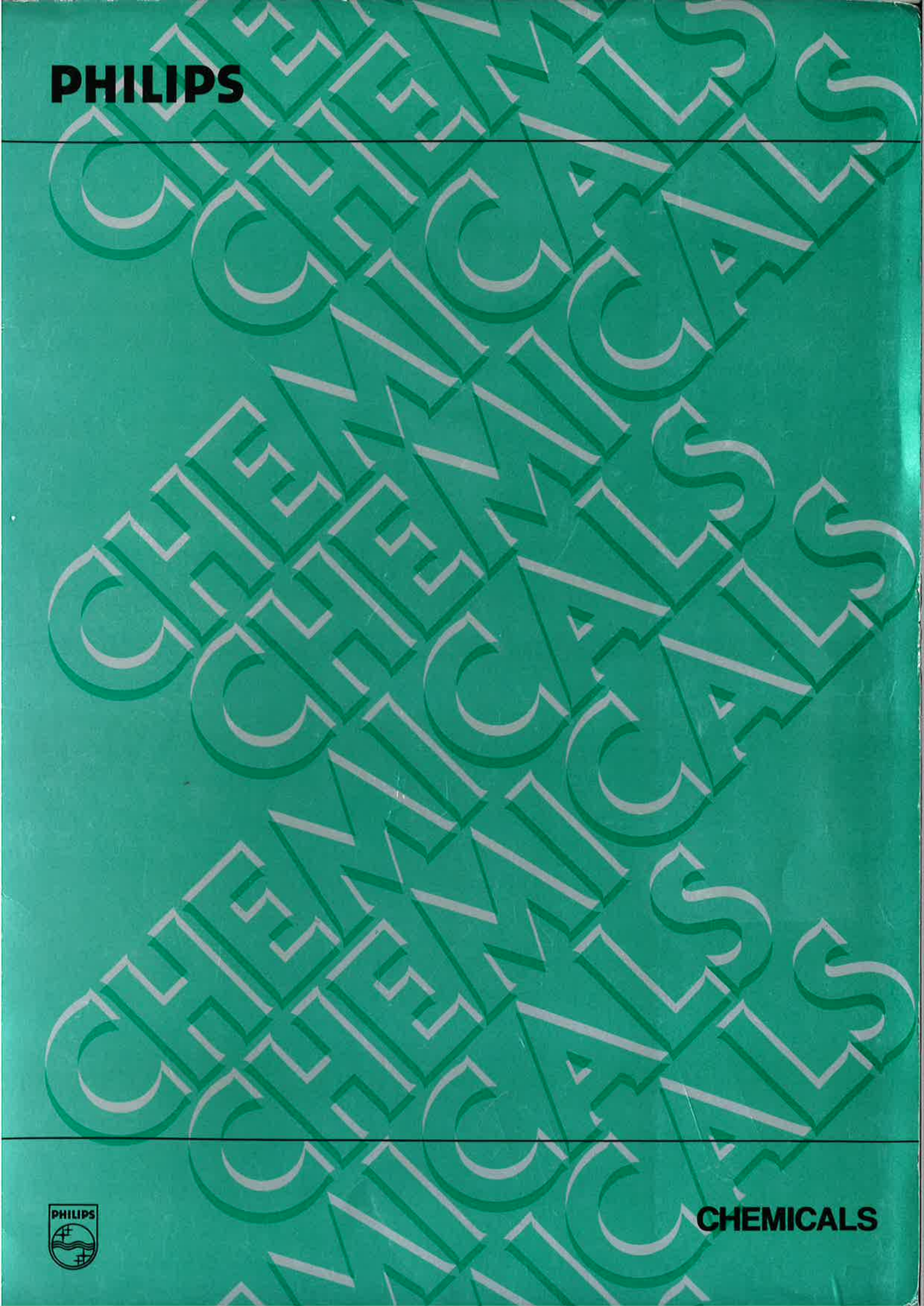
PHILIPS



PHILIPS

CHEMICALS

INTRODUCTION

The range of raw materials offered for sale by the Lighting Division of Philips comprises products that can be used in the lighting industry and in many other fields of manufacture.

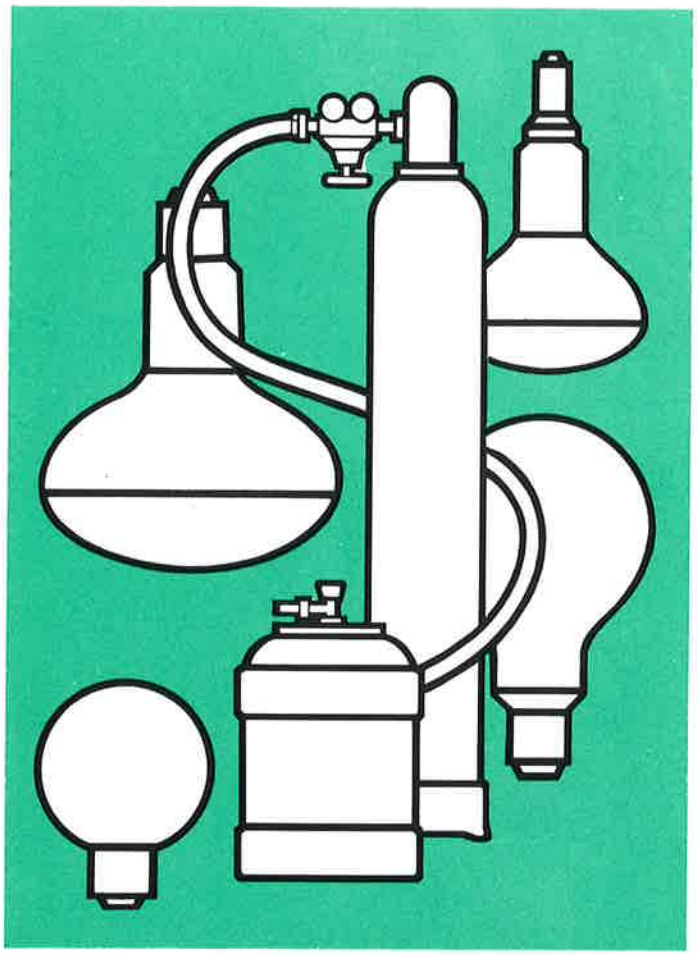
Our raw materials activity can be roughly divided into two main areas, the metallurgical group and the chemical group. The metallurgical group specialises in tungsten and molybdenum products and various special products (see our W-Mo brochure), while the chemical group concentrates on items that are used in the production of lamps. However, the extensive knowledge and production techniques of the chemical group also enable it to make products for other applications in manufacturing industry.

