	32	311	G10 q	1700	53
32	FC32W/UW	Universal White	00488	12	32	311	G10 q	1700	53
40	FC40W/W	White	00492	12	32	413	G10 q	2900	72
40	FC40W/CW	Cool White	00493	12	32	413	G10 q	2900	72
40	FC40W/WW	Warm White	00494	12	32	413	G10 q	2900	72
40	FC40W/D	Daylight	00491	12	32	413	G10 q	2300	57
40	FC40W/UW	Universal White	00497	12	32	413	G10 q	2300	57

Blacklight Circline Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions Ø A	Dimensions Ø B Nom.	Dimensions Ø B Max.	Cap
22	FC8T9/BL/RS	Blacklight	00481	12	29	−	216	G10q
32	FC12T10/BL	Blacklight	00511	12	32	−	311	G10q

Gro-Lux® Lamps

Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ⌀	Length Nom.	Length Max.	Cap	Initial light output −100 h (lm)
8	F8W/GRO	GRO	00026	25	16	300	288	G5	130
14	F14W/T8/GRO	GRO	00043	12	26	–	360	G13	235
15	F15W/T8/GRO	GRO	00069	12	26	–	437	G13	280
15	F15W/T8/GRO/WS	GRO/WS	00746	24	26	–	437	G13	465
20	F20W/GRO	GRO	00462	12	38	600	590	G13	370
20	F20W/GRO/WS	GRO	00747	24	38	600	590	G13	660
22	FC8T9/GRO/WS	GRO/WS	00686	12	29	–	216*	G10q	340
30	F30W/T8/GRO	GRO	00150	12	26	900	895	G13	700
40	F40W/GRO	GRO	00463	12	38	–	1200	G13	930
40	F40W/GRO/WS	GRO/WS	00187	6	38	–	1200	G13	1650
73	F96T12/GRO	GRO	00295	12	38	96″	2370	Fa8	1870
73	F96T12/GRO/WS	GRO/WS	00748	12	38	96″	2370	Fa8	3275
105	F96T12/GRO/HO	GRO	00304	12	38	96″	2385	R17d	2700
105	F96T12/GRO/HO/WS	GRO/WS	00749	12	38	96″	2385	R17d	5000
110	F48T12/GRO/VHO/WS	GRO/WS	00230	6	38	48″	1166	R17d	3750
110	F48T12/GRO/VHO	GRO	00229	6	38	48″	1166	R17d	2050
160	F72T12/GRO/VHO	GRO	00273	12	38	72″	1776	R17d	3600
160	F72T12/GRO/VHO/WS	GRO/WS	00274	12	38	72″	1776	R17d	5500
215	F96T12/GRO/VHO	GRO	00311	12	38	96″	2385	R17d	4800
215	F96T12/GRO/VHO/WS	GRO/WS	00312	12	38	96″	2385	R17d	8400
215	FR96T12/GRO/VHO/235/WS/1*	GRO/WS	00313	12	38	96″	2385	R17d	7200

*see schema under Reflector Lamps page 11

Blacklight/Blacklight−Blue Lamps
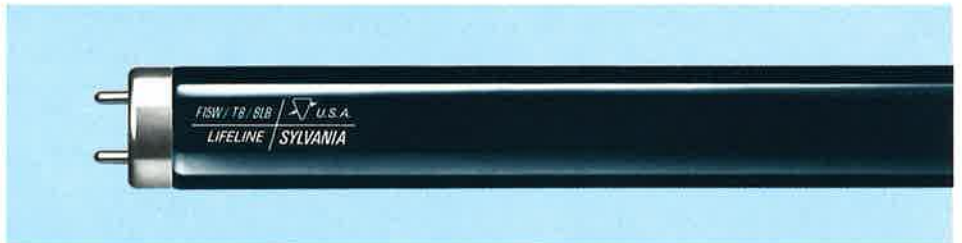
Wattage (W)	Type description	Colour	Code No.	Standard packing quantity	Dimensions ⌀	Length Nom.	Length Max.	Cap
4	F4W/BL	Blacklight	00007	24	16	150	136	G5
4	F4W/BLB	Blacklight-Blue	00008	24	16	150	136	G5
6	F6W/BL	Blacklight	00017	24	16	225	212	G5
6	F6W/BLB	Blacklight-Blue	00018	24	16	225	212	G5
8	F8W/BL	Blacklight	00023	24	16	300	288	G5
8	F8W/BLB	Blacklight-Blue	00024	24	16	300	288	G5
15	F15W/T8/BL	Blacklight	00076	24	26	–	437	G13
15	F15W/T8/BLB	Blacklight-Blue	00077	6	26	–	437	G13
20	F20W/BL	Blacklight	00359	24	38	600	590	G13
20	F20W/BLB	Blacklight-Blue	00358	6	38	600	590	G13
30	F30W/T8/BL	Blacklight	00157	24	26	900	895	G13
30	F30W/T8/BLB	Blacklight-Blue	00158	6	26	900	895	G13
40	F40W/BL	Blacklight	00185	24	38	–	1200	G13
40	F40W/BLB	Blacklight-Blue	00186	6	38	–	1200	G13

