MATERIALS AND COMPONENTS FOR MANUFACTURERS OF:

- **LIGHTING PRODUCTS**
- **SEMICONDUCTORS**
- **ELECTRICAL SYSTEMS**
- **INDUSTRIAL FURNACES**

PHILIPS ELMET

PHILIPS

Let's make things better.

PRODUCT LIST

REFRACTORY METALS

• MOLYBDENUM

- Powder
- Rod
- Wire
- Sheet
- Diode Studs
- Furnace Hot Zones, Shields and Heating Elements
- Matallizing/Evaporation Sources
- Molybdenum Sintering Boats
- Pressed and Sintered Powder Metallurgy Parts
- Fabricated Electronic and Mechanical Components
- HCT Molybdenum (for higher temperature applications)

• TUNGSTEN

- Powder
- Rod, Pure and Potassium Doped
- Wire, Pure and Potassium Doped
- Furnace Heating Elements
- Stranded Wire
- Metallizing/Evaporation Coils
- Diode Studs
- Fabricated Electronic and Mechanical Components
- Pressed and Sintered Powder Metallurgy Parts

LAMP MATERIALS AND COMPONENTS

• GLASS/QUARTZ

- Incandescent Bulbs
- Fluorescent Tubing
- Flare and Exhaust Tubing
- Fused Quartz Tubing
- Neon Sign Tubing
- Cane
- Cullet (Soda Lime) for Fiberglass

• COMPONENTS

- Coiled Tungsten Filaments
- Molybdenum Mandrel and Support Wire (Standard and HCT)
- Cut Tungsten and Molybdenum Parts
- Lamp Lead-in Wires
- Lamp Bases
- Phosphors, Chemicals
- HID Arc Tubes
- Fabricated Steel and Aluminum Parts

Tungsten Lamp Filaments and Coils

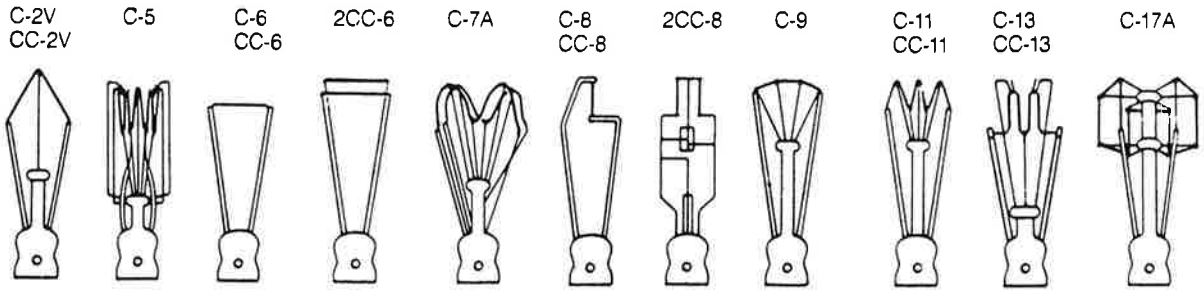
Philips, Elmet, located in Lewiston, Maine is the producer of tungsten wire and lamp components for all of the Philips Lighting plants in North America. They also supply tungsten lamp coils and filaments to other domestic and offshore lamp manufacturers for a broad spectrum of lighting requirements. Tungsten wire components generally fall into two broad categories of product.

INCANDESCENT LAMP FILAMENTS: These filaments are the light source for incandescent lamps. There are thousands of filament designs which have been developed over time based on changing lamp technology and lighting requirements, and new designs are being developed on a daily basis. Such filaments vary with respect to many parameters such as basic coil type (single coil or coiled coil), bulb shape, gas fill, service life and lumen output.

The Philips Elmet coil engineering personnel have wide experience in filament design and welcome customer inquiries. A check list made for developing specifications for lamp filaments is provided below to aid customers in defining their requirements.

_____ Wattage
_____ Voltage
_____ Current
_____ Life
_____ Light Output
_____ Color Temperature
_____ Efficacy
_____ Fill, Gas Type
_____ Fill Gas Pressure
_____ Insert Length (if applicable)

_____ Number of Supports
_____ Mounted TPI
_____ Overclamp
_____ Filament Shape
_____ Overall Length
_____ Body Length
_____ End (leg) Length
_____ Inactive Length
_____ O.D. of Filament



Filament Designations consist of a letter or letters to indicate how the wire is coiled, and an arbitrary number sometimes followed by a letter to indicate the arrangement of the filament on the supports. Prefix letters include C (coil) - wire is wound into a helical coil or it may be deeply fluted; CC (coiled coil) - wire is wound into a helical coil and this coiled wire again wound into a helical coil. Some of the more commonly used types of filament arrangements are illustrated.

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Philips Lighting Company

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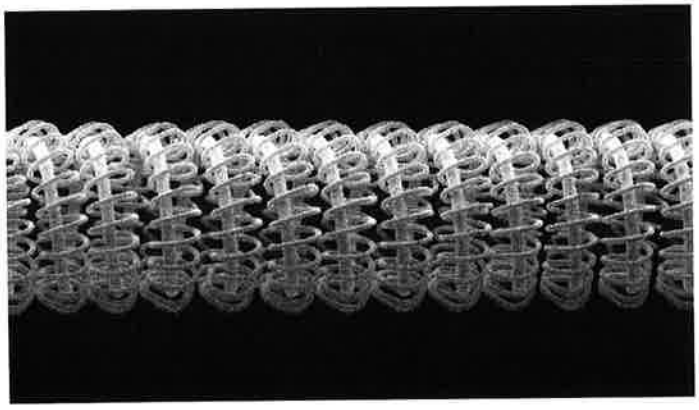
FLUORESCENT LAMP FILAMENTS: Fluorescent coils, unlike incandescent filaments are not true light sources, but more correctly, energy sources. Such coils are also referred to as exciter coils or cathodes. They are given an emission material coating after coiling, and their function inside of the lamp is to provide a flow of electrons which activate the light-producing fluorescent phosphors.

Fluorescent lamp coil designs are considerably more limited in number that those incandescent filaments. As a result, the product line is somewhat more standardized: Philips Elmet is pleased to offer such standard types of coils as well as modifications of these to specific customer requirements.

