

Thinner cryo sections

Perfect cryosections from ultrathin to semi with the same knife

Minimal compression and best structure preservation

Highest quality diamonds and optimal crystal orientation  
guarantee perfect ultrathin sections and a durable edge





## Your benefits of working with Diatome

### **Free customer service**

Sectioning tests with biological and material research specimens of all kinds.

We send you the sections along with the surfaced sample, a report on the results obtained and a recommendation of a suitable knife.

Complete discretion when working with proprietary samples.

### **Re-sharpening and reworking service**

A re-sharpened Diatome diamond knife demonstrates the same high quality as a new knife. Even knives purchased in previous years can continue to be re-sharpened.

All knives can be reworked into another type of knife for no extra charge, e.g. ultra to cryo or 45° to 35°.

### **Exchange service**

Whenever you exchange a knife we offer you a new Diatome knife at an advantageous price.

### **Area of application**

The Diatome cryo knives are the perfect solution for the sectioning of sucrose protected samples, frozen hydrated samples (Refs. Al-Amoudi, Richter, Zhang), as well as for industrial samples such as polymers, rubber, etc.

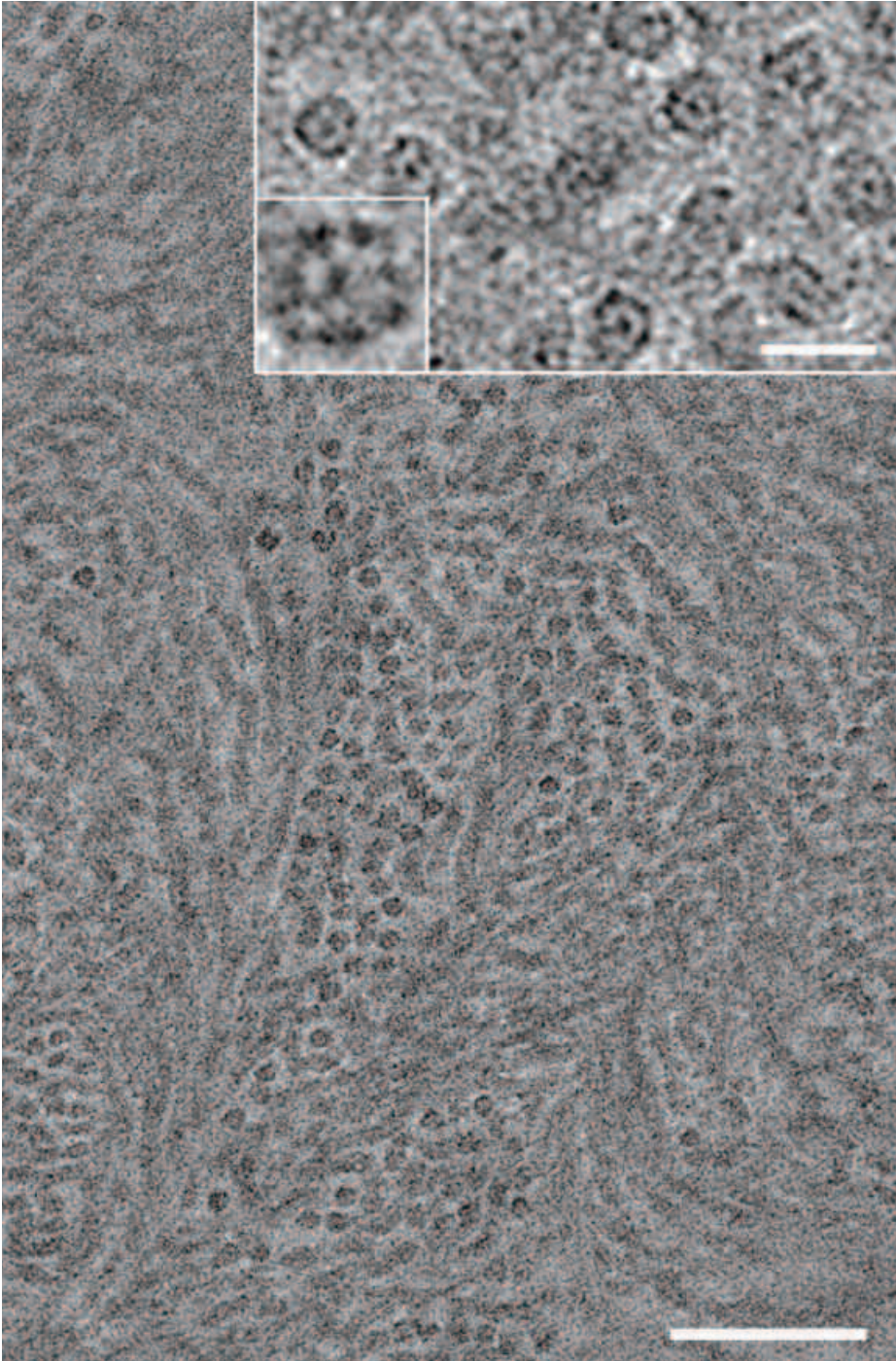
The triangular holder, suitable for dry sectioning, as well as the trough, for sectioning using fluids, (DMSO/water) are both made from a special copper-nickel alloy, guaranteeing the best possible heat/cold conduction.