Multiply by 0.01 for Watts/nm

Chlorophyll Synthesis

F 40 W/GRO
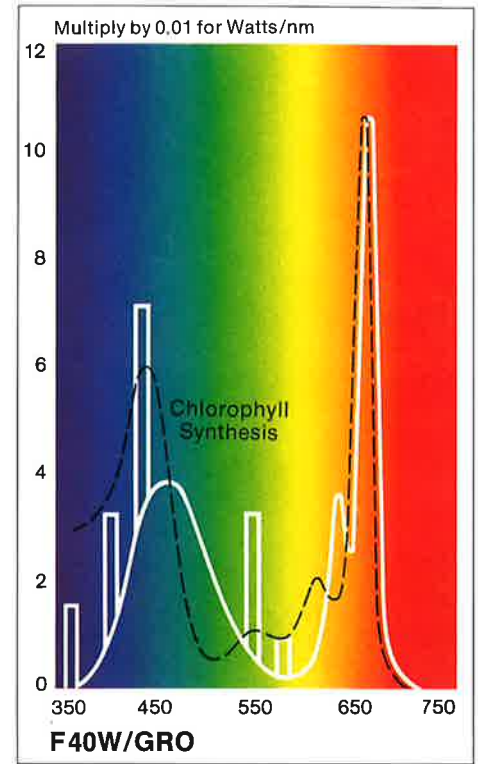
**Gro-Lux®** fluorescent lamps contain phosphors which generate light energy in wavelengths most stimulating to plant growth. They also enhance the colours of tropical fish and are widely used in aquarium lighting.

Comparison of the spectral energy distribution of the Gro-Lux® fluorescent lamp with the energy requirement for chlorophyll synthesis (dotted line).

Multiply by 0.01 for Watts/nm

F 40 W/BLB

Blacklight-Blue fluorescent lamps are made with a special dark blue "Woods glass" filter, which absorbs practically all the visible light but freely transmits the ultra-violet radiation.

They are used to create dramatic lighting effects in bars, night clubs and discotheques and also in industry for detection/tracing work.
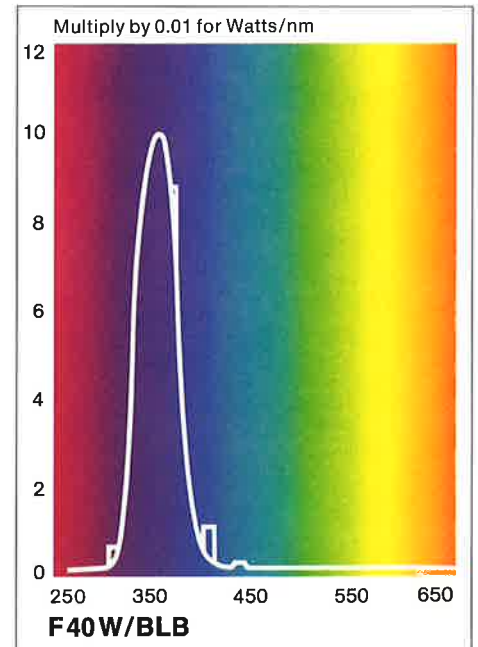
Starters

Type	Code No.	Std. pack Quantity	Lamps Wattage									
Standard Starters			4 6 8	13 16	14 15	20	22	25/1	25/28" 25/30" 25/33"	30 32	40* 42	65
FS-1	24405	500		■				■		■	■	■
FS-2	24403	500		■	■	■						
FS-25	24410	500	■				■	■	■			
COP Starters												
COP/H-20	24420	100		■	■							
COP/H-40	24421	100									*	
COP/H-65	24422	100										■

* 40 W/1M and 42 W lamps only in open luminaires

Although insignificant in appearance and apparently simple in design, the quality of the starter can greatly influence the life of a fluorescent lamp and the reliability of a lighting installation.

In Sylvania's high-quality starters, great attention is given to careful timing of the switching delay, ensuring reliable starting and maximum lamp life.

The packing materials for Sylvania starters are colour-coded by type. Each box contains ten starters, with clear application details.

