DIATOME

STATIC LINE II

The ionizer with variable voltage: your guarantee for successful ultramicrotomy, at both room- and low temperature!

Introduction

Dear customer,

since the introduction of our Static Line ionizer in 1990 and the Static Line II in 1992, cryo-ultramicrotomy has been dramatically improved.

When the Static Line II is used in combination with our cryotrim diamond blade and our 35° cryo diamond knife, quality sections are obtained a a level that was never possible before (1, 2, 3, 4).

Section collection is easier as the sections are discharged by the ionizer so they stay in place and do not fly away.

The Static Line II ionizer has been used for cutting all types of frozen samples:

- Sucrose protected tissue.
- Cell cultures in gelatin/sucrose.
- Frozen hydrated tissue.
- Polymers and rubber.
- Gels, paints, etc.

Electrostatic charging not only occurs at low temperature in a cryochamber, but also during room temperature ultramicrotomy whether dry sectioning or with a water bath.

High cutting forces occur from separating an ultrathin section from an insulating sample such as epoxy or acrylic emedding resins. This leads to a highly charged sample surface. The following sections are attracted towards the sample surface, pulled back over the cutting edge, distorted, etc.

During hundreds of sectioning experiments at room temperature we have found great improvement of the above mentioned problems with the use of the ionizer.

The sections glident in nice ribbons and without distortion over the cutting edge and on the water surface.

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

Your Diatome Team

Wet 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.

The ionizer electrode is mounted to the stereo-microscope of the ultramicrotome by a rubber band or a tape as shown above:

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

No adjustment of the voltage dial is needed. The dial can be set at full voltage.

Dry sectioning at room temperature

It may be neccessary to section samples dry (water sensible samples, Lowicryl embedded samples used for element analysis 5, 6).

The correct ion emission is achieved by adjustment of the voltage dial. If sections stick to the knife surface, increase the voltage dial in the clockwise direction (towards 10).

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

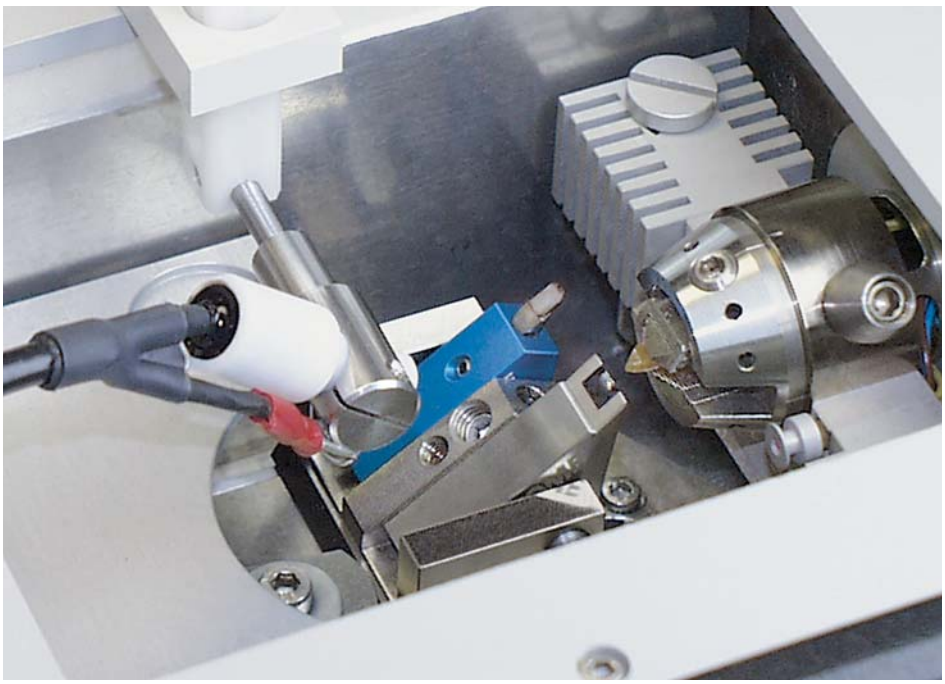
The magnetic holder can be ordered from Diatome (Order no DZ 6).

Using the Static Line II at low temperatue

The Static Line II electrode can easily be connected in the Leica cryo chambers with the use of the Leica cryo manipulator (Art. no 70 24 18 for FCS).

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 blades, 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.