Our chemical range includes the following products: lamp adhesives, insulation powders, solder fluxes, pigment suspensions, lacquers, getters, marking pastes and inks, fluorescent powders, glues, glass powders, etc.

The products in this brochure have been classified according to the areas of application that can be found in the lighting industry. They are perfectly suited to their applications, being the result of many years of production experience and extensive research in our laboratories.

Whilst you may find that many of our existing products will suit your purposes, we are, if necessary, always prepared to modify our specifications according to your special requirements.

If your company manufactures products that involve the processing of chemicals or are related to the raw materials mentioned above, we are confident that we can be of service to you.



Our company has manufactured gases by fractionation of air since 1916. In that year Philips was the only manufacturer of incandescent lamps in the world, who also began with the production of argon and oxygen. Argon, used as a filling gas for incandescent lamps, remained in relatively low demand until shortly after World War II when a new and much bigger field of sales was opened as a welding gas for electric welding in an argon atmosphere.
This application naturally involved a quantitative expansion, but the qualitative specifications also became much severer. After many years of research and development the rising demand for gases and gas mixtures of a very high degree of purity and accurately specified composition has led to a production potential able to stand up to any comparison. The wide field of application within the company itself has led to a range of products which can meet even the most varied demands of third parties. We would therefore recommend that you get in touch with us so that we can arrange to supply gas compositions to suit your specific requirements.

Name	Chemical formula	Percent by vol. in air	Specific gravity (air=1)	Weight, kg/m³, at 0°C/1 bar	Boiling point °C	Melting point °C
nitrogen	N_2	78,084	0,9672	1,23	−195,8	−210,0
oxygen	O_2	20,946	1,105	1,41	−183,0	−218,8
argon	Ar	0,934	1,380	1,76	−185,8	−189,4
neon	Ne	0,0018	0,6964	0,89	−246,0	−248,6
helium	He	0,00053	0,1380	0,18	−268,9	−269,7
krypton	Kr	0,00011	2,896	3,70	−152,0	−157,3
xenon	Xe	0,000008	4,561	5,82	−108,0	−111,5
Air furthermore contains:						
hydrogen	H_2	0,00005	0,0695	0,09	−252,7	−259,2
methane	CH_4	0,00015	0,5545	0,70	−161,4	−182,6
carbon dioxide	CO_2	0,033	1,529	1,95	−78,5	−56,6
water vapour	H_2O	variable			100	0

GASES

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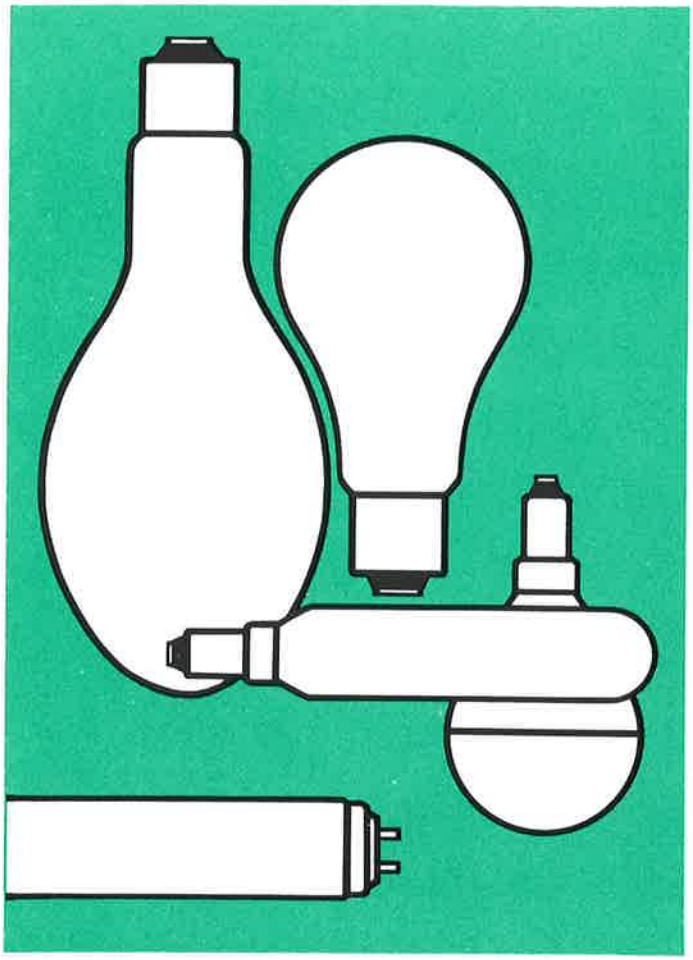

Philips produce a complete range of powders for cementing lamp bases to glass bulbs. They cover every lamp type in current use and have been specially developed in our laboratories to suit the characteristics of these light sources.