Sylvania starters carry Test House approval marks for many countries as an indication of their safety and performance.
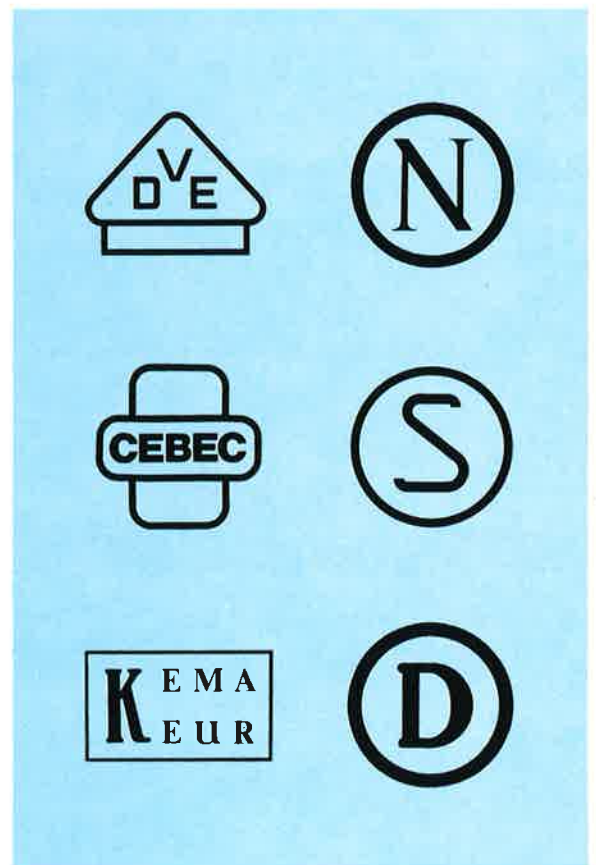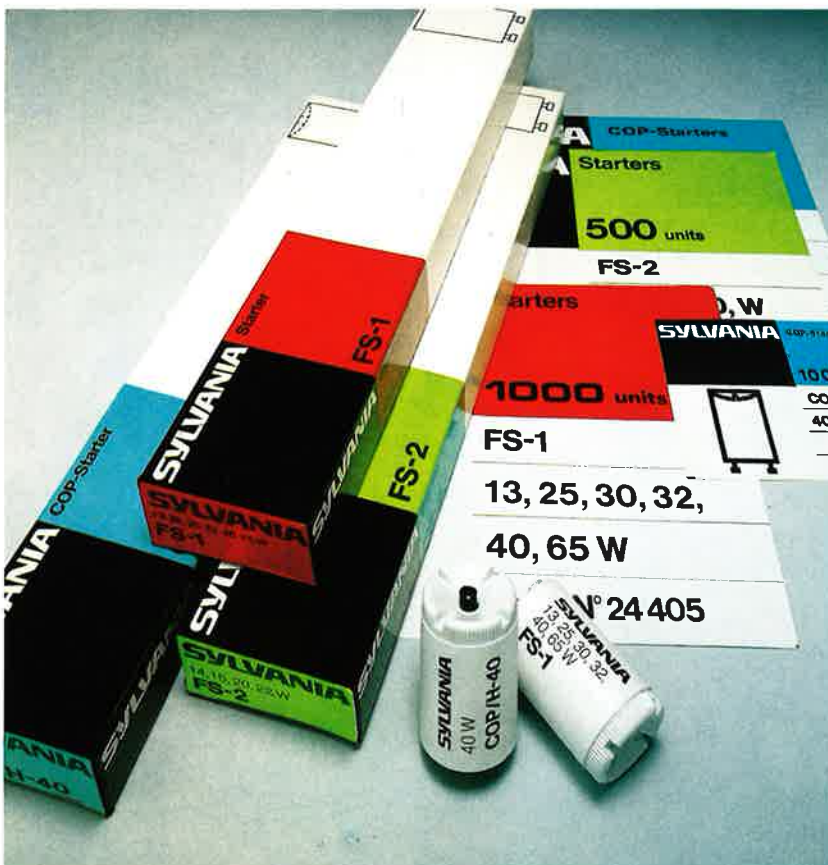
Standard Starters

Sylvania starters are mounted in plastic cans to give maximum electrical safety and fireproofing. Each can is clearly marked with its type and Test House approval marks.

The glow switch is the heart of the starter. Its quality and performance determine the starting efficiency and influence the life of the lamp. Every Sylvania starter is fitted with a Mylar insulated suppressor capacitor to prevent radio interference.

COP Starters

When a fluorescent lamp reaches the end of its life, "false starts" cause the lamp to flicker. Sylvania COP starters overcome this problem with an automatic cut-out device which