A cold-resistant epoxy resin is used for the seal.

**For all cryo sectioning of biological as well as industrial specimens, the use of an ionizer is essential (Ref. Michel)!**



## cryo 25°

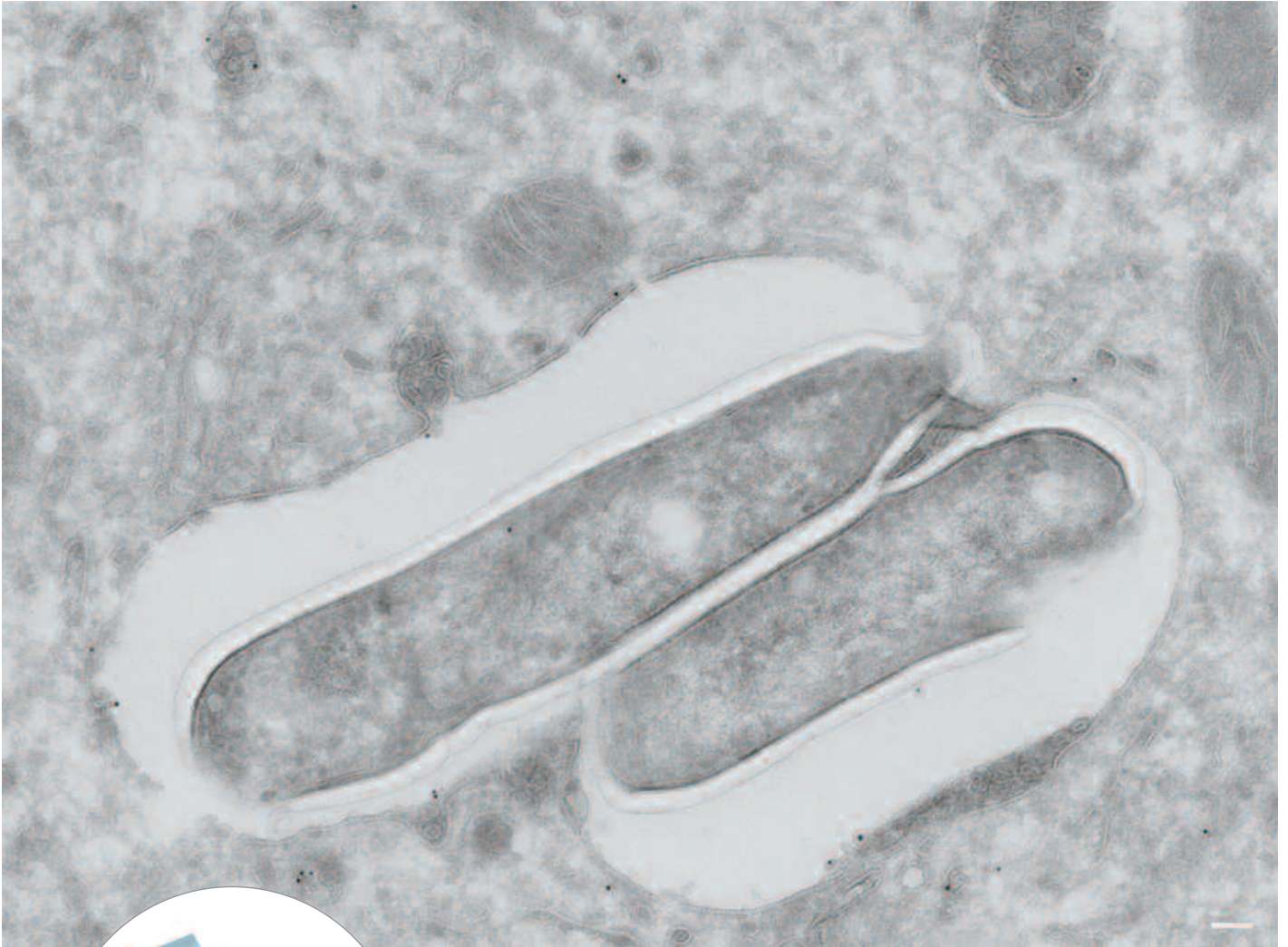


The cryo 25° knife is designed for sectioning frozen hydrated specimens. The 25° angle results in the least possible compression and the best structure preservation.



▲ High resolution electron micrograph of vitreous section of keratin intermediate filaments in the midportion of stratum corneum of human epidermis. The fine structure of the keratin filaments is well resolved and their molecular organisation is seen in favourable cases (inset).  
