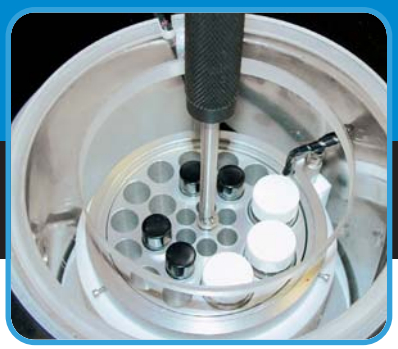
Electron Microscopy Sciences

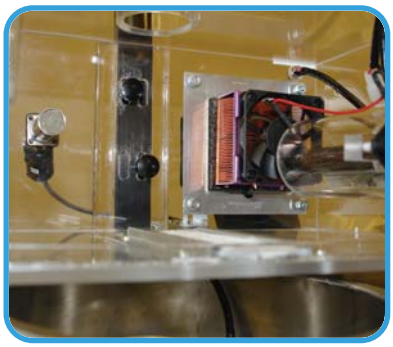
Grids, Grid Storage Boxes and Related Supplies

Grids C-flat™ Holey Carbon Grids OmniProbe Accessories and Consumables
DuraSiN™ Carbon Film Grid Storage Boxes Vacuum Equipment
Grid Sticks Pinholes Nebulizers Staining Equipment Perfect Loop

Economical, Universal Application Rapid Freezing Workstation

EMS-002 Cryo Workstation





Allows for a reliable, virtually routine freezing of biological samples.

Applications:

- Cryo-fixation of virus partials
- Cryo-fixation of isolated or assembled macromolecules
- Cryo-fixation of emulsions paints and polymers
- Cryo-fixation of suspension and tissues for Cryo-techniques such as freeze fracture/etch, freeze drying, freeze substitution.

Advantages:

- Economical, universal application rapid freezing unit.
- Plunge freezing with temperature controlled cryogen.
- Frozen samples handled under cold dry nitrogen atmosphere.
- Rapid set up and easy use.
- Reproducible results.
- High and low set points for cryogen control.

Optional Accessories

Freeze Substitution Module
Cryo-TEM Transfer Interface
Climate Controlled Environmental Chamber
Metal Mirror Impact Freezing Fixture
Diamond Anvil
Automatic Liquid Nitrogen Filling
Propane Transfer System
Freeze Forceps
Muscle Biopsy Clamps

For more information, please visit our website at www.emsdiasum.com

Electron Microscopy Sciences

P.O. Box 550 • 1560 Industry Rd. • Hatfield, Pa 19440
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Electron Microscopy Sciences

Grids, Grid Storage Boxes and Related Supplies

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In PA: (215) 412-8400
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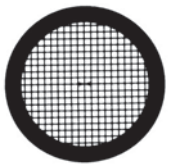
www.emsdiasum.com

➤ Gilder Grids

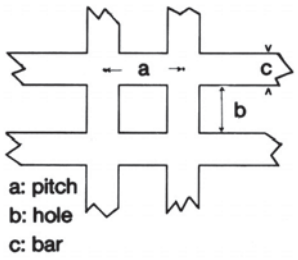
➤ 3.05mm diameter, 0.7 mil (18µm) thickness
Material: Copper (Cu), Nickel (Ni), Gold (Au), Copper/Palladium (Cu/Pd=CP), Molybdenum (Mo)

A reliable support specimen grid source. Features: well-defined grid bars, maximum open area, and a matt/shiny side. Each grid is individually inspected. Newly introduced are copper grids with palladium plating. This plating offers better grid strength and avoids tarnishing.

➤ Standard Square Mesh



G100 - G400



G200TH

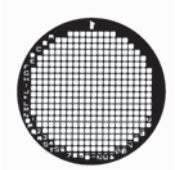
G200TT

G200T

➤ Gilder Finder Grids

G200F1

G200F2



G200HF3

			Technical Data		
Type	Cat#	Packed	Pitch µm	Hole µm	Bar µm
75 mesh	G75-Cu	100/vial	340	285	55
75 mesh	G75-Ni	100/vial	340	285	55
100 mesh	G100-Cu	100/vial	250	205	45
100 mesh	G100-Ni	100/vial	250	205	45
100 mesh	G100-CP	100/vial	250	205	45
100 mesh	G100-Mo	25/vial	250	205	45
150 mesh	G150-Cu	100/vial	165	125	40
150 mesh	G150-Ni	100/vial	165	125	40
150 mesh	G150-CP	100/vial	165	125	40
200 mesh	G200-Cu	100/vial	125	90	35
200 mesh	G200-Ni	100/vial	125	90	35
200 mesh	G200-CP	100/vial	125	90	35
200 mesh	G200-Au	50/vial	125	90	35
200 mesh	G200-Mo	25/vial	125	90	35
*200 mesh	G200TH-Cu	100/vial	125	85	40
*200 mesh	G200TH-Ni	100/vial	125	85	40
**200 mesh	G200TT-Cu	100/vial	125	95	35-25
**200 mesh	G200TT-Ni	100/vial	125	95	35-25
***200 mesh	G200T-Cu	100/vial	125	85	40
***200 mesh	G200T-Ni	100/vial	125	85	40
300 mesh	G300-Cu	100/vial	83	58	25
300 mesh	G300-Ni	100/vial	83	58	25
300 mesh	G300-CP	100/vial	83	58	25
300 mesh	G300-Au	50/vial	83	58	25
400 mesh	G400-Cu	100/vial	62	37	25
400 mesh	G400-Ni	100/vial	62	37	25
400 mesh	G400-CP	100/vial	62	37	25
400 mesh	G400-Au	50/vial	62	37	25
+200 mesh	G200F1-Cu	100/vial	125	100	35-12
+200 mesh	G200F1-Ni	100/vial	125	100	35-12
+200 mesh	G200F1-CP	100/vial	125	100	35-12
+200 mesh	G200F1-Au	50/vial	125	100	35-12
++200 mesh	G200F2-Cu	100/vial	125	106	25-12
++200 mesh	G200F2-Ni	100/vial	125	106	25-12
++200 mesh	G200F2-CP	100/vial	125	106	25-12
++200 mesh	G200F2-Au	50/vial	125	106	25-12
+++200 mesh	G200HF3-Cu	25/vial	125	-	-
+++200 mesh	G200HF3-Ni	25/vial	125	-	-

* A thickened version of the standard, G200TH with an assymetric center. A mark on the rim allows for precise orientation of the grids.

** A combination of thin and thick bar grids, with a mark on the rim for orientation.

*** The handle is designed for ease of handling and is easily removed if necessary. To remove the handle, just bend it over on a 90 degree angle.

\+ Thick bars dividing regions into 6 thin bar areas, which are identified by a numeric system.

++ Thick bars dividing regions into 9 thin bar areas, which are identified by alphabetical letters located in the center of the grid.

+++ Each of the 322 grids squares, can be identified by reference to its unique combination of base 2 binary number and alphabet symbol (A-T). 0 is a short rounded solid pillar and 1 is a longer rounded solid pillar.

