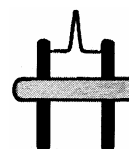


## Replacement Filaments for Electron Microscopes

The filaments supplied by TAAB are made in specially designed jigs to ensure accuracy and reproducibility. High ductility tungsten wire is used to minimise strain in the wire. All filaments are stress relieved by flashing in a vacuum at temperatures above the normal operating level. They are then checked for accuracy of centring. Filament assemblies with alignment screws are set up under a light microscope to ensure they are ready for immediate operation in the EM.

**F086** Filaments for **AEI** and all **Cambridge/LEO** microscopes except S2A and S4-10 box of 10



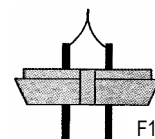
F086



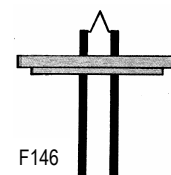
F085

**F085** Agar filaments for **AEI** microscopes. Box of 10

**F147** Filaments for **JEOL (K type)** box of 6



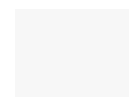
F147



F146

**F146** Filaments for **Philips** box of 10

**F087** Filaments for **Siemens** microscopes, **Cambridge S2A, S4-10** and **Cam scan** Single - packed in individual transit tube



F087

**F087/1** Filaments as above but packed 20 filaments in special wooden box

**F148** Filaments for **ISI/ABT** (2 pin) box of 10



F148

**F201** Filaments for **ISI/ABT** (3 pin) box of 10



F201

**F202** Filaments for **ISI/ABT** (Bent 2 pin) box 10

**F203** Filaments for **Hitachi** (HU series), box of 10

**F192** Filaments for **Hitachi** (H, S, and X series) box of 10

**F198** Filaments for **Zeiss** box of 10

**F204** Filaments for **Amray** (except model 1200) box of 10

**F205** Filaments for **JEOL** (GC type) box of 10



F202



F192



F198

**F096** Filament retaining washer for filaments in **Stereoscan S600** each

### Filament Repair Service

Most filaments can be accepted for repair provided the bases are in good condition. If the insulators need replacement these will be changed (if available) and charged in addition. Repaired filaments are given the same exacting care as new filaments. All are pre-flashed in vacuum to promote stability in operation and those filaments on bases provided with adjustment screws are subsequently re-centred under the light microscope. The filaments sent for repair must be in a suitable transit box or tube.

**F149** Refilamenting **Siemens** type

**F150** Refilamenting **JEOL** type

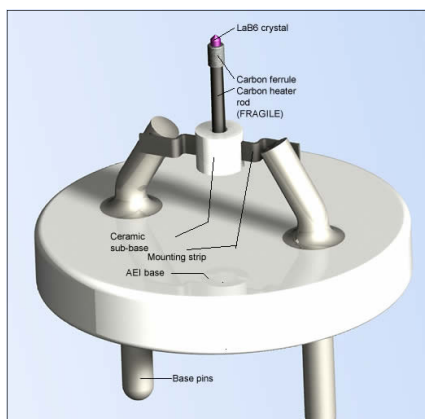
**F151** Refilamenting **ISI/ABT**

**F206** Refilamenting **Amray**

**F207** Refilamenting **Philips**

**F208** Refilamenting **Hitachi**

## Lanthanum Hexaboride Filaments



Kimball Physics single crystal lanthanum hexaboride cathodes are available for most makes of electron microscopes and other electron beam instruments where a suitable gun vacuum in the region of  $10^{-7}$  Torr is attainable. The filament heater can then be driven by the normal power supply of the microscope. These are tiny tips ( $15\mu\text{m}$  diameter) of lanthanum hexaboride mounted on the end of a single, stress-free carbon heater rod held in place by a carbon ferrule.

Brightness above  $1 \times 10^6$  Amp/cm<sup>2</sup> steradian is achievable.

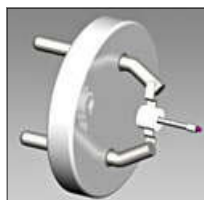
For SEM applications, the higher brightness provides better imaging resolution and improved efficiency for microanalytical applications. For TEM imaging, the low energy spread of the LaB<sub>6</sub> filament is particularly advantageous for high-resolution imaging. Alternatively, LaB<sub>6</sub> filaments may be used where a long filament life is of importance. Lifetimes in excess of 6 months continuous operation are regularly achieved. The standard LaB<sub>6</sub> filament has a  $15\mu\text{m}$  microflat tip and a cone angle of  $90^\circ$ . Other LaB<sub>6</sub> configurations are available for specialist applications. For further information please ask for Kimball Physics leaflet.

