



**ICP | AAS | FT-IR | UV-VIS | XRF**

**ENGLISH**

**V 10**

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## Hydraulic Laboratory Presses Series

### MP150 | MP250

#### Sample Preparation made perfect

For KBr powder, grounded soil or other materials: if you analyze such samples with X-Ray fluorescence instruments, Infrared Spectroscopy, Calorimeters or others, you need to have a solid lab press with easy handling and a long lifetime. It should be able to produce perfect pellets, handle huge loads up to 25 tons, but it also needs to be small enough to fit on a table.

Then you have to choose our lab presses: solid stainless steel and aluminium construction for best quality, enabling to use a variation of die sets from 3 to 50 mm.

#### Maassen Lab Presses make the difference

- The hand pump is a special Maassen design, so you need less force for 25 tons load compared to other presses in the market
- The presses are reduced to essential parts. Therefore we only use the best material qualities: high solid aluminium, hardened steel and polished stainless steel
- All presses can maintain the load for several hours
- The MP250M is one of the motorized presses with the easiest handling available. It combines a long lifetime with easy operation and it is one of the most popular lab presses now
- The presses need no special maintenance. Just keep it clean!
- *Options for the digital versions MP150D / MP250D:*

MP-DA1: the serial connector allows to connect the press to your computer and save the data for each process

MP-S1 / MP-S2: with the digital pressure limiter, you can exactly program the load where the press needs to stop. Further pumping will not exceed this limit, so you can save small die sets from over pressure and make reproducible samples

- Our presses are completely designed and produced in Germany. So we are able to guarantee the spare parts supply and availability of service documents for many years

- Every single press is intensely tested to ensure that it matches our high quality standards
- Certify your load: with the optional Maassen Pressure Certificate, you can be sure about the exact load on your sample
- The press can be easily separated, single components can be replaced. Spare parts shipment available worldwide
- For individual needs, we are able to modify the press in some ways, like splitting it in two parts (for glove boxes) or adding a remote control

## Safety Features

- Limited cylinder movement with a spring to pull it back to the lower position
- Integrated pressure overload protection
- Clear cover shield around the press unit
- MP250M: Emergency stop button and safety switch to ensure that the front cover is closed while pressing

## Easy Operation

Almost every die set for IR and XRF purpose can be used. We offer a wide range from 3 to 50 mm diameter, for aluminium cups or steel rings. For vacuum connection, the cover has an opening at the back for the vacuum tube.

If you need a die set to operate with our presses, we refer to our separate brochure.

The next pages show pictures, technical data and special features of each version.



Solutions for  
AAS | ICP | UV-VIS | XRF | FT-IR

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# MP150

## The small manual laboratory press

The best solution for IR purpose

The standard MP150 has a pressure gauge with 80 mm diameter and a scale of 0.5 tons. This is suitable for many applications, especially with the common 13 mm die sets for IR purposes.

The MP150D with its digital display shows pressure differences in 10 kg steps (0.01 tons). So you can precisely check the load on your die set. This makes sense for very small die sets which usually don't stand high loads.

We recommend a minimum pressure of about 1 ton to allow the hydraulic lines to close. Then, the press can maintain the load for hours. The maximum load is limited to 15 – 16 tons. For die sets larger than 18 mm, you need to prove if the surface pressure is high enough to get solid pellets.

The manual release valve allows a smooth pressure decrease to avoid cracks in your pellets.

The MP150D can be combined with an adjustable pressure limiter (p/n: MP-S1) to set the maximum load individually. It can be programmed with the buttons at the display. This saves samples and dies from over load and allows reproducible samples. This setting is saved, even when you turn off the display.

With the serial connector, you can send the press data to your Computer (p/n: MP-DA1).



Model	MP150	MP150D
Dimensions (H min/max x W x D)	436/538 x 370 x 300 mm	
Width between columns	150 mm	
Min. / Max. clear height (for die set)	52 mm / 142 mm	
Display / resolution	Analogue, 0.5 to.	Digital four digit, 0.01 to.
Spindle diameter	35 mm	
Max. way of spindle movement	102 mm	
Cylinder diameter / max. lifting	105 mm / 22 mm	
Net. weight	43.5 kg	43.0 kg
Mains connection	–	Ext. power supply, 12 V
Order Number	54MP150	54MP150D

# MP250

## The manual laboratory press for XRF

### The All-round talent

The MP250 has a pressure gauge with 100 mm dia. and a scale of 0.5 tons. It uses four longer columns compared to the MP150 for larger die sets and improved stability. The enhanced pressure range extends the press use for the common 32 and 40 mm die sets, needed for XRF analysis.

The MP250D uses the same digital display as the MP150D and shows pressure differences in 10 kg steps (0.01 tons). So you can precisely check the load on your die set. This makes sense for very small die sets which usually don't stand high loads. Therefore, the MP250D is a press for all applications in your lab.

We recommend a minimum pressure of about 1 ton to allow the hydraulic lines to close. Then, the press can maintain the load for hours. The maximum load is limited to 25 – 27 tons.

The manual release valve allows a smooth pressure decrease to avoid cracks in your pellets.

The MP250D can also be combined with an adjustable pressure limiter (p/n: MP-S2) to set the maximum load individually. It can be programmed with the buttons at the display. This saves samples and dies from over load and allows reproducible samples. This setting is saved, even when you turn off the display.

With the serial connector, you can send the press data to your Computer (p/n: MP-DA1).



Model	MP250	MP250D
Dimensions (H min/max x W x D)	497/609 x 370 x 300 mm	
Width between columns	150 mm	
Min. / Max. clear height (for die set)	73 mm / 185 mm	
Display / resolution	Analogue, 0.5 to.	Digital four digit, 0.01 to.
Top Spindle diameter	45 mm	
Max. way of spindle movement	112 mm	
Cylinder diameter / max. lifting	105 mm / 22 mm	
Net. weight	49.5 kg	49 kg
Mains connection	–	Ext. power supply, 12 V
Order Number	54MP250	54MP250D



# MP250M

## The motor power hydraulic press

Easiest handling for frequent use

The MP250M motor power press is made to handle a large number of press actions.

You control the load by positioning a red mark inside the 63 mm pressure gauge. Although it is possible to set 2 tons as minimum load, we recommend to use die sets not smaller than 8 mm because the 63 mm pressure gauge scale is 1 ton. So the load is reproducible as long as the mark is at the same position, but it is not exact enough for very small dies. The MP250M is able to hold the load for several hours.

We integrated two additional safety features compared to the manual versions: a safety switch to prevent press actions with opened cover and an illuminated emergency stop button.

The handling is very easy: pushing the green button starts the action and it stops at the marked position. The manual release valve allows a smooth pressure decrease to avoid cracks in your pellets.



Model	MP250M
Dimensions (H min/max x W x D)	497/609 x 360 x 400 mm
Width between columns	150 mm
Min. / Max. inner height for die set	73 mm / 185 mm
Display / resolution	Analogue, 0.5 to.
Top Spindle diameter	45 mm
Max. way of spindle movement	112 mm
Cylinder diameter / max. lifting	105 mm / 22 mm
Net. weight	68 kg
Mains connection	230 V / 50 Hz / 250 W
Order Number	54MP250M

# MP5MD

## Motorized precise load press

Programmable power for small dies

This compact laboratory press was especially designed for frequent and intense use of small die sets. The small electric hydraulic pump is made for precise load from 200 kg to 5 tons.

The pressure can be set in 0.01 tons steps at the digital display. The programmed load does not get lost when turning off the press. So it is perfectly suitable to reproduce the same press action with the same settings over and over again.

The press starts to work by pushing the green button, the blue button is for decreasing the load until the cylinder is back in his lowest position. The black rotary knob at the top of the metal cover adjusts the pump speed to minimize the overload for best precision and sample protection. The press can keep the load for several hours. If the load drops down to a predefined limit, it will automatically start again.

It also includes a safety switch at the front cover to interrupt the press action until it's closed.



Model	MP5MD
Dimensions (H min/max x W x D)	436/538 x 370 x 300 mm
Width between columns	150 mm
Min. / Max. clear height	52 mm / 142 mm
Display / resolution	Digital four digit, 0.01 to.
Spindle diameter	35 mm
Max. way of spindle movement	102 mm
Cylinder diameter / max. lifting	105 mm / 22 mm
Net. weight	40 kg
Mains connection	230 V / 50 Hz
Order Number	54MP5MD



## Die Sets for XRF / RFA and FT-IR

### Maassen Die Sets for Laboratory Presses

Precise pressing tools are very important for high quality pellets. Our Maassen press tools are made to produce such pellets in a fast and very easy way! There is no need to disassemble a heavy die set again and again. We have introduced a simple way to remove the base and push out the pellet. It was never easier or faster!

- Fill the Die Set as usual, put the plunger on top and start pressing with your lab press.
- After releasing the pressure: instead of removing the die set from the press and disassemble it, only pull the base block out of the black bracket and press again until the pellet is visible.
- Done!

And when using the Die Set upside down, it is more comfortable and faster to handle: push out the pellets without any vibrations or damage. Useful if the pellet is brittle.

All our die sets from 10 to 50 mm are working the same way. The 13 mm die set includes a wooden protection box. For 32 / 40 mm, the wooden box is available as an option

There is also a combined set of 32 and 40 mm available in a black protection case.

Our Die Sets for **3, 5 and 8 mm** pellets are also very easy to handle, small and efficient. They consist of three cylinders (lower, middle and upper part, made of hardened stainless steel) and two press pins (short and long version, made of KXF which means 90% tungsten carbide). This increases stability, lifetime and maximum possible load. The outer diameter of the cylinders is 13 mm, so for vacuum connection, you can put them inside any available 13 mm die set.

All our Die Sets are completely designed and made in Germany!



13 mm Die Set with wooden box



32 mm Die Set

Upside down handling



5 mm Die Set

## Order informations:

Part number	Description	Max. pressure
54KB0300M-H	3 mm Die Set with hard metal press pins	1,5 to.
54KB0302M-H	3 mm spare hard metal press pins set	1,5 to.
54KB0500M-H	5 mm Die Set with hard metal press pins	4 to.
54KB0502M-H	5 mm spare hard metal press pins set	4 to.
54KB0800M-H	8 mm Die Set with hard metal press pins	6 to.
54KB0802M-H	8 mm spare hard metal press pins set	6 to.
54KB1000M	10 mm Die Set	7 to.
54KB1002M	10 mm spare pellets, 2 pcs.	7 to.
54KB1300M	13 mm Die Set in wooden case	10 to.
54KB1302M	13 mm spare pellets, 2 pcs.	10 to.
54KB1300M-H	13 mm Die Set with hard metal pellets in wooden case	14 to.
54KB1302M-H	13 mm spare hard metal pellets, 2 pcs.	14 to.
54KB1600M	16 mm Die Set	20 to.
54KB1602M	16 mm spare pellets, 2 pcs.	20 to.
54KBX20M	20 mm Die Set	24 to.
54KBX202M	20 mm spare pellets, 2 pcs.	24 to.
54KBX25M	25 mm Die Set	30 to.
54KBX252M	25 mm spare pellets, 2 pcs.	30 to.
54KBX32M	32 mm Die Set	30 to.
54KBX32M-H	32 mm Die Set with hard metal pellets	33 to.
54KBX322M	32 mm spare pellets, 2 pcs.	30 to.
54KBX322M-H	32 mm hard metal spare pellets, 2 pcs.	33 to.
54KBX40M	40 mm Die Set	40 to.
54KBX40M-H	40 mm Die Set with hard metal pellets	44 to.
54KBX402M	40 mm spare pellets, 2 pcs.	40 to.
54KBX402M-H	40 mm hard metal spare pellets, 2 pcs.	44 to.
54KB3240M	Combined Set 32 and 40 mm in plastic case	30 / 40 to.
54KBX500M	50 mm Die Set	45 to.

O-Rings, spare cylinders, plunger, pins or pellets are also available apart from the complete die set. Contact us for price and availability.

Maassen also offers individual sizes for die sets in case your size is not mentioned.

# MAASSEN Die Set Series XRF

## The new standard Die Sets for X-ray fluorescence analysis

The Maassen Die Set Series XRF is simplifying your sample preparation! With the spring-suspended base, combined with different adapters for different analysing instruments, you are able to press samples in a very short time.

The adapters enable to use steel rings or alu-cups in different sizes. You simply insert the ring or alu-cup, fill in your sample, put the lid on top and place it inside your laboratory press. The XRF series can take up to 40 tons load. After releasing the load, you can simply take out the ring or use a separate extractor ring to push the alu-cup out of the cylinder.



XRF-BC40 with inserted Alu-cup

These are the different types available:

### **XRF-BR51**

This Die Set is made for steel rings with 8 - 9 mm height, an outer diameter of 51 mm and inner diameter of 35 mm.

It is made of the base unit XRF-B combined with the adapter XRF-51.

### **XRF-BC40**

This Die Set is made for Aluminiumcups with 40 mm (usually 39.8 mm) diameter.

It is made of the base unit XRF-B combined with the adapter XRF-40

### **XRF-BR4035**

This Die Set is made for steel rings with 14 mm height, an outer diameter of 40 mm and inner diameter of 35 mm.