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Gilder Grids (continued)

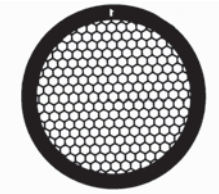
3.05mm diameter, 0.7 mil (18µm) thickness (for all mesh), 50µm thickness (single hole and slot) Material: Copper (Cu), Nickel (Ni)

To comply with the demands of immunogold labeling techniques, our Gilder copper and nickel specimen grid types, are now available with a gold plating (gilded) all with the same specifications as our regular grids. 24K gold is chemically deposited onto copper and nickel grids producing a uniform coating, with a gold thickness in the range of 0.10 to 0.25 microns. When doing autoradiography techniques, gilded grids have been used successfully for the localization and distribution of labelled compounds in specimens. The gold gilded grids decrease the risk of chemical reaction in many specimen treatment procedures, and is an alternative to the more expensive pure gold grids.

Gold Gilded Square Mesh

GG100-GG400

Gold Gilded Hexagonal Mesh



GG200H-GG400H

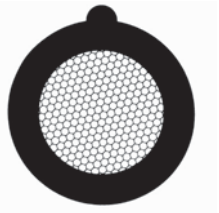
Gold Gilded Single Oval Hole

GS 2x0.5-GS 2x1

Gold Gilded Thin Bar Square Mesh

GT200-GT300

Gold Gilded Thin Bar Hexagonal Mesh



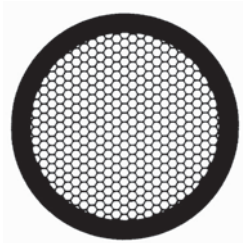
GT200H-GT400H

			Technical Data		
Type	Cat#	Packed	Pitch µm	Hole µm	Bar µm
100 mesh	**GG100-Cu**	100/vial	250	205	45
100 mesh	**GG100-Ni**	100/vial	250	205	45
150 mesh	**GG150-Cu**	100/vial	165	125	40
150 mesh	**GG150-Ni**	100/vial	165	125	40
200 mesh	**GG200-Cu**	100/vial	125	90	35
200 mesh	**GG200-Ni**	100/vial	125	90	35
300 mesh	**GG300-Cu**	100/vial	83	58	25
300 mesh	**GG300-Ni**	100/vial	83	58	25
400 mesh	**GG400-Cu**	100/vial	62	37	25
400 mesh	**GG400-Ni**	100/vial	62	37	25
200 Hex	**GG200H-Cu**	100/vial	125	100	25
200 Hex	**GG200H-Ni**	100/vial	125	100	25
300 Hex	**GG300H-Cu**	100/vial	83	58	25
300 Hex	**GG300H-Ni**	100/vial	83	58	25
400 Hex	**GG400H-Cu**	100/vial	62	37	25
400 Hex	**GG400H-Ni**	100/vial	62	37	25
GS2x0.5	**GG205-Cu**	100/vial	–	2000x500	–
GS2x0.5	**GG205-Ni**	100/vial	–	2000x500	–
GS2x1	**GG2010-Cu**	100/vial	–	2000x1000	–
GS2x1	**GG2010-Ni**	100/vial	–	2000x1000	–
200 mesh	**GT200-Cu**	100/vial	125	113	12
200 mesh	**GT200-Ni**	100/vial	125	113	12
300 mesh	**GT300-Cu**	100/vial	83	73	10
300 mesh	**GT300-Ni**	100/vial	83	73	10
200 mesh	**GT200H-Cu**	100/vial	125	113	12
200 mesh	**GT200H-Ni**	100/vial	125	113	12
300 mesh	**GT300H-Cu**	100/vial	83	73	10
300 mesh	**GT300H-Ni**	100/vial	83	73	10

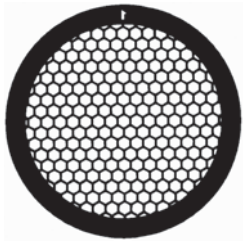
➤ Gilder Grids (continued)

➤ 3.05mm diameter, 0.7 mil (18µm) thickness Material: Copper (Cu), Nickel (Ni), Gold (Au)

➤ Standard Hexagonal Mesh



G100H & G200H

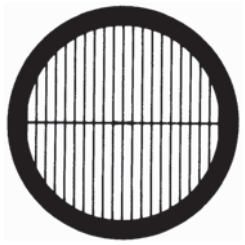


G150H; G300H & G400H

➤ Parallel Bars

G100P & G200P

G100PB & G200PB



G100PB & G200PB

G300P & G400P

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
100 Hex	**G100H-Cu**	100/vial	250	215	35
100 Hex	**G100H-Ni**	100/vial	250	215	35
200 Hex	**G200H-Cu**	100/vial	125	100	25
200 Hex	**G200H-Ni**	100/vial	125	100	25
200 Hex	**G200H-Au**	50/vial	125	100	25
300 Hex	**G300H-Cu**	100/vial	83	58	25
300 Hex	**G300H-Ni**	100/vial	83	58	25
300 Hex	**G300H-Au**	50/vial	83	58	25
400 Hex	**G400H-Cu**	100/vial	62	37	25
400 Hex	**G400H-Ni**	100/vial	62	37	25
400 Hex	**G400H-Au**	50/vial	62	37	25
G100P	**G100P-Cu**	100/vial	250	185	65
G100P	**G100P-Ni**	100/vial	250	185	65
G100PB	**G100PB-Cu**	100/vial	250	185	65
G100PB	**G100PB-Ni**	100/vial	250	185	65
G200P	**G200P-Cu**	100/vial	125	80	45
G200P	**G200P-Ni**	100/vial	125	80	45
G200PB	**G200PB-Cu**	100/vial	125	80	45
G200PB	**G200PB-Ni**	100/vial	125	80	45
G300P	**G300P-Cu**	100/vial	83	48	35
G300P	**G300P-Ni**	100/vial	83	48	35
G300PB	**G300PB-Cu**	100/vial	83	48	35
G300PB	**G300PB-Ni**	100/vial	83	48	35
G400P	**G400P-Cu**	100/vial	62	22	40
G400P	**G400P-Ni**	100/vial	62	22	40
G400PB	**G400PB-Cu**	100/vial	62	22	40
G400PB	**G400PB-Ni**	100/vial	62	22	40

TECHNICAL TIPS

SHINY SIDE OR ROUGH SIDE?

Retention of sections on grids during poststaining and immunocytochemical procedures frequently is of crucial importance in the electron microscopy laboratory. Opinions differ regarding the side of grids most suitable for permanent adhesion. The controversy is easily solved by examination of the surfaces involved. Grids are manufactured with a dull or rough side, and a shiny or smooth side. Epoxy sections exhibit a bumpy surface when viewed in the boat. Scanning electron microscopy images of epoxy sections without embedded material also reveal an uneven surface. Let us imagine a grid to be a single sided piece of sandpaper and the section to be a double sided piece of sandpaper. Sandpaper grips another piece of sandpaper much more readily than it does a smoothly polished metal surface. For the most secure adhesion of sections to grids SECTIONS SHOULD BE PICKED UP ON THE ROUGH SIDE OF THE GRID.

Hildegard H. Crowley, Dept. of Biological Sciences,
University of Denver, Denver, CO. 80208

REMOVING A CHARGE FROM THE SURFACE OF GRIDS

Sometimes when you are trying to pick up sections, they won't adhere to the grid surface. If you don't have time to glow discharge clean the grid surfaces, try this little trick. Dip the grids in distilled water for a moment and wick off the excess with filter paper. Let them dry while you are arranging your sections. Your sections should now adhere to the grid surface. Some labs soak the grids they will use for the day in distilled water until they are needed.

If this procedure fails, reclean your grids with acetone or chloroform or glow discharge clean the grid surfaces.

Jeanette Killius, NEOUCOM, Rootstown, OH.