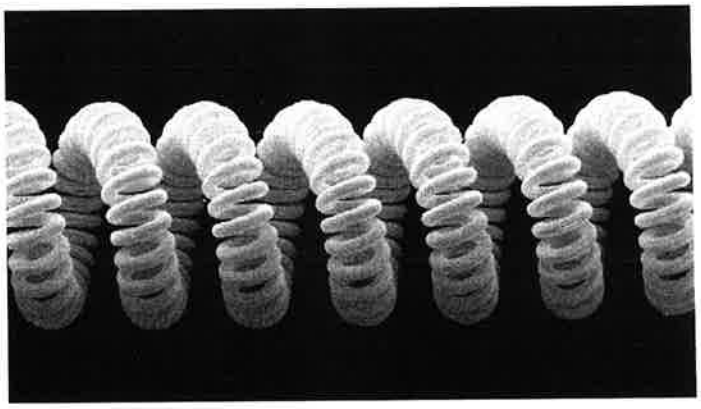
COMMON FLUORESCENT COILS

Coil Type	Application	Ballast Type
Stick	15 Watt, T8	PH*
Coiled Coiled	15 Watt, T8	DC
Stick	20Watt, T12	RS
Triple Coiled	40 Watt, T12	RS
Stick	40Watt, T12	RS
Stick	75Watt, T12	IS
Stick	HO, T12	RS
Stick	VHO, T12	RS

*Ballast Type: PH-Preheat • DC-Direct Current • RS-Rapid Start



SEM photo of single cell fluorescent cathode current carrying wire with overwrap. (33x)



SEM coiled coil 100 watt incandescent lamp filament. (33x)

Lamp Bases

Philips Lighting Company has been a supplier of lighting components for our own use as well as for sale to the lighting industry for many years. Tooling is in place for a variety of lamp bases and parts can be supplied from stock on standard items or produced to customer order as required.

It is impractical to illustrate all the types that are available because of the wide variety of items in the line. However, due to their end use (in lamp sockets) most of the base types have been standardized dimensionally by the lighting industry. Design details of each base type are determined by the requirements and conditions of the intended application. The back page will illustrate the various types we can supply, together with the common name cross-referenced with a base number. For example, a medium (MED) base will indicate base number 102 available in aluminum or brass. Commercial prints will be furnished on request on all items listed or available.

Manufacturing standards for all types of bases are set high to assure dependable performance under the most exacting conditions of service and lamp assembly operations. Component parts of bases are inspected closely in every one of the manufacturing and assembling operations. Rigid quality controls are employed so that the product we supply is uniform within close tolerances.

In addition to all the manufacturing quality controls and inspections, other quality assurance measurements are performed daily. These include: base contour, base dimensions, longitudinal strength, rim and torsional strength.

KEY TO BASE DESIGNATIONS:

PHILIPS PART # _____

ANSI # _____

IEC # _____

SEE BACK PAGE FOR ILLUSTRATIONS

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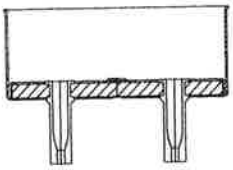
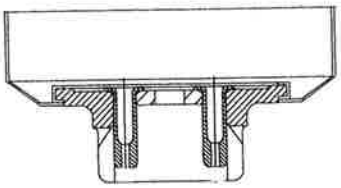
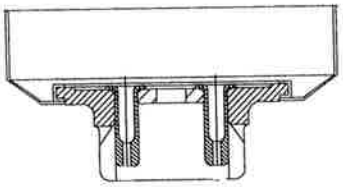
T-8 FLUORESCENT BASES



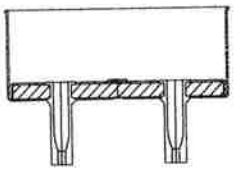
513980
CRIMP PIN
G13/11X35



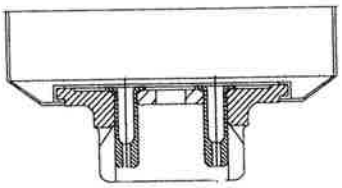
549633
G13 CRIMP PIN
G13/9X35



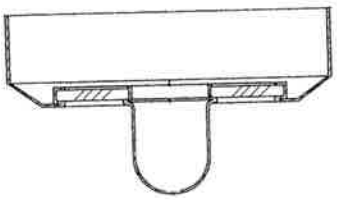
549635
G13 CRIMP PIN NOTCHED
G13/9X35



547020
CRIMP PIN NOTCHED
G13/11X35



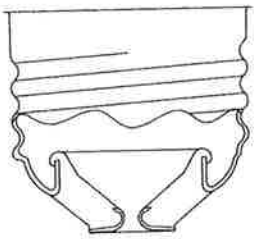
540009
R17D DOUBLE CONTACT
Rd17d/10X35



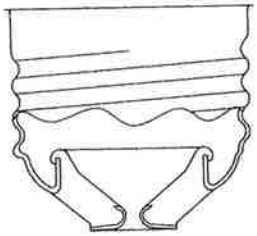
540007
FA8 SINGLE PIN, INT WELD
FA8/10X35

INCANDESCENT BASES

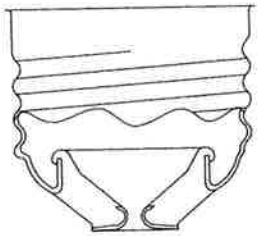
A = Aluminum B = Brass



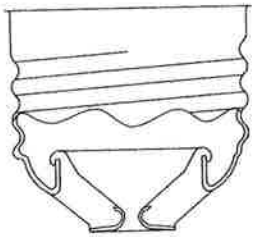
544289
102A NO NEST
E26/24A



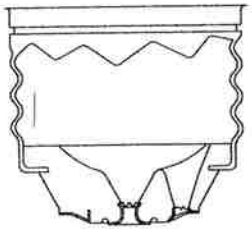
554396
102A NO NEST, NO DIP
E26/24A NO DIP



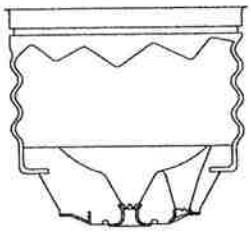
554476
102A NO NEST, VENTED
E26/24A VENTED



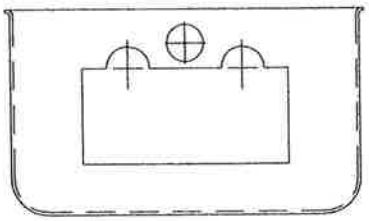
544287
102B
E26/24B



583294
122A NO NEST
E26d/24



512753
122B
E26d/24



737270
1605 BASE CUPS

Lead Wires

Electrical lead-in wires, commonly called "leads", are required for practically every electronic device using a glass envelope. In addition to conducting current, a section inside the envelope (inner) usually supports other parts. A section must be suitable for making a hermetic seal with glass (press). A section outside the envelope (outer) is a connector.

Generally, the common factor in leads is that Dumet wire will be used for the press section. Inners may be straight, bent or have pre-formed tip hook, and be of many materials. Outers may be soft wire to be soldered to a connector, or flexible cable for power tube leads, or stiff pins for subminiature tubes.

The simplest lead is a single piece of Dumet used in diodes, transistors and some small lamps. Next are two-piece and three-piece welded types in literally thousands of combinations of sizes and materials. These are high-speed automatic machine types which comprise the largest volume of the business. Beyond these come the hard-glass types, usually called hand leads because they often require some hand assembly.