It is made of the base unit XRF-B combined with the adapter XRF-R4035

### **XRF-BR4032**

This Die Set is made for steel rings with 14 mm height, an outer diameter of 40 mm and inner diameter of 32 mm.

It is made of the base unit XRF-B combined with the adapter XRF-R4032



## Accessories for Die Sets

### Wax, Cups or filling tools for your die set

SO-FL032	32mm filling tool (Bild 1)
SO-FL040	40mm filling tool
SO-PF32	Pellet Film 32mm - 500 ct./box (Bild 3)
SO-PF40	Pellet Film 40mm - 500 ct./box
SO-T32	Tapered Aluminum cups 31,8 x 9mm - 1000 cups (Bild 2)
SO-T40	Tapered Aluminum cups 39.8 x 9.5mm - 600 cups
SO-T35	Tapered Aluminum cups 35 x 8mm - 1000 cups
SO-S32	Straight Walled Aluminum cups 30 x 8mm - 1000 cups
SO-S33	Straight Walled Aluminum cups 33 x 8mm - 1000 cups
SO-S40	Straight Walled Aluminum cups 38.5 x 9.5mm - 600 cups
SO-S40H	Straight Walled Aluminum cups 39.8 x 7.5mm - 600 cups
SO-press001	Boric acid powder - 1.5kg
SO-press00125	Boric acid tablets; 250mg - 1000 tablets (Bild 4)
SO-press00150	Boric acid tablets; 500mg 1000 tablets
SO-press0011	FreeBORE powder (replaces "Boric acid" classified CMR) - 0.8kg
SO-press002	Cellulose powder - 0.8kg
SO-press00325	Cellulose tablets; 250mg - 500 tablets
SO-press00333	Cellulose tablets; 330mg - 500 tablets
SO-press00350	Cellulose tablets; 500mg - 500 tablets
SO-press004	Licowax® C micropowder (Hoechst wax) - 0.75kg
SO-press0041	Licowax® C micropowder (Hoechst wax) - 5kg
SO-press0042	Licowax® C micropowder (Hoechst wax) - 20kg
SO-press005	MIX55 - 0.75kg
SO-press00525	MIX55 tablets;250mg - 500 tablets
SO-press00550	MIX55 tablets;500mg - 500 tablets
SO-press00525K	MIX55 tablets;250mg - 5000 tablets
SO-press00550K	MIX55 tablets;500mg - 5000 tablets
SO-PM012	Methyl methacrylate ball - 12.7mm - 500 balls
SO-PM04	Methyl methacrylate ball - 5mm - 500 balls
SO-PM05	Methyl methacrylate ball - 9.3mm - 500 balls



# ADA-1 Steam Cleaning System

Cleaning your vessels with acid or purified water



To get the best possible results for trace analysis, you have to use very clean vessels to avoid contamination of your samples which may otherwise lead to wrong results.

The ADA-1 exposes contaminated vessels to hot steam from distilled water or diluted nitric acid. This way of cleaning is much better than just to wash the vessels, because:

- 1.) rinsing with hot steam is more effective
- 2.) the walls get saturated with the ions of the cleaning solvent

This reduces adsorption effects from analytical solvents at the wall from the cleaned vessels and makes it clean enough for trace analysis.

The ADA-1 is made to clean all kind of vessels made of glass, quartz, PTFE/PFA or ceramics.

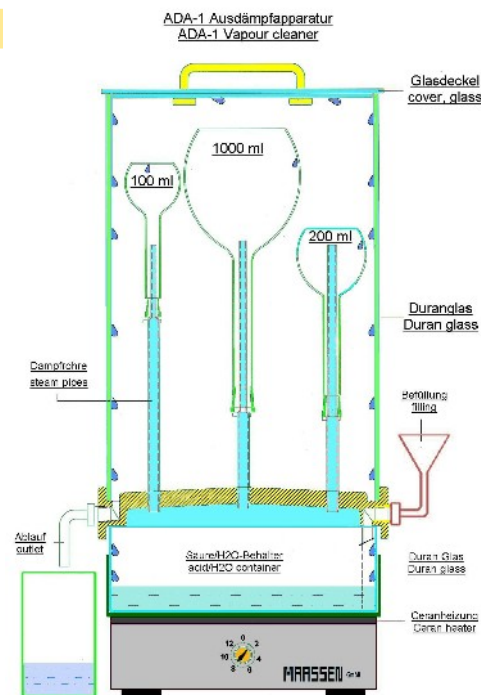
## Benefits

- Only the fresh cleaning solvent (bi-distilled water or diluted acid) gets in touch with the vessels surfaces.
- The liquid does not flow back into the bowl, so there is no contamination possible (you can reuse the liquid by cleaning it with one of our Subboiling Instruments)
- Even small spaces can be cleaned continually
- Blank values and methodical errors are minimized
- The cleaning process can be monitored
- no cooling required - saves water consumption.
- large capacity - up to 3 x 1 liter flasks or 49 small vessels simultaneously

## Design

A modified ceran heating unit heats up the glass bowl which can contain enough liquid for several cleaning processes (about 5 L). The system board where up to 49 steam tubes can be plugged in is completely made of PTFE. The steam comes through these tubes to clean the vessels on top. Unused holes need to be closed with the included glass plugs. The steam production can be adjusted by turning the power up or down.

The duration of one cleaning process is depending on the contamination level of your vessels, it is usually done within 1 – 3 hours. The ADA-1 does not need to be cooled. An external timer can shut off the heating element. You only have to make sure that the glass bowl does not run dry and you don't fill in cool liquids into a hot glass bowl.



## Capacity

There are two different sizes available to suit different sizes of vessels, one with 6 mm and one with 8 mm outlet diameter (10 mm on special request). They can be placed individually for best use of the space. The Standard ADA-1 has 25 cleaning places and comes with 2 x 15 steam tubes. The high capacity version has 49 cleaning places and comes with 2 x 25 steam tubes. We recommend only to use the same size of steam tubes in each cleaning process.

## Setup

It is possible that hot acid steam can escape, so we recommend to place the whole unit under a fume cupboard and replace the vessels inside only when the system is cooled down.

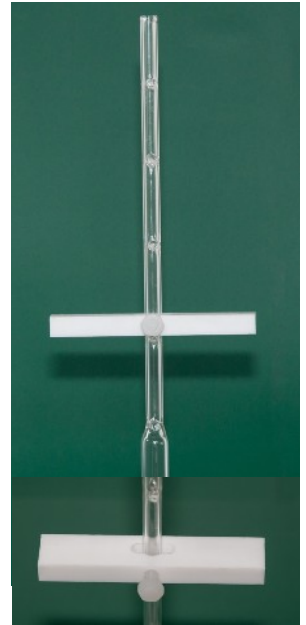
Vessels made of glass are usually dry after the cleaning process, but other vessels made of synthetic material cool down quite fast, so they may still be wet. Then you have to let them dry in the air.

## Steam tubes



You can use different steam tubes for different vessels. No. 1 shows the 6 mm small tubes, suitable for small sample cups. No. 2 shows medium size steam tubes with 8 mm outlet, for universal use.

If you have small bowls or if you don't want the tip of the steam tube touching the wall of the vessel, you can now use a new kind of steam tube. It uses a PTFE bar to hold the vessels. Simply pull it over the steam tube, turn it for 90° and fix it with a screw. With this method, you can clean bowls with up to 90 mm diameter.



## Technical Data

Width	32 cm
Depth	42 cm
Total height with lid	72 cm
Max. height inside cylinder	44 cm
Inner diameter cylinder	29 cm
Power consumption	max. 1600 W when heating up

## Order numbers

5293000	ADA-1 with 25 cleaning places, each 15 steam tubes small / medium, external timer
5293000X	ADA-1 with 49 Reinigungsplätzen, 50 steam tubes in the size you want, ext. timer
5293110	Steam tubes small (No. 1), 6 mm OD
5293109	Steam tubes medium (No. 2), 8 mm OD
5293108	Steam tubes large, (w/o picture, shape like No. 2), 10 mm OD
5293100	Glass bowl
5293301	modified heater with protection ring
5293114	Glass plugs, set of 10 pcs.
5293103	Glass lid with handle





To reach the best detection limits for trace analysis, you need to have the best quality of acids and distilled water to avoid contamination and introducing traces of other elements which leads to wrong results. But the ultra clean quality of acids is very expensive and that's why you should think about having your own cleaning station, Maassen's ECO Q Subboiling unit:

- Availability of clean acid in the quantity you need, every day. Minimized risk of contamination if different people are using the same acid.
- Save money! Cleaning your own acid returns the investment of such an acid cleaning system within a few months.
- Improve the quality of existing acids or clean your contaminated ones. No unnecessary disposal any more!

### How it works

The liquid inside the quartz container gets evaporated below the boiling point. The heating source is above the liquids surface, so only the pure acid steam condensates at the cooling finger inside.

The ECO Q double uses two IR heating sources which is especially made for H<sub>2</sub>SO<sub>4</sub> and other acids which need a higher temperature to evaporate.

There are no metal parts inside the acid cleaning system, so there is no contamination possible.



## Setup

IR radiators heat up the liquid inside the quartz container. The maximum capacity is 500 ml, filled through the port on top. Adjust the power with a rotary knob to avoid boiling, slow steam production improves the cleaning quality.

Connect a water chiller at the cooling finger, so clean acid can drop into the PFA bottle in front of the system. One PTFE filter is installed for aeration to avoid over pressure. The narrow socket with integrated catching bowl does not need much space in a fume hood. The separate electronic box contains the power switch, power regulator and a timer. It can be taken out of the socket for easier handling.

## Cleaning results

This index shows the achieved cleaning grades, depending on the duration of the cleaning process. You can improve the quality by cleaning the acid again, therefore these data is just a reference value.

Distillation volume: g / min					purity: ng / ml					
W (Watt)	200	400	600	800	Element	Al	Cd	Cu	Pb	Zn
H <sub>2</sub> O	1,1	2,8	4,4	5,8	purity	< .05	.01	.04	.02	--
HNO <sub>3</sub>	1,2	3,3	5,3	7,5		< .05	.001	.25	.05	.04
HCl	0,8	2,8	4,9	7,1		.07	.01	.07	.05	.04
H <sub>2</sub> SO <sub>4</sub>	--	--	0,3	0,8		and better!				



## Features

- ➔ *improving standard quality acids to ultra clean*
- ➔ *returns the investment in only a few months*
- ➔ *cleaning of all acids possible, like HCl, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub> and H<sub>2</sub>O (except: HF which damages quartz)*
- ➔ *No metal parts inside – no contamination and corrosion*
- ➔ *easy to fill and clean*
- ➔ *Narrow rack with separate electronic box for easy operation*

## Order information and technical data

<b>ECO Q single</b>	Quartzcontainer, capacity: max. 1000 ml, One 500W heater with PTFE Conneters, Rack with separate electronic box, 1 x 1 L PFA bottle, Power cable, manual	LxBxH ca. 50 x 20 x 42 cm 220V/50Hz/500 W P/N: <b>5038010</b>
<b>ECO Q Dual</b>	Content as mentioned above, Difference: two heater version with 2x 500W heaters	LxBxH ca. 50 x 40 x 42 cm 220V/50Hz/ 1000W P/N: <b>5038030</b>

The Subboiling unit is sent in a carton and meant to be installed by the user. Installation is very easy: The rack comes in two parts, the quartz container needs to be put on top. IR heaters are preassembled. Plug in power and connect to a water chiller and start cleaning your liquids!

## Sense of subboiling

- Save money: improve standard quality acids or clean contaminated acids instead of disposing
- Clean in time the quantity you need – every day!
- No unnecessary dispose of acids any more

## Features

- Very compact design, small footprint
- No external chiller is needed
- Fast and easy handling
- Max. 800 ml capacity
- Control the liquid level inside with the PFA tube
- Separate waste drain on the opposite side
- Contactless IR heating source, can easily be replaced by the user
- Best cost-benefit-ratio in the market
- Pure PTFE and PFA makes it a long lasting instrument
- Can clean every kind of acid (except H<sub>2</sub>SO<sub>4</sub>). Suitable for HF!



## Setup

Fill in your liquid through the funnel on top (max. 800 ml). The level inside can be monitored through the PFA tube. Then switch on the IR heating element and control the power with the rotary knob to avoid boiling the acid inside. The first 1-2 hours are needed to heat up the system, then the steam condensates at the wall. You can get up to 100 ml / h of clean liquid, this means about 600 ml in 8 h. The clean acid drops into a 1 L PFA bottle. If you repeat this process, the quality will improve!

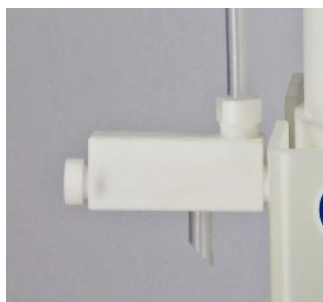
The results are depending on your acid. For HF, for example, you usually have less than 0.05 ppb of Ag, As, Au, Ba, Cd, Co, Cr, Cu, Li, Mn, Mo, Pb, Sn and Zn left in the cleaned acid, Na and K are around 0.6 ppb, Fe 0.25 ppb.

This subboiling unit is not suitable for cleaning exothermic liquids like perchloric acid, liquids generating explosive steam like alcohol or liquids with a very high boiling point like H<sub>2</sub>SO<sub>4</sub>.

The Subboiler is meant to be installed by the user. Most parts are preassembled and only need to be put into a fume hood.

## Technical data

Part number:	<b>5036000-15</b>
Current:	230 V / 50/60 Hz, 150 W max.
space needed:	width 40 cm, depth 23 cm, height 68 cm (incl. funnel)
capacity:	max. 800 ml
distillation rates	150W IR: water: max. 600 ml / 8 h, acids: about 400 - 500 ml / 8 h



Separate waste drain



Power switch and -regulator



PTFE funnel for filling

# Test and Calibration Glasses

Different national and international rulings like Good Laboratory Practice (GLP) or ISO 9000/9004 require to check the performance of spectral photometers periodically.

## Affordable Calibration Standards for UV/VIS/NIR Spectroscopy



Grey glasses for linearity controls

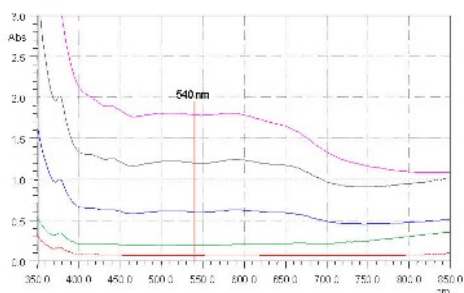
Spectral Glasses for Wavelength Accuracy

With these test glasses, the user can check the main parameters of his spectrometer both quickly and safe. This can be daily routine or it can be done with the quality management program to avoid mistakes in the measuring parts. It can also be used to internal recertify after service and to train new ones in the use of UV-VIS spectral photometers, easy and fast. All test glasses have the size of a 10 mm cuvette and fit in most instruments. A wooden box is protecting the glasses from dust.

There is also a secondary certification against a NIST Standard Type 930D available. The measurements are done with a double beam high performance spectrometer with double monochromator.

Older Spectrometers with analogue electronics sometimes have errors in the linearity (instead of new digital ones). Generally you can test the instrument's VIS wavelength range. Apart from the extinction test, you can check more values as there are reproducibility, relative standard divergences and dispersion.

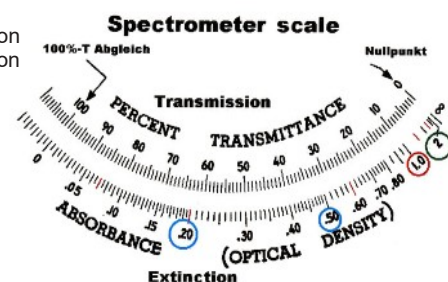
The mainly specified values are showed at 6 wavelengths between 440 – 635 nm, according to NIST because this range is relatively flat and wavelength deferrals are no factor. If needed, we can also show the values at different wavelengths. The glasses can have an extinction between 0,07 and 1,6 +/- 2.5% tolerance. If a higher difference is detected, we recommend to do service for the instrument. We recommend re-certification every 2-4 years.



Spectra of grey glasses



Showing transmission and extinction

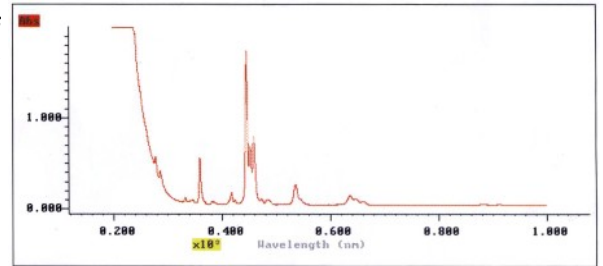


# Test glasses to check wavelength

## Holmium Oxide Glass

Wavelength differences can lead to huge errors if measured on narrow peaks or flanks. That's why wavelength control over the complete range of UV and VIS is so important.

Holmium oxide glass is perfect to check the UV range with narrow peaks down to 270 nm. When varying the slit size and measuring speed you can demonstrate typical errors.

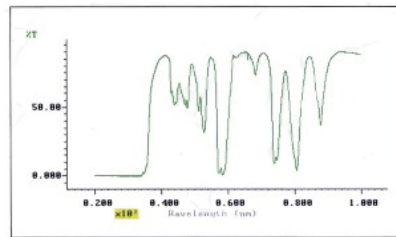


Spectrum of Holmium oxide glass in extinction

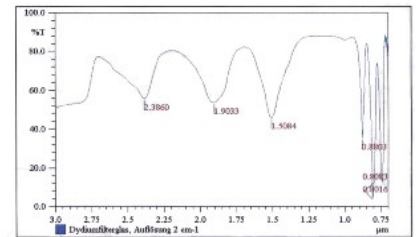
And also the functions of creating higher derivatives or influence of smoothing and other mathematic manipulations can be shown. If the tolerance is out of range, the instrument should be checked. Recertification is recommended every 2-4 years.

## Didymium oxide glass

A mixed glass for wavelength controls for the complete VIS and NIR range. Didymium oxide glass is perfect to be used for wavelength up to 3.000 nm. Maximums and minimums are wider but also allow a good control of the wavelengths.



Dy-Spectrum with UV-VIS instrument



Dy Spectrum with FT-IR instrument

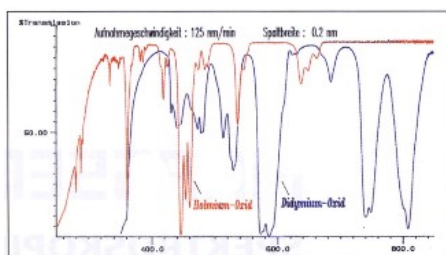
This can be done with NIR photometers and also with FT-IR instruments as shown on the spectra below. The same manipulations as with the Ho glass can be done, recommended tolerance +/- 0.5 nm. Didymium is a mixture of neodymium oxide and praseodymium oxide glass.

## Test glasses for training use

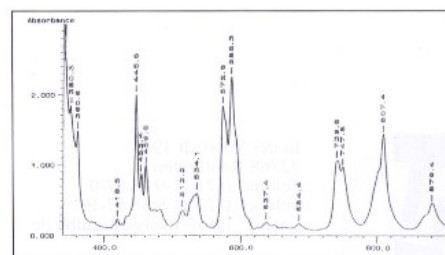
### Holmium and Didymium oxide double glass

Two glasses in one bracket: a total spectrum of Holmium and Didymium.

An excellent tool for training on instrument techniques like subtraction of spectra down to the base line. All mathematic manipulations and typical attributes of the system can also be done with Ho-Dy glasses. In particular subtractions and additions of spectra can be explained. Simple mathematic overlay or the difference to the mixed spectrum can be easily shown.



Single spectra of Dy and Ho in %T overlaid



Spectrum of double glass Ho+Dy in extinction

## Order Informations

GLASS	Specs:	Part No.:
NEUTRAL GLASS, Type 1 Extinktion:	ca. 0,07	5821105
NEUTRAL GLASS, Type 2 Extinktion:	ca. 0,2	5821101
NEUTRAL GLASS, Type 3 Extinktion:	ca. 0,6	5821102
NEUTRAL GLASS, Type 4 Extinktion:	ca. 1,2	5821103
NEUTRAL GLASS, Type 5 Extinktion:	ca. 1,6	5821104
HOLMIUM GLASS, Filter with defined Absorption lines	ca.245-750 nm	5821151
DIDYMIUM GLASS, Filter with defined Absorption lines	ca.350-2500 nm	5821171
DOUBLE GLASS HOLMIUM and DIDYMIUM		5821081
SECONDARY CERTIFICATE for SINGLE GLASS		5821106
SECONDARY CERTIFICATE for existing 4 glass set		5821111
WOODEN BOX for cuvettes and glasses		5821001
<b>TEST GLASS SETS, including wooden box</b>		
<b>NG= Neutral glass, Ho=Holmium, Dy= Didymium, DG= Double glass Ho+Dy</b>		
TEST SET, 4 pieces, NG-0,2-0.6-1.2-1.6	without Secondary Certificate	5821009
TEST SET, 4 pieces, NG-0,2-0.6-1.2-1.6	with Secondary Certificate	5821010
TEST SET, 7 pieces. ( 5xNG+Ho+Dy) NG 0,07-0,2-0.6-1.2-1.6 +Ho+Dy	without Secondary Certificate	5821060
TEST SET, 7 pieces. ( 5xNG+Ho+Dy) NG 0,07-0,2-0.6-1.2-1.6 +Ho+Dy	with Secondary Certificate	5821062
TEST SET, 8 pieces, NG 0,07-0,2-0.6-1.2-1.6 +Ho+Dy+HoDy	without Secondary Certificate	5821070
TEST SET, 8 pieces, NG 0,07-0,2-0.6-1.2-1.6 +Ho+Dy+HoDy	with Secondary Certificate	5821072



## Premium Graphite Parts for Atomic Spectroscopy

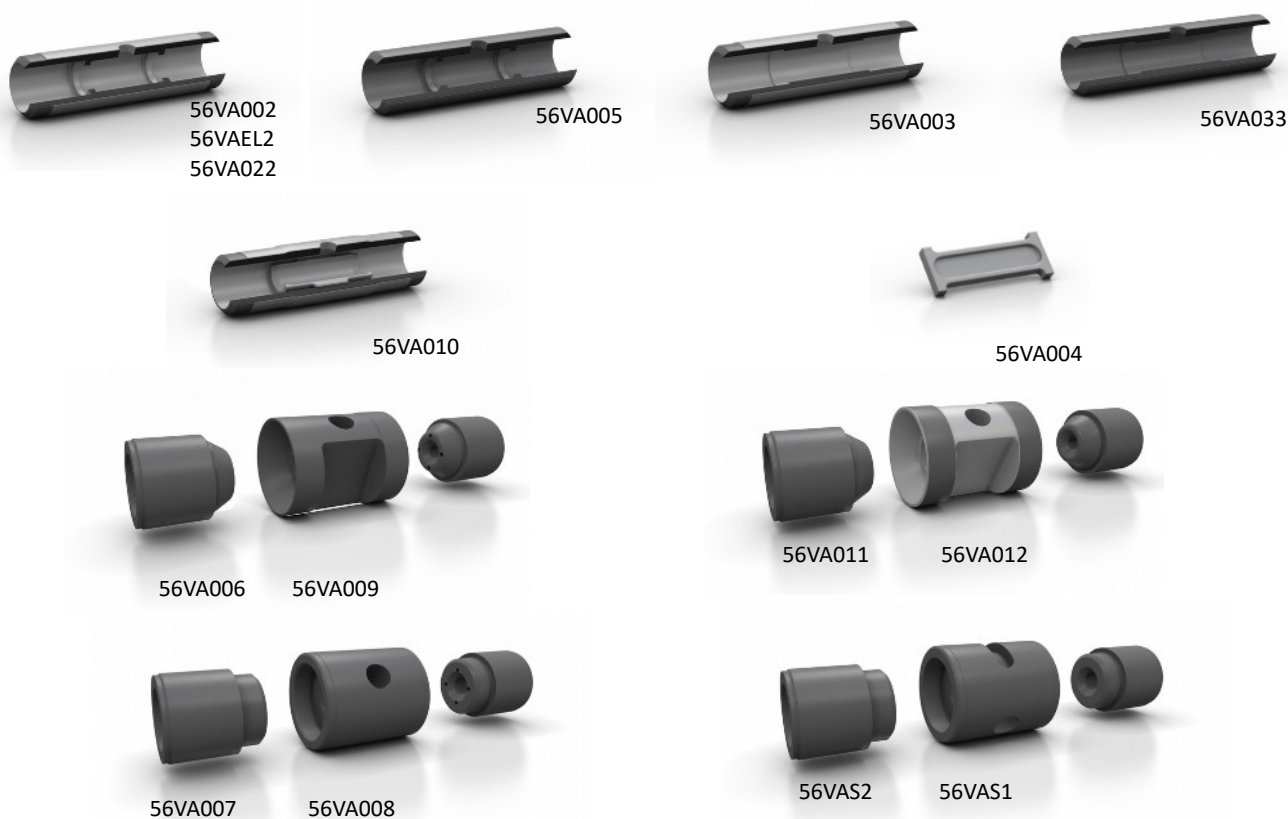


Graphite furnace technology provides highest sensitivity and exceptional accuracy for detection of trace elements. The purity of the graphite tube and its extreme temperature resistance are the basis for reliable and accurate analytical results.

These graphite parts set the benchmark for analytical applications in all spectrometers worldwide: exceptional temperature resistance, highest purity and unreachable lifetimes. Made in Germany.

# Premium Graphite Parts and Electrodes for AA Spectrometer

## Agilent

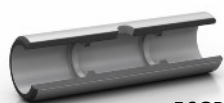


Agilent (Varian)	Agilent p/n	Maassen p/n	QTY / box
Partition Tube, coated recommended Standard Tube	63-100012-00	<b>56VA002</b>	10
Partition Tube coated, ELC ( <b>longlife</b> )	63-100012-EL	<b>56VAEL2</b>	10
Partition tube coated, HP	63-100012-HP	<b>56VA022</b>	10
Plateau Tube, coated	63-100011-00	<b>56VA003</b>	10
Bone Platform pyrolytic graphite, for Plateau tube	63-100013-00	<b>56VA004</b>	10
Partitioned tube, uncoated	63-100015-00	<b>56VA005</b>	10
Omega-Platform Tube, coated	63-100037-00	<b>56VA010</b>	10
Plateau Tube, uncoated	63-100014-00	<b>56VA033</b>	10
Contact set for SpectrAA	63-100016-00	<b>56VA006</b>	1
Contact Set for Zeeman	63-100017-00	<b>56AV007</b>	1
Shroud for SpectrAA	63-100018-00	<b>56VA008</b>	1
Shroud for Zeeman	63-100019-00	<b>56VA009</b>	1
Shroud for GTA 120	63-100031-00	<b>56VAS1</b>	1
Contact Set for GTA 120	63-100034-00	<b>56VAS2</b>	1
Contact set	63-10035-00	<b>56VA011</b>	1
Shroud, coated, for Zeeman	63-10036-00	<b>56VA012</b>	1

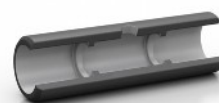


# Premium Graphite Parts and Electrodes for AA Spectrometer

## GBC



56GB700  
56GB725



56GB720



56GB710



56GB750



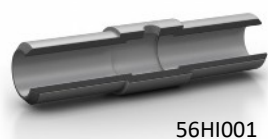
56GB811

56GB902

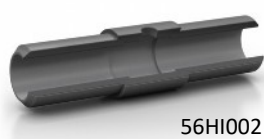
GBC	GBC p/n	Maassen p/n	QTY / box
Partitioned tube, coated	99-0059-00	<b>56GB700</b>	10
Omega-Platform Tube, coated Partitioned tube, coated	99-0342-00	<b>56GB710</b>	10
Partitioned tube, uncoated	99-0059-01	<b>56GB720</b>	10
Partitioned tube, coated, longlife (ELC)	--	<b>56GB725</b>	10
Platform L'vov, pyrolytic graphite	99-0060-00	<b>56GB750</b>	10
Transversely heated tube for Ultra-Z, coated	45-0012-00	<b>56GB3UZ</b>	10
Contact Set	99-0061-00	<b>56GB811</b>	1
Shroud	45-0004-00	<b>56GB902</b>	1

# Premium Graphite Parts and Electrodes for AA Spectrometer

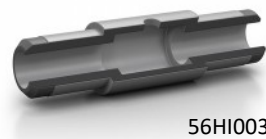
## Hitachi



56HI001



56HI002



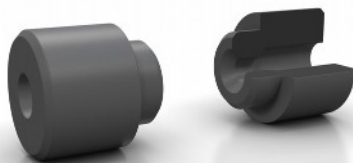
56HI003



56HI010



56HI004



56HI008

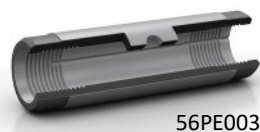


56HI009

Hitachi	Hitachi p/n	Maassen p/n	QTY / box
Tube, uncoated	180-7444	<b>56HI001</b>	10
Tube, coated	180-7400	<b>56HI002</b>	10
Tube for extended injection volume, coated	190-6003	<b>56HI003</b>	10
Omega-Platform Tube, coated	-	<b>56HI010</b>	10
L'vov Platform	180-7404	<b>56HI004</b>	10
Contact Set standard (20 mm)	180-7401	<b>56HI008</b>	1
Contact Set Zeeman (18 mm)	172-8805	<b>56HI009</b>	1

# Premium Graphite Parts and Electrodes for AA Spectrometer

## Perkin Elmer



56PE003



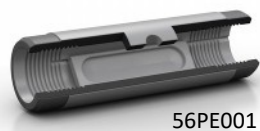
56PE002



56PE007



56PE005



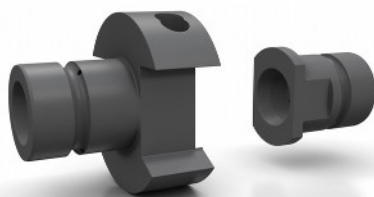
56PE001



56PE004



56PE010



56PE014



56PE012

Perkin Elmer	Perkin Elmer p/n	Maassen p/n	QTY / box
HGA Tube coated, with L'vov Platform HGA 3/4/5/6/7/800, Z3030/5000/5100/5100PC	B0112660 B3000343 (20)	<b>56PE001</b>	10
HGA Standard Tube, coated HGA 3/4/5/6/7/800, Z3030/5000/5100/5100PC	B0135653 B0105197 (5) B3000342 (20) B0091504 (50)	<b>56PE002</b>	10
HGA Tube coated, for L'vov Platform HGA 3/4/5/6/7/800, Z3030/5000/5100/5100PC	B0121092 B0137111 (5) B3001254 (20) B0109322 (50)	<b>56PE003</b>	10
L'vov Platform, pyrolytic graphite	B0121091 B0137112 (5) B3001256 (20) B0109324 (50)	<b>56PE004</b>	10
HGA Standard Tube, uncoated HGA 3/4/5/6/7/800, Z3030/5000/5100/5100PC	B0137113 (5) B3001253 (20) B0070699 (50)	<b>56PE005</b>	10
HGA Tube uncoated, for L'vov Platform HGA 3/4/5/6/7/800, Z3030/5000/5100/5100PC	B0121093 B0109321 (50)	<b>56PE007</b>	10
Contact set, without Sensor hole 3 pieces HGA 300/600/700/800	B0128495 B3130086 (5)	<b>56PE010</b>	1
Contact set, with Sensor hole 3 pieces, HGA 400/500	B0128490 B0180363 (5)	<b>56PE012</b>	1
Contact set, for Z-AAS 2 pieces	B0116823 B0180361 (5)	<b>56PE014</b>	1

# Premium Graphite Parts and Electrodes for AA Spectrometer

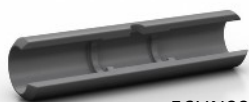
## Shimadzu



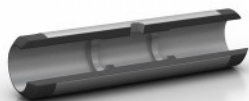
Shimadzu	Shimadzu p/n	Maassen p/n	QTY / box
Tube for larger injection volume, uncoated, 60°	206-80153-03	<b>56Shi10</b>	10
Tube for larger injection volume, coated, 60°	206-69984-02	<b>56Shi11</b>	10
Tube with forked platform, coated, 60°	206-82541	<b>56Shi12</b>	10
Standard Tube, coated, 60°	200-54525	<b>56Shi15</b>	10
Standard Tube, uncoated, 60°	200-54520	<b>56Shi16</b>	10
Standard Tube with 5 holes, coated, 60°	200-54525 (old)	<b>56Shi17</b>	10
Standard Tube with 5 holes, uncoated, 60°	200-54520 (old)	<b>56Shi18</b>	10
Contact left, 60°	206-80165	<b>56Shi13</b>	1
Contact right, 60°	206-80164	<b>56Shi14</b>	1
Standard Tube uncoated, 90°	206-50587	<b>56Shi00</b>	10
Standard Tube coated, 90°	206-50588	<b>56Shi01</b>	10
Tube with forked platform, coated, 90°	206-50887	<b>56Shi02</b>	10
Contact right, 90°	206-50603	<b>56Shi03</b>	1
Contact left, 90°	206-50602	<b>56Shi04</b>	1
Omega Platform tube, coated	980-05340	<b>56ShiOP</b>	10

# Premium Graphite Parts and Electrodes for AA Spectrometer

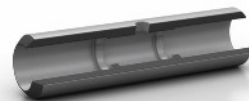
## Thermo Scientific



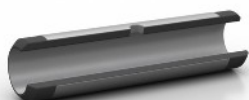
56UN002



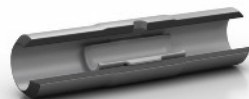
56UN004



56UN006



56UN001



56TEUOP



56UN011



56UN012



Thermo Scientific	Thermo p/n	Maassen p/n	QTY / box
Standard tube coated, plain	9423-393-95091	<b>56UN001</b>	10
Patridged Tube, uncoated	9423-393-95031	<b>56UN002</b>	10
Patridged Tube, coated	9423-393-95071	<b>56UN004</b>	10
Patridged Tube, oated, ELC	9423-393-95041	<b>56UN006</b>	10
Omega-Platform Tube, coated	9423-490-20101	<b>56TEUOP</b>	10
Contact Set Zeeman	9423-393-95161	<b>56UN011</b>	1
Contact Set Standard	9423-393-95011	<b>56UN012</b>	1



## Spectrometer Light Sources



**PHOTRON** PTY. LTD.  
LIGHTEN YOUR HORIZON



### **Hollow Cathode Lamps | Superlamps | Power Supplies**

Photron produces high quality lamps for analytical instruments at competitive prices for more than 50 years now. Modern equipment, careful selection of the raw material and strict quality controls guarantee a lamp with short heating time, long lifetime, 2 years warranty and a 5 years shelf life.

Here you can find details to lamps for spectrometers of GBC, Shimadzu, Hitachi, Analytik Jena, Thermo Scientific (Unicam), Agilent (Varian), Perkin Elmer and many more. You can find coded lamps for single and multi elements, optogalvanic „see-trough“ lamps and lamps to calibrate astronomical spectrometers

Photron can customise lamps and also offers a wide range of Deuterium lamps.

The following pages show details and part numbers so you can easily find the correct lamp for your needs.

# 37 mm / 1.5" Hollow Cathode Lamps coded and uncoded

These lamps fit directly into AA-Systems from Agilent, GBC, Analytik Jena, Thermo Scientific, Hitachi, Shimadzu and many more.

With the Adapter Kit P204 they can also be used in Perkin Elmer AAS, but we recommend to use 51 mm (2.0") lamps instead.

All lamps can handle the Smith-Hieftje background correction, but due to this high energy pulsation, the lifetime of the lamp is significantly reduced.

Element	Maassen part no.	Photron part no.	Primary Wavelength	Alternative Wavelength
Ag Silver	M1001	P851	328.1	338.3
Al Aluminium	M1002	P801	396.2	308.2 – 309
As Arsen	M1003	P803	193.7	189.0 – 197.2
Au Gold	M1004	P821	242.8	267.6
B Boron	M1005	P807	249.8	208.9
Ba Barium	M1006	P804	553.5	455.4 – 493.4
Be Beryllium	M1007	P805	234.9	-
Bi Bismut	M1008	P806	223.1	222.8 – 227.7
Ca Calcium	M1009	P809	422.7	239.9
Cd Cadmium	M1010	P808	228.8	326.1
Ce Cer	M1011	P811	520.0	569.7
Co Cobalt	M1012	P813	240.7	304.4
Cr Chrom	M1013	P812	357.9	425.4 – 427.5
Cs Caesium	M1014	P810	852.1	455.6
Cu Copper	M1015	P814	324.8	217.9 – 218.2
Dy Dysprosium	M1016	P815	421.2	404.6
Er Erbium	M1017	P816	400.8	389.3
Eu Europium	M1018	P817	459.4	462.7
Fe Iron	M1019	P826	248.3	248.8 – 372.0
Ga Gallium	M1020	P819	294.4	403.3 – 417.2
Gd Gadolinium	M1021	P818	368.4	405.8 – 407.9
Ge Germanium	M1022	P820	265.2	271.0
Hf Hafnium	M1023	P822	307.8	268.2
Hg Mercury	M1024	P833	253.7	-
Ho Holmium	M1025	P823	410.4	405.4 – 425.4
H2	M1026	P869	170 – 380	-
In Indium	M1027	P824	303.9	325.6 – 410.2
Ir Iridium	M1028	P825	208.9	264.0 – 266.5
K Potassium	M1029	P841	766.5	404.4 – 769.9
La Lanthan	M1030	P827	550.1	403.7
Li Lithium	M1031	P829	670.8	323.3

## M1000 Series:

Uncoded, for all AAS,  
2 pin socket

## M2000 Series:

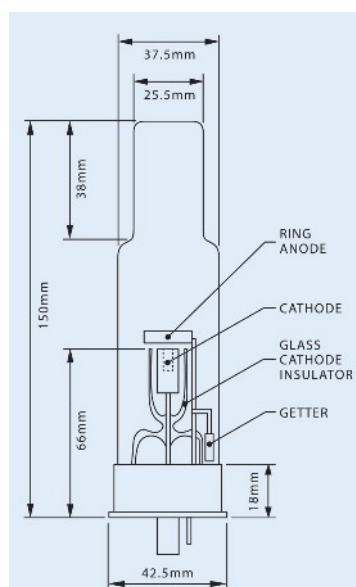
For Agilent (Varian)  
coded lamps,  
4 pin socket

## M3000 Series:

For Thermo Scientific  
(Unicam) coded Lamps,  
7 pin socket

### How to order, example:

If you want to have a  
coded Fe lamp for an  
Agilent AA, use the part  
no. M2019



<b>Element</b>	<b>Maassen part no.</b>	<b>Photron part no.</b>	<b>Primary Wavelength</b>	<b>Alternative Wavelength</b>
Lu Lutetium	M1032	P830	335.9	337.6 – 356.7
Mg Magnesium	M1033	P831	285.2	202.5
Mn Manganese	M1034	P832	279.5	279.8 – 280.1
Mo Molybdenum	M1035	P834	313.3	320.9
Na Sodium	M1036	P852	589.0	330.2 – 589.6
Nb Niob	M1037	P837	334.9	405.9 – 408.0
Nd Neodym	M1038	P835	492.5	463.4
Ni Nickel	M1039	P836	232.0	231.1 – 341.5
Os Osmium	M1040	P838	290.9	305.9 – 426.0
P Phosphor	M1041	P874	213.6	-
Pb Lead	M1042	P828	217.0	261.4 – 283.3
Pd Palladium	M1043	P839	247.6	244.8 – 340.5
Pr Praseodym	M1044	P842	495.1	513.3
Pt Platinum	M1045	P840	265.9	264.7 – 299.8
Rb Rubidium	M1046	P845	780.0	794.8
Re Rhenium	M1047	P843	346.0	346.5
Rh Rhodium	M1048	P844	343.5	328.1 – 369.2
Ru Ruthenium	M1049	P846	349.9	392.6
Sb Antimony	M1050	P802	217.6	206.8 – 217.9
Sc Scandium	M1051	P848	391.2	390.8
Se Selenium	M1052	P849	196.0	204.0
Si Silicone	M1053	P850	251.6	250.7 – 251.4
Sm Samarium	M1054	P847	429.7	476.0
Sn Tin	M1055	P860	235.5	224.6 – 266.1
Sr Strontium	M1056	P853	460.7	407.8
Ta Tantal	M1057	P854	271.5	275.8
Tb Terbium	M1058	P856	432.7	431.9 – 433.8
Te Tellurium	M1059	P855	214.3	225.9
Ti Titanium	M1060	P861	364.3	365.4 – 399.0
Th Thorium	M1061	P858	371.9	-
Tl Thallium	M1062	P857	276.7	258.0
Tm Thulium	M1063	P859	371.8	436.0 – 410.6
U Uranium	M1064	P863	358.5	356.6 – 351.4
V Vanadium	M1065	P864	318.5	306.6 – 318.4
W Tungsten	M1066	P862	255.1	294.7 – 400.9
Y Yttrium	M1067	P866	410.2	414.2
Yb Ytterbium	M1068	P865	398.8	346.4
Zn Zinc	M1069	P867	213.9	307.6
Zr Zirkonium	M1080	P868	360.1	468.7 – 354.8

All lamp windows are made of quartz glass for maximum transmission of the spectral line.

The fill gas is Neon. If you need another fill gas, add the suffix A for Argon, H for Helium, X for Xenon or K for Krypton at the end of the part number.





# 37 mm / 1.5" Hollow Cathode Lamps

## Multi element

Multi element lamps can be combined as desired. They can decrease the time you need for analyses because there is no need to change the lamps and only one lamp needs to be heated up. But they are of little use in detection limit applications. The P873 for example was made to measure concentrations in %. So we recommend to use single element lamps for better detection limits.

This list shows some common combinations. Some of them are also available as a coded version for Agilent or Thermo.

### Two Elements

Ca-Mg	M1070	P870
Cu-Zn	M1072	P872
Na-K	M1071	P871
Cr-Ni	M1074	P551
Cr-Cu	M1075	P587
Al-Mn	M1101	P501
Al-Sb	M1102	P502
Al-Si	M1103	P503
Ag-B	M1104	P504
Ag-Cd	M1109	P509
Au-Cu	M1111	P511
Co-Mn	M1112	P512
Cr-Fe	M1114	P514
Cd-Cu	M1119	P519
Cu-Fe	M1121	P521
Cu-Mn	M1125	P525
Cu-Ni	M1127	P527
Fe-Mn	M1130	P530
Fe-Ni	M1131	P531
Ag-Hg	M1133	P533
K-Ni	M1134	P535
Mn-Ni	M1135	P536
As-Pb	M1138	P539
Ag-Ru	M1139	P540
Co-Cu	M1140	P541
Se-Sn	M1141	P542
Ag-Si	M1142	P543
Mo-Si	M1143	P544
Ag-Sn	M1144	P545
Ag-Tl	M1145	P547
Ag-Zn	M1146	P548
Cr-Ni	M1149	P551
Ag-W	M1151	P554
Ag-Ti	M1152	P555
Au-Pd	M1155	P559
Ca-Zn	M1157	P561
Cr-Se	M1158	P562
Ti-V	M1159	P563
Cd-Sn	M1160	P565
Ag-Pb	M1161	P566
Ca-Fe	M1166	P572
Cd-Zn	M1168	P578
Co-Ni	M1173	P584
Au-Ag	M1175	P586
Al-Fe	M1184	P596
Sb-Se	M1185	P598

Co-Mo	M1187	P5-0001
Co-Fe	M1193	P5-0008
Ag-Fe	M1195	P5-0011
Cr-Mn	M1202	P5-0020
Al-Ca	M1206	P5-0024
Cr-Mo	M1209	P5-0027
Cd-Pb	M1211	P5-0029
Mo-V	M1213	P5-0031
Fe-Zn	M1214	P5-0033
Mg-Ti	M1221	P5-0047

### Three Elements

Cu-Fe-Mn	M1076	P585
Al-Fe-Si	M1105	P505
Al-Ca-Mg	M1106	P506
Ca-Fe-Mg	M1108	P508
Cr-Fe-Mn	M1115	P515
Cr-Fe-Ni	M1116	P516
Cr-Ni-Mo	M1117	P517
Cr-Cu-Ni	M1120	P520
Cu-Mn-Zn	M1126	P526
Ag-Cu-Ni	M1128	P528
Cu-Zn-Fe	M1129	P529
Fe-Mn-Ni	M1132	P532
K-Na-Ni	M1136	P537
Ag-Cd-Pb	M1147	P549
Ag-Cu-Fe	M1148	P550
Cd-Cu-Zn	M1153	P556
Al-Cr-Ni	M1154	P557
Cu-Fe-Ni	M1156	P560
Ca-Mg-Si	M1167	P576
Cr-Cu-Zn	M1171	P582
Ag-Cu-Zn	M1177	P589
Cu-Mo-Zn	M1178	P590
Ag-Pb-Zn	M1182	P594
Au-Cu-Fe	M1183	P595
Ag-Cr-Ni	M1186	P599
Cr-Mn-/Ni	M1188	P5-0003
Co-Cu-Fe	M1189	P5-0004
Fe-Ni-Zn	M1191	P5-0006
Cd-Pb-Zn	M1196	P5-0012
Co-Cr-Mn	M1198	P5-0015
Al-Mo-Si	M1203	P5-0021
Ag-Cd-Zn	M1207	P5-0025
Al-Si-Ti	M1208	P5-0026
Ca-Mg-Ni	M1216	P5-0035

Ag-Cd-Zn	M1217	P5-0037
Cr-Cu-Fe	M1219	P5-0045
Cr-Ni-Zn	M1222	P5-0049
Cu-Fe-Mo	M1223	P5-0052
Cu-Mg-Zn	M1225	P5-0059

### Four Elements

Cr-Ni-Cu-Mn	M1077	P538
Ca-Cu-Mg-Zn	M1107	P507
Cd-Co-Cr-Mn	M1110	P510
Cu-Fe-Mn-Ni	M1122	P522
Cr-Cu-Fe-Zn	M1123	P523
Cu-Fe-Mn-Zn	M1124	P524
Cr-Fe-Mn-Ni	M1162	P567
Al-Ca-Fe-Mg	M1163	P569
Co-Cu-Fe-Ni	M1165	P571
Cr-Fe-Mn-Mo	M1150	P553
Cd-Cu-Pb-Zn	M1169	P579
Al-Ca-Fe-Si	M1172	P583
Co-Cu-Mo-Zn	M1179	P591
Ag-Cr-Cu-Ni	M1181	P593
Ag-Cd-Pb-Zn	M1190	P5-0005
Co-Fe-Ni-Zn	M1192	P5-0007
Cr-Fe-Mn-Ti	M1200	P5-0017
Co-Cu-Fe-Mn	M1205	P5-0023
Co-Cu-Mn-Ni	M1210	P5-0028
Ag-Cu-Pb-Zn	M1212	P5-0030
Al-Cu-Fe-Mn	M1218	P5-0043
Co-Cu-Ni-Zn	M1220	P5-0046
Cu-Fe-Sn-Zn	M1224	P5-0053

### Five Elements

Co-Cr-Fe-Mn-Mo	M1113	P513
Ag-Cr-Cu-Fe-Ni	M1164	P570
Co-Cu-Fe-Mg-Ni	M1170	P581
Co-Cu-Fe-Mn-Mo	M1180	P592
Co-Cr-Cu-Fe-Ni	M1197	P5-0014
Ag-Cr-Cu-Fe-Ni	M1201	P5-0019
Co-Cr-Cu-Mn-Ni	M1215	P5-0034

### Six Elements

Co-Cr-Cu-Fe-Mn-Ni	M1073	P873
Cr-Co-Fe-Mg-Mn-Ni	M1194	P5-0010
Ag-Al-Cr-Cu-Fe-Mg	M1204	P5-0022

# 51 mm / 2.0" Hollow Cathode Lamps for PerkinElmer Spectrometer

These lamps are intended to be used in PerkinElmer Spectrometers. The current lamps for Aanalyst instruments are our M6000 series (Lumina Lamps). But if you need the previous versions with a coded 12 pin plug (M5000 Series) or uncoded 9 pin plug (M4000 Series), you can still get them from Photron. So you don't need expensive adapters.

Element	Maassen part no.	Photron part no.	PerkinElmer part no.
Ag Silver	M6001	P951LL	N305-0102
Al Aluminium	M6002	P901LL	N305-0103
As Arsenic	M6003	P903LL	N305-0105
Au Gold	M6004	P921LL	N305-0107
B Borium	M6005	P907LL	N305-0108
Ba Barium	M6006	P904LL	N305-0109
Be Beryllium	M6007	P905LL	N305-0110
Bi Bismut	M6008	P906LL	N305-0111
Ca Calcium	M6009	P909LL	N305-0114
Cd Cadmium	M6010	P908LL	N305-0115
Co Cobalt	M6012	P913LL	N305-0118
Cr Chrome	M6013	P912LL	N305-0119
Cu Copper	M6015	P914LL	N305-0121
Dy Dysprosium	M6016	P915LL	N305-0122
Er Erbium	M6017	P916LL	N305-0123
Eu Europium	M6018	P917LL	N305-0124
Fe Iron	M6019	P926LL	N305-0126
Ga Gallium	M6020	P919LL	N305-0128
Gd Gadolinium	M6021	P918LL	N305-0129
Ge Germanium	M6022	P920LL	N305-0130
Hf Hafnium	M6023	P922LL	N305-0133
Hg Mercury	M6024	P933LL	N305-0134
Ho Holmuim	M6025	P923LL	N305-0135
In Indium	M6027	P924LL	N305-0137
Ir Iridium	M6028	P925LL	N305-0138
K Potassium	M6029	P941LL	N305-0139
La Lanthan	M6030	P927LL	N305-0141
Li Lithium	M3031	P929LL	N305-0142
Lu Lutetium	M6032	P930LL	n.v.
Mg Magnesium	M6033	P931LL	N305-0144
Mn Manganese	M6034	P932LL	N305-0145
Mo Molybdaen	M6035	P934LL	N305-0146
Na Sodium	M6036	P952LL	N305-0148
Nb Niob	M6037	P937LL	N305-0149
Nd Neodym	M6038	P935LL	N305-0150
Ni Nickel	M6039	P936LL	N305-0152
Os Osmium	M6040	P938LL	n.v.
P Phosphor	M6041	P974LL	N305-0155
Pb Lead	M6042	P928LL	N305-0157
Pd Palladium	M6043	P939LL	N305-0158
Pr Praesodym	M6044	P942LL	N305-0161
Pt Platinum	M6045	P940LL	N305-0162
Rb Rubidium	M6046	-	n.v.
Re Rhenium	M6047	P943LL	N305-0165
Rh Rhodium	M6048	P944LL	N305-0166
Ru Ruthenium	M6049	P946LL	N305-0168
Sb Antimony	M6050	P902LL	N305-0170
Sc Scandium	M6051	P918LL	N305-0171

Element	Maassen part no.	Photron part no.	PerkinElmer part no.
Se Selenium	M6052	P949LL	N305-0172
Si Silicone	M6053	P950LL	N305-0173
Sm Samarium	M6054	P947LL	N305-0174
Sn Tin	M6055	P960LL	N305-0175
Sr Strontium	M6056	P953LL	N305-0176
Ta Tantalium	M6057	P954LL	N305-0177
Tb Terbium	M6058	P956LL	N305-0178
Te Tellurium	M6059	P955LL	N305-0180
Ti Titanium	M6060	P961LL	N305-0182
Tl Thallium	M6062	P957LL	N305-0183
Tm Thulium	M6063	P959LL	N305-0184
V Vanadium	M6065	P964LL	N305-0186
W Tungsten	M6066	P962LL	N305-0187
Y Yttrium	M6067	P966LL	N305-0189
Yb Ytterbium	M6068	P965LL	N305-0190
Zn Zinc	M6069	P967LL	N305-0191
Zr Zirkonium	M6080	P968LL	N305-0192

For wavelength informations, please refer to the 1.5" lamps list

## M4000 Series:

Uncoded, with cable and 9 Pin plug



## M5000 Series:

Codiert, with cable and 12 Pin plug



## M6000 Series:

Lumina Lamps, coded, Socket with 4 pins for current Aanalyst instruments



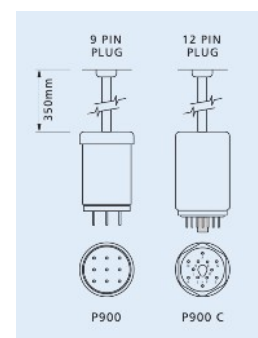
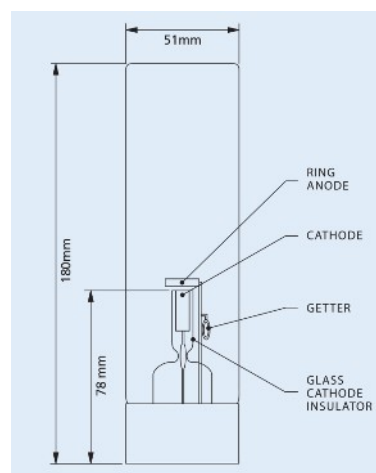
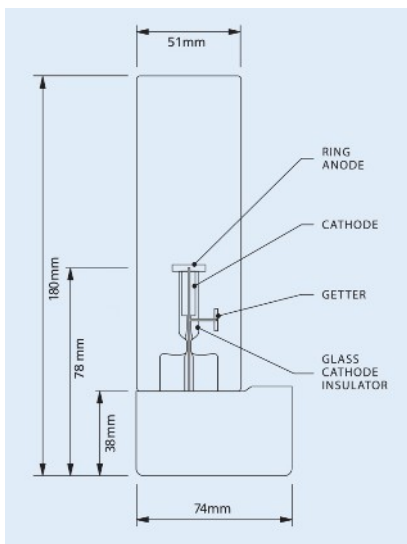
To order M4000 / M5000 Lamps, simply replace the order number (example: M5019 is a Fe lamp with cable and 12 pin plug, coded)

# 51 mm / 2.0" Hollow Cathode Lamps Multi element

Multi element lamps can be combined as desired. They can decrease the time you need for analyses because there is no need to change the lamps and only one lamp needs to be heated up. But they are of little use in detection limit applications.

This list shows some common combinations, suitable for all Analyst instruments.

Element	Art. Nr.	Photron Art. Nr.	PerkinElmer Art. Nr.
Au-Ag	M6174	P686LL	N305-0201
Ca-Mg	M6070	P970LL	N305-0202
Ca-Zn	M6156	P661LL	N305-0203
K-Na	M6071	P971LL	N305-0204
Al-Ca-Mg	M6106	P606LL	N305-0207
Ca-Mg-Zn	M6075	P6-0002LL	N305-0208
Cu-Fe-Ni	M6155	P660LL	N305-0209
Cu-Fe-Mn-Zn	M6124	P624LL	N305-0212
Ag-Cr-Cu-Ni	M6180	P693LL	N305-0210
Ag-Cr-Cu-Fe-Ni	M6163	P670LL	N305-0213
Co-Cu-Fe-Mn-Mo	M6179	P692LL	N305-0215
Co-Cr-Cu-Mn-Ni	M6214	P6-0034LL	N305-0214
Co-Cr-Cu-Fe-Mn-Ni	M6073	P973LL	N305-0217
Ag-Al-Cr-Cu-Fe-Mg	M6203	P6-0022LL	N305-0216



# Superlamps 1.5" and 2.0"

## High Intensity for AAS and AFS Spectrometer

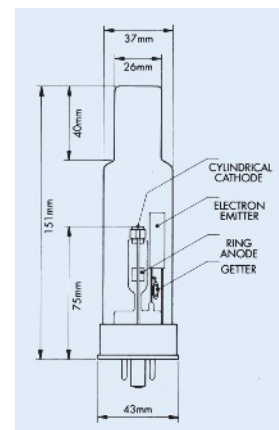


Superlamps are perfect for Elements with resonance spectra in the far UV where instrumental efficiency is reduced, like Arsenic and Selenium. They also make sense for elements with complex spectra, where the enhanced resonance line reduces the interference of background radiation, allowing the use of wider slit widths and reducing signal to noise, like Nickel and Iron.

For determinations at or near the detection limit, you can reach in some cases a 10 fold improvement in detection limit. This lamp produces intense spectra with narrow line widths. 10 Volt Super Lamps are also used in Atomic Fluorescence Spectrography.

Photron Superlamps combined with the power supply P200 to adjust the boost current are compatible with most commercial atomic absorption instruments. Once the power supply is installed, normal hollow cathode lamps can be used in the same position without disconnecting the power supply. Some instruments already have an integrated super lamp power supply, like Analytik Jena.

Superlamps may also be used as replacement for PerkinElmer EDL lamps.



Element	Art. Nr. 1.5" 3V	Art. Nr. 1,5" 10 V*	Art. Nr. 2.0"	Wellenlänge	Verbesserung ggü. Std. HKL
As Arsen	P803S	P803S-10V	P903S	193.7 nm	5
Bi Bismut	P806S	P806S-10V	P906S	223.1 nm	15
Cd Cadmium	P808S	P808S-10V	P908S	228.8 nm	35
Cr Chrom	P812S	P812S-10V	P912S	357.9 nm	2
Fe Iron	P826S	P826S-10V	P926S	248.3 nm	13
Ir Iridium	P825S	P825S-10V	P925S	208.9 nm	7
Mn Manganese	P832S	P832S-10V	P932S	279.5 nm	13
Ni Nickel	P836S	P836S-10V	P936S	232.0 nm	16
P Phosphor	P874S	P874S-10V	P974S	213.7 nm	3
Pb Lead	P828S	P828S-10V	P928S	217.0 nm	10
Sb Antimony	P802S	P802S-10V	P902S	217.6 nm	10
Se Selenium	P849S	P849S-10V	P949S	196.0 nm	26
Te Tellurium	P855S	P855S-10V	P955S	214.3 nm	10
Tl Thallium	P857S	P857S-10V	P957S	276.8 nm	10
Zn Zink	P867S	P867S-10V	P967S	213.9 nm	24
6 Multi ↓	P873S	P873S-10V	P973S		
Co				240.7 nm	28
Cr				257.9 nm	3
Cu				324.8 nm	5
Fe				248.3 nm	3
Mn				279.5 nm	2
Ni				232.0 nm	12

Helium *** <b>He</b> 2																		
Lithium * <b>Li</b> 3	Beryllium * <b>Be</b> 4															Neon *** <b>Ne</b> 10		
Sodium * <b>Na</b> 11	Magnesium * <b>Mg</b> 12															Fluorine *** <b>F</b> 9		
Potassium * <b>K</b> 19	Calcium * <b>Ca</b> 20	Scandium * <b>Sc</b> 21	Titanium * <b>Ti</b> 22	Vanadium * <b>V</b> 23	Chromium * <b>Cr</b> 24	Manganese * <b>Mn</b> 25	Iron * <b>Fe</b> 26	Cobalt * <b>Co</b> 27	Nickel * <b>Ni</b> 28	Copper * <b>Cu</b> 29	Zinc * <b>Zn</b> 30	Gallium * <b>Ga</b> 31	Germanium * <b>Ge</b> 32	Arsenic * <b>As</b> 33	Selenium * <b>Se</b> 34	Bromine ** <b>Br</b> 35	Krypton *** <b>Kr</b> 36	
Rubidium * <b>Rb</b> 37	Sr 38	Yttrium * <b>Y</b> 39	Zirconium * <b>Zr</b> 40	Niobium * <b>Nb</b> 41	Molybdenum * <b>Mo</b> 42	Technetium * <b>Tc</b> 43	Ruthenium * <b>Ru</b> 44	Rhodium * <b>Rh</b> 45	Palladium * <b>Pd</b> 46	Silver * <b>Ag</b> 47	Cadmium * <b>Cd</b> 48	Indium * <b>In</b> 49	Tin * <b>Sn</b> 50	Antimony * <b>Sb</b> 51	Tellurium * <b>Te</b> 52	Iodine * <b>I</b> 53	Xenon *** <b>Xe</b> 54	
Cesium * <b>Cs</b> 55	Ba 56	LANTHANIDES																
Francium * <b>Fr</b> 87	Ra 88	ACTINIDES																
																		Radon *** <b>Rn</b> 86
																		Ununseptium ***** <b>Uus</b> 117
																		Ununoctium ***** <b>Uuo</b> 118
																		Uup 115
																		Lv 116
																		Fl 114
																		Cn 112
																		Rg 111
																		Ds 110
																		Mt 109
																		Hs 108
																		Bh 107
																		Sg 106
																		Db 105
																		Rf 104
																		La 14
																		Ce 58
																		Pr 59
																		Nd 60
																		Pm 61
																		Sm 62
																		Eu 63
																		Gd 64
																		Tb 65
																		Dy 66
																		Ho 67
																		Er 68
																		Tm 69
																		Yb 70
																		Lu 71
																		Ac 89
																		Th 90
																		Pa 91
																		U 92
																		Np 93
																		Pu 94
																		Am 95
																		Cm 96
																		Bk 97
																		Cf 98
																		Es 99
																		Fm 100
																		Md 101
																		No 102
																		Lr 103

- \* Solid
- \*\* Liquid
- \*\*\* Gas
- \*\*\*\* Unknown

Copper  
\*  
**Cu**  
29  
4  
15

Name of element  
Element state  
Chemical symbol  
P800 1.5" Std Hollow Cathode Lamp – Recommended Current (mA)  
P900LL 2.0" Perkin Elmer style AAS – Recommended Current (mA)  
Atomic number

Colour denotes elements that can be made into Hollow Cathode Lamps

\* Used in some AFS or Analytik Jena instruments. Please check the manual of your instrument to be sure.

# Power Supplies and Accessories For Standard- and Superlamps

The standard power supply for hollow cathode lamps (P209) is made for many applications beside the standard Atomic Absorption purpose. It starts the lamp automatically with 600 V and allows the adjustment between 0 and 25 mA.

The Super lamp power supply (P200) adds a boost discharge for use with super lamps. It uses the existing spectrometer lamp current and adds the boost discharge to increase the excitation of atoms sputtered by the instrument lamp supply. This is a cost efficient way to improve the sensitivity of your AAS.

Photron also offers adaptors which may be required to fit the power supply to some instruments.

P200	Photron's Super Lamp Power Supply
P201	Adaptor Kit, Super Lamp Power Supply - Varian AA
P202	Adaptor Kit, Super Lamp Power Supply - Varian Spectra Series AA
P203	Adaptor Kit, Super Lamp Power Supply - Hitachi AA
P204	Adaptor Kit, 37mm Lamps - PE AA (9 Pin)
P204A	37mm Anti-heat Holder – 2" O/D
P204C	Adaptor Kit, 37mm Lamps - PE Coded AA (12 Pin)
P204L	Adaptor Kit, 37mm Lamps - PE AAnalyst (4 Pin)
P205	Adaptor Kit, Super Lamp Power Supply - GBC AA
P205-AvantAA	Adaptor Kit, Super Lamp Adaptor to suit AvantAA
P205-Sanvanta	Adaptor Kit for Super Lamp to GBC Savanta
P205-SensAA	Adaptor Kit for Super Lamp to SensAA
P205-XplorAA	Adaptor Kit for Super Lamp to XplorAA
P207	Adaptor, PE 12 Pin Lamp - PE AA (9 Pin)
P208	Adaptor, PE 9 Pin Lamp - PE AAnalyst (4 Pin)
P209	Hollow Cathode Lamp Power Supply
P210	Adaptor, PE 12 Pin Lamp - PE AAnalyst (4 Pin)
P211	Adaptor, PE 9 Pin Lamp - PE Coded AA (12 Pin)
P215	Adaptor, PE AAnalyst (4 Pin) Lamp - PE Coded AA (12 Pin)
P216	Adaptor, PE AAnalyst (4 Pin) Lamp - PE AA (9 Pin)
P217	HCL Power Supply - Lamp Extension Cable (10mtr)
P220	Adaptor, Super Lamp Power Supply - PE AA (9 Pin)
P220C	Adaptor, Super Lamp Power Supply - PE Coded AA (12 Pin)
P220L	Adaptor, Super Lamp Power Supply - PE AAnalyst (4 Pin)



## Technical Data

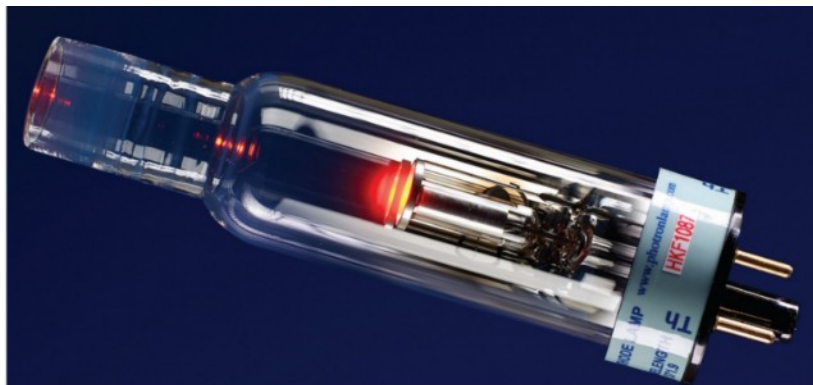
Input: 100-240V, 50/60 Hz  
 Size: 360 x 310 x 135 mm  
 Weight: 6 kg

# Astronomical Calibration Lamps

Astronomical spectrographs are used for a variety of high-precision measurements, ranging from the discovery of low-mass exoplanets to the possible variation of fundamental constants, such as the fine structure constant or the proton-electron mass ratio. These works require excellent wavelength calibration sources and a detailed understanding of the associated uncertainties and systematics. In the era of extremely large telescopes, it is often the accuracy of the calibration source, not the intrinsic photon noise, that limits the achievable precision. Furthermore, the science goals of future extremely large telescopes will require very high precision calibration sources.

Continual improvements in the line list have now enabled Th/Ar lamps to be used to calibrate almost the entire optical bandpass below 900 nm with high precision.

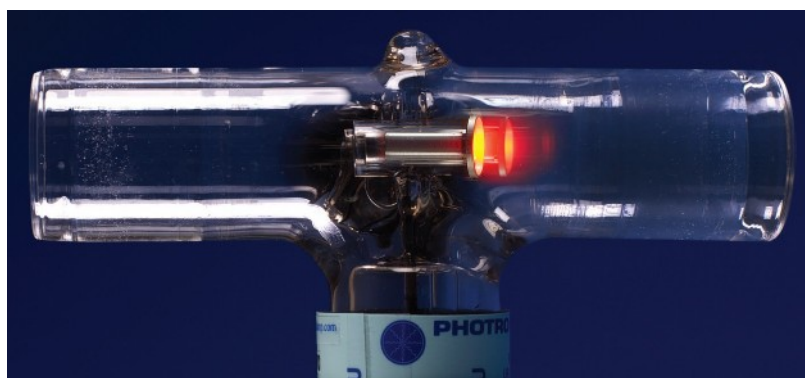
They are the preferred wavelength calibration solution for most astrophysical spectrographs. Thorium ( $^{232}\text{Th}$ ) exhibits many of the desired characteristics of an atomic emission calibration source: it has many energy levels (leading to many lines), a heavy nucleus, a very long half-life, and occurs in nature as a single isotope. Other elements such as Uranium can also be used as a calibration source.



# Optogalvanic See-through Lamps

Photron manufactures Optogalvanic (see-through) hollow cathode lamps, they are designed to act as a frequency stable reference for high intensity tuneable monochromatic light sources, particularly lasers.

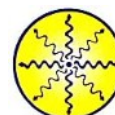
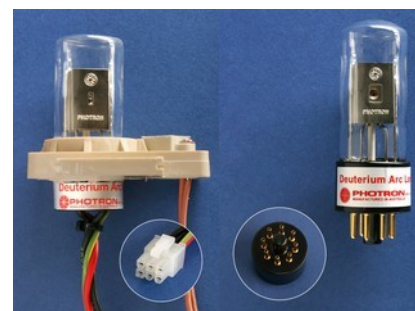
Most of the cathode materials used in standard hollow cathode lamps may be used in the "see-through" design. We can also offer a range of fill gases, such as: Neon, Argon, Xenon and Krypton.



# Deuterium Lamps

Deuterium Lamps for UV-VIS, AAS and UV-Detectors, for HPLC and Colorimeters with different sizes, current and connection. Hamamatsu and Heraeus D2 lamps on special request.

Maassen order no.	Photron order no.	current	
514700.0	P700	10 V	-
514701.0	P701	10 V	-
514702.0	P702	10 V	-
514703.0	P703	10 V	With bracket
514704.0	P704	10 V	-
514705.0	P705	3 V	-
514706.0	P706	10 V	-
514707.0	P707	10 V	With bracket
514712.0	P712	10 V	With bracket
514713.A	P713A	10 V	-
514714.0	P714	3 V	-
514715.0	P715	10 V	-
514716.0	P716	3 V	With bracket
514717.0	P717	10 V	only lamp
514718.0	P718	10 V	-
514719.0	P719	3 V	-
514721.0	P721	3 V	special socket
514726.0	P726	3 V	-
514727.0	P727	3 V	-
514729.0	P729	10 V	-
514733.0	P733	10 V	With bracket
514735.0	P735	10 V	With bracket
514736.0	P736	10 V	With bracket
514737.0	P737	3 V	With bracket
514738.0	P738	3 V	With bracket
514739.0	P739	3 V	-
514747.0	P747	10 V	-
514748.0	P748	10 V	With bracket
514750.0	P750	10 V	With bracket



More details: [www.photronlamp.com](http://www.photronlamp.com)



## Comparison list D2 Lamps

Manufacturer	Detector- / Spectrometer -Type	Lamp
Frei	bare lamp with cable	P700
Agilent / HP	HP- 1040 / 1040 -A-DAD /1050 DA-MW-VW / 1100	P721
Altex	155	P704
	163	P705
Altex / Hitachi	CE-100 (HPLC)	P713A
Barspec	Alle Modelle	P713A
BAS	200	P707 / P717
BECKMAN	DK / DU / DB / DBG / 163	P705
	24/25/26 /ACTA	P713A
	155	P704
	34/35/DU-6/7/8/40/50	P715
	Halterung von alter Lampe nehmen	
BIORAD	BT3035	P704
	MLD1790 - 1801 / CE2000 / HPE100 / UV VIS 20 / UV2ORS	P707 / P717
	1000 / 2000 / 3000 / 5000 / 6000 / 7000 / 8000 / 9000 series	P713A
BIOTRONIC	BT-3035	P704
Carlo Erba	SP601	P705
	UV-VIS 20 / UV2ORS	P707 / P717
CECIL Instruments	CE1010 & CE1020, CE1070, CE1200 & CE1220, CE2202 & CE2272, CE2292 & CE4400, CE5501 & CE5502, CE6600 & CE6600S, CE6602 & CE6603, CE7200 & CE8020, CE9020 & CE9050, CE9080 & CE9090, Series 2 Models	P713A
Coleman	124	P713A
DIONEX	DSA-1 / VDM-1	P707 / P717
Dupont	825	P704
	850	P713A
Dynamax	UV-C, OV-D11 & UV-M	P707 / P717
Erma	ERC 7210	P704
G B C	All AA Instruments, UV-911/ -911A	P701
	UV-VIS 914 / 916 / 918 / 920; Cintra-10 / 20 / 40 / 101 / 202 / 303 / 404	P702
	LC 1205 / 1206 /1210	P707 / P717
GILFORD	RESPONSE	P713A
	200,220,222,230, 2000,2400,2600	P711
HITACHI	101/102/111	P704
	200, 220, 300, 330 & 340, 2000, 3000, 4000, 6000, 7000, 3200, 150-20 100-40 L2500 L3000 L4000 L4200 L4500 L4720 L4225 L4250 L6000 L7000 Lachrom L7400 UV L7400 UV /Vis L7450A U2001 U3010 U3310 U4000 U4100 L7000 L7400 L7420 L7450 L7455 U1100 UL1100 U2000 U3200 U3210 U3410 U3501 U4001	P703
I B M	DETEKTOREN	P707 / P717
IFCO	S500	P707 / P717
JASCO	UVIDEC 1 & 2 & 4 / 100/ 100-II / 320 / 340 / 420/ 505 / 510 / 710 / 4D	P704
	7800	P726
Joyce Loebel	Scan400	P705
KONTRON	UVICON 725	P704
	710 & 715 / 810,810P, 820 & 860 / 922 / 72013C / 810P Uvikon 600 Uvikon 700 Uvikon 710 Uvikon 715 Uvikon 820 Uvikon 942 Uvikon 430 & 432 Uvikon 720 Uvikon 720LC Uvikon 800 & 810 Uvikon 860 Uvikon 930	P705
LDC	3000, 3100, 3200 / 4000, 4100, 4200 / Spectromonitor D /Spectromonitor III	P705
Linear	200 bis 206,206PH ,Focus, UV200	P707 / P717
L K B	Siehe Pharmacia	
Merck / Hitachi	200/300/2000/3200/655A22,L3000/ L4000/L4020/L4500/U1000/U1100/ U1500/U2000/U2001/U3010/U3210/ U3410/U3501/U4001/U4010/	P703
PE / Hitachi	123 / 200/ 320 / 330 / 340 / 556 / 557	P703
PERKIN ELMER	LAMBDA - 2 & 2S /3 &3B/ 5, 7,9,10 11,12,15,17,18,19,20,40, BIO, 800 (B0160917)	P712
	55E / LC55 / LC55B / 65T / 75 / 85 / 85B 90 / 95 / 135 / 139 / 235 / 575 Lambda	P713A
	1, 6 /Integral 2000 / Integral 4000 / M46 / M55 / M57	
	2280 / 2380 / 4000 / 5000 / 5100 / 272 / 280 / 360 / 370 / 372 / 373 / 380 / 460 / 3030	P718
	1100/2100/4100, AAnalyst 600/700/800	P735
	AAAnalyst 200 / 400	P748




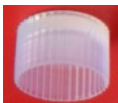


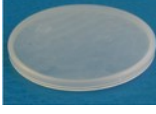
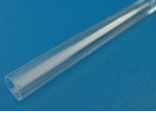
<b>Manufacturer</b>	<b>Detector- / Spectrometer -Type</b>	<b>Lamp</b>
<b>Perspective Biosystems</b>	BioCAD/Sprint system for Perfusion Chromatography	P707 P717
<b>Pharmacia</b>	Ultrospec+ ab s/n 176, Ultrospec II ab s/n 6598, Ultrospec III / TDS ab s/n 206	P713A
<b>Saitron</b>	Monospec B	P705
<b>Scientific systems Inc (SSI)</b>	201, 500, 506 UV/Vis & 525	P707 P717
	SA6500, 6503, 6504 6508 (Rapidscan)	P707 P717
<b>SHIMADZU</b>	SPD 2A/6A/6aV , LC3A/4A/6A / SP4 / 6500AA	P711
	UV 120,160,160A, 240, 250, 260	P719
<b>Speck Analytical SPECTRA PHYSICS</b>	SA 203 & 302	P707 / P717
	3100	P705
	SP8400,8430,8440,8450,8480, 8490 / wie Heraeus D0902T	P714
	UV-100, 150, 200, UV1000,2000,3000 Focus Det.	P707 P717
<b>Thermo Separation</b>	SC100&200, UV100,150,200,1000, 2000, 3000,	P707 P717
<b>Themo Fisher</b>	Helios + Aquamate	P736
<b>Turner</b>	330 / 430	P705
<b>Unicam (Thermo)</b>	4225	P707 / P717
	5600 Series 8500, 8740 SP8,SP8100/SP8150/ SP8200/SP8400/SP8600	P704
	Solaar 929 / 939	P739
<b>VARIAN (Agilent)</b>	UV 634/635	P704
	Cary 210 / 219(neuer), Cary220 /2300	P705
	Cary-1,3,4,5 100/300/400/500	P715
	DMS-100 / UV-Superscan 75 series AA275,400,475,775,875,975, AA1275,1475,3000 Spectra A10/A20/A30/A40	P706
<b>Waters</b>	481 / 480LC / 481LC / Lambda max	P705
	484 / 486	P716

If you don't find your D2 lamp, please search at [www.photronlamp.com](http://www.photronlamp.com) or ask us and we will find it!

We can also supply Deuterium lamps from other brands.

## Sample Cups

For AA – Systems and other purposes. Need more? Just ask!

Description	Picture	Part number quantity / unit
<b>Sample cups PS 0.25 / 0.5 ml</b> conical bottom, polystyrene, for samples with acids and bases		0.25 ml: 5637899 0.5 ml: 5637900 each 1000 pcs
<b>Sample cups PS 1.5 ml</b> conical bottom, polystyrene for samples with acids and bases OEM PE: B0119079		5637902 1000 pcs.
<b>Sample cups PFA 1.5 ml conical bottom,</b> Perfluoroalkoxy multi purpose cup for all samples including HF PE Nr. B0087600		5095020 10 pcs.
<b>PFA caps</b> for cups 5095020		5095090 10 pcs.
<b>Universal sample cup</b> 50 ml, conical with skirt		5637906 100 pcs.
<b>Sample cup</b> 15 ml, without lid, 42 mm dia. on top		5637907 100 pcs.
<b>Lid for 5637907</b>		5637908 100 pcs.
<b>Sample cups PS,</b> 20 ml		5636700 200 pcs.