ON-GRID ENHANCEMENT

The use of nickel grids is recommended for on-grid enhancement, as nickel is relatively insensitive to silver enhancement. Gold or copper grids should not be used.

Gilder Grids (continued)

3.05mm diameter, 0.7 mil (18µm) thickness (mesh), 50µm thickness (single hole and slot) Material: Copper (Cu), Nickel (Ni), Molybdenum (Mo)

Rectangular

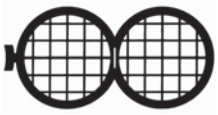
G75/300

G100/400

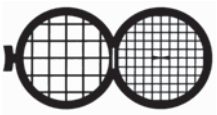
Double Grids (Oyster)

These are used mostly in metallurgical applications for supporting thin metal foils. These grids have a curved securing tab which folds to the curvature of the 'sandwiched' grid.

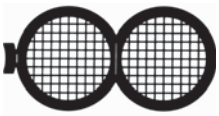
Four configurations are available:



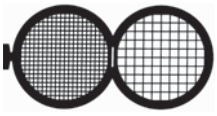
GD50/50



GD50/100



GD100/100



GD100/200

Single Slot Grids

GS2x0.5 GS2x1 GS2/3x1

The two central bars provide increased support enabling thinner films of the formvar/carbon type to be used.

Single Slot Grids (Aperture Grids)

GA75 GA100 GA150 GA300

GA400 GA600 GA800 GA1000

GA1500 GA2000

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
G75/300	**G7530-Cu**	100/vial	340/83	290/58	50/25
G75/300	**G7530-Ni**	100/vial	"	"	"
G100/400	**G1040-Cu**	100/vial	250/62	205/37	45/25
G100/400	**G1040-Ni**	100/vial	"	"	"
GD50/50	**GD50-Cu**	100/vial	500/500	430/430	70/70
GD50/50	**GD50-Ni**	100/vial	"	"	"
GD50/100	**GD5010-Cu**	100/vial	500/250	430/195	70/55
GD50/100	**GD5010-Ni**	100/vial	"	"	"
GD100/100	**GD1010-Cu**	100/vial	250/250	200/200	50/50
GD100/100	**GD1010-Ni**	100/vial	"	"	"
GD100/200	**GD1020-Cu**	100/vial	250/125	200/85	50/40
GD100/200	**GD1020-Ni**	100/vial	"	"	"
GS2x0.5	**G205-Cu**	100/vial	—	2000x500	—
GS2x0.5	**G205-Ni**	100/vial	—	2000x500	—
GS2x1	**G2010-Cu**	100/vial	—	2000x1000	—
GS2x1	**G2010-Ni**	100/vial	—	2000x1000	—
GS2x1	**G2010-Mo**	25/vial	—	2000x1000	—
GS2/3x1	**G60610-Cu**	100/vial	—	~606x1000	—
GS2/3x1	**G60610-Ni**	100/vial	—	~606x1000	—
GS2/3x1	**G60610-Au**	50/vial	—	~606x1000	—
GS2/3x1	**G60610-Mo**	100/vial	—	~606x1000	—
GA75	**GA75-Cu**	100/vial	—	75	—
GA100	**GA100-Cu**	100/vial	—	100	—
GA150	**GA150-Cu**	100/vial	—	150	—
GA300	**GA300-Cu**	100/vial	—	300	—
GA400	**GA400-Cu**	100/vial	—	400	—
GA600	**GA600-Cu**	100/vial	—	600	—
GA600	**GA600-Ni**	100/vial	—	600	—
GA800	**GA800-Cu**	100/vial	—	800	—
GA800	**GA800-Ni**	100/vial	—	800	—
GA1000	**GA1000-Cu**	100/vial	—	1000	—
GA1000	**GA1000-Ni**	100/vial	—	1000	—
GA1000	**G1000-Mo**	25/vial	—	1000	—
GA1500	**GA1500-Cu**	100/vial	—	1500	—
GA1500	**GA1500-Ni**	100/vial	—	1500	—
GA2000	**GA2000-Cu**	100/vial	—	2000	—
GA2000	**GA2000-Ni**	100/vial	—	2000	—

Gilder Thin Bar Grids

3.05 diameter, 0.8 mil thickness Material: Copper(Cu), Nickel(Ni), Gold(Au)

Thin Bar Grids have been developed using a new technology to produce ultra-fine grids with thinner cross bars than regular grids. The result is equally firm specimen support but with 40% more open area for viewing maximum specimen surface area.

Square Mesh

T200-T400

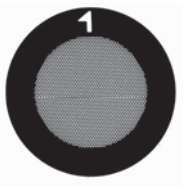
T1000

Variable Mesh

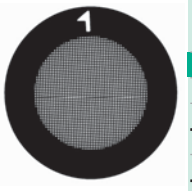
Hexagonal Mesh

T200H-T600H

New Revolutionary Specimen Support Grids**



T601



T601H

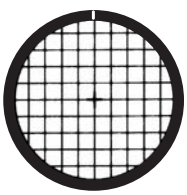
**In addition to our square and hexagonal mesh Gilder Thin Bar Grids, we are now able to produce a very fine mesh that values up to 2,000 lines/inch. There is an increasing need in TEM for support thin films, routinely carbon, as thin as 1.5 - 2.0nm.
The pitch (the distance from the center of one bar to the center of the next bar) dimension in all grids remains constant, which allows them to be used as a lower magnification calibration aid.
Type T600HH (hexagonal) and T600HS (square) represent our efforts to reduce the grid bar width (only 5 microns) enabling more of the specimen to be viewed. All new types, apart from one side being shiny, the other matt, have a large asymmetrical mark in the rim which gives the identification of which side the specimen is on. Grids are 3.05mm overall diameter; 2.05mm mesh area diameter.

			Technical Data		
Type	Cat#	Packed	Pitch µm	Hole µm	Bar µm
200 mesh	T200-Cu	100/vial	125	113	12
200 mesh	T200-Ni	100/vial	125	113	12
200 mesh	T200-Au	25/vial	125	113	12
300 mesh	T300-Cu	100/vial	83	73	10
300 mesh	T300-Ni	100/vial	83	73	10
300 mesh	T300-Au	25/vial	83	73	10
400 mesh	T400-Cu	100/vial	62	54	8
400 mesh	T400-Ni	100/vial	62	54	8
400 mesh	T400-Au	25/vial	62	54	8
1000 mesh	T1000-Cu	25/vial	25	19	6
1000 mesh	T1000-Ni	25/vial	25	19	6
Variable Mesh	TVM-Cu TVM-Ni	100/vial 100/vial	Combined:150, 200, 300, 400 mesh Same as above		
200 mesh	T200H-Cu	100/vial	125	113	12
200 mesh	T200H-Ni	100/vial	125	113	12
300 mesh	T300H-Cu	100/vial	83	73	10
300 mesh	T300H-Ni	100/vial	83	73	10
400 mesh	T400H-Cu	100/vial	62	54	8
400 mesh	T400H-Ni	100/vial	62	54	8
600 mesh	T600H-Cu	100/vial	37	29	8
600 mesh	T600H-Ni	100/vial	37	29	8
600 mesh (square)	T601-Cu T601-Ni	100/vial 100/vial	42 42	37 37	5 5
600 mesh (hexagonal)	T601H-Cu T601H-Ni	100/vial 100/vial	42 42	37 37	5 5
1500 mesh (square)	T1500-Cu T1500-Ni	15/vial 15/vial	16.5 16.5	11.5 11.5	5 5
2000 mesh (square)	T2000-Cu T2000-Ni	10/vial 10/vial	12.5 12.5	7.5 7.5	5 5

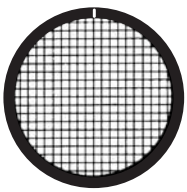
TEM Specimen Supports in Molybdenum

We have extended our range of TEM grid materials to include four types, which are now available in Molybdenum. The new products are manufactured using a process known as chemical 'milling' (etching) instead of the more familiar technique of 'electroforming' (deposition) that is used in the manufacture of copper, nickel and gold products. Molybdenum is used principally in applications where it's high temperature, hardness, expansion of coefficient and corrosion resistance characteristics are considered important. The material which is used has a purity of 99.9%.