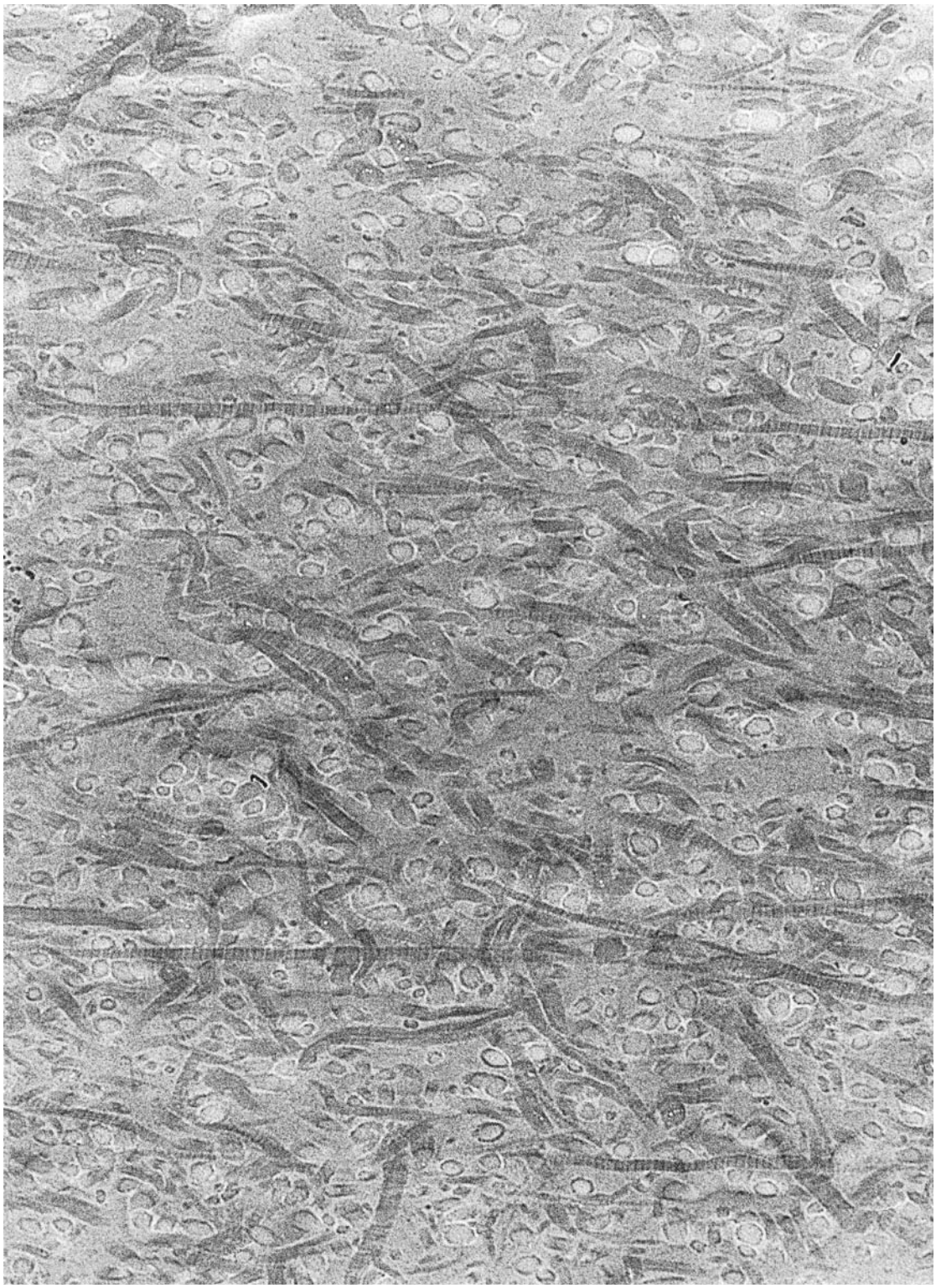
Sectioning and section pick-up

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 section pick-up very little voltage is needed to prevent them from flying away.

The dial can be set at 3.



M. Michel, M. E. Müller Inst. for Biomechanics, University of Bern. Cryosection of high pressure frozen mature bovine articular cartilage tissue. X35000

Technical description and data

The Static Line II ionizer is an antistatic device which emits negative and positive ions, neutralising the electrostatic charging.

It consists of a high voltage power pack, an ionizer electrode which is connected to the power pack by a cable, and a testing device, the Multi Check.

A dial on the power pack allows for adjustment of the voltage. The correct ion emission can be achieved by turning the variable voltage dial.

Voltage	230V, 115V
Nominal frequency	50-60Hz
Nominal output voltage	7-8kV variable
Power consumption	approx. 50VA
Short circuit output current	max. 3mA
Dimensions	Length 173mm Width 113mm Height 110mm
Weight	approx. 3.5kg

We reserve the right to make technical changes.

Helpful hints

- Electrostatic charging in the chamber is dependent on many different factors such as chamber temperature, atmospherical conditions (e.g. humidity), specimen, etc. It may be necessary to vary the ion emission as the sectioning conditions change.
- The ionizer will loose 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.

References

1) M. Michel, H. Gnägi, and M. Müller: Diamonds are a cryosectioner's best friend. Journal of Microscopy, Vol.166, Pt 1, pp 43-56, 1992.
2) H. Sitte: Advanced instrumentation and methodology related to cryo-ultramicrotomy: a review. Scanning Microscopy Supplement 10, pp 387-466, 1996.
3) G. Griffith: Fine Structure Immunocytochemistry. Springer-Verlag, New York, 1993.
4) P.J. Peters: Cryo-Immunogold Electron Microscopy. Current Protocols in Cell Biology, pp. 4.7.1-4.7.12, 1999. John Wiley & Sons, New York.
5) L. Edelmann: Freeze-substitution and the preservation of diffusible ions. Journal of microscopy, Vol.161, pp 217-228, 1991.
6) L. Edelmann, A. Ruf: Freeze-dried human leukocytes stabilized with uranyl acetate during low temperature embedding or with OsO4 after embedding. Scanning Microscopy Supplement 10, pp 295-307, 1996.

"STATIC LINE II" ionizer with powerpack and "MULTI CHECK" control unit.

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