

LaB₆/CeBix™ Cathode Handling Instructions and Test Data

PLEASE READ BEFORE OPENING CONTAINER
These instructions contain information for several cathode types. Please refer to the section checked for the appropriate instructions.

CAUTION

The LaB₆/CeBix™ crystal is fragile and is precisely assembled and aligned. **THE CRYSTAL MUST NEVER BE TOUCHED OR BUMPED AGAINST THE WEHNELT.** This can cause the crystal to become misaligned, resulting in non-operation of the device in which it is installed. In addition, no part of the cathode assembly should ever be touched with bare fingers. **ALWAYS WEAR CLASS 100 CLEAN ROOM GLOVES WHEN HANDLING THE CATHODE ASSEMBLY.**

If the cathode is to be stored for a period of more than a few months before or after it is used, we recommend that it be left in the shipping jar and stored in a clean, dry environment such as a vacuum desiccator or a nitrogen box.

Do not remove a cathode that has operated for more than 50 hours in a system with the intention of reinstalling it at a later date. During use lanthanum rich zones are formed on the shank of the crystal adjacent to the carbon blocks. If the cathode is removed from the vacuum into air these zones can oxidize. La₂O₃ is an insulator; therefore the resistance across the emitter can become high enough that it is no longer possible to adequately heat the cathode. In this case, the cathode must be replaced.

MINI VOGEL MOUNT TEST DATA

LaB₆ CeBix™

Part Number: _____
Serial Number: _____
Base Style: _____
Cone Angle: _____
Flat Diameter: _____

Filament Heating Parameters

Recommended Operating Temperature: 1800 K
Current: _____ Amps (DC)
Voltage: _____ Volts
Resistance: _____ Ohms (at 1800 K)
Resistance: _____ Ohms (at room temp.)

Note: This information is provided only as a guideline. Cathode temperatures were measured in an APTECH test chamber. The actual values in your system may vary because of differences in heat conduction paths.

Mini-Vogel Mount Cathodes
Container 3 inches (7.6 cm) tall

The cathode is held in the black container base with two screws and is protected by a clear acrylic cap. There is a desiccant cap inserted into the bottom of the black base to help keep moisture away from the cathode. Do not remove the cathode until ready to install it in the instrument.

1. Hold the container upright, grasp the black container base between your thumb and forefinger, and carefully unscrew the clear cover. When the threads are fully disengaged, carefully lift the cover straight up and off, taking care not to bump the cathode tip.
2. Put the black container base with the cathode on a level tabletop. While holding the container firmly with one hand, use a small Phillips screwdriver to back out the clamping screws.
3. Remove the cathode by grasping the edges of the white ceramic with the thumb and forefinger.

Mini-Vogel Mount Cathodes
Container 1.25 inches (3.2 cm) tall

1. Place the small plastic cathode container on a level tabletop (or other flat, stable surface) with the APTECH logo resting on the table and the band with the blue insert facing upward.
2. Firmly grasp the clear portion of the storage container and hold it securely against the tabletop. Slowly, twist the black band then pull upward until it separates from the clear portion of the container.
3. To remove the source, first remove and discard brown spacer, then carefully insert a pair of tweezers through the slot on the side of the clear storage container and grasp *both* emitter legs. Carefully raise the source straight up and out of the storage container.

LaB₆/CeBix™ crystals (sources) should be operated at the lowest heat setting where the beam is stable. The vacuum level in the emission chamber should be < 10⁻⁶ Torr prior to applying power to the LaB₆/CeBix™ crystals. Ultimately, pressures in the low 10⁻⁷ Torr range should be attainable. Heat the LaB₆/CeBix™ crystals very slowly. Take care to heat the crystal slowly to the normal crystal temperature setting. This heating should be on the order of 40 to 60 seconds.

**See reverse side for Vogel Mount Cathode,
Grid Cap and Wehnelt Assembly Instructions.**

Wehnelt Assemblies

Packaging Description

The Wehnelt is secured to the container with one clamping screw and is protected by a clear acrylic cap. There is a tamper proof seal on the container to maintain the desiccant packaged environment and to keep moisture away from the Wehnelt. Do not remove the Wehnelt from the container until ready to install it into the instrument.

Removing the Wehnelt

Grasp the container base between your thumb and forefinger and carefully unscrew the clear cover. When the threads are disengaged, carefully lift the cover straight up and off, taking care not to scratch the Wehnelt cap.

Next, place the container base with Wehnelt on a level tabletop. While holding the container firmly with one hand, use a small Phillips-head screwdriver to back out the securing screw a couple of turns. Remove the Wehnelt by grasping the copper-colored holder with thumb and forefinger.

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**Vogel Mount Cathodes
(rebuilding service)**

The Vogel mount cathode is in a clear plastic storage container. Place this container on the tabletop with the emitter pointed downward. Firmly hold the bottom portion of the container while removing the clear top by twisting. Remove the cathode by inserting clean tweezers and firmly grasping *both* legs. Some Vogel mount cathodes have flat contact pins rather than legs, to remove these cathodes from the plastic container, firmly grasp these pins and remove the cathode from the container. The cathode should be raised straight up out of its holder, being careful to avoid contact between the crystal and the container.

**Grid Cap Assemblies
(rebuilding service)**

Gently lift the grid cap assembly by its contact pins to remove it from its container. Some grid cap assemblies may be held in the container with additional screws. Remove these screws. Firmly grasp the sides of the grid cap and carefully lift from the storage container. Never disassemble the grid cap itself as this can cause damage to the LaB₆/CeBix™ crystal.

Grid Cap Assembly & Vogel Mount Heating Data

Temperature (K)	Current (dc Amps)	Resistance (Ohms)	Voltage (dc volts)
1700			
1750			
1800			
1850			
1900			

Note: This information is provided only as a guideline. Cathode temperatures were measured in an APTECH test chamber. The actual values in your system may vary because of differences in heat conduction paths.



LaB₆/CeBix™ Cathode Handling Instructions

Important Information Enclosed

Do Not Discard

Part Number: _____

Serial Number: _____

Mfr. Date: _____