Lead wires are identified by a detailed description of every section beginning with the inner lead. The complete description is necessary for every item on an order or inquiry. For each section, the first numbers are the wire diameter in thousandths of an inch, next an abbreviation of the material and last the length in millimeters. A hyphen separates each section.

Example: 20NIAH14 - 12D5 - 18CU29
Inner - Press - Outer

.020" standard electronic A nickel 14 millimeters long
welded to .012" Dumet 5 millimeters long
welded to .018" copper 29 millimeters long.

A list of the material abbreviations commonly used is presented on the back of this page.

In practice, there is little or no standardization of lead wire design. Philips Elmet, therefore, is ready to quote to individual customer requirements, and is also able to offer alternate designs from their production line which may be more economical. Customer inquiries are welcomed.

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LEAD SYMBOLS

Symbols	Materials
CB	Conduction Bronze
CBNP	Conduction Bronze, Nickel Plated
CRCUNP	Chrome-Copper Nickel Plated (soft)
CU	Oxygen-free Copper (soft)
HCU	Oxygen-free Copper (hard)
CUNP	Copper Nickel Plated (4%)
CUNPG	Copper Nickel Plated (8%)
CW	Copper Clad Iron Wire
EV	Silicon Bronze Alloy 651 (Everdur)
FE	Iron
FENF	Iron Wire 1/2% Nickel Plated
FENP	Iron Nickel Plated 4-6% Standard
FENPE	Iron Nickel Plated 2.25%
FENPG	Iron Nickel Plated 8%
FESNP	Music Wire Nickel Plated
ML	Monel
NIAH	Commercial Nickel degassified (soft)
NIMN (1)	1% Manganese Nickel
NID	4% Manganese Nickel
HNID	4% Manganese Nickel (hard)
NIFE	Nickel Iron Wire (#52 alloy)
HNIFE	Nickel Iron Wire (hard #52 alloy)
D	Dumet (light unless otherwise specified)
DB	Dumet (Bare - No Oxide or Borated Coating)
DNB	Dumet Non-Borated
DNP	Dumet Nickel Plated
SS	Stainless Steel #430
STR	Stranded Wire
T (GS)	Tungsten Lead Wire Pins (GS) type
T (WK)	Tungsten Lead Wire Pins (WK) type

Fluorescent Lamp Tubing

Our glass melting and tube drawing operations have been engineered to supply high visual quality tubing with very stable dimensional controls.

Fluorescent tubes are classified by an alpha/numeric designation similar to that of Incandescent lamp bulbs. The first letter "T", indicates the tubular shape. The following number indicates the general outside diameter (O.D.) of the tubing in units of 1/8".

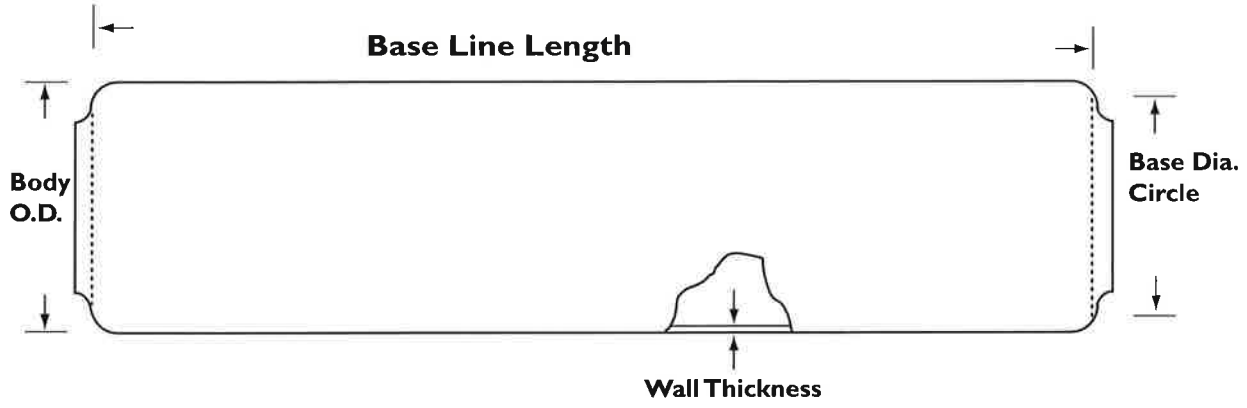
i.e. T - 8 = 1.000" O.D.

The second letter is used to designate a specific dimensional variation in either O.D. or wall thickness, etc. for given tube size. The last number indicates either the nominal base line length for end formed tubes or the overall length for straight tubes.

Fluorescent tubes are currently available in either version T8, T9, T10 and T12 diameters. (See back page)

When ordering, please specify your requirements in terms of O.D., wall thickness and length (base line or straight cut).

Philips Lighting produces tubular glass envelopes for the fluorescent lamp production line, using our #0081 glass composition at our Danville, Kentucky and Salina, Kansas facilities.
This glass composition is designed to produce excellent transmittance of the visible spectrum of light for all general purpose fluorescent lamp requirements.



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GENERAL DIMENSIONS

Title	O.D. (in inches)	Wall Thickness (in inches)	Base Line Length (in inches)
T8F16.496	.990 - 1.040	.029 - .033	16.476 - 16.516
T8F22.496	.990 - 1.040	.029 - .033	22.476 - 22.516
T8F24.496	.990 - 1.040	.029 - .033	24.476 - 24.516
T8F26.496	.090 - 1.040	.029 - .033	26.476 - 26.516
T8F28.496	.990 - 1.040	.029 - .033	28.476 - 28.516
T8F34.496	.990 - 1.040	.029 - .033	34.476 - 34.516
T8F68.520	.990 - 1.040	.029 - .033	68.480 - 68.560
T8F92.520	.990 - 1.040	.029 - .033	92.480 - 92.560
T9F22.440	1.120 - 1.160	.036 - .042	*22.400 - 22.480
T9C32.675	1.120 - 1.160	.036 - .042	*32.616 - 32.734
T10F46.350	1.300 - 1.350	.028 - .034	46.330 - 46.370
T12F16.505	1.450 - 1.505	.028 - .034	16.485 - 16.525
T12L16.527	1.465 - 1.495	.028 - .034	16.515 - 16.539
T12F20.495	1.450 - 1.505	.028 - .034	20.475 - 20.515
T12F20.505	1.450 - 1.505	.028 - .034	20.485 - 20.525
T12F22.505	1.450 - 1.505	.028 - .034	22.485 - 22.525
T12L22.517	1.465 - 1.495	.028 - .034	22.505 - 22.529
T12F24.505	1.450 - 1.505	.028 - .034	24.485 - 24.525
T12F26.475	1.450 - 1.505	.028 - .034	26.455 - 26.495
T12F26.505	1.450 - 1.505	.028 - .034	26.485 - 26.525
T12F28.505	1.450 - 1.505	.028 - .034	28.485 - 28.525
T12F31.505	1.450 - 1.505	.028 - .034	31.485 - 31.525
T12F32.495	1.450 - 1.505	.028 - .034	32.475 - 32.515