Scale bar = 100nm.  
Scale bar inset = 20nm.  
Ashraf Al-Amoudi, Laboratoire d'Analyse Ultrastructurale, Lausanne.

## cryo immuno

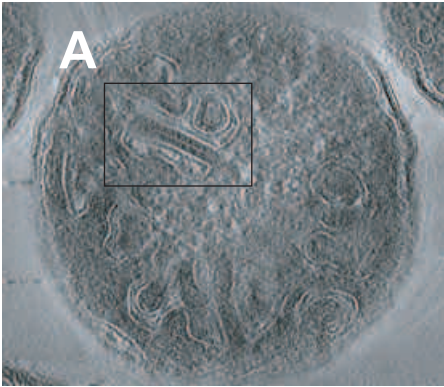


The first cryo knife with a diamond platform, guarantees the best possible sectioning for cryo-immuno-chemistry.

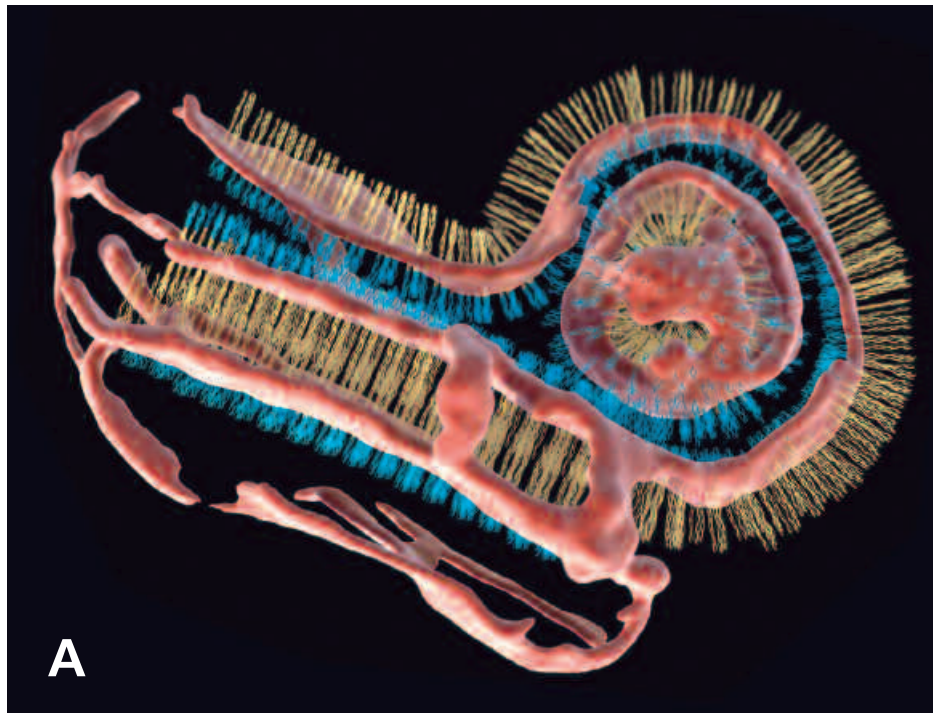
The diamond platform guarantees easy and gentle section collection. Sections are collected directly from the diamond surface using a loop and a sucrose/methylcellulose droplet (Refs. Liou, Peters).