Symbol: Mo
Atomic number: 42
Melting point: 2617.0°C (2890.15°K, 4742.6°F)
Boiling point: 4612.0°C (4885.15°K, 8333.6°F) –
Density: 10.22 g/cm3



G200-Mo
200# Grid



G100-Mo
100# Grid

G2010-Mo
2x1Grid

G1000-Mo
1000 Micron Grid

Model No.	Overall Diameter	Rim Width	Rim Mark	Center Mark	Lines/ inch	Pitch	Bar Width	Hole Width	Overall thickness	Packed
G200-Mo	3.05mm	0.225mm	Yes	Yes	200	125 µm	35 µm	90 µm	25 µm	25/vial
G100-Mo	3.05mm	0.225mm	Yes	Yes	100	250 µm	45 µm	205 µm	25 µm	25/vial
G2010-Mo	3.05mm	N/A	N/A	N/A	N/A	N/A	N/A	2 x 1mm	50 µm	25/vial
G1000-Mo	3.05mm	N/A	N/A	N/A	N/A	N/A	N/A	1000 µm	50 µm	25/vial

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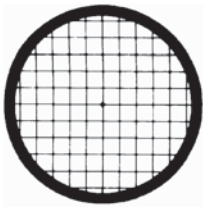
Veco Grids

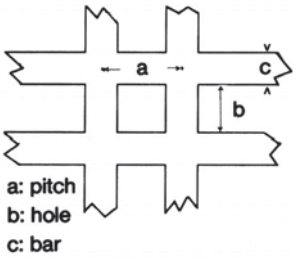
3.05 mm diameter, 0.8 mil thickness Material: Copper (Cu); Nickel (Ni); Gold (Au);

With a wide variety of styles available, Veco Grids offer superior handling characteristics.
Plus, with a 0.8 mil thickness, Veco Grids are the most rigid grids available.

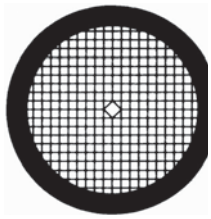
Square Mesh with Center Reference



Square Mesh

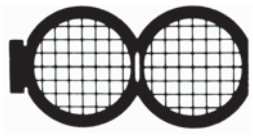


SS-200

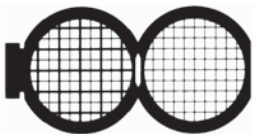


E-200

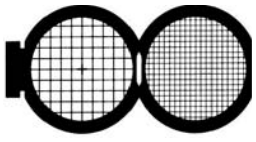
Square Mesh Oyster Grids



D-75



D-100/100B



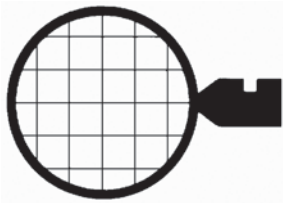
D-100K/200

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
50 mesh	**0050-Cu**	100/vial	500	450	50
50 mesh	**0050-Ni**	100/vial	500	450	50
50 mesh	**0050-Au**	50/vial	500	450	50
75 mesh	**0075-Cu**	100/vial	333	283	50
75 mesh	**0075-Ni**	100/vial	333	283	50
75 mesh	**0075-Au**	50/vial	333	283	50
100 mesh	**0100-Cu**	100/vial	250	200	50
100 mesh	**0100-Ni**	100/vial	250	200	50
100 mesh	**0100-Au**	50/vial	250	200	50
150 mesh	**0150-Cu**	100/vial	167	117	50
150 mesh	**0150-Ni**	100/vial	167	117	50
150 mesh	**0150-Au**	50/vial	167	117	50
200 mesh	**0200-Cu**	100/vial	125	85	40
200 mesh	**0200-Ni**	100/vial	125	85	40
200 mesh	**0200-Au**	50/vial	125	85	40
250 mesh	**0250-Cu**	100/vial	100	60	40
250 mesh	**0250-Ni**	100/vial	100	60	40
300 mesh	**0300-Cu**	100/vial	83	45	38
300 mesh	**0300-Ni**	100/vial	83	45	38
300 mesh	**0300-Au**	50/vial	83	45	38
400 mesh	**0400-Cu**	100/vial	63	30	33
400 mesh	**0400-Ni**	100/vial	63	30	33
400 mesh	**0400-Au**	50/vial	63	30	33
E200	**E200-Cu**	100/vial	125	85	40
E200	**E200-Ni**	100/vial	125	85	40
SS 200	**0200-SS**	100/vial	Punched from Stainless Steel Woven 200 mesh		
D75	**D75-Cu**	100/vial	333	283	50
D75	**D75-Ni**	100/vial	333	283	50
D100/100B	**D100B-Cu**	100/vial	250x 7777777	200 190	50x 40/80
D100/100B	**D100B-Ni**	100/vial	250x 7777777	200 190	50x 40/80
D100K/200	**D1002D-Cu**	100/vial	250x 125	200/ 85	50x 40
D100K/200	**D1002D-Ni**	100/vial	250x 125	200x 85	50x 40

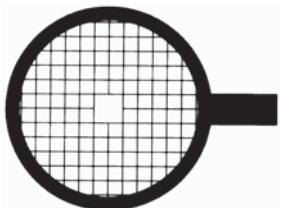
➤ Veco Grids (continued)

➤ 3.05 mm diameter, 0.8 mil thickness Material: Copper (Cu); Nickel (Ni); Gold (Au);