Title	O.D. (in inches)	Wall Thickness (in inches)	Base Line Length (in inches)
T12F34.505	1.450 - 1.505	.028 - .034	35.485 - 34.525
T12L34.510	1.450 - 1.505	.028 - .034	34.498 - 34.522
T12F38.495	1.450 - 1.505	.028 - .034	38.475 - 38.515
T12L44.485	1.450 - 1.505	.028 - .034	44.473 - 44.497
T12F44.495	1.450 - 1.505	.028 - .034	44.475 - 44.515
T12F44.495	1.450 - 1.505	.028 - .034	44.475 - 44.515
T12F46.505	1.450 - 1.505	.028 - .034	46.493 - 46.517
T12L46.525	1.450 - 1.505	.028 - .034	46.513 - 46.537
T12FE46.555	1.450 - 1.505	.028 - .034	46.543 - 46.567
T12L56.500	1.450 - 1.505	.028 - .034	56.480 - 56.520
T12F56.529	1.450 - 1.505	.028 - .034	56.504 - 56.554
T12F57.330	1.450 - 1.505	.028 - .034	57.305 - 57.355
T12L60.500	1.450 - 1.505	.028 - .034	60.480 - 60.520
T12F60.529	1.450 - 1.505	.028 - .034	60.504 - 60.554
T12F68.529	1.450 - 1.505	.028 - .034	68.504 - 68.554
T12L68.530	1.450 - 1.505	.028 - .034	68.510 - 68.550
T12F69.410	1.450 - 1.505	.028 - .034	69.385 - 69.435
T12L80.370	1.450 - 1.505	.028 - .034	80.350 - 80.390
T12L80.470	1.450 - 1.505	.028 - .034	80.450 - 80.490
T12F80.529	1.450 - 1.505	.028 - .034	80.504 - 80.554
T12G92.460	1.450 - 1.505	.028 - .034	92.440 - 92.480
T12F92.504	1.450 - 1.505	.028 - .034	92.479 - 92.529
T12S92.529	1.450 - 1.505	.028 - .034	92.504 - 92.554
T12L92.530	1.450 - 1.505	.028 - .034	92.510 - 92.550
T12F92.590	1.450 - 1.505	.028 - .034	92.565 - 92.615

OVERALL LENGTH (NOT END FORMED)

Clear Neon Sign Tubing

0291 Glass

TOTE BOX (BULK)				SADDLE PACK CARTONS
Description				
O.D.	Wall	Length	Average Lbs/Box	Average Lbs/Box
5mm	.042 - .047"	48"	1650	50
6mm	.052 - .058"	48"	1700	50
7mm	.052 - .058"	48"	1450	50
8mm	.052 - .058"	48"	1450	50
9mm	.052 - .058"	48"	1250	50
10mm	.052 - .058"	48"	1200	50
11mm	.052 - .058"	48"	1100	50
12mm	.052 - .058"	48"	1100	50
13mm	.052 - .058"	48"	1200	50
15mm	.052 - .058"	48"	1150	50
18mm	.052 - .058"	48"	1000	40
20mm	.052 - .058"	48"	900	35
25mm	.052 - .058"	48"	750	30
15mm	.100 - .150"	48"	1400	50
19mm	.100 - .150"	48"	1600	50
24mm	.100 - .150"	48"	1200	50

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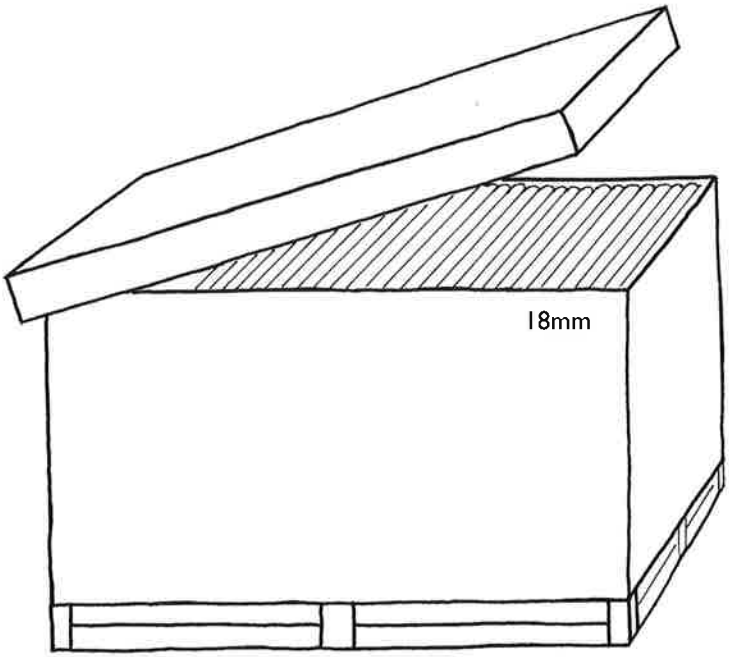
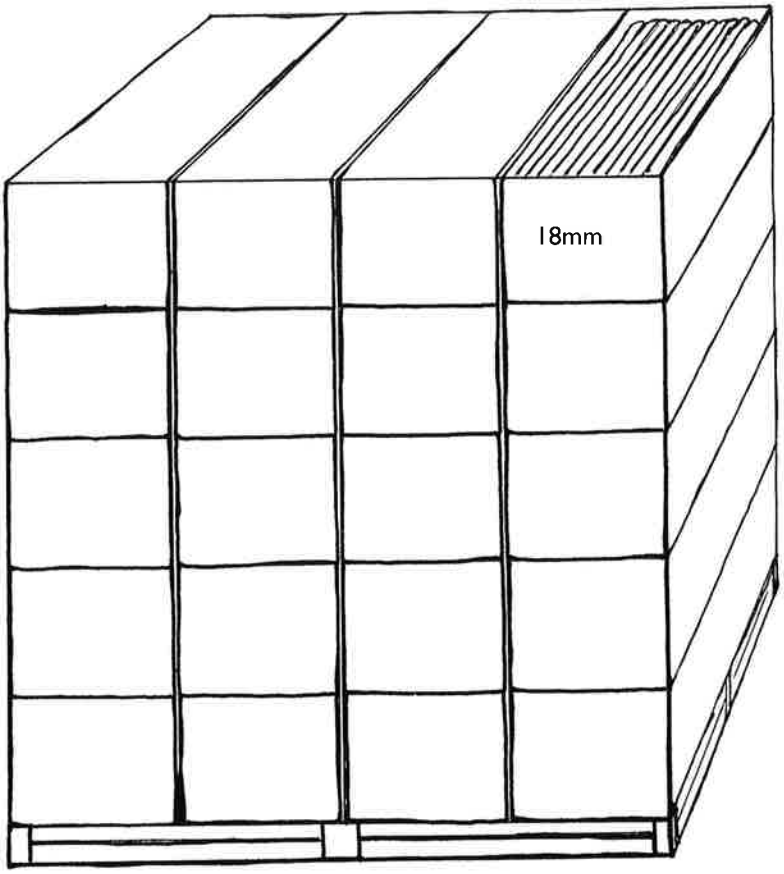