interrupts the circuit, eliminates unpleasant flickering and any dangerous over-heating of the choke. The circuit is reactivated through a manual reset button on the end of the can.
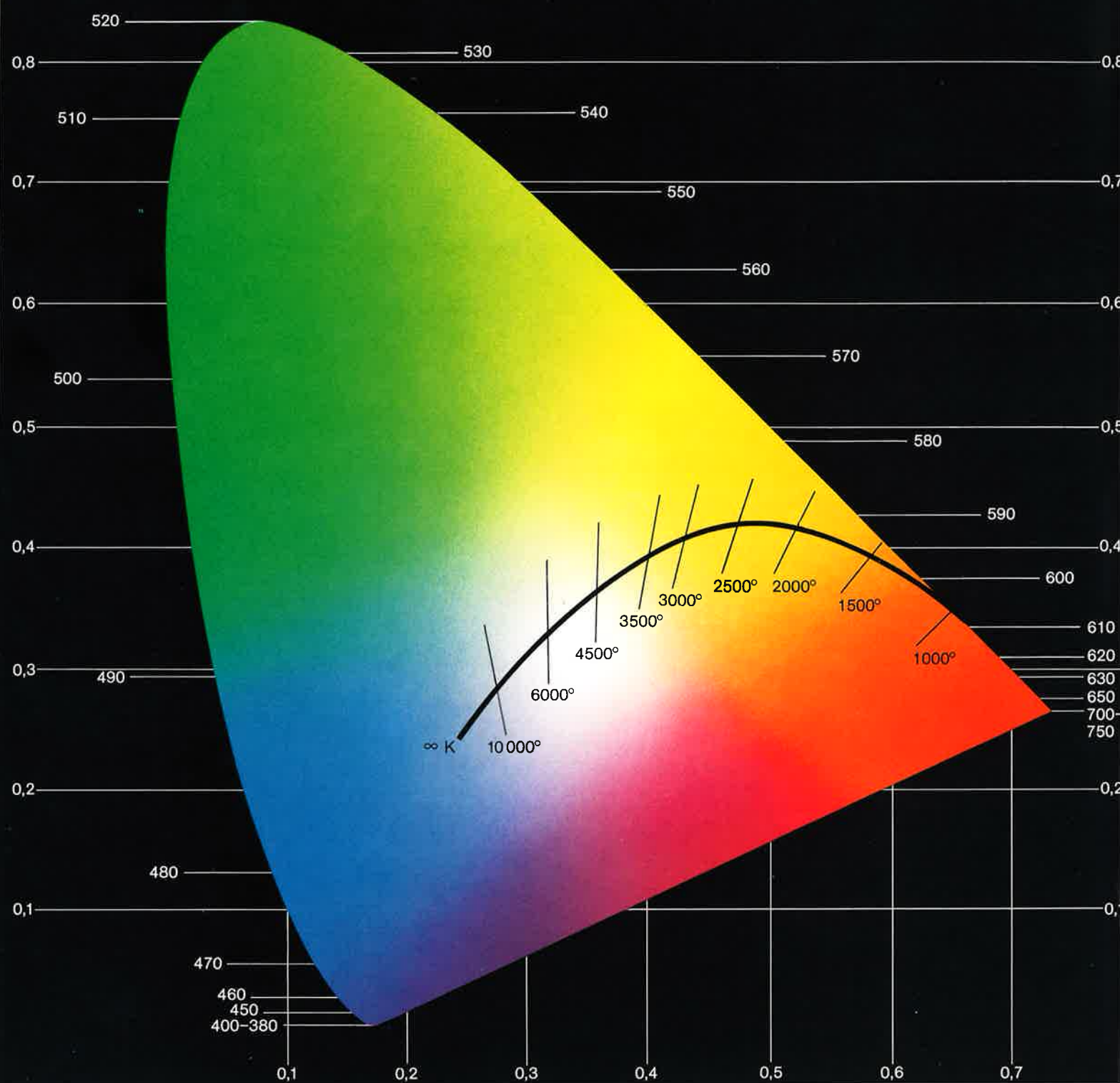
Fluorescent Lamp Colours

There are four current methods to identify the colour of light emitted by fluorescent lamps.

Correlated Colour Temperature
One method is to describe the colour by comparing it to the appearance of the light emitted by an incandescent black body. The black body locus in the CIE chromaticity diagram indicates the colour appearance at different temperatures expressed in degree Kelvin, and the lines across show possible positions of light sources with the same correlated colour temperature but different spectral energy distribution.

CIE Chromaticity Coordinates
The CIE chromaticity diagram shows all possible colours of light with the pure colours around the edge and mixed colours merging to the whites around the centre. By quoting the X and Y coordinates it is possible to pinpoint light appearance and correlated colour temperature of a light source.

Spectral Energy Distribution
Depending on the phosphor mix used fluorescent lamps will emit light of different tones of white. The spectral energy distribution diagrams on page 7, 8, 9 and 22 show how the energy in form of light is emitted over the visible spectrum. A light with a high proportion of yellow to red will appear warmer and emphasize the colour rendering of objects of these colours, a light with major emission in the green to blue spectrum will appear cool and will emphasize those colours.

Colour Rendering Index (Ra)
The colour rendering index is a measure of the colour distortion of objects illuminated by a lamp, expressed as a percentage of the colour rendering performance of a perfect source of equal colour temperature. High values indicate better colour rendering, i.e. less colour distortion.

Colour Rendering and Colour Appearance

Colour Rendering	Colour Appearance	Fluorescent Lamp Colour	Comparable Lamp Types
High Fidelity	Cool	DX 86	Xenon Metal Halide
	Intermediate	N, CWX, CWX84	
	Warm	IF, WWX83	Incandescent Tungsten Halogen
Medium Fidelity	Cool	D	
	Intermediate	UW	Metal Halide
	Warm	WWX	
Low Fidelity	Cool		
	Intermediate	CW, W	Mercury
	Warm	WW	
No Fidelity			Sodium

Fluorescent lamps are differentiated using two colour criteria: colour rendering and colour appearance.