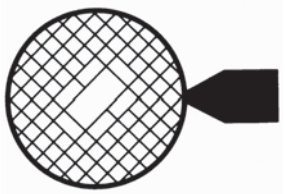
➤ Square Mesh Handle Grids



Square Mesh Handle Grid



111HDspec



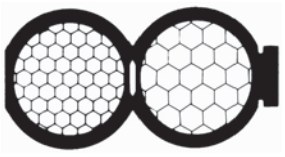
100HDspec

➤ Hexagonal Mesh

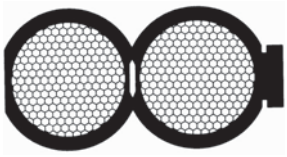
Hexagonal Mesh

H111K Spec

➤ Oyster Type Hexagonal Mesh



DH75/300



DH75-DH300

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
100 mesh	HD100-Cu	100/vial	250	200	50
100 mesh	HD100-Ni	100/vial	250	200	50
150 mesh	HD150-Cu	100/vial	167	117	50
150 mesh	HD150-Ni	100/vial	167	117	50
200 mesh	HD200-Cu	100/vial	125	85	40
200 mesh	HD200-Ni	100/vial	125	85	40
300 mesh	HD300-Cu	100/vial	83	45	38
300 mesh	HD300-Ni	100/vial	83	45	38
400 mesh	HD400-Cu	100/vial	63	30	33
400 mesh	HD400-Ni	100/vial	63	30	33
111HDspec	HD111S-Cu	100/vial	-	190	-
111HDspec	HD111S-Ni	100/vial	-	190	-
100HDspec	HD100S-Cu	100/vial	-	200	-
100HDspec	HD100S-Ni	100/vial	-	200	-
H75 mesh	H075-Cu	100/vial	333	283	50
H75 mesh	H075-Ni	100/vial	333	283	50
H100 mesh	H100-Cu	100/vial	250	200	50
H100 mesh	H100-Ni	100/vial	250	200	50
H150 mesh	H150-Cu	100/vial	167	117	50
H150 mesh	H150-Ni	100/vial	167	117	50
H200 mesh	H200-Cu	100/vial	125	85	40
H200 mesh	H200-Ni	100/vial	125	85	40
H200 mesh	H200-Au	50/vial	125	85	40
H300 mesh	H300-Cu	100/vial	83	45	38
H300 mesh	H300-Ni	100/vial	83	45	38
H300 mesh	H300-Au	50/vial	83	45	38
H400 mesh	H400-Cu	100/vial	63	30	33
H400 mesh	H400-Ni	100/vial	63	30	33
H111KSpec	H111K-Cu	100/vial	-	185	-
H111KSpec	H111K-Ni	100/vial	-	185	-
DH75/300	D753H-Cu	100/vial	333/ 83	293/ 45	50/ 38
DH75/300	D753H-Ni	100/vial	333/ 83	293/ 45	50/ 38
DH75 mesh	D75H-Cu	100/vial	333	283	50
DH75 mesh	D75H-Ni	100/vial	333	283	50
DH100 mesh	D100H-Cu	100/vial	250	200	50
DH100 mesh	D100H-Ni	100/vial	250	200	50
DH200 mesh	D200H-Cu	100/vial	125	85	40
DH200 mesh	D200H-Ni	100/vial	125	85	40
DH300 mesh	D300H-Cu	100/vial	83	45	38
DH300 mesh	D300H-Ni	100/vial	83	45	38

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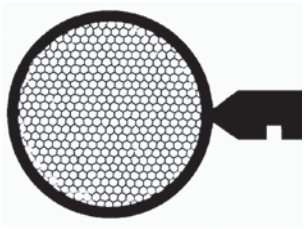
➤ Veco Grids (continued)

➤ 3.05 mm diameter, 0.8 mil thickness Material: Copper (Cu); Nickel (Ni); Gold (Au);

➤ Handle Grids Hexagonal Mesh



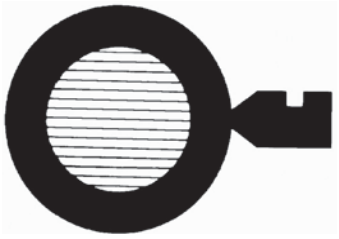
100-400 mesh

➤ Parallel Bar (R)

R100-R300

RB90

➤ Parallel Bar Handle Grids



R100-R300

➤ Parallel Bar with Divider

R100D-R300D

R100 Aspec

			Technical Data		
Type	Cat#	Packed	Pitch µm	Hole µm	Bar µm
100 mesh	**HD100H-Cu**	100/vial	250	200	50
100 mesh	**HD100H-Ni**	100/vial	250	200	50
150 mesh	**HD150H-Cu**	100/vial	167	117	50
150 mesh	**HD150H-Ni**	100/vial	167	117	50
200 mesh	**HD200H-Cu**	100/vial	125	85	40
200 mesh	**HD200H-Ni**	100/vial	125	85	40
300 mesh	**HD300H-Cu**	100/vial	83	45	38
300 mesh	**HD300H-Ni**	100/vial	83	45	38
400 mesh	**HD400H-Cu**	100/vial	63	30	33
400 mesh	**HD400H-Ni**	100/vial	63	30	33
R100	**R100-Cu**	100/vial	250	200	50
R100	**R100-Ni**	100/vial	250	200	50
R150	**R150-Cu**	100/vial	167	117	50
R150	**R150-Ni**	100/vial	167	117	50
R200	**R200-Cu**	100/vial	125	85	40
R200	**R200-Ni**	100/vial	125	85	40
R300	**R300-Cu**	100/vial	85	45	38
R300	**R300-Ni**	100/vial	85	45	38
RB90	**RB90-Cu**	100/vial	276	92	184
RB90	**RB90-Ni**	100/vial	276	92	184
R100	**HDR100-Cu**	100/vial	250	200	50
R100	**HDR100-Ni**	100/vial	250	200	50
R200	**HDR200-Cu**	100/vial	125	85	40
R200	**HDR200-Ni**	100/vial	125	85	40
R300	**HDR300-Cu**	100/vial	85	45	38
R300	**HDR300-Ni**	100/vial	85	45	38
R100D	**R100D-Cu**	100/vial	250	200	50
R100D	**R100D-Ni**	100/vial	250	200	50
R150D	**R150D-Cu**	100/vial	167	117	50
R150D	**R150D-Ni**	100/vial	167	117	50
R200D	**R200D-Cu**	100/vial	125	85	40
R200D	**R200D-Ni**	100/vial	125	85	40
R300D	**R300D-Cu**	100/vial	85	45	38
R300D	**R300D-Ni**	100/vial	85	45	38
R100Aspec	**R100As-Cu**	100/vial	250	200	50
R100Aspec	**R100As-Ni**	100/vial	250	200	50

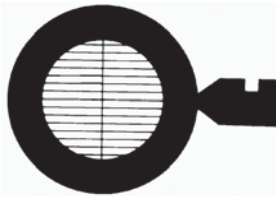
➤ Veco Grids (continued)

➤ 3.05 mm diameter, 0.8 mil thickness Material: Copper (Cu); Nickel (Ni); Gold (Au);

➤ Sjostrand for Serial Sections

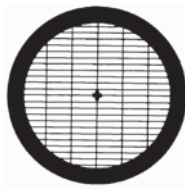
R100/200A

➤ Parallel Bar w/ Divider Handle Grids



R100D-R300D

➤ Slotted Patterns

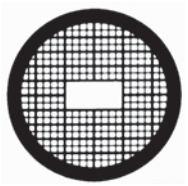


50/75-100/400

➤ Thin and Thick Bars

100µk

100+ym



GE 200

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
R100/200A	**R12CA-Cu**	100/vial	250/	120/	130/
R100/200A	**R12CA-Ni**	100/vial	125	75	50
R100D	**HDR100D-Cu**	100/vial	250	200	50
R100D	**HDR100D-Ni**	100/vial	250	200	50
R200D	**HDR200D-Cu**	100/vial	125	85	40
R200D	**HDR200D-Ni**	100/vial	125	85	40
R300D	**HDR300D-Cu**	100/vial	85	45	38
R300D	**HDR300D-Ni**	100/vial	85	45	38
50/75	**575-Cu**	100/vial	500/	450/	50
50/75	**575-Ni**	100/vial	333	283	50
75/300	**753-Cu**	100/vial	300/ 83	293/ 43	40
75/300	**753-Ni**	100/vial	300/ 83	293/ 43	40
100/400	**1040-Cu**	100/vial	250/ 63	212/ 25	38
100/400	**1040-Ni**	100/vial	250/ 63	212/ 25	38
100µK	**100S-Cu**	100/vial	156/ 132	100	56/ 32
100µK	**100S-Ni**	100/vial	156/ 132	100	56/ 32
100+ym	**100YM-Cu**	100/vial	-	100	-
100+ym	**100YM-Ni**	100/vial	-	100	-
GE200	**GE200-Cu**	100/vial	Slotted area 125/ 145	80	45/ 65 **Single slot: 1000x500**
GE200	**GE200-Ni**	100/vial	Same as above		