The 35° cutting angle leads to a considerable reduction in mechanical stresses and therefore to improved structure preservation in sucrose-protected samples.

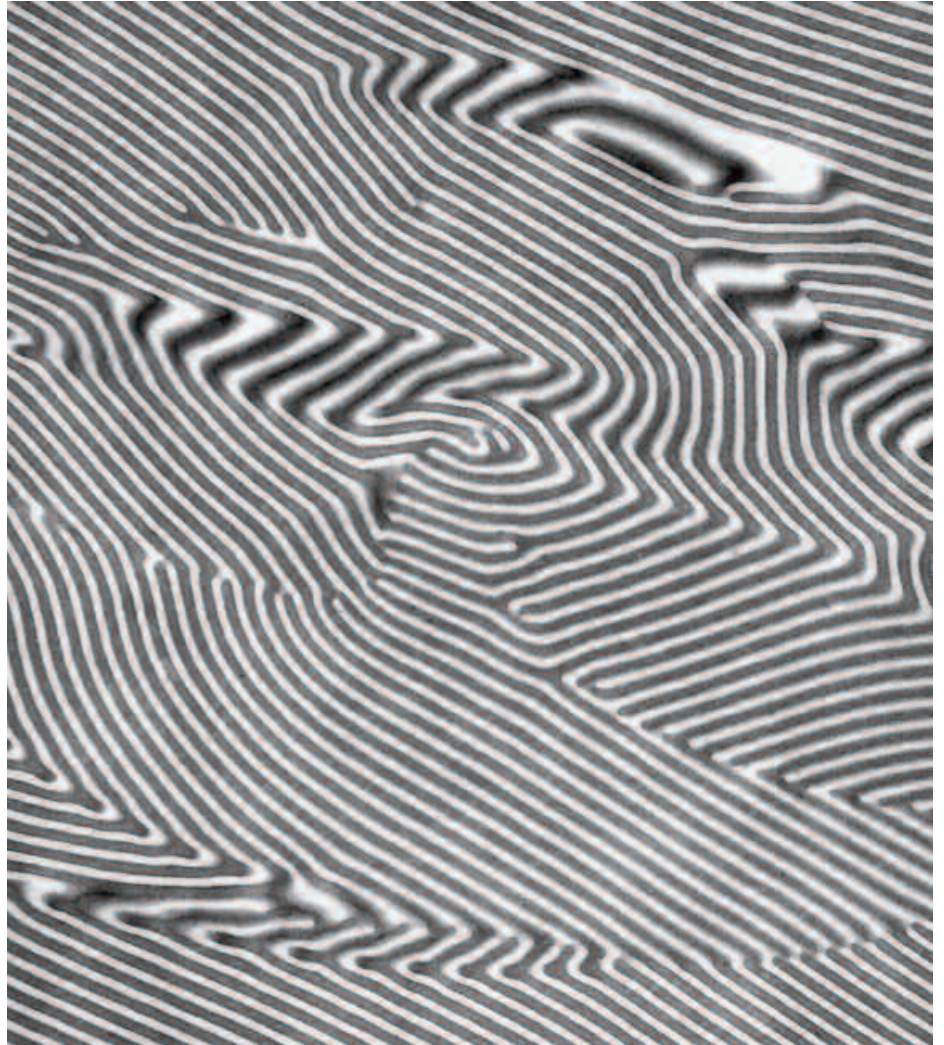
◀  
 Fusion of late endosome/lysosome with the  
 Mycobacteria tuberculosis phagosome.  
 Aldehyde fixed cryo-section labeled with anti-  
 CD63 and protein-A gold 10nm.  
 Scale bar = 100nm.  
 Nicole van der Wel and Peter J. Peters,  
 Netherlands Cancer Institute, Amsterdam.