– The colour rendering index makes it possible to group lamps into 4 categories from high to no fidelity rendering.

– The colour appearance of a lamp refers to the apparent colour of the light it emits, grouped into 3 categories: cool, intermediate, warm.

| Colour description (1)	Approx. cor-related colour temperature (K)	Approximate colour appearance (x & y coordinates) x	y	Sylvania abbreviation	Philips code (2)	Osram code (2)
Incandescent-Fluorescent	2700	0.461	0.418	IF	27	39
Warm White Deluxe 83	3000	0.435	0.405	WWX 83	83	31
Warm White Deluxe	3000	0.435	0.400	WWX	32	32
Warm White	3000	0.435	0.405	WW	29	30
White	3500	0.410	0.400	W	35	23
Cool White Deluxe 84	4000	0.382	0.382	CWX 84	84	21
Cool White Deluxe	3900	0.380	0.367	CWX	34	22
Universal White	4000	0.380	0.380	UW	25	25
Cool White	4300	0.372	0.380	CW	33	20
Natural	3700	0.388	0.360	N	36	36
Daylight Deluxe 86	(3)	(3)	(3)	DX 86	86	11
Daylight	6500	0.315	0.345	D	54 (4)	10 (4)
(1) Selection of popular types; information on other colours available on request. (2) Nearest equivalent. (3) Available on special request. (4) Also available: Daylight Deluxe and Daylight 5000 Deluxe.					55 (6000) 57 (7000)	15 (6000) 19 (5000)

Operating Circuits

The Switch Start – The most common circuit using a choke and a glow starter, which effects electrode pre-heating. When the starter contacts open the choke supplies the starting voltage. Reliable starting is from +5°C to +50°C.
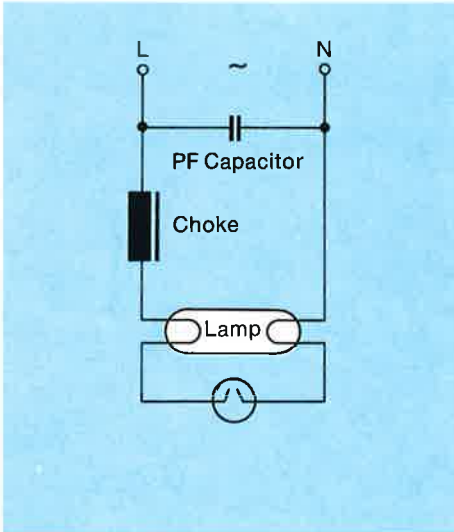
The Series Twin – A circuit used for most lamps up to 20w. Two fluorescent lamps are run in series on one choke but with individual starters operating as above.
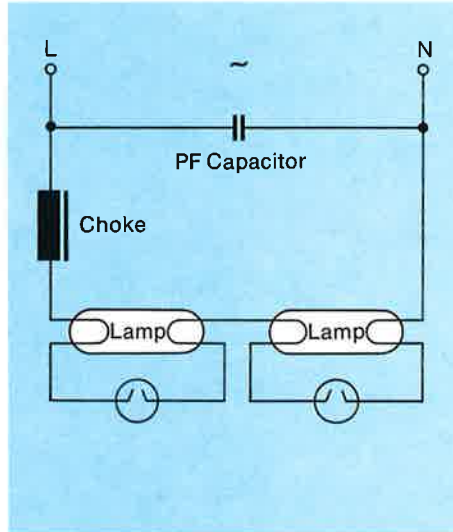
The Lead/Lag – A common circuit combination for twin-lamp fixtures, with high power factor and less likelihood of flicker.