All our cements are characterised by their considerable torsional strength between the lamp bulb and base. They include the following additional specifications:

a. Cements with a high reflection coefficient to prevent absorption losses;
b. Cements with a good temperature resistance for high wattage lamps and for lamps employed in hot environments i.e. furnaces;
c. Cements with flow characteristics suited to cementing bulb-shaped lamps or lamps with small bases.

As a general rule, cements are supplied in powder form and have unlimited shelf life provided that they are stored in a cool and dry condition.
Since the cement can only be retained for a restricted length of time (approx. 7 days), preparation should take place just prior to use by mixing the powder with the appropriate solvent.

Should you be unable to select a suitable cement powder from our existing range, we will be pleased to modify any of our existing standards to meet your requirements.

Ordering number	Shelf life	Application
10.00	unlimited providing it is kept in a cool and dry place	standard thermosetting cement for incandescent lamps with a rating $\leq$ 100 watt
10.01	unlimited providing it is kept in a cool and dry place	standard thermosetting cement for incandescent lamps with a rating $>$ 100 watt
10.02	unlimited providing it is kept in a cool and dry place	standard thermosetting cement for high pressure gas-discharge lamps
10.03	unlimited providing it is kept in a cool and dry place	standard thermosetting cement for fluorescent lamps
10.04	unlimited providing it is kept in a cool and dry place	standard white thermosetting cement for miniature lamps
10.05	unlimited providing it is kept in a cool and dry place	standard thermosetting cement with better flow characteristics for lustre and candle incandescent lamps
10.06	unlimited providing it is kept in a cool and dry place	standard capping cement for oven lamps
10.07	unlimited providing it is kept in a cool and dry place	capping cement for plastic lamp bases with very good flow characteristics
10.08	more than 1 year	thermosetting silicone resin cement with very good temperature resistance; particularly suitable for lamps with a very high operating temperature
10.09	more than 1 year	thermoplastic melt glue for plastic lamp bases and drawing dies
10.10	unlimited providing it is kept in a cool and dry place	capping cement for automotive lamps

CAPPING CEMENT POWDERS

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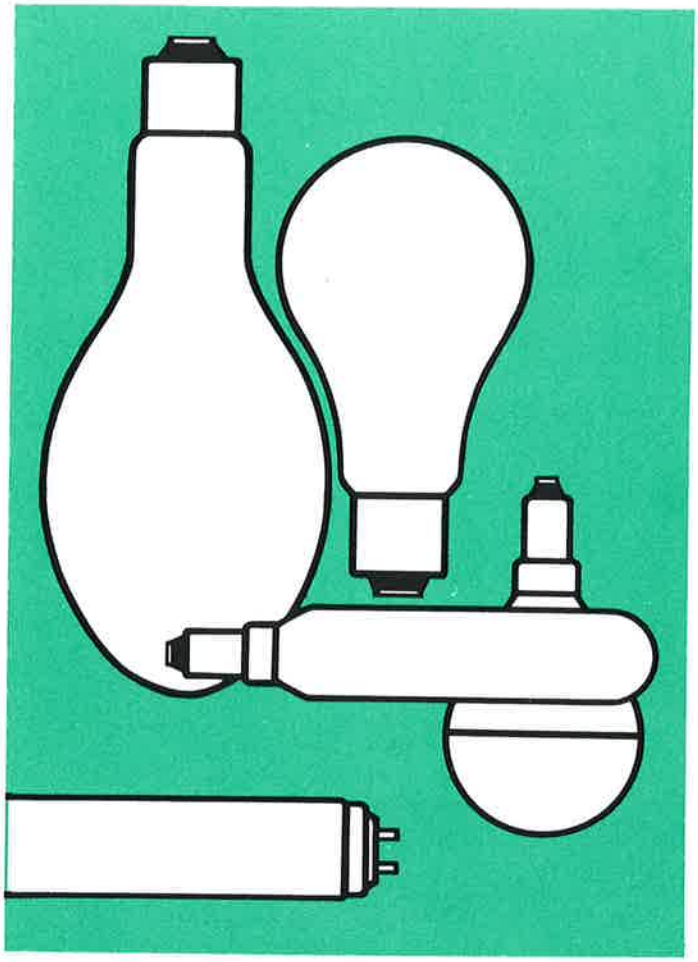

Our solder fluxes have been specially developed with regard to the solderability of the surface and they ensure that the solder flows properly to produce a good connection.

Solder fluxes can be divided into various types, namely fluxes for certain types of metal, fluxes for certain solder types and fluxes that are suitable for machines, manual soldering, etc. We have developed a number of types for use on lamp machines so that you can be sure of trouble-free lamp manufacture.

If you are unable to make a choice from our standard range, please get in touch with us as we shall be happy to modify any flux so that it complies with your requirements and wishes, and at the same time we shall be happy to advise you on your choice if it is for applications other than lighting engineering ones.

Ordering number	Solder flux	Applications
11.01	35% Sn + 65% Pb	additional manual soldering
11.02	easy-flow-flux	soldering of stainless steel
11.03	513	solder flux for low-pressure sodium lamps
11.05	2954 orange	solder flux for soldering cap contacts of low-pressure fluorescent lamps
11.06	528	solder flux for soldering side contacts on brass capshells for incandescent and high-pressure mercury vapour lamps
11.07	621	solder flux for bottom centre contact of incandescent lamps
11.09	116	solder flux for silver soldering
11.11	hydrazine 12,5%	hard solder flux for cadmium soldering
11.12	611	solder flux for soldering side contacts on Al capshells for incandescent lamps
11.13	128	solder flux for hard soldering of lamp bases of high-pressure gas-discharge lamps
11.14	617	solder flux for cadmium soldering
11.15	530	solder flux for bottom centre contacts of incandescent lamps

SOLDER FLUXES

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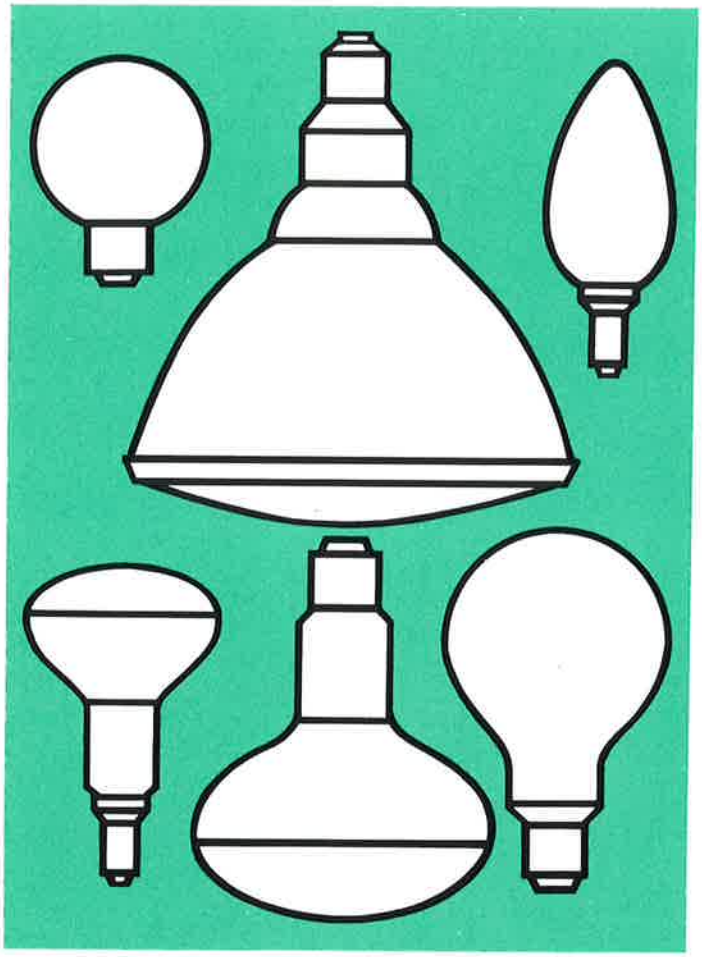

We can subdivide pigment suspensions into three types:
a. pigment suspensions taking maximum advantage of the luminous surface;
b. pigment suspensions for colouring the lamp and for enlarging the luminous surface;
c. pigment suspensions for applying a reflective layer in the lamp.

In order to make the best possible use of these properties the suspensions are applied to the inside of the bulb.

Lacquers have been developed in our laboratories for the colouring of pressed glass and disco lamps that are resistant to the high operating temperature of these lamps. These silicon-based lacquers are available in various colours, and, if the colour you desire is not included on this sheet, please get in touch with us.

We have also developed varnishes for the protection of lamps or lamp components. These varnishes protect the lamps from the environments in which they are used.

Pigment suspensions

Ordering number	Colour	Application
12.01	white	reflecting layer in heat radiation lamps
12.02	yellow	darkroom lamps
12.03	white	decorative lamps
12.04	white	high-pressure mercury gas-discharge lamps with reflector
12.05	yellow-pastel	GLS lamps
12.06	blue-pastel	GLS lamps
12.07	green-pastel	GLS lamps
12.08	blue	GLS lamps
12.09	green	GLS lamps
12.10	ivory	GLS lamps
12.11	orange	GLS lamps
12.12	pink	GLS lamps
12.13	red	GLS lamps
12.14	white	GLS lamps
12.15	white	GLS photo- enlarger lamps
12.16	yellow	GLS lamps
12.17	flame	GLS lamps

PIGMENT SUSPENSIONS AND LACQUERS

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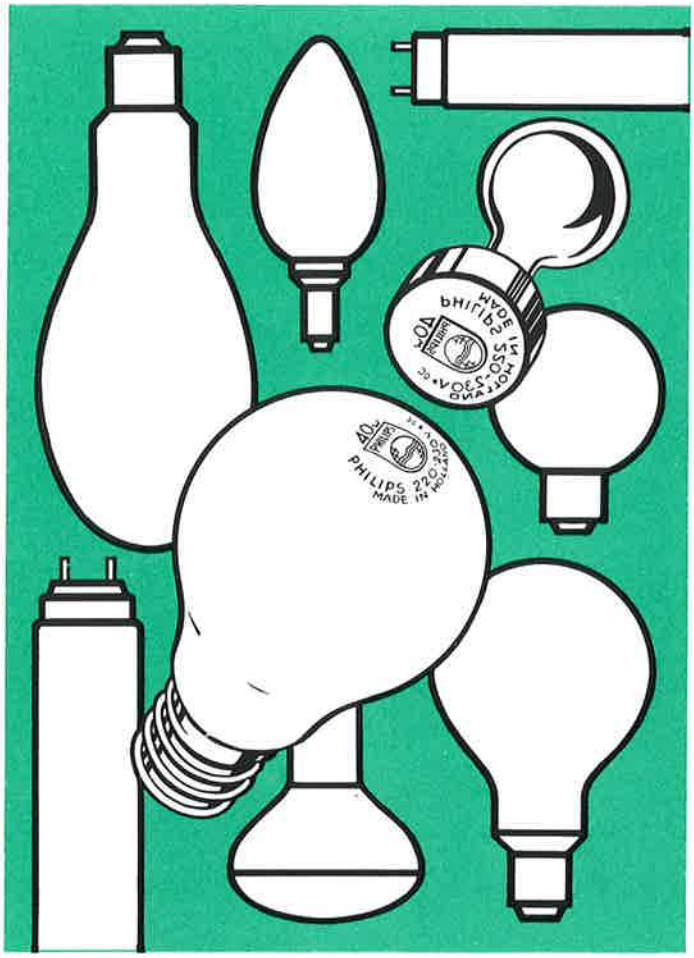
Lacquers

Ordering number	Lacquer	Colour	Application
12.50	translucent silicone varnish	blue	pressed glass flood and blown-bulb reflector lamps
12.51	translucent silicone varnish	yellow	pressed glass flood and yellow disco lamps
12.52	translucent silicone varnish	green	pressed glass flood and blown-bulb reflector lamps
12.53	translucent silicone varnish	red	pressed glass flood and blown-bulb reflector lamps
12.54	translucent silicone varnish	violet	pressed glass flood and blown-bulb reflector lamps
12.55	translucent resin paint A406	blue	reflector lamps up to 25 watts
12.56	translucent resin paint A406	yellow	reflector lamps up to 25 watts
12.57	translucent resin paint A406	green	reflector lamps up to 25 watts
12.58	transparent silicone varnish	blue	coloured disco lamps
12.59	transparent silicone varnish	green	coloured disco lamps
12.60	transparent silicone varnish	red	coloured disco lamps
12.61	transparent silicone varnish	orange	coloured disco lamps
12.62	transparent silicone varnish	violet	coloured disco lamps
12.63	ethyl silicate	black	lamps with a high operating temperature



The marking materials used in the lighting industry can be divided into two types, namely silver-based burning-in pastes and inks with a light etching effect for glass and metal.

During the burning-in of the lamp the burning-in pastes start an exchange reaction with antimony in the glass, the result of this being that the stamp is drawn into the glass so that we can speak of an indelible stamp.

One drawback of these silver-based pastes is that the number of colours available is limited and that they have to be burned in, in other words they are unsuitable for subsequent stamping and they can only be used on glass.

If coloured on metal we must then use a stamp that dries in air. Such stamps are available in a wide range of colours and most of them have a light etching effect for glass and metals so that the profile of the stamp is etched into the glass.

If you are unable to make a choice from our current product list please contact us so that we can advice you and perhaps develop a paste or ink that meets your own specific requirements.

Ordering number	Material	Colour	Application
	Marking paste		
14.01	G11	silver	GLS lamp bulbs
14.02	G19	silver	high-pressure mercury gas-discharge, blended light, high- and low-pressure sodium gas-discharge lamps
14.03	G214	silver	high-pressure gas-discharge lamps 125 W and fluorescent lamps
14.04	G306	silver	GLS lamp bulbs (small letters)
14.05	L496	red	fluorescent lamps
	Marking paint		
14.06	E184	silver yellow	air-drying marking paint for re-marking
14.07	G471	grey	air-drying marking paint for various purposes
14.08	G472	silver	air-drying marking paint for various purposes
14.09	H16	orange	air-drying marking paint for various purposes
14.10	L298	red	air-drying marking paint for various purposes
14.11	C237	brown	air-drying marking paint for various purposes
14.12	E265	yellow	air-drying marking paint for various purposes

MARKING PASTES, PAINT AND INKS

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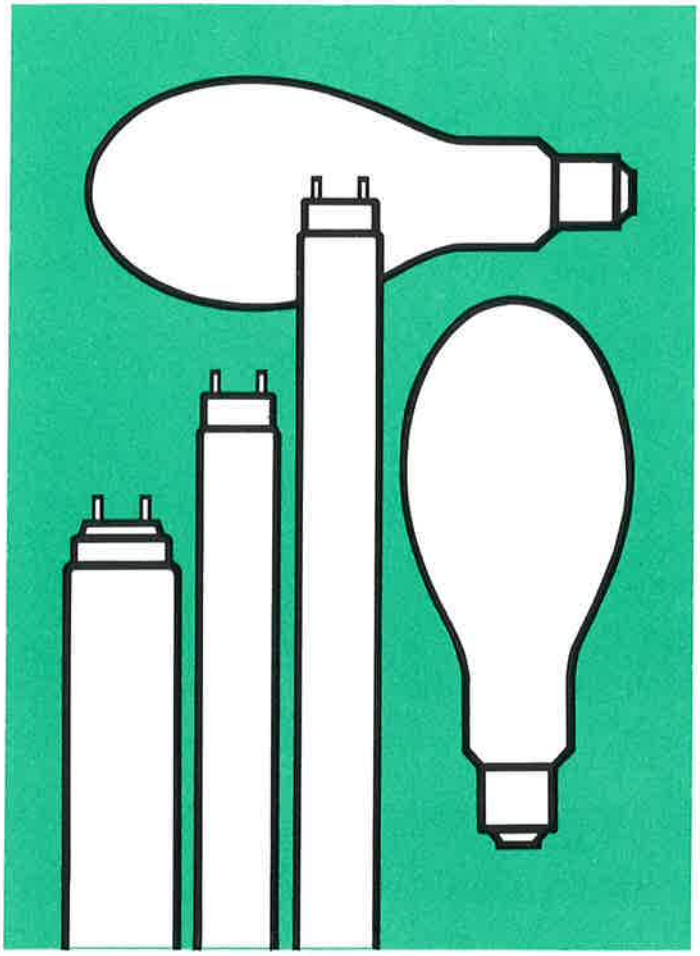
Ordering number	Material	Colour	Application
	Marking paint		
14.13	F218	green	air-drying marking paint for various purposes
14.14	A224	blue	air-drying marking paint for various purposes
14.15	N30	violet	air-drying marking paint for various purposes
14.16	B254	black	air-drying marking paint for vaious purposes
14.17	P81	white	quick air-drying marking paint
14.18	P54	white	air-drying marking paint for various purposes
	Marking ink		
14.19	glass ink	white	for marking of bulbs and sets
14.20	glass ink	black	for marking of bulbs and sets



Fluorescent powders convert ultraviolet radiation into visible light.
More than 40 years of laboratory research and experience in lamp manufacture have culminated in a range of Philips fluorescent materials for high- and low-pressure gas-discharge lamps with the following qualities:

- high conversion efficiency of the UV radiation;
- low absorption of converted light;
- very good adhesion to the glass;
- excellent maintenance.

Thanks to this experience we are able to meet almost any requirement of the lamp manufacturer.

Our fluorescent powders can be divided into four groups according to their application:

- Fluorescent powders for a high light output and moderate colour rendering properties (standard phosphors);
- Fluorescent powders for a moderate light output and excellent colour rendering properties (de luxe phosphors);
- Fluorescent powders for high-pressure mercury vapour lamps;
- Fluorescent powders with UV emission for medical and industrial purposes.

Philips have also developed fluorescent powders for a very high light output and excellent colour rendering: the so-called three-line phosphors.
In view of the existing patent rights of our company, the application of these powders in lamp manufacture is only possible with the conclusion of a patent license agreement.

Additional information can be supplied on request. Further, we are willing to discuss your specific requirements and enact modifications to meet your specifications.

Ordering number	Colour	Colour temperature	Colour coordinates
Standard phosphors for low-pressure gas-discharge lamps			
15.01	cool white	4100K	0,377-0,381
15.02	white	3500K	0,409-0,394
15.03	warm white	3000K	0,440-0,403
15.04	tropical daylight	6250K	0,317-0,342
15.05	white universal	4100K	0,381-0,377
De luxe phosphors for low-pressure gas-discharge lamps			
15.06	cool white de luxe	3900K	0,384-0,368
15.07	warm white de luxe	3000K	0,439-0,400
15.08	daylight de luxe	6250K	0,316-0,334
15.09	artificial daylight	6500K	0,301-0,319

Ordering number	Colour	Application
Miscellaneous powders		
15.10	U.V.-B.	solarium and germicidal lamps
15.11	normal	high-pressure mercury vapour lamps
15.12	de luxe	high-pressure mercury vapour lamps

FLUORESCENT POWDERS

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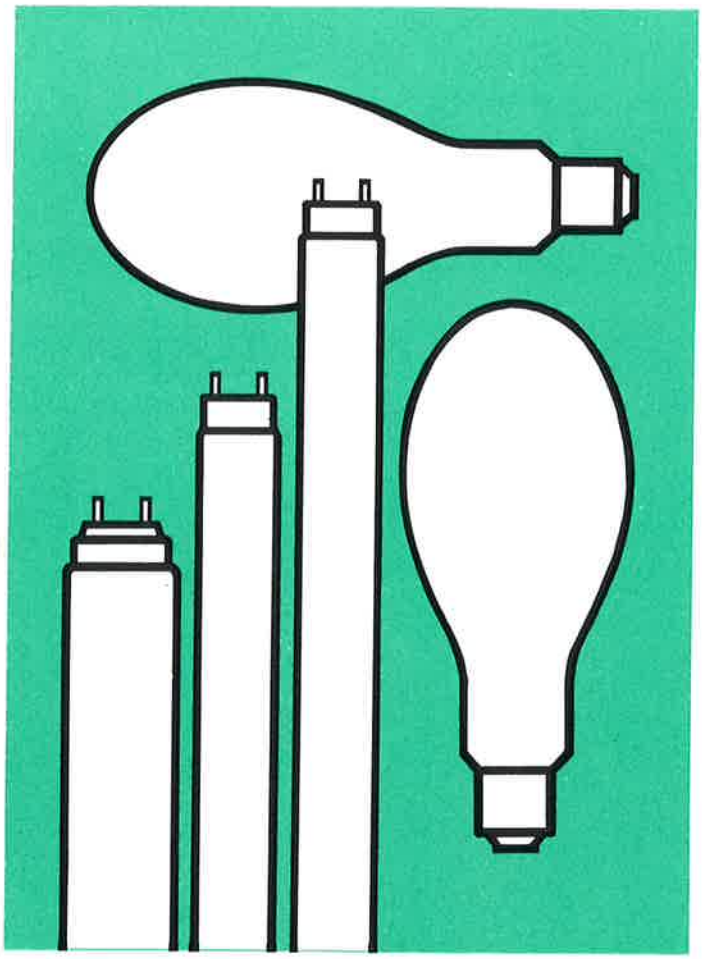

Emissive materials are used in gas-discharge lamps in order to lower the exit potential of electrons on the surface of electrodes.

For low-pressure gas-discharge lamps we use triple carbonates. These consist of a mixture of barium carbonate, strontium carbonate and calcium carbonate. This mixture is applied to the electrode which is annealed during pumping. In the course of this annealing process the metal carbonates are reduced to oxides. In other words, barium oxide, strontium oxide and calcium oxide are produced on the surface of the coil.

The exit potential of this oxide mixture is no less than a factor four lower than that of tungsten.

For high-pressure gas-discharge lamps we currently use an yttrium oxide-based emissive material, which is the successor to the thorium-based material. The main advantage of this new type is that it is not radioactive as is the thorium version.

Ordering number	Emissive material	Application
16.01	suspension 003	barium-strontium-calcium carbonate-zirconium-dope emitter for low-pressure gas-discharge fluorescent lamps
16.02	suspension 007	thorium-oxide emitter for high-pressure gas-discharge and blended light lamps
16.03	suspension 013	barium-strontium carbonate suspension for glow lamps (Ne)
16.04	suspension 025	thorium oxide emitter for high-pressure gas-discharge lamps
16.05	suspension 026	yttrium oxide emitter for high-pressure gas-discharge lamps
16.06	suspension 1417	barium-strontium-calcium-carbonate-suspension emitter for low-pressure sodium lamps

EMISSIVE MATERIALS

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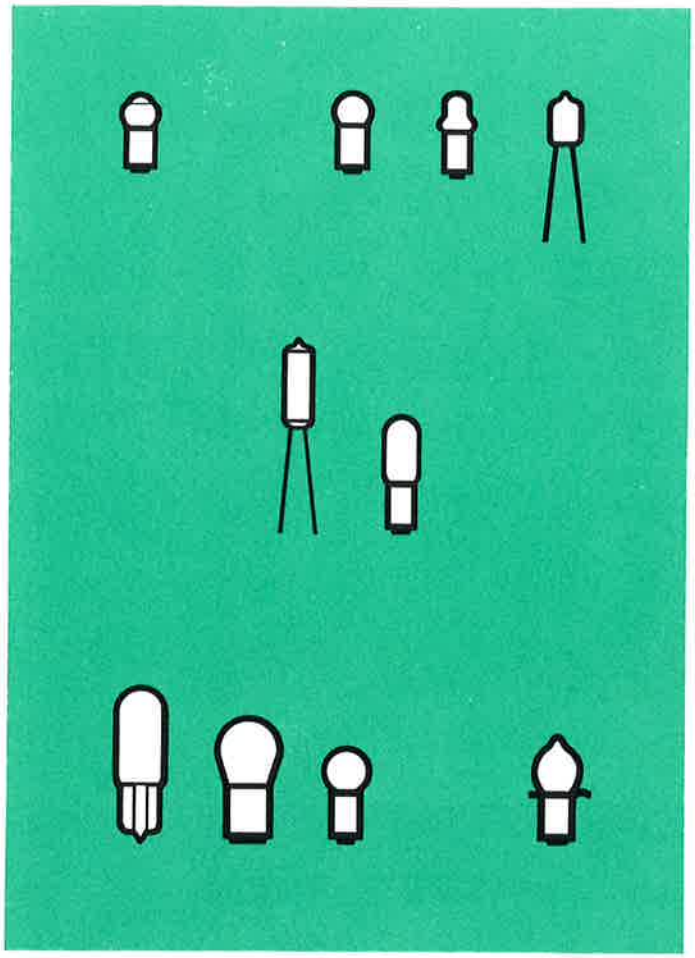

We have developed a large number of glass powders for lamp manufacture, including:

a. Moulding compounds for moulding ringlets that are later melted to a form known as the 'beads' in miniature lamps.
b. Glass powder suspensions for coating metals with a layer of glass so that these metals can later be melted into glass bulbs as supply wires.
c. Glass granulates for moulding insulation knobs, beams and rods in special lamps.

Ordering number	Glass powder	Colour	Application
17.01	moulding compound 003	green	beads for miniature lamps
17.02	moulding compound 004	blue	beads for miniature lamps
17.03	moulding compound 007	brown	beads for miniature lamps
17.04	moulding compound 008	pink	beads for miniature lamps
17.05	moulding compound 009	natural	beads for miniature lamps
17.06	suspension 1	white	internal colouring of bulbs
17.07	powder 28		enamelling of molybdenum supply wires
17.08	powder 38		enamelling of tungsten supply wires
17.09	powder 57		enamelling of tungsten rods
17.10	powder 67		protective layer against sodium vapour
17.11	powder 95		enamelling of molybdenum rods
17.12	powder 178		lead borate ringlets
17.13	powder 779		enamelling of tungsten wires
17.14	powder 95		glass knobs for molybdenum supports granulated 0,43 mm

GLASS POWDERS

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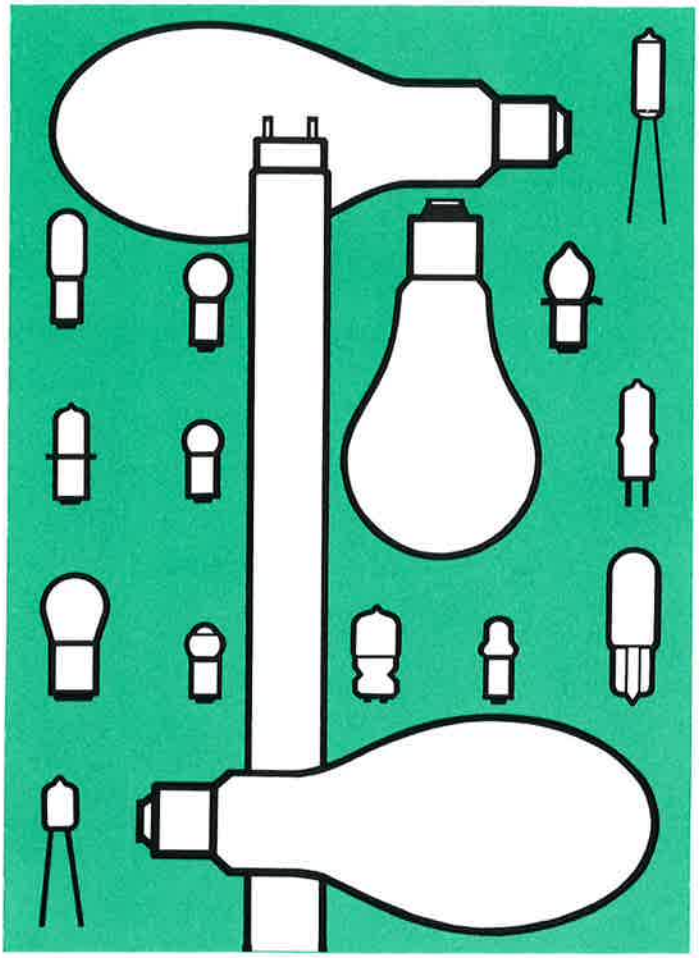

We have developed a number of chemicals for various applications. Some examples of these are particularly suited to those applications given in the table below.

We also have available chemicals that can be used for insulation purposes and for initiating discharge mechanisms, etc.