▶▶  
 A single slice of a tomogram of an aldehyde  
 fixed and sucrose infiltrated cryosection with a  
 3D reconstruction.  
 Erik Bos and Peter J. Peters, Netherlands Cancer  
 Institute, Amsterdam.  
 (see: J. Lefman, P. Zhang, T. Hirai, RM. Weis,  
 J. Juliani, D. Bliss, M. Kessel, E. Bos, P.J. Peters,  
 S. Subramaniam: Three-dimensional electron  
 microscopic imaging of membrane invaginations  
 in Echerichia coli overproducing the chemotaxis  
 receptor Tsr. J. Bacteriol. 2004 Aug; 186(15):  
 5052-61.



**cryo 35°**  
**cryo 45°**



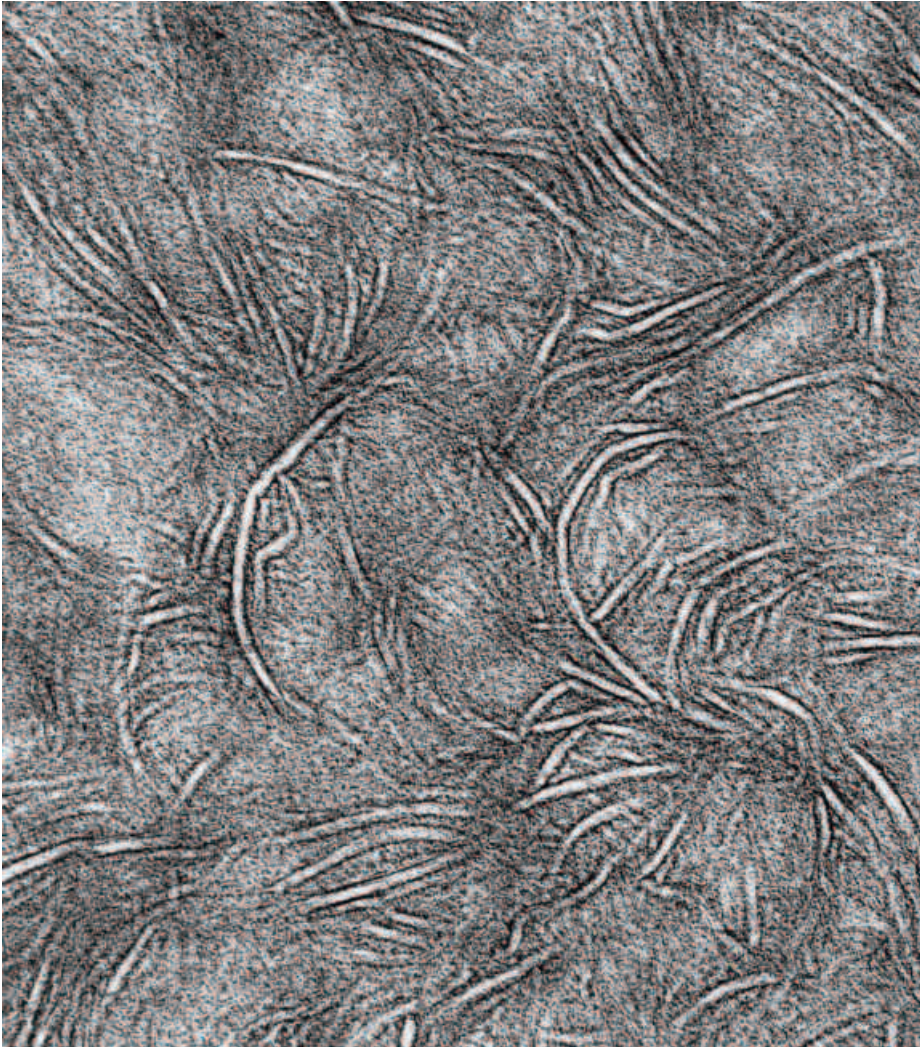
The cryo 35° knife has demonstrated its usefulness as a standard knife for the low temperature sectioning of polymers, rubber, paints, etc.