Resistor and Metal Strip incorporated
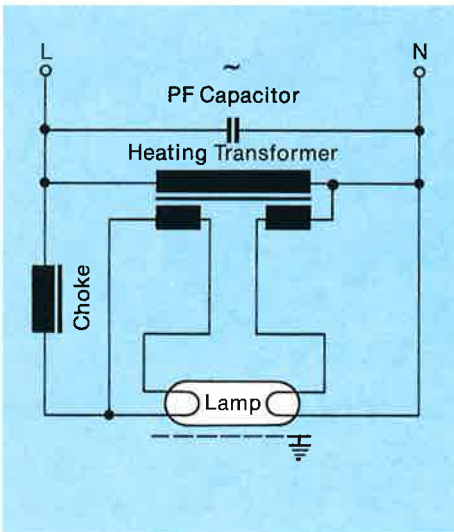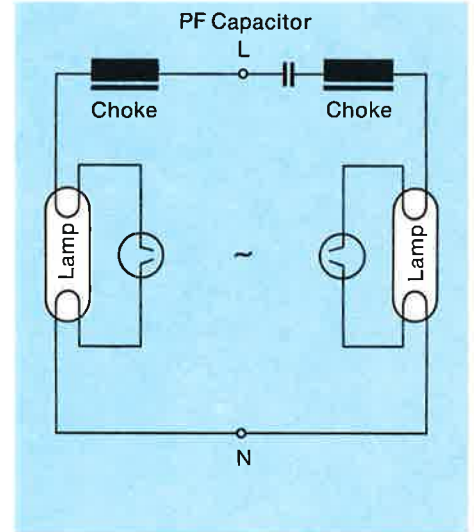
The Quick Start – A circuit giving flicker-free instant starting and thus increased lamp life. The lamp is operated in series with a standard choke; the electrode pre-heating voltage is provided by a separate transformer. Reliable starting is from +10°C to +40°C.
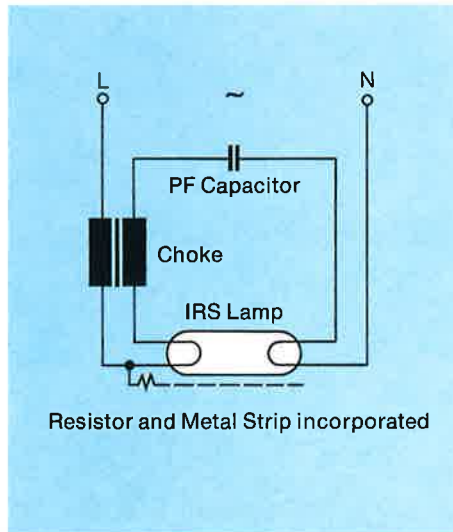
The Semi-Resonant Start – A circuit with flicker-free instant start and electrode pre-heating. An electrical resonance occurs between the secondary winding of the choke and the capacitor, amplifying the mains voltage for starting the IRS metal striped lamp. The resonance stops after starting and the capacitor assumes a power factor correction function. Reliable starting is from 0°C to +50°C.
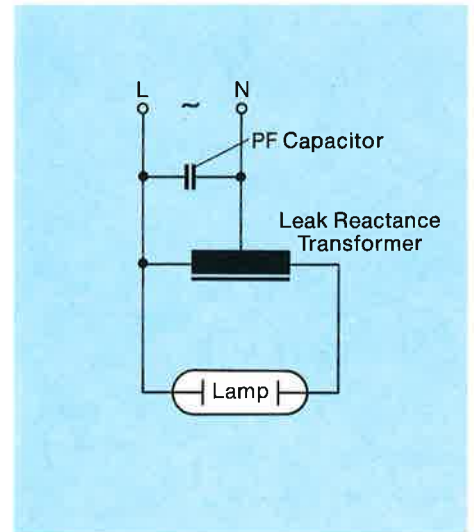
The Instant Start – An instant starting circuit without electrode pre-heating, using cold cathode single pin fluorescent lamps. A leak reactance transformer amplifies the mains to a reliable starting voltage and then acts as a choke. Reliable starting is from +5°C to +50°C.

Lamp Operating Characteristics

The effect of mains voltage variations on the operating characteristics of Sylvania fluorescent lamps is indicated in the graph. Increases in the mains voltage can influence lamp life in proportion to the increases in the lamp current.