Ordering number	Product	Application
18.01	mercury	distilled mercury for gas-discharge lamps
18.02	mercury	oxidically purified mercury for diffusion lamps
18.03	mercury	capsules for gas-discharge lamps
18.04	sodium	sodium for gas-discharge lamps
18.05	iodide	pills for compact-source lamps
18.06	iodide	pills for metal halogen lamps
18.07	iodide	capsules
18.08	silvered copper powder	ignition strips for fluorescent lamps
18.09	resin varnish	epoxy-urea-formaldehyde resin varnish that is used together with silvered copper powder
18.10	foam insulation powder	internal insulation of lamp bases
18.11	moulding powder	foam insulation rings
18.12	lubricant 011	prevention of sticking lamp bases
18.13	resin glue	epoxy resin glue for bonding metal to glass
18.14	filament glue	two component glue for bonding carbon filaments
18.15	adhesive	calcium pyrophosphate bonding agent for fluorescent lamps
18.16	conductive suspension 003	electrically conductive layer in fluorescent lamps
18.17	tinning salt 2	non electrical tinning of supply wires of glow lamps
18.18	silvering liquid no. 2	internal and external silvering of lamp bulbs

MISCELLANEOUS CHEMICAL PRODUCTS

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PHILIPS

Philips Lighting

The Philips Centre, 420-430 London Road, Croydon, Surrey CR9 3QR

FROM:

MR HOOKER
G.E. LEICESTER
FAX 01162 610612

CAROLE STEELE
PHILIPS LIGHTING
FAX 0181 665 5102

27TH FEBRUARY 1997

RE SILVER INK FOR GLS

DEAR MR HOOKER

RE YOUR ENQUIRY FOR SILVER INK, I ENCLOSE A SPECIFICATION SHEET FOR OUR G019 - CODE 1322 111 00006.

PRICE £22.34 PER 100 GRAMS
MIN ORDER QUANTITY 3 KGS
DELIVERY 4/6 WEEKS FROM RECEIPT OF ORDER

KIND RGDS

CAROLE STEEE

Philips Lighting Limited
Registered in England No. 113701
Registered Office 420-430 London Road
Croydon, Surrey CR9 3QR
Tel: 0181-665 6655
Fax: 0181-684 0136

STAMP-PAD INK G 019, SILVER

DESCRIPTION
Dark grey paste.

TEST REQUIREMENTS

- viscosity, 23°C (LV 036-002-068) : 30 ± 20 Pa.s
  (Haake Roto viskosi meter, test body SVII, Rheogram from 8 rpm down to 0 rpm in 2 min.
  To be calculated for D = 3,6 sec^{-1})
- yield value, 23°C (LV 036-002-068) : 60 ± 40 Pa
- grain size (LV 036-002-102) : ≤ 30 µm
  (Eriksen fineness gauge)

APPLICATION
Indelible marking on incandescent lamps, high pressure gas discharge lamps, high pressure sodium lamps, low pressure sodium lamps.

SHELF LIFE
Max. 1 year.

PACKING : 170 gram in aluminium tube
ORDERING NO. : 1322 111 00006

COMPOSITION

CAS number(s)	Perc.	Component(s)
14720-53-7	39,2 %	boric acid, lead salt/ lead borate
7440-22-4	47,0 %	silver
68187-84-8	13,8 %	ricinus oil

Indentification: 1322 111 00006 (CA) date new: 95-10-30 (date old:)

Let's make things better.

Philips Lighting

PHILIPS

PHILIPS

Philips Lighting

The Philips Centre, 420-430 London Road, Croydon, Surrey CR9 3QR

TO:
MR HOOKER
GE LEICESTER

FAX 01162 610612

FROM:
CAROLE STEELE
PHILIPS LIGHTING

FAX 0181 665 5102

19TH MARCH 1997

RE INK

I enclose a copy of technical specs for the only air-drying ink we have. As you can see, it is not silver but yellow. The price is £9.60 per 100 grams. The minimum order quantity is 5 kilos and the delivery time 4 weeks from receipt of order.

Kind rgds

CAROLE STEELE

Enc

Philips Lighting Limited
Registered in England No. 141701
Registered Office 420-430 London Road
Croydon Surrey CR9 3QR
Tel: 0181-665 6655
Fax: 0181-684 0136

Base

of

Stamp-pad Ink, Yellow

TEST REQUIREMENTS

- viscosity, at 23°C: 20 - 40 pa.s

APPLICATION

Air-drying marking paint for marking of lamps

SHELF LIFE

Max. 6 months (2 - 5°C)

PACKING AND ORDERING NO.

- 40 gram in tube: 1322 114 00082

COMPOSITION

CAS number(s)	Component(s)
1344-37-2	C.I. Pigment Yellow 34/lead sulphochromate yellow
108-88-3	benzene, methyl/toluene
61790-14-5	naphthenic acids, lead salt/Pb-naphthenate
61789-51-3	naphthenic acids, cobalt salt/Co-naphthenate
8001-20-5	tung oil, chinese
12713-03-0	burnt umber
1344-28-1	aluminium oxide
2530-83-8	silane, trimethoxy(3-(oxiranylmethoxy)propyl)-/methoxy silane
80-05-07	phenol, 4,4'-isopropylidenedi-/diphenylol propane
30389-89-0	siloxanes & silicones, phenyl methyl-
64742-94-5	solvent naphtha (petroleum), heavy aromatic
112-34-5	ethanol, 2-(2-butoxyethoxy)-/ butyldiglycol
1336-93-2	naphthenic acids, manganese salt, Mn-naphthenate

Let's make things better.

Philips Lighting

PHILIPS

N.V. Philips' Gloeilampenfabrieken
Lighting Division - Building
Tel. 040 - 75 61 42 - Telex 35000 - PHTC-NL
Eindhoven - The Netherlands

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1013 210 00011