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➤ 3.05 mm diameter, 0.8 mil thickness Material: Copper (Cu); Nickel (Ni); Gold (Au);

➤ Single Hole

A600-A2000

➤ Special Shapes

Z1600

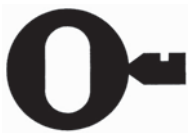
EA1500

Z600

➤ Single Slot Oval

L0.2x1.5-L2x1.5

➤ Handle



HDL2X1

➤ Rectangular

L2.X0.6-L0.2X0.5

Type	Cat#	Packed	Technical Data Pitch Hole Bar diameter µm
A600	**0600-Cu**	100/vial	600
A600	**0600-Ni**	100/vial	600
A800	**0800-Cu**	100/vial	800
A800	**0800-Ni**	100/vial	800
A1000	**1000-Cu**	100/vial	1000
A1000	**1000-Ni**	100/vial	1000
A1500	**1500-Cu**	100/vial	1500
A1500	**1500-Ni**	100/vial	1500
A2000	**2000-Cu**	100/vial	2000
A2000	**2000-Ni**	100/vial	2000
Z1600	**Z1600-Cu**	100/vial	inner:1600 outer:1900 width:150
EA1500	**EA150-Cu**	100/vial	1500
Z600	**Z600-Cu**	100/vial	inner:600 outer:900 width:150
L0.2x1.5	**0215-Cu**	100/vial	200x1500
L0.2x1.5	**0215-Ni**	100/vial	200x1500
L2x1	**2010-Cu**	100/vial	2000x1000
L2x1	**2010-Ni**	100/vial	2000x1000
L2x1.5	**2015-Cu**	100/vial	2000x1500
L2x1.5	**2015-Ni**	100/vial	2000x1500
HDL2x1	**HD2010-Cu**	100/vial	2000x1000
HDL2x1	**HD2010-Ni**	100/vial	2000x1000
L2x0.6	**0620-Cu**	100/vial	2000x600
L2x0.6	**0620-Ni**	100/vial	2000x600
L0.2x1	**1002-Cu**	100/vial	200x1000
L0.2x1	**1002-Ni**	100/vial	200x1000
L0.2x0.5	**0502-Cu**	100/vial	200x500
L0.2x0.5	**0502-Ni**	100/vial	200x500

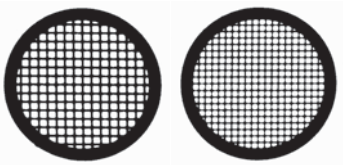
Maxtaform Grids

3 mm diameter, 0.75 mil thickness
Material: Copper/Rhodium (Cu/Rh = CR), Nickel (Ni), Gold (Au)

High Grade Maxtaform Grids with clean and smooth edges, firm support, and a large open area. Our copper grids are available with one surface coated with inert Rhodium. This coating will eliminate tarnishing, give side identification, and reduce the bar thickness.

Type	Cat#	Packed	Technical Data Pitch µm	Hole µm	Bar µm
100 mesh	**M100-CR**	100/vial	254	213	41
100 mesh	**M100-Ni**	100/vial	254	213	41
150 mesh	**M150-CR**	100/vial	165	131	34
150 mesh	**M150-Ni**	100/vial	165	131	34
150 mesh	**M150-Au**	100/vial	165	131	34
200 mesh	**M200-CR**	100/vial	127	103	24
200 mesh	**M200-Ni**	100/vial	127	103	24
200 mesh	**M200-Au**	100/vial	127	103	24
300 mesh	**M300-CR**	100/vial	84	61	23
300 mesh	**M300-Ni**	100/vial	84	61	23
300 mesh	**M300-Au**	100/vial	84	61	23
400 mesh	**M400-CR**	100/vial	63	43	20
400 mesh	**M400-Ni**	100/vial	63	43	20
400 mesh	**M400-Au**	100/vial	63	43	20
2x1 mm	**M2010-CR**	100/vial	—	2000x1000	—
2x1 mm	**M2010-CR**	100/vial	—	2000x1000	—

Square Mesh



100–400 mesh 100–400 mesh

Oval Hole

100–400 mesh

Maxtaform Finder Grids

Maxtaform grids with reference patterns are of the highest consistent quality, with a wide choice to choose from to suit all your particular needs.

London Finder

H 2, Pitch 127µ, 200 mesh

LF200-Cu	100/vial
LF200-Ni	100/vial
LF200-Au	100/vial

LF-200

London Finder

H 7, Pitch 63µ, 400 mesh

LF400-Cu	100/vial
LF400-Ni	100/vial
LF400-Au	100/vial

LF-400

London Finder

H 15, Pitch 188µ, 135 mesh

LF135-Cu	100/vial
LF135-Ni	100/vial

LF-135

London Honeycomb

H 6, Pitch 235µ, Honeycomb

LH200-Cu	100/vial
LH200-Ni	100/vial

Maxtaform Specialist Grids

3 mm diameter. These grids fill all your special needs.

H 9, Pitch 508µ, 50 mesh

H9Spec-Cu	100/vial
H9Spec-Ni	100/vial

HF14, Pitch 127µ, 200 mesh

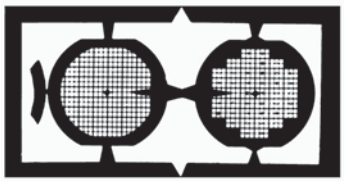
HF14Spec-Cu	100/vial
HF14Spec-Ni	100/vial

H 1, Pitch 127µ, 200 mesh

H1Spec-Cu	100/vial
H1Spec-Ni	100/vial

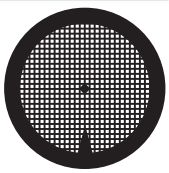
H 12 Folding, Pitch 126µ, 200 mesh

H12Spec-Cu	25/vial
H12Spec-Ni	25/vial



H 4, Pitch 63µ, 400 mesh

H4Spec-Cu	100/vial
H4Spec-Ni	100/vial



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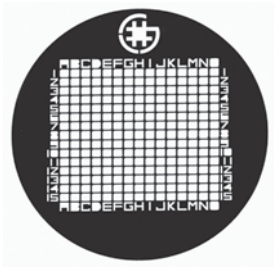
Alpha Numeric Index Grid



By employing a rectangular mesh the support value of the grid has been increased, offering a value intermediate between the most commonly used grid (200 Lines/") and (300 Lines/"/). Each grid rectangle is asymmetrical having different outlines in all four corners. This allows for the orientation of the grid to be determined at microscopic levels. The index feature enables the position of each grid to be identified with reference to the letters A-O along the horizontal axis and the numbers 1-15 along the vertical axis. The logo in the rim allows for precise orientation and aids in the identification of each side. Grids are available in Copper, Copper/Palladium, Nickel, and Gold.