The typical relationship between temperature and lumen output of a fluorescent lamp is illustrated in the diagram. As can be seen, the optimum light output occurs when the bulb wall temperature is approximately 40°C.
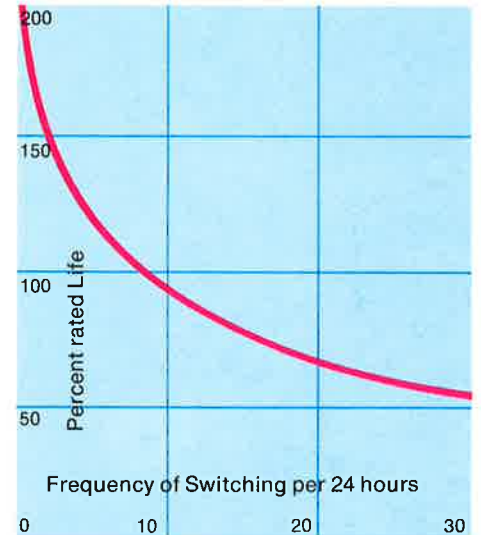
The life of a fluorescent lamp is dependent to a certain degree on the frequency of switching on and off. A lamp which is switched infrequently will last considerably longer. The typical effect of this is illustrated in the graph.
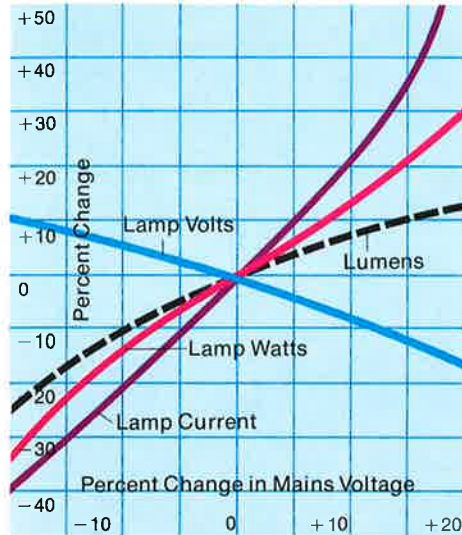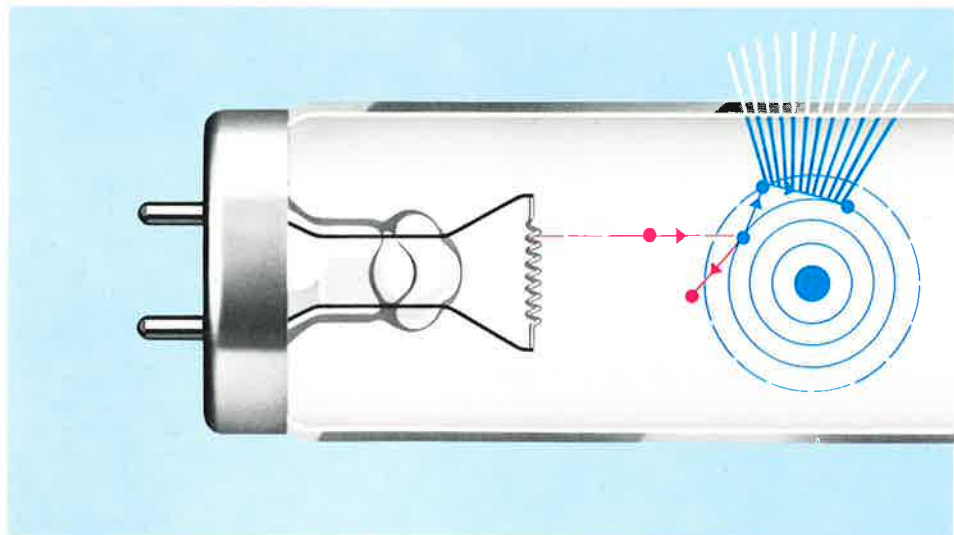

Lamp Performance
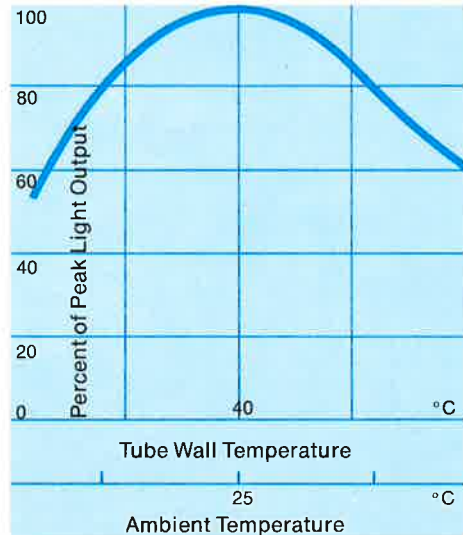
Typical Relationship between Temperature and Lumen Output

Typical Effect on Life of Switching

How Fluorescent Lamps convert Electrical Energy into Light

Typical Lumen Maintenance Curve

The fluorescent lamp is an electrical discharge source which makes use of ultra-violet energy generated by passing electric current through low pressure mercury vapour to activate a coating of phosphor on the inner surface of a glass tube. Phosphors have the property of absorbing the ultra-violet energy and re-radiating it at longer wavelengths in the visible spectrum. The wavelength or colour of the light produced by a fluorescent lamp depends upon the chemical composition of the phosphor used.

Excellent lumen maintenance is a key feature of Sylvania fluorescent lamps. Efficient gas filling ensures the lamps continue to deliver their high light output throughout their rated lives, making the most use of the electricity consumed.

Electrical Reference Data

Some of the characteristics most often used commercially are listed below for reference.

Lamp Rating	Dimensions		Lamp Cap	Electrical Characteristics (IEC nominal)		Recommended Lamp Ballast		
	Length max (IEC) mm	Diameter nominal (IEC) mm		Lamp Current. A	Lamp Voltage V	Starter Ballast	Rapid Start Ballast (starterless, low electrode resistance)	Semi-Resonant Ballast Dimming Circuit (low electrode resistance)
W			(IEC)					
4	136	16	G 5	0.17	29	●		
6	212	16	G 5	0.16	42	●		
8	288	16	G 5	0.145	57	●		
13	517	16	G 5	0.165	95	●		
15	437	25	G 13	0.30	56	●		
20	590	38	G 13	0.37	57	●	●	
20 IRS	590	38	G 13	0.37	57	●	●	●
22	216*	29	G 10 q	0.39	61	●		
25	970**	38	G 13	0.29	94	●		
30	895	25	G 13	0.365	96	●		
30	895	38	G 13	0.405	81	●	●	
32	311*	32	G 10 q	0.43	82	●		
40	1200	38	G 13	0.43	103	●	●	
40 IRS	1200	38	G 13	0.43	103	●	●	●
40	970**	38	G 13	0.56	81	●		
40	413*	32	G 10 q	0.43	109	●		
42	1047	38	G 13	0.535	89	●		
60	413*	32	G 10 q	0.71	97	●		
65	1500	38	G 13	0.67	110	●	●	
65 IRS	1500	38	G 13	0.67	110	●	●	●
80	1500	38	G 13	0.87	99	●		
85	1764	38	G 13	0.80	120	●		
125	2375	38	G 13	0.94	149	●		