**ES423E Series with  $90^\circ$  cone and  $15\mu\text{m}$  microflat.** This style 90-15 cathode is the standard LaB<sub>6</sub> crystal filament, ground with a  $90^\circ$  cone, terminated with a truncation of  $15\mu\text{m}$  diameter. This is the standard style of filament recommended for long life, stability and uniformity

**ES423E Series with  $90^\circ$  cone and  $20\mu\text{m}$  microflat.** This style is designed to be used in scanning electron microscopes that normally operate with a high emission current in the range 60-100 $\mu\text{A}$ . The  $90^\circ$  cone is terminated with a  $20\mu\text{m}$  diameter microflat. A long lifetime of this filament can be achieved providing a good gun vacuum is maintained.

**ES423E Series with  $60^\circ$  cone and  $6\mu\text{m}$  microflat.** This 60-06 filament has the tip of an ES423E LaB<sub>6</sub> crystal ground with a  $60^\circ$  cone terminated with a polished truncation of  $6\mu\text{m}$  diameter. This type of filament can provide a higher brightness than filaments with larger truncations. The main application of this style is in high resolution TEM where the total beam current is frequently restricted to minimise electron energy spread. Adequate brightness is attainable at very low emission levels. As a consequence of achieving the higher brightness the effective lifetime is likely to be slightly shorter than the conventional 90-15 filament.

- F209 On Philips base
- F210 On Siemens base
- F211 On Cambridge/LEO base
- F212 On JEOL base
- F213 On Zeiss base
- F214 On ISI/ABT base
- F215 On Hitachi Sbase
- F216 On Amray base
- F217 On VG base



Microscope Type	$90^\circ$ cone $15\mu\text{m}$ microflat	$90^\circ$ cone $20\mu\text{m}$ microflat	$60^\circ$ cone $6\mu\text{m}$ microflat
AEI base for Camscan, Cameca, Electroscan, Cambridge Instruments, LEO/Leica/Zeiss	F211-9015	F211-9020	F211-6006
FEI/Philips(not XL30)	F-209-9015	F209-9020	F209-6006
FEI XL30	F217-9015	F217-9020	F217-6006
JEOL K Base	F212-9015	F212-9020	F212-6006
Zeiss (please specify make & model)	F213-9015	F213-9020	F213-6006
ISI/ABT/Topcon two pin	F214-9015	F214-9020	F214-6006
Hitachi S	F215-9015	F215-9020	F215-6006

## EM Apertures

### Thin Film Apertures

Thin film gold apertures are slow to contaminate due to the film "running hot" in the electron beam and to the small critical edge. Optimum working conditions are therefore maintained for a longer period.

They may be cleaned *in-situ* when necessary by exposure to the focused electron beam. Time is saved as down-time is minimised as the vacuum is undisturbed and re-alignment is unnecessary. Thin film apertures are of course more fragile to handle than other apertures and can be irreparably damaged by abrasion or if subject to a sudden rush of air into the vacuum system. All aperture diameters are close tolerance ( $\pm 1\mu\text{m}$ ).

**Do not use thin film apertures in the condenser lens due to danger of melting.**

#### Ordering information:

Please quote base number followed by hole size required.

**3mm x 0.25mm apertures** available in 10, 15, 20, 25, 30, 40, 50, 60, 70, 75, 80, 90, 100, 200, 500 $\mu\text{m}$ .

**2mm x 0.6mm apertures** available in 10, 15, 20, 25, 30, 40, 50, 60, 70, 100, 200 $\mu\text{m}$ .

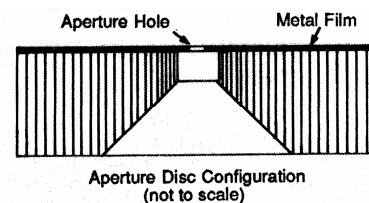
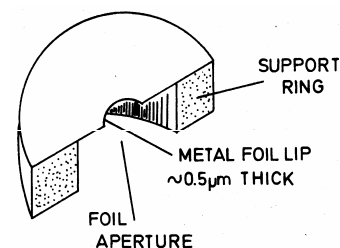
#### Examples

**T193-100** 3mm  $\varnothing$  aperture with 100 $\mu\text{m}$  hole

**T193-20** 3mm  $\varnothing$  aperture with 20 $\mu\text{m}$  hole

**T195-100** 2mm  $\varnothing$  aperture with 100 $\mu\text{m}$  hole

**T195-30** 2mm aperture with 30 $\mu\text{m}$  hole



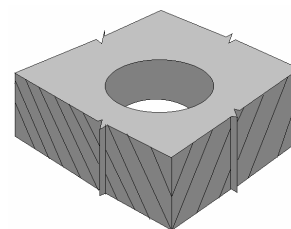
### 10mm $\varnothing$ Disc Apertures for Zeiss/LEO

10mm  $\varnothing$  x 0.1mm thick apertures in molybdenum or platinum for Zeiss and Cambridge/LEO SEM's. Available in 20, 50, 70, 150, 200, 300, 400, 600 and 1000 $\mu\text{m}$  hole sizes.

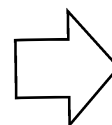
#### Ordering information:

For **molybdenum** use prefix no. **A064** followed by hole size e.g. A064-0020 (20 $\mu$ ), A064-0300 (300 $\mu$ ), A064-1000 (1000 $\mu$ )

For **platinum** use prefix no. **A065** followed by hole size e.g. A065-0050 (50 $\mu$ ), A065-0600 (600 $\mu$ )

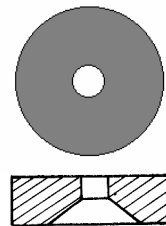


## Disc Apertures



## Disc Apertures

TAAB stocks a wide range of molybdenum and platinum (95:5 platinum/iridium alloy) apertures. These apertures are manufactured to the very highest standards of accuracy and cleanliness and they offer easy changeability and cleaning. Due to their ability to be heated to higher temperatures in a vacuum coating unit, molybdenum discs are easier to clean than platinum. An accepted way of cleaning platinum discs is to heat them in a butane flame with platinum tipped tweezers. Platinum apertures can be made with holes as small as 5µm whereas molybdenum is limited to 20µm. Some special apertures can be supplied in tantalum. The chart shows our currently stocked sizes but others may be in stock from time to time or can be ordered.



## Disc Aperture Selection Chart

Metal Type & Description	5µ	10µ	20µ	25µ	30µ	40µ	50µ	70µ	100µ	150µ	200µ	250µ	300µ	400µ	500µ	600µ	750µ	1000µ
Molybdenum 2mm Ø x 0.6mm		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Platinum 2mm Ø x 0.6mm	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Molybdenum 3.04mm Ø x 0.25mm		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Platinum 3.04mm Ø x 0.25mm	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Molybdenum 4mm Ø x 0.2mm		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Platinum 4mm Ø x 0.2mm		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Moly 10mm Ø x 0.1mm		•	•			•	•	•	•	•	•		•	•		•		•
Platinum 10mm Ø x 0.1mm		•	•			•	•	•	•	•	•		•	•		•		•
Platinum 12mm Ø x 0.1mm			•			•	•		•	•	•			•				
Molybdenum 12.68mm Ø x 0.25mm																•		•
Molybdenum 10.5mm Ø x 0.25mm																•		•
Platinum 10.5mm Ø x 0.25mm																•		•

**Ordering Information:** When ordering please quote base catalogue no. followed by hole size of aperture required.

Examples; **A056-0020** (2mm Ø Molybdenum aperture with 20µm hole) **A059-0400** (3.04mm Ø Platinum aperture with 400µm hole)

**A056** 2mm Ø x 0.6mm Molybdenum aperture

**A057** 2mm Ø x 0.6mm Platinum aperture

**A058** 3.04mm Ø x 0.25mm Molybdenum aperture

**A059** 3.04mm Ø x 0.25mm Platinum aperture

**A062** 4mm Ø x 0.2mm Molybdenum aperture

**A063** 4mm Ø x 0.2mm Platinum aperture

**A064** 10mm Ø x 0.1mm Molybdenum aperture

**A065** 10mm x 0.1mm Platinum aperture

**A071** 12mm Ø x 0.1mm Platinum aperture

## Spray Apertures

12.68mm Ø x 0.25mm thick used in Cambridge/LEO S2A, S4-10, S180 & Camscan SEM's.

10.5mm Ø x 0.25mm thick used in all Cambridge/LEO except the above models.

**A060** 12.68mm Ø x 0.25mm Molybdenum spray aperture

**A069** 10.5mm Ø x 0.25mm Molybdenum spray aperture

**A061** 10.5mm Ø x 0.25mm Platinum spray aperture

12.68mm spray apertures also available with hole sizes 1500 and 2000µm

10.5mm spray apertures also available with 2000µm hole