SPECIFICATIONS:

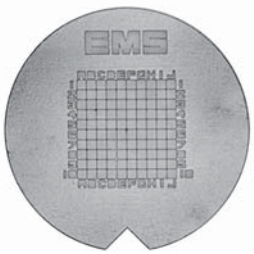
	Horizontal Axis:	Vertical Axis:
Mesh:	200 Lines/"	250 Lines/"
Pitch:	125 microns	105 microns
Bar Width:	20 microns	15 microns
Hole Width:	105 microns	90 microns
Overall Diameter:	3.05 mm	3.05 mm

CORNER OUTLINE WITH REFERENCE TO LOGO IN THE RIM:

Top Right:	Right Angle
Top Left:	Inverted Quadrant
Bottom Right:	Diagonal Line
Bottom Left:	Quadrant

G200F4-Cu	Alpha/Numeric Index Grid	Copper	100/vial
G200F4-CP	Alpha/Numeric Index Grid	Copper/Palladium	100/vial
G200F4-Ni	Alpha/Numeric Index Grid	Nickel	100/vial
G200F4-Au	Alpha/Numeric Index Grid	Gold	50/vial

Asbestos Analysis Index Grids



Our unique index grids for all of your microscopy work. These grids are manufactured in the strictest accordance to meet AHERA requirements.

Specifications:

Overall Diameter	3.05mm
Mesh	200 lines/"
Pitch	125 microns
Bar Width	10 microns +/- 2 microns
Hole Width	115 microns +/- 2 microns
Index Identification	Horizontal: A-J
Index Identification	Vertical: 1-10
EMS Logo in Rim	———————
Asymmetrical Cut Out In Rim	Allows for precise repeat location and aids in side differentiation

G200EMSIND-Cu	Index Copper Grids	Copper	100/vial
G200EMSIND-Ni	Index Nickel Grids	Nickel	100/vial

Synaptek™ Grids

Very reliable under the electron beam- Synaptek® unflexible grids, made of a special alloy (Berylium-Copper). Offers extreme stability for coating with support film. 4 mil thick (100um), 3.05mm diameter, this standard 2x1mm oval slot grids are contamination free and reusable after cleaning. 0.5x2mm oval slots are also available.

NUM grids: Numbered grids are in random order. Numbers may be duplicated.

DOT grids: 2 dots are marked on one side of the grid for identification. Dots are visible to the naked eye.

NOTCH grids: A mark, stamped on one side of the grid to facilitate the handling of the grids. Notch is available with NUM or DOT grids.

GILDED grids: completely Gold-Plated grids, suitable for immunology research, autoradiography, as well as special needs.

DOT 2x1mm slot
S2010-DOT 100/vial

NOTCH-DOT 2x1mm slot
S2010-ND 100/vial

DOT 2x0.5mm slot
S2005-DOT 100/vial

NOTCH-NUM 2x1mm slot
S2010-NN 100/vial

NUM 2x1mm slot
S2010-NUM 100/vial

GILDED NOTCH-NUM 2x1mm slot
SG2010-NN 100/vial

NOTCH 2x1mm slot
S2010-NOTCH 100/vial

Beryllium Grids for Transmission Electron Microscopy

Beryllium grids are superior to all other materials for in situ analysis in transmission electron microscopes because for practical purposes they give off no detectible background radiation which could interfere with the analysis.

Purity: 99.97%
Size: 3.05mm

0200-Be	Beryllium Grids 200 Mesh	each
2010-Be	Beryllium Grid 2mm x 1mm	each

➤ EMBRA Grids

3.05 mm diameter, 16µm thickness for meshed and 5-20 µm thickness for oval hole grids

Material: Copper (Cu), Nickel (Ni), Gold (Au), Stainless Steel (SS), Titanium (Ti), Molybdenum (Mo), Aluminum (Al)

EMBRA electroformed grids combine a high open area with a rigid construction which allows for relatively easy handling. We offer these grids in a series of hard to find materials, which are not available from other manufacturers. They are as follows: Stainless Steel (SS), Titanium (Ti), Molybdenum (Mo), and Aluminum (Al)

Type	Cat. #	Open Area	Packed
100 mesh	E100-SS	65%	25/vial
100 mesh	E100-Ti	65%	25/vial
100 mesh	E100-Mo	65%	25/vial
100 mesh	E100-Al	65%	25/vial
200 mesh	E200-SS	50%	25/vial
200 mesh	E200-Ti	50%	25/vial
200 mesh	E200-Mo	50%	25/vial
200 mesh	E200-Al	50%	25/vial
300 mesh	E300-Ti	40%	25/vial
300 mesh	E300-Mo	40%	25/vial
300 mesh	E300-Al	40%	25/vial
0.4x2mm	E0420-SS	—	25/vial
0.4x2mm	E0420-Ti	—	25/vial
0.4x2mm	E0420-Mo	—	25/vial
0.4x2mm	E0420-Al	—	25/vial
2x1mm	E2010-SS	—	25/vial
2x1mm	E2010-Ti	—	25/vial
2x1mm	E2010-Mo	—	25/vial
2x1mm	E2010-Al	—	25/vial
100 mesh	EF100-Cu	—	100/vial
100 mesh	EF100-Ni	—	100/vial
200 mesh	EF200-Cu	—	100/vial
200 mesh	EF200-Ni	—	100/vial
200 mesh	EF200-Au	—	25/vial
300 mesh	EF300-Cu	—	100/vial
300 mesh	EF300-Ni	—	100/vial
300 mesh	EF300-Au	—	25/vial
400 mesh	EF400-Cu	—	100/vial
400 mesh	EF400-Ni	—	100/vial
400 mesh	EF400-Au	—	25/vial
100 mesh	EC100-Cu	—	100/vial
100 mesh	EC100-Ni	—	100/vial
200 mesh	EC200-Cu	—	100/vial
200 mesh	EC200-Ni	—	100/vial
300 mesh	EC300-Cu	—	100/vial
300 mesh	EC300-Ni	—	100/vial
200 mesh	EN200-CF	—	25/vial

➤ Square Mesh

100 mesh

200 mesh

300 mesh

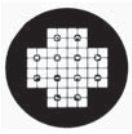
➤ Oval Slot

0.4-2mm

2x1mm

➤ Finder

Standard 3.05mm diameter grids which have one straight and one round cut out from the rim which assists in the orien-tation of the grid. They are available in Copper, Nickel, and Gold Grids.



100 mesh

200 mesh

300 mesh

400 mesh

➤ Coordinator

Standard 3.05mm grids, with a handle. They are available in copper and nickel.

➤ Nylon

3.05mm diameter, non-conductive grid. They come with a carbon coating.

100 mesh

➤ Selective Grids

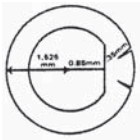
7 Hexagon

75 Mesh Freeze Fracture

150 Mesh Tissue Processing

200 Mesh Tissue Processing

CHIEN Grids



CHIEN Grids

Type	Cat. #	Open Area	Packed
7-Hex	E7HEX-Cu	—	100/vial
7-Hex	E7HEX-Ni	—	100/vial
75FF	E75FF-Cu	—	100/vial
75FF	E75FF-Ni	—	100/vial
6G150	ETP150-Cu	—	100/vial
6G150	ETP150-Ni	—	100/vial
6G200	ETP200-Cu	—	100/vial
6G200	ETP200-Ni	—	100/vial
9G20H	EC20H-Cu	—	100/vial
9G20H	EC20H-Ni	—	100/vial

* Reference: Chien R, Van de Velde R, Heusser R: Simultaneous Ultramicrotomy of multiple areas and examination of ribbons on one new grid. Proc. 43rd Annual Meeting, Elec. Micro. Soc. Amer., G W Bailey, ed, San Franciso Press, 460 (1985). Galey FR, Nilson SEG: A new method for transferring sections from the liquid surface of the trough through staining solutions to the supporting film of a grid. J. Ultrastruct. Res., 14, (1966), 405-410.