TOTE BOX PACK

SADDLE PACK CARTONS



Lead Glass Tubing

STANDARD DIMENSIONAL TOLERANCES

OUTSIDE DIAMETER

Tubing

Nominal Range	+/-
.080 - .100"	.003"
.105 - .200"	.005"
.205 - .300"	.006"
.305 - .400"	.007"
.405 - .500"	.008"
.505 - .600"	.009"
.605 - .800"	.010"
.805 - .900"	.012"
.905 - 1.000"	.014"

Cane

Nominal Range	+/-
.120 - .140"	.007"
.150 - .159"	.008"
.160 - .180"	.009"

WALL THICKNESS

Nominal Range	+/-
.014 - .018"	.0015"
.020 - .029"	.0015"
.030 - .039"	.0020"
.040 - .049"	.0025"
.050 - .059"	.0030"
.060 - .069"	.0035"
.070 - .100"	.0040"
> .100"	10% of Nominal Wall

SIDING

Nominal Range	Max
.020 - .024"	.002" for O.D. < .220"
.020 - .029"	.0015" for O.D. >.221"
.030 - .049"	.002"
.050 - .059"	.003"
.060 - .069"	.004"
> .070"	10% of Nominal Wall

(Larger Diameters Available Upon Request)

OUT OF ROUND (OOR)

Tubing from .080" to .330" O.D.	.002" max
Tubing from .331" to 1.000" O.D.	0.6% of Nominal O.D.
Tubing greater than 1.000" O.D.	1.0% of Nominal O.D.
Cane	2.0% of Nominal O.D.

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Philips Elmet
1560 Lisbon Road
Lewiston, Maine 04240

A Division of Philips Electronics North America

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800-343-8008
FAX 207-786-8924

www.philipselmet.com

Philips
Lighting
Company

PHILIPS

Incandescent Lamp Bulbs

Philips Lighting Company produces high quality, incandescent lamp bulbs utilizing "state of the art" technology applied to the ribbon machine processes at our Danville, Kentucky facility.

These bulbs are manufactured from our type #0081 Soda Lime Glass composition which we believe offers a unique balance of optical clarity, excellent sealing characteristics to Lead Glass stern components and superior dimensional control. This provides a lamp manufacturer quality bulbs at an economical price for lamp assembly operations.

The ribbon machine is, by nature, a high volume process requiring sizeable investments in related or peripheral equipment to produce a given bulb size. Consequently, while small volumes can be produced with it's proven dimensional controls, quantities in the millions are necessary to provide the economic benefits of this process.

Philips incandescent bulbs are identified by a combination of specific part number plus an alpha/numeric description to designate each item as follows:

- The first letter identifies the bulb shape.
- The first number identifies the maximum diameter of the bulb in terms of $^1/_8$ inches.
- The second letter identifies a major dimensional revision of the original bulb.
- The second number identifies a minor dimensional revision of the original bulb.
- Suffix letters CL = clear glass.

For example, the description A19C3CL indicates a bulb that has an "A-line" shape, 19 x $^1/_8$" or 2.375" maximum diameter and is clear glass.

All currently available bulb types are bulk packed in corrugated paper boxes, commonly referred to as "hampers", and shipped in unitized cubes per the listing on the reverse side.

Ornaments

The ribbon machine process also lends itself to the production of decorative glass ornaments. At the present time Philips offers two spherical sizes at 2.125 and 2.625 inches in diameter. In addition, a tear drop shaped ornament at 2.125 inches in diameter is available. These shapes are coded X214, X258 and XD300respectively.

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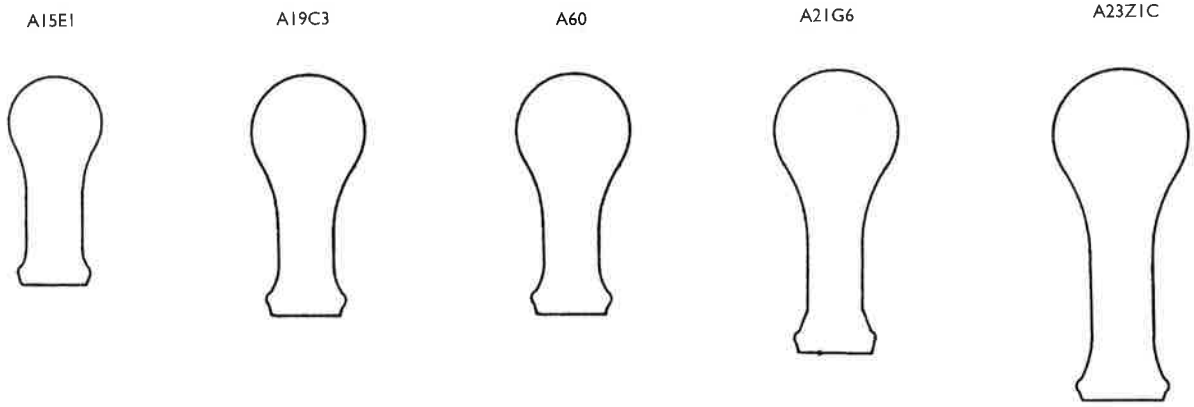
#0081 GLASS RIBBON MACHINE BULBS

Designation	Hamper Type	Pieces/Hamper	Pieces/Skid (24 Hampers)
A15E1 CL	BH3	742	17,808
A19C3 CL	BH3	460	11,040
A60	BH3	440	11,640
A21G6 CL	BH3	325	7,800
A23Z1C CL	BH3	247	5,928

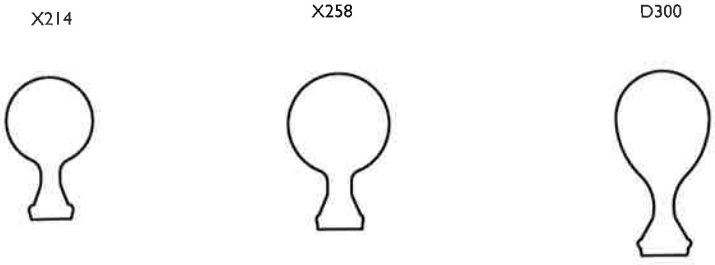
#0081 GLASS RIBBON MACHINE ORNAMENTS

Designation	Hamper Type	Pieces/Hamper	Pieces/Skid (24 Hampers)
X214	BH3	760	18,240
X258	BH3	450	10,800
D300	BH3	325	7,800

INCANDESCENT BULB SHAPES



ORNAMENT SHAPES



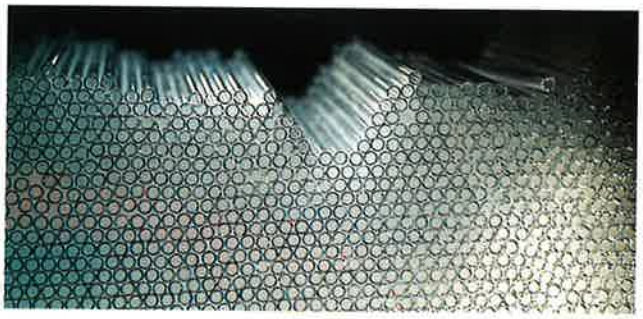
Soda Lime and Lead Silicate Glass Products

Glass tubing is a vital component of the lighting industry. Philips Elmet supplies both lead and lime compositions to meet such varied needs as fluorescent tubing, exhaust tubing, flare tubing and cut rings for the lighting and electronics industries.

Glass has been used by mankind for thousands of years. Today, its applications range from the kitchen to the construction industry, from electronics to the arts. Although many thousands of compositions have been developed, it is generally classified into two major families; "soft glass" and "hard glass."

Philips Lighting is a leader in the production of two of the soft glasses which find the widest application in the lighting, electronics and ornament industries. These are soda lime glass and lead silicate glass. Other glass products which have special applications in the chemical industry, special lighting and high temperature lighting products are such formulations as borosilicate, alumosilicate, barium silicate and fused silica or quartz glass.

Philips Elmet is a supplier of high speed ribbon machine bulbs and shapes for the lighting and ornament industries.



Small diameter, precision cut tubing has become increasingly important to the lamp and electronic industries. Philips Elmet supplies high volumes of this product on a worldwide basis.

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Phillps Lighting Company

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Lewiston, Maine 04240

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Commercial glass compositions are selected on a combination of the following physical properties:

Density - gm/cc

Optical - Index of refraction, transmittance values and stress optical coefficient.

Viscosity - Ability to flow measured in terms of "poises" to identify strain, anneal, softening and working points.

Thermal Expansion Coefficient - Expressed in terms of 10^{-7} cm/cm/°C.

Electrical - Resistivity, dielectric constant, loss factor.

Philips Elmet offers high quality soda lime and lead silicate glass products. These are manufactured by our Philips Lighting Company in Danville, Kentucky. In addition, we offer fused silica and specialty glass products from our European facility in Winschoten, the Netherlands.

Availability and Applications

The Danville glass products are used in the manufacture of lighting, electronics, neon sign, fiberglass and ornament products. Material is available in the form of bulbs, small diameter flare and exhaust tubing, fluorescent tubing, ornament shells and cullet.

TYPICAL GLASS PROPERTIES

GLASS TYPE	Soda Lime #0081	Low Lead Silicate #0010
DENSITY		
gm/cc	2.470	2.835
REFRACTIVE INDEX		
n_d	1.512	1.539
VISCOSITY DATE °C		
Strain Pt.	473	397
Anneal Pt.	514	437
Soft Pt.	696	632
THERMAL EXPANSION COEFFICIENT		
(10^{-7} cm/cm/°C)	93.5	91.0
ELECTRICAL RESISTANCE (log ohm-cm)		
250°C	6.4	8.0
350°C	5.1	7.0

Ordering Information and Technical Assistance

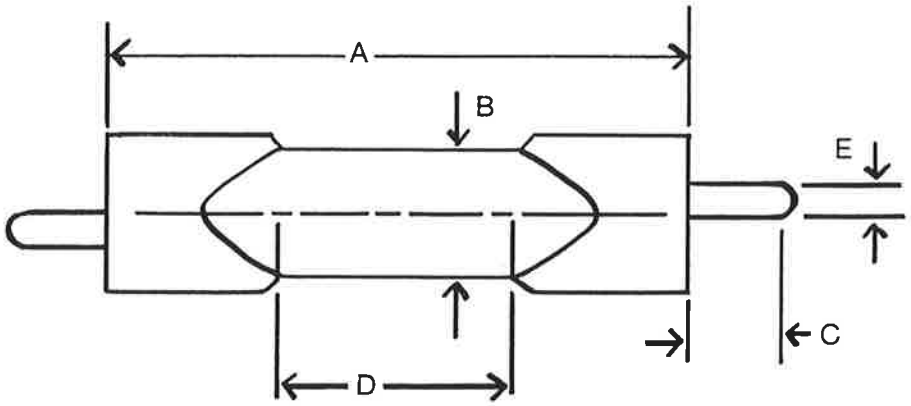
Call or send your request to our Customer Service Department at the address listed on this information bulletin for orders or for application engineering assistance.

Philips Lighting

Product Information

Philips Elmet

H.I.D. Arc Tubes



	WATTS	OPERATING VOLTS*	NOMINAL OPERATING CURRENT (AMPERES)	ORDERING CODE	Nominal Dimensions (mm) A LENGTH	B ARC TUBE DIAMETER	C HAIR PIN LENGTH	D LIGHTED LENGTH	E DISTANCE BETWEEN LEAD IN WIRES
METAL HALIDE	175	115-145	1.5	780403	65	15	9	27	4.5
	250	115-145	2.1	965459	74	17	9	36	4.5
	400	120-150	3.25	780510	87.5	21.6	9	44.5	4.5
	1000	238-288	4.2	786327	142	25.8	9	88	7.5
	1500	255-285	6.2	780569	160	28.8	9	104	7.5
MERCURY VAPOR	175	115-145	1.5	768606	94	13	9	50	4.5
	250	115-145	2.1	768598	95	17	9	54	4.5
	400	120-150	3.2	726323	116	20	9	70	4.5
	700	240-290	2.8	727123	177	20	9	125	4.5
	1000	125-145	8.0	725184	205	24.5	9	140	7.5
	1000	245-285	4.0	724054	205	24.5	9	152	7.5

**LAMP OPERATING VERTICALLY AT RATED WATTS*

PHILIPS

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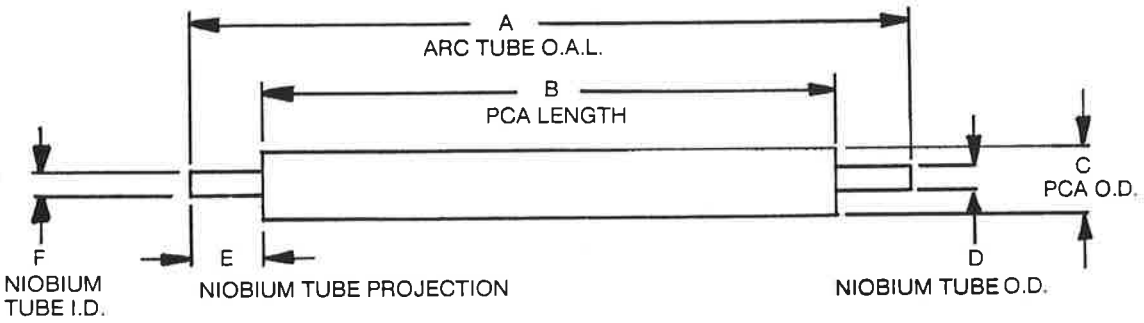
Philips Elmet
Philips Lighting Company
1560 Lisbon Road
Lewiston, ME 04240
A Division of North American Philips Corporation

To place orders or obtain more information:
Phone: 1-800-343-8008 or (207) 784-3591
TWX - (710) 223-0675/FAX - (207) 786-8924

HIGH PRESSURE SODIUM



			Nominal Dimensions (mm)					
WATTS	VOLTS* NOM	ORDERING CODE	A ARC TUBE O.A.L.	B PCA LENGTH	C PCA O.D.	D NIOBIUM TUBE O.D.	E NIOBIUM PROJECTION	F NIOBIUM TUBE I.D.
35	52	963298	56 +-2	44 +-2	5.2	2.0	6.5 +-1	1.6
50	52	963025	56 +-2	44 +-2	5.2	2.0	6.5 +-1	1.6
70	52	965087	65 +-3	48 +-2	6.2	3.0	8.5 +-1	2.5
100	52	965202	74 +-3	58 +-2	6.9	3.0	8.0 +-1	2.5
150	52	963124	83 +-3	69 +-2	6.9	3.0	7.0 +-1	2.5
150	100	963132	101 +-3	86 +-2	6.4	3.0	7.5 +-1	2.5
200	100	964650	98 +-3	83 +-2	7.0	3.0	7.5 +-1	2.5
250	100	963116	108 +-3	91 +-2	8.5	3.0	8.5 +-1	2.5
400	100	963017	131 +-3	113 +-2	9.2	4.0	9.0 +-1	3.5
1000	250	528749	260 +-3	244 +-2	9.5	4.0	8.0 +-1	3.5

*NOTE: ACTUAL OPERATING VOLTAGE WILL DEPEND ON HEAT REFLECTING PROPERTIES OF THE OUTER BULB.

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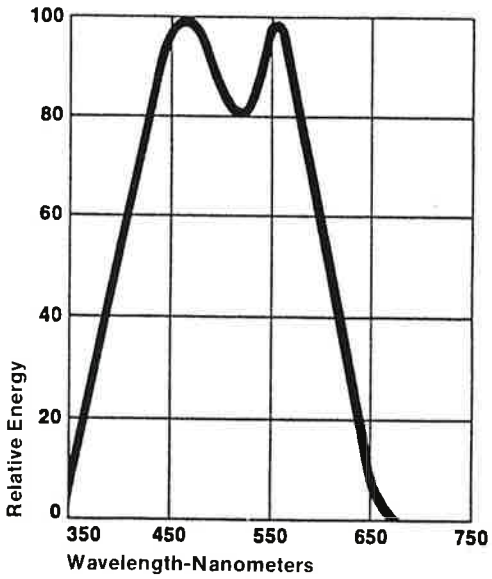
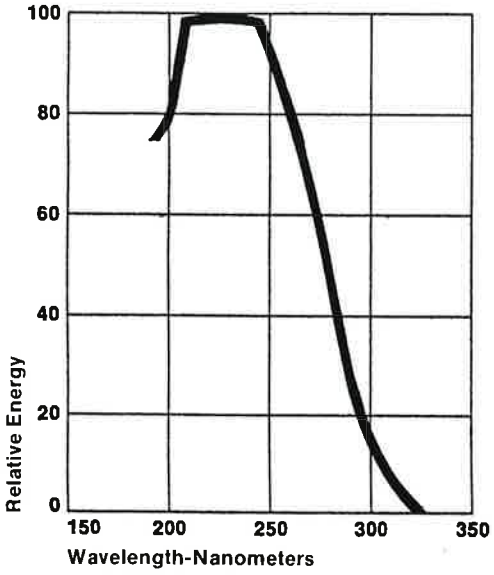
Standard White Fluorescent Phosphor

EMISSION SPECTRUM



EXCITATION SPECTRUM



Chemical Composition:

Calcium Halophosphate:	Sb, Mn

Application:

3500°K White Fluorescent Lamps

Optical Characteristics:

Fluorescense	White
Wave Length at Peak	579nm
Band Width (50%)	79nm
ANSI Color Coordinates	x = 0.414
	y = 0.401
Excitation Peak	209nm

Physical Characteristics:

Particle Size Distribution

Microtrac II (microns)	10%	50%	90%
	2.5-5.5	9.0-13.0	19.0-27.0
Alpine Sieve Test (microns)	45		
Body Color	White		
Milling for Paint Making	Not Required		

Product Number: **902304**

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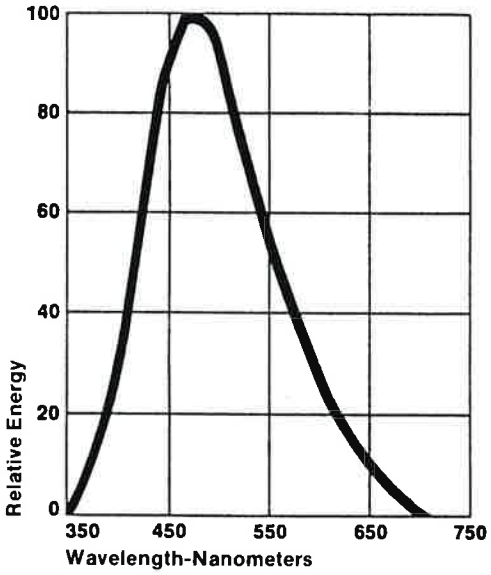
Blue Halo Fluorescent Phosphor

EMISSION SPECTRUM



Chemical Composition:

Calcium Fluoro-phosphate:	Sb

Application:

Fluorescent Lamps

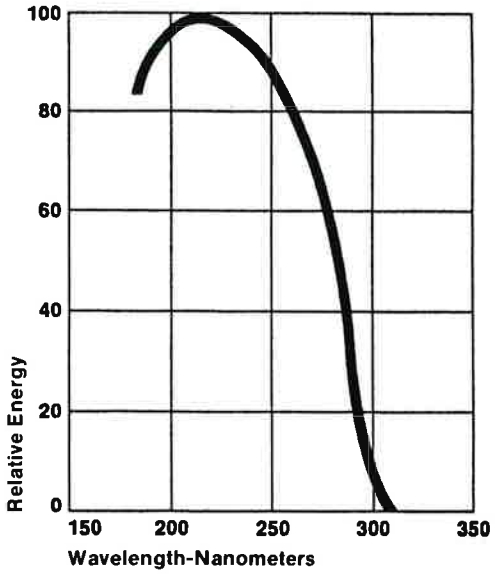
Optical Characteristics:

Fluorescense	Blue
Wave Length at Peak	456nm
Band Width (50%)	138nm
ANSI Color Coordinates	x = 0.214
	y = 0.274
Excitation Peak	236nm

Physical Characteristics:

Particle Size Distribution

EXCITATION SPECTRUM



Microtrac II (microns)	10%	50%	90%
	0.5-6.5	7.0-15.0	15.0-30.0
Alpine Sieve Test (microns)	45		
Body Color	White		
Milling for Paint Making	Not Required		

Product Number: **902338**

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Philips
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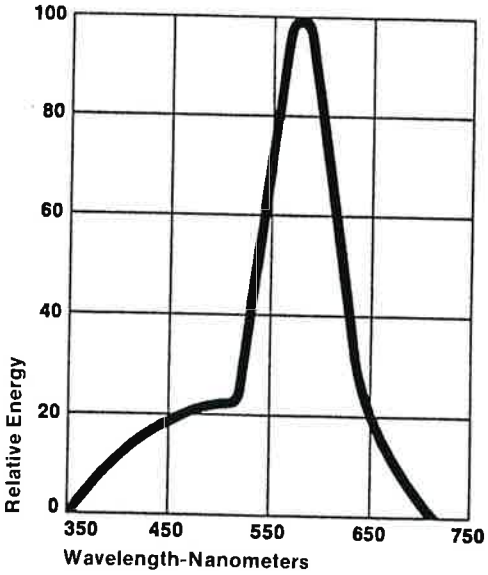
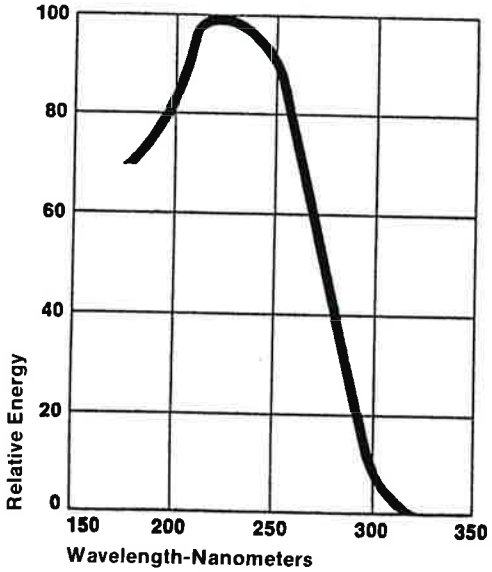
Cool White Fluorescent Phosphor

EMISSION SPECTRUM



EXCITATION SPECTRUM



Chemical Composition:

Calcium Halophosphate:	Sb, Mn

Application:

Cool White Fluorescent Lamps

Optical Characteristics:

Fluorescense	White
Wave Length at Peak	580nm
Band Width (50%)	89nm
ANSI Color Coordinates	x = 0.383
	y = 0.389
Excitation Peak	238nm

Physical Characteristics:

Particle Size Distribution

Microtrac II (microns)	10%	50%	90%
	>6.0	12.0-16.0	<29
Alpine Sieve Test (microns)	45		
Body Color	White		
Milling for Paint Making	Not Required		

Product Number: **902312**

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Philips
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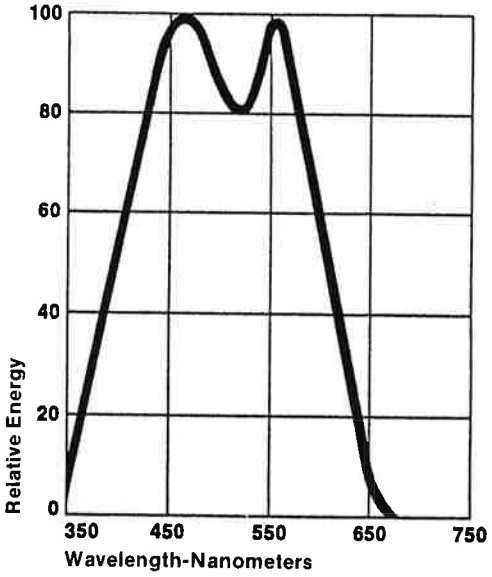
Daylight Fluorescent Phosphor

EMISSION SPECTRUM



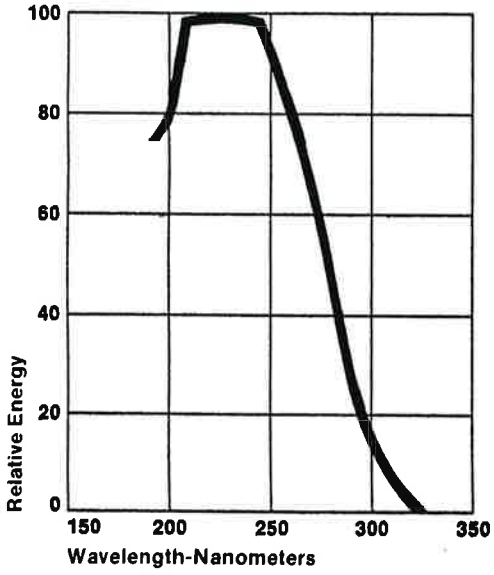
Chemical Composition:
Blend of Blue Halo and Standard White (3500)

Application:
Standard 6500° Daylight Lamps

Optical Characteristics:

Fluorescense	Light Blue
Wave Length at Peak	475nm
Band Width (50%)	190nm
ANSI Color Coordinates	x = 0.311
	y = 0.335
Excitation Peak	225nm

EXCITATION SPECTRUM



Physical Characteristics:
Particle Size Distribution

Microtrac II (microns)	10%	50%	90%
	7	13	22
Alpine Sieve Test (microns)	45		
Body Color	White		
Milling for Paint Making	Not Required		

Product Number: **902700**

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PHILIPS ELMET has been producing molybdenum and tungsten products for industry since its founding in 1929 in Lewiston, ME. Since its inception, the company has grown substantially in plant size and production volume, as well as product diversity and services to industrial customers.

Originally there were fifty employees in a 13,400 square foot facility, while today, there are about 400 employees and over 220,000 square feet of plant space. Earlier, only wire products were manufactured; today the product line has expanded to include wire, rod, sheet, and pressed-and-sintered parts. Precision machined and fabricated components are also produced. Philips Elmet is a part of Philips Lighting Company and enjoys the unique position of supplying tungsten lamp filaments and other components to all the Philips lamp plants in North America, as well as other customers around the world.

This facility is also headquarters for a marketing department which has world-wide sales responsibilities. These include international and domestic sales of traditional Philips Elmet produced products to non-lighting markets. Major customers around the world are found throughout the semiconductor, electronics, and furnace industries. Philips Elmet also markets all lamp components manufactured by Philips Lighting Company and imports components from Philips overseas for resale in the United States.

Philips
Lighting
Company

PHILIPS