Static Line

Ultramicrotomy Accessories

With our exclusive Diamond Trimming Tool and Static Line Ionizer in combination with our Cryo diamond knives, it is now possible to achieve perfect ribbons of ultra-thin cryo sections. Never has your job been easier. Our three pieces of equipment work together as a team offering you a perfect match for all of your ultramicrotomy needs.

The Static Line II is a versatile addition to your ultramicrotome, regardless of your application. Room temperature work, cutting dry or wet sections and cryo-ultramicrotomy can all benefit from the use of the ionizer.

Static Line Ionizer

Since the introduction of our "Static-Line" Ionizer in 1990, cryo sectioning has been dramatically improved. The age old problems of cryo sectioning which were mainly due to electrostatic charging in the cryo chamber, have been eliminated.

The "Static-Line" II is an anti static device which emits negative and positive ions neutralizing the electrostatic charging. The sections no longer stick to the knife edge, or bunch up one a top the other, they float in a nice ribbon over the surface of the knife. The sections can now be picked up easily.

When the "Static-Line" is used in combination with our Diamond Cryo Trimming Tool, and our 35° cryo diamond knife, quality sections are obtained at a level that was never possible before (Ref: Journal of Microscopy, Vol. 166, PT 1, April 1992 "Diamonds are a Cryosectioner’s Best Friend").

Our goal has always been to offer the most advanced equipment on the market that makes the cryo process easier. After extensive testing and research we have developed the "Static-Line" II. The "Static-Line II simplifies the handling and use. It allows for the adjustment of the voltage by the turn of a dial. No longer is it necessary to change the distance of the ionizer from the knife to obtain the correct ion emission as was with the "Static-Line" I. The same effect is now possible by simply turning the variable voltage dial.

The ion emission is more precise and with the left hand on the voltage dial the sectioning process can be continuously influenced.

The "Static-Line II ionizer has been used successfully for the cutting of all types of samples:

- Sucrose Protected Tissue: -80°C to -120°C
- Cell Cultures in Gelatin/Sucrose: -80°C to -120°C
- Frozen Hydrated Tissues: -150°C to -170°C
- Dry Cut Lowicryls at room Temperature
- Polymers and Rubbers: -60°C to -140°C
Sectioning at room temperature

As mentioned in the introduction, we recommend use of the Static Line II ionizer for all ultramicrotomy work, regardless of the type of samples or embedding resins.

Mounting of the unit is accomplished in two easy steps:

1. Screw the plug of the ionizer electrode to either of the two ports of the power pack (before connecting the power pack to the mains power supply!).
2. Mount the ionizer electrode to the stereo-microscope of the ultramicrotome by a rubber band or a tape as shown below.

The distance of the electrode tip to the cutting edge and the sample is not critical for room temperature sectioning.

No adjustment of the voltage dial is needed for room temperature work. The dial can be set at full voltage.

Dry sectioning at room temperature

It may be necessary to section samples dry (water sensitive samples, Lowicryl embedded samples used for element analysis Ref. 3, 4).

For these applications the ionizer electrode is mounted as shown below.

The correct ion emission is achieved by adjustment of the voltage by turning the dial. Set the voltage dial on 5. If the sections stick to the knife surface, slowly increase the voltage by turning the dial in the clockwise direction (towards 10). If the sections begin to lift up, slowly decrease the voltage by turning the dial in a counter-clockwise direction (towards 1).

Using the «Static Line II» ionizer at low temperature

The Static Line II ionizer can easily be connected in the Leica cryo chambers FC4D, FC4E and FCS with the use of the Leica cryo manipulator

Mounting of the unit is accomplished in 3 easy steps:

1. Screw the plug of the ionizer electrode to either of the two ports of the power pack (without connecting the power pack to the network).
2. Connect the ionizer electrode to the cryo manipulator.
3. Place the cryo manipulator on the wall of the cryo chamber and then set the ionizer electrode approximately 30mm from the knife edge. Note: in the FCS chamber the cryo holder can be fixed in place directly with the set screw provided.

To start the unit connect the power pack to the network and switch it on. The device is absolutely shockproof.

Trimming

It is recommended to use the Static Line II for trimming with our cryotrim diamond blade, or with any other trimming tools, because it eliminates the sticking of the chips on the specimen and on the blade.

Set the voltage dial for trimming at full voltage (10).

Please note that for perfect ribbons of sections a perfectly trimmed sample is mandatory.
**Sectioning and section pick-up**

Set the voltage dial on 5. If the sections tend to stick on the knife edge, slowly increase the voltage by turning the dial in the clockwise direction (towards 10) until the sections begin to float in a nice ribbon over the knife surface.

If the sections begin to lift up, slowly decrease the voltage in a counter-clockwise direction (towards 1).

During the picking up of the sections very little voltage is needed to prevent them from flying away (the dial should be set at 3).

**Helpful hints**

- Electrostatic charging in the chamber is dependent on many different factors such as chamber temperature, humidity, specimen, etc. It may be necessary to vary the ion emittance as the sectioning conditions change.
- The ionizer will lose its power if its metal tip becomes covered with ice. If this occurs, just clean the ionizer tip with a fine brush.
- To avoid breaking, do not bend the frozen cable.
- Switch off the unit prior to doing any manipulation in the chamber (specimen change, knife change, etc).
- When the unit is on, the tip of the ionizer should not come in contact with the metallic parts of the chamber.
- Never heat the chamber with the ionizer inside.