The 35° angle represents a balanced compromise between section quality and durability.

The cryo 45° knife is well suited for routine cryo sectioning.

▲ Styrene-butadiene block copolymer x 25'000  
Ronald Walter, BASF Aktiengesellschaft,  
Polymer Physics, D-67056 Ludwigshafen.

## **cryotrim 20°** **cryotrim 45°**



◀ Polyethylene x120'000  
Ronald Walter, BASF Aktiengesellschaft,  
Polymer Physics, D-67056 Ludwigshafen.

For successful ultramicrotomy in biology and materials science, precise trimming is mandatory.

The Diatome trimming blades cryotrim 45 and cryotrim 20 will fulfil all your trimming requirements, allowing quick, easy and accurate trimming.

Due to the extreme sharpness of our diamond blades, less mechanical damage is applied to the sample during trimming.

Very shiny sample faces and precise sides are the result.

The cryotrim 45 produces pyramidal sides with an inclined angle of 45° and the cryotrim 20 produces pyramidal sides with an inclined angle of 20°.



## Specifications

### **cryo 25°**

Cutting range:	25 - 200nm
Available size:	3mm

### **cryo immuno**

Knife angle:	35°
Cutting range:	30nm - 1µm
Available sizes:	2mm, 3mm

### **cryo 35° and cryo 45°**

Cutting range:	30nm - 1µm
Available sizes:	1.5mm, 2.0mm, 2.5mm, 3.0mm, 3.5mm, 4.0mm

### **cryotrim 20° and cryotrim 45°**

Knife angle:	45°
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## References

A. Al-Amoudi, D. Studer and J. Dubochet: Cutting artefacts and cutting process in vitreous sections for cryo-electron microscopy. *Journal of Structural Biology* 150, pp. 109-121, 2005.

W. Liou, H.J. Geuze, J.W. Slot: Improving structural integrity of cryosections for immunogold labeling. *Histochemistry and Cell Biology*, Vol. 106, pp. 41-55, 1996.

M. Michel, H. Gnägi und M. Müller: Diamonds are a cryosectioners best friend. *Journal of Microscopy*, Vol. 166, Pt 1, pp. 43-56, 1992.

P.J. Peters, E. Bos: Cryo-Immunogold Electron Microscopy. *Current Protocols in Cell Biology*, pp. 4.7.1-4.7.18, 2006. Copyright © 2006 by John Wiley & Sons Inc.

K. Richter: Cutting artefacts on ultrathin cryosections of biological bulk specimens. *Micron*, Vol. 25, No. 4, pp. 297-308, 1994.

P. Zhang, E. Bos, J. Heymann, H. Gnaegi, M. Kessel, P.J. Peters, S. Subramaniam: Direct visualisation of receptor arrays in frozen-hydrated sections and plunge-frozen specimens of E.coli engineered to overproduce the chemotaxis receptor Tsr. *Journal of Microscopy*, Vol. 216, Pt 1, pp. 76-83, 2004.

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