* Circline Lamp, max. Outer Diameter   ** 1 Meter Lamp

Lamp Cap Identification Chart

This chart graphically shows the majority of the caps used for fluorescent lamps. The popular description, the corresponding IEC nomenclature are shown together with the most important dimensions.

G 5

G 13

R 17d

Fa 6

Fa 8

G 10 q
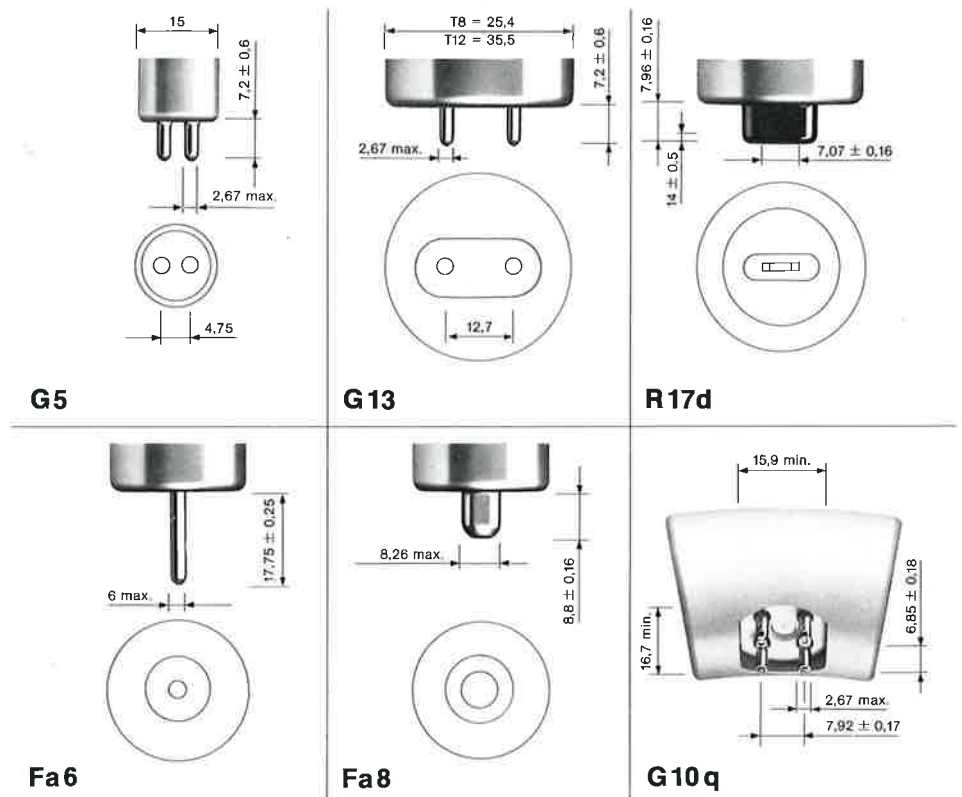
Lamp Selection Chart

Fluorescent lamps are one of the most versatile light sources available. The following lamp identification chart matches some of the most popular colours commonly associated with specific applications.

These have been grouped by general colour appearance.

	D	*DX86	N	CW	UW	CWX	CWX 84	W	WW	WWX	WWX 83	IF
Shop Lighting												
Grocery						•		•		•		
Butcher			•		•					•		
Baker					•	•						
Clothing					•	•	•					
Shoes						•				•		
Furniture					•	•						
Books					•			•				
Sports					•			•				
Watches										•		
Cosmetics						•				•		
Flowers	•	•				•				•		
Commercial Lighting												
Offices				•	•							
Conference Rooms					•					•	•	
Hotels			•							•		•
Restaurants			•							•		
Theatres			•							•		
Schools					•			•		•	•	
Sports Installations						•		•				
Hospitals	•	•			•					•		
Industrial Lighting												
Steel				•				•				
Textiles	•	•		•				•				
Printing	•	•		•				•				
Electrical				•				•				
Chemical	•	•		•	•							
Wood				•				•				
Automobile				•				•				
Laboratory	•	•		•						•		
Stores				•				•				
Domestic Lighting												
Lounge									•	•		•
Kitchen, Bathroom			•							•		
Garage, Cellar				•				•				

* Available on request only

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