## Sample Cells / Cuvettes

## UV-VIS-NIR Liquids Analysis

### Self Masking Micro Cells Type 18B

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
18B	5	12.5	45	0.35	18B-G-5	18B-1-5	18B-Q-5
18B	10	12.5	45	0.7	18B-G-10	18B-1-10	18B-Q-10
18B	20	12.5	45	1.4	18B-G-20	18B-1-20	18B-Q-20
18B	30	12.5	45	2.1	18B-G-30	18B-1-30	18B-Q-30
18B	40	12.5	45	2.8	18B-G-40	18B-1-40	18B-Q-40

### Demountable Cells Type 20C

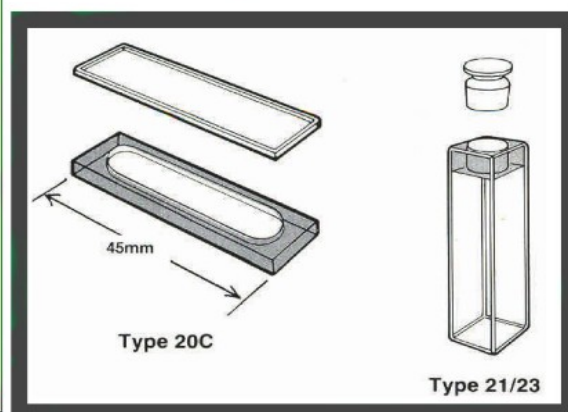
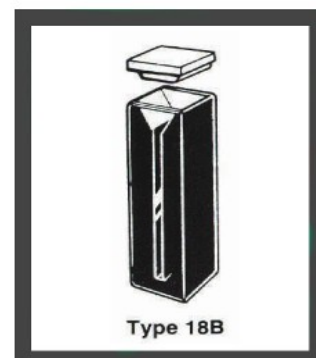
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code U UV-VIS-NIR	Code UV-VIS
20C	0.01	12.5	45	0.003	20C-G-0.01	20C-1-0.01	20C-Q-0.01
20C	0.1	12.5	45	0.03	20C-G-0.1	20C-1-0.1	20C-Q-0.1
20C	0.5	12.5	45	0.15	20C-G-0.5	20C-1-0.5	20C-Q-0.5
20C	1.0	12.5	45	0.3	20C-G-1.0	20C-1-1.0	20C-Q-1.0

### Standard Rectangular with Stopper Type 21

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
21	1	12.5	45	0.4	21-G-1	21-1-1	21-Q-1
21	2	12.5	45	0.7	21-G-2	21-1-2	21-Q-2
21	5	12.5	45	1.7	21-G-5	21-1-5	21-Q-5
21	10	12.5	45	3.5	21-G-10	21-1-10	21-Q-10
21	20	12.5	45	7.0	21-G-20	21-1-20	21-Q-20
21	30	12.5	45	10.5	21-G-30	21-1-30	21-Q-30
21	40	12.5	45	14.0	21-G-40	21-1-40	21-Q-40
21	50	12.5	45	17.0	21-G-50	21-1-50	21-Q-50

### Fluorimeter Rectangular with Stopper Cells Type 23

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
23	5	12.5	45	1.7	23-G-5	23-1-5	23-Q-5
23	10	12.5	45	3.5	23-G-10	23-1-10	23-Q-10
23	20	12.5	45	7.0	23-G-20	23-1-20	23-Q-20
23	40	12.5	45	10.5	23-G-40	23-1-40	23-Q-40
23	50	12.5	45	14.0	23-G-50	23-1-50	23-Q-50



### Anaerobic Fluorimeter Cells Type 28F

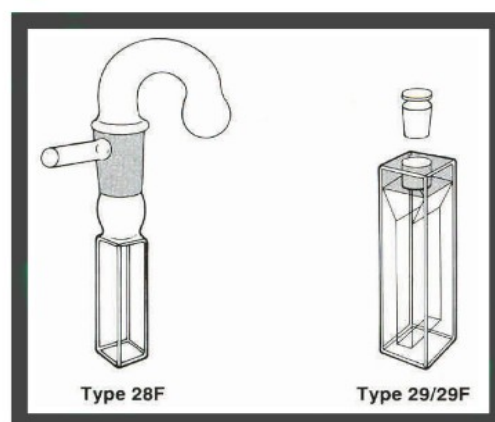
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
28F	10	12.5	45	3.5	28F-G-10	N/A	28F-Q-10

### Semi Micro with Stopper Cells Type 29

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
29	5	12.5	45	0.7	29-G-5	29-1-5	29-Q-5
29	10	12.5	45	1.4	29-G-10	29-1-10	29-Q-10
29	20	12.5	45	2.8	29-G-20	29-1-20	29-Q-20
29	30	12.5	45	4.2	29-G-30	29-1-30	29-Q-30
29	40	12.5	45	5.6	29-G-40	29-1-40	29-Q-40
29	50	12.5	45	7.0	29-G-50	29-1-50	29-Q-50

### Semi Micro Fluorimeter with Stopper Cells Type 29F

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
29F	10	12.5	45	1.4	29F-G-10	N/A	29F-Q-10



### Semi Micro with Stopper Self Masking Cells Type 29B

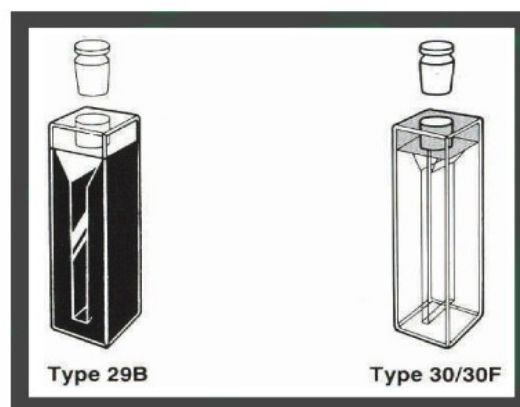
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
29B	5	12.5	45	0.7	29B-G-5	29B-1-5	29B-Q-5
29B	10	12.5	45	1.4	29B-G-10	29B-1-10	29B-Q-10
29B	20	12.5	45	2.8	29B-G-20	29B-1-20	29B-Q-20
29B	40	12.5	45	5.6	29B-G-40	29B-1-40	29B-Q-40

### Micro with Stopper Cells Type 30

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
30	5	12.5	45	0.35	30-G-5	30-1-5	30-Q-5
30	10	12.5	45	0.7	30-G-10	30-1-10	30-Q-10
30	20	12.5	45	1.4	30-G-20	30-1-20	30-Q-20
30	30	12.5	45	2.1	30-G-30	30-1-30	30-Q-30
30	40	12.5	45	2.8	30-G-40	30-1-40	30-Q-40
30	50	12.5	45	3.5	30-G-50	30-1-50	30-Q-50

### Micro Fluorimeter Cell with Stopper Type 30F

30F	10	12.5	45	0.7	30F-G-10		30F-Q-10
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# Sample Cells / Cuvettes

## UV-VIS-NIR Liquids Analysis

### Standard Rectangular Type 1

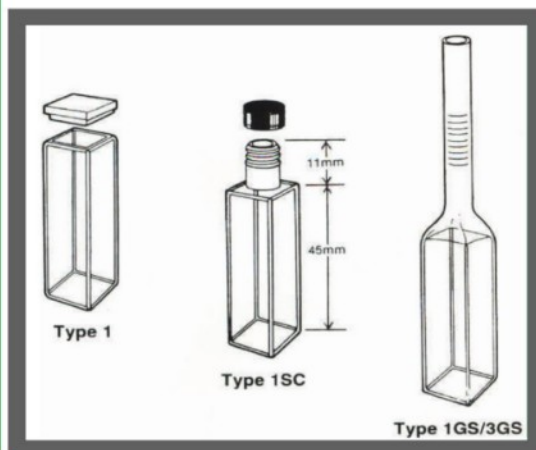
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
1	1	12.5	45	0.4	1-G-1	1-1-1	1-Q-1
1	2	12.5	45	0.7	1-G-2	1-1-2	1-Q-2
1	5	12.5	45	1.7	1-G-5	1-1-5	1-Q-5
1	10	12.5	45	3.5	1-G-10	1-1-10	1-Q-10
1	20	12.5	45	7.0	1-G-20	1-1-20	1-Q-20
1	30	12.5	45	10.5	1-G-30	1-1-30	1-Q-30
1	40	12.5	45	14.0	1-G-40	1-1-40	1-Q-40
1	50	12.5	45	17.5	1-G-50	1-1-50	1-Q-50

### Rectangular with Screw Cap Type 1SC

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
1SC	10	12.5	56	3.5	N/A	1SC-I-10	1SC-Q-10

### Rectangular with Graded Seal Type 1GS (Tube ID 8mm, OD 10mm, Tube length 70mm)

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
1GS	10	12.5	45	3.5	N/A	1GS-I-10	1GS-Q-10
3GS	10	12.5	45	3.5	N/A	N/A	3GS-Q-10



### Fluorimeter Rectangular Cells Type 3

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
3	5	12.5	45	1.7	3-G-5	3-1-5	3-Q-5
3	10	12.5	45	3.5	3-G-10	3-1-10	3-Q-10
3	20	12.5	45	7.0	3-G-20	3-1-20	3-Q-20
3	40	12.5	45	10.5	3-G-40	3-1-40	3-Q-40
3	50	12.5	45	14.0	3-G-50	3-1-50	3-Q-50

### Semi-Micro Rectangular Cells Type 9

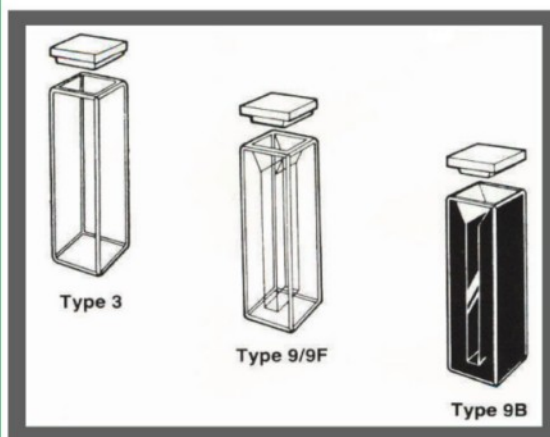
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
9	5	12.5	45	0.7	9-G-5	9-1-5	9-Q-5
9	10	12.5	45	1.4	9-G-10	9-1-10	9-Q-10
9	20	12.5	45	2.8	9-G-20	9-1-20	9-Q-20
9	30	12.5	45	4.2	9-G-30	9-1-30	9-Q-30
9	40	12.5	45	5.6	9-G-40	9-1-40	9-Q-40
9	50	12.5	45	7.0	9-G-50	9-1-50	9-Q-50

### Semi-Micro Self Masking Cells Type 9B

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
9B	5	12.5	45	0.7	9B-G-5	9B-I-5	9B-Q-5
9B	10	12.5	45	1.4	9B-G-10	9B-I-10	9B-Q-10
9B	20	12.5	45	2.8	9B-G-20	9B-I-20	9B-Q-20
9B	40	12.5	45	4.2	9B-G-40	9B-I-40	9B-Q-40

### Semi-Micro Fluorimeter Cell Type 9F

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code U UV-VIS-NIR	Code UV-VIS
9F	10	12.5	45	1.4	9F-G-10	N/A	9F-Q-10



### Micro Short Rectangular Cells Type 17

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
17	5	12.5	25	0.2	17-G-5	17-I-5	17-Q-5
17	10	12.5	25	0.4	17-G-10	17-I-10	17-Q-10
17	20	12.5	25	0.6	17-G-20	17-I-20	17-Q-20
17	30	12.5	25	0.8	17-G-30	17-I-30	17-Q-30
17	40	12.5	25	1.0	17-G-40	17-I-40	17-Q-40
17	50	12.5	25	1.2	17-G-50	17-I-50	17-Q-50

### Micro Short Self Masking Cells Type 17B

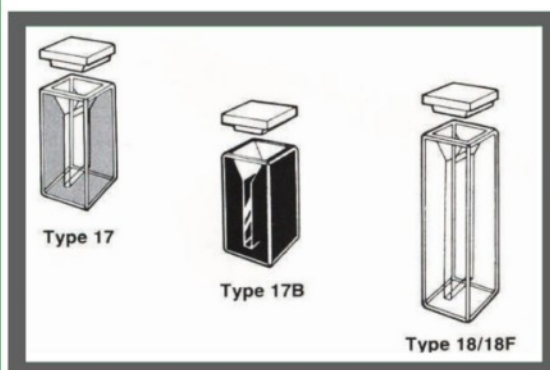
Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
17B	5	12.5	25	0.2	17B-G-5	17B-I-5	17B-Q-5
17B	10	12.5	25	0.4	17B-G-10	17B-I-10	17B-Q-10
17B	20	12.5	25	0.6	17B-G-20	17B-I-20	17B-Q-20
17B	30	12.5	25	0.8	17B-G-30	17B-I-30	17B-Q-30
17B	40	12.5	25	1.0	17B-G-40	17B-I-40	17B-Q-40
17B	50	12.5	25	1.2	17B-G-50	17B-I-50	17B-Q-50

### Micro with lid Cells Type 18

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
18	5	12.5	45	0.35	18-G-5	18-I-5	18-Q-5
18	10	12.5	45	0.7	18-G-10	18-I-10	18-Q-10
18	20	12.5	45	1.4	18-G-20	18-I-20	18-Q-20
18	30	12.5	45	2.1	18-G-30	18-I-30	18-Q-30
18	40	12.5	45	2.8	18-G-40	18-I-40	18-Q-40
18	50	12.5	45	3.5	18-G-50	18-I-50	18-Q-50

### Micro Fluorimeter Cell Type 18F

Cell Type	Path length	Width (mm)	Height (mm)	Capacity (ml)	Code Optical Glass	Code UV-VIS-NIR	Code UV-VIS
18F	10	12.5	45	0.7	18F-G-10	N/A	18F-Q-10





ICP | AAS | FT-IR | UV-VIS | RFA

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