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➤ Support Film Grids

Support Film on grids has become a main product line for us since the demand for high quality coated grids has increased. To make your microscopy work easier and to save you a great deal of time we offer you a complete line. All of our coated grids are optically checked followed by batch testing in the EM. Packed in grid storage box.

NOTE: All of our film is laid on the shiny side of the grid.

➤ 1. Formvar film only:

A thin film of pure formvar resin. The thickness range is from 30 to 75nm.

Copper Grids

Type	Cat. #	Pack
100 mesh	FF100-Cu	25/box
	FF100-Cu	50/box
150 mesh	FF150-Cu	25/box
	FF150-Cu	50/box
200 mesh	FF200-Cu	25/box
	FF200-Cu	50/box
300 mesh	FF300-Cu	25/box
	FF300-Cu	50/box
400 mesh	FF400-Cu	25/box
	FF400-Cu	50/box

Nickel Grids

100 mesh	FF100-Ni	25/box
	FF100-Ni	50/box
150 mesh	FF150-Ni	25/box
	FF150-Ni	50/box
200 mesh	FF200-Ni	25/box
	FF200-Ni	50/box
300 mesh	FF300-Ni	25/box
	FF300-Ni	50/box
400 mesh	FF400-Ni	25/box
	FF400-Ni	50/box

Gold Grids

100 mesh	FF100-Au	25/box
	FF100-Au	50/box
150 mesh	FF150-Au	25/box
	FF150-Au	50/box
200 mesh	FF200-Au	25/box
	FF200-Au	50/box
300 mesh	FF300-Au	25/box
	FF300-Au	50/box
400 mesh	FF400-Au	25/box
	FF400-Au	50/box

➤ 2. Carbon Film only:

A thin film of pure carbon deposited on one side of the grid. The thick-ness range is from 30 to 50 nm.

Copper Grids

Type	Cat. #	Pack
150 mesh	CF150-Cu	25/box
	CF150-Cu	50/box
200 mesh	CF200-Cu	25/box
	CF200-Cu	50/box
300 mesh	CF300-Cu	25/box
	CF300-Cu	50/box
	CF400-Cu	50/box
400 mesh	CF400-Cu	25/box
	CF400-Cu	50/box

Nickel Grids

150 mesh	CF150-Ni	25/box
	CF150-Ni	50/box
200 mesh	CF200-Ni	25/box
	CF200-Ni	50/box
300 mesh	CF300-Ni	25/box
	CF300-Ni	50/box
400 mesh	CF400-Ni	25/box
	CF400-Ni	50/box

Gold Grids

150 mesh	CF150-Au	25/box
	CF150-Au	50/box
200 mesh	CF200-Au	25/box
	CF200-Au	50/box
300 mesh	CF300-Au	25/box
	CF300-Au	50/box
400 mesh	CF400-Au	25/box
	CF400-Au	50/box

➤ 3. Formvar/ Carbon Film:

A formvar coated grid, stabilized with evaporated carbon film. This type of coating is excellent for specimen support, especially for ultra thin sections.

Copper Grids

Type	Cat. #	Pack
100 mesh	FCF100-Cu	25/box
	FCF100-Cu	50/box
150 mesh	FCF150-Cu	25/box
	FCF150-Cu	50/box
200 mesh	FCF200-Cu	25/box
	FCF200-Cu	50/box
300 mesh	FCF300-Cu	25/box
	FCF300-Cu	50/box
400 mesh	FCF400-Cu	25/box
	FCF400-Cu	50/box
2x1mm slot	FCF2010-Cu	25/box
	FCF2010-Cu	50/box

Nickel Grids

100 mesh	FCF100-Ni	25/box
	FCF100-Ni	50/box
150 mesh	FCF150-Ni	25/box
	FCF150-Ni	50/box
200 mesh	FCF200-Ni	25/box
	FCF200-Ni	50/box
300 mesh	FCF300-Ni	25/box
	FCF300-Ni	50/box
400 mesh	FCF400-Ni	25/box
	FCF400-Ni	50/box
2x1mm slot	FCF2010-Ni	25/box
	FCF2010-Ni	50/box

Gold Grids

100 mesh	FCF100-Au	25/box
	FCF100-Au	50/box
150 mesh	FCF150-Au	25/box
	FCF150-Au	50/box
200 mesh	FCF200-Au	25/box
	FCF200-Au	50/box
300 mesh	FCF300-Au	25/box
	FCF300-Au	50/box
400 mesh	FCF400-Au	25/box
	FCF400-Au	50/box
2x1mm slot	FCF2010-Au	25/box
	FCF2010-Au	50/box

➤ 4. Formvar/ Silicone Monoxide

A formvar film stabilized with a thin film of Silicone monoxide. Silicone monoxide produces a desirable support film because it offers low background contrast and it is stable under the electron beam and it is more hydrophilic than carbon film.

Copper Grids

Type	Cat. #	Pack
200 mesh	FSF200-Cu	50/box
300 mesh	FSF300-Cu	50/box
400 mesh	FSF400-Cu	50/box

Nickel Grids

200 mesh	FSF200-Ni	50/box
300 mesh	FSF300-Ni	50/box
400 mesh	FSF400-Ni	50/box

➤ 5. Silicone Monoxide Film only

A thin film of pure silicone Monoxide (15 – 30 nm) is deposited directly on top of the grid

Copper Grids

Type	Cat. #	Pack
200 mesh	SF200-Cu	50/box
300 mesh	SF300-Cu	50/box
400 mesh	SF400-Cu	50/box

Nickel Grids

200 mesh	SF200-Ni	50/box
300 mesh	SF300-Ni	50/box
400 mesh	SF400-Ni	50/box

➤ 6. Lacey Carbon Film

This carbon coated film on a broken pattern consists of woven-mesh-like holes of different sizes and shapes. This type of pattern provides support but does not interfere when observing specimen sections.

Copper Grids

Type	Cat. #	Pack
200 mesh	LC200-Cu	5/box
	LC200-Cu	25/box
300 mesh	LC305-Cu	5/box
	LC325-Cu	25/box

Nickel Grids

200 mesh	LC200-Ni	5/box
	LC200-Ni	25/box
300 mesh	LC305-Ni	5/box
	LC325-Ni	25/box

Gold Grids

200 mesh	LC205-Au	5/box
	LC225-Au	25/box
300 mesh	LC305-Au	5/box
	LC 325-Au	25/box

➤ 7. Holey Carbon Film

A thin piece of carbon with numerous round holes of various sizes.

Copper Grids

Type	Cat. #	Pack
200 mesh	HC200-Cu	25/box
300 mesh	HC300-Cu	25/box

Nickel Grids

200 mesh	HC200-Ni	25/box
300 mesh	HC300-Ni	25/box

Gold Grids

200 mesh	HC200-Au	25/box
300 mesh	HC300-Au	25/box

➤ 8. Beryllium Support Film

A deposition of 250 Angstroms thick Beryllium onto the 0.005" thick, 25x25mm squares of a Cu substrate. The Be can be removed by dissolving the substrate in nitric acid. The Be film will then be removed from the acid, washed in distilled water and mounted on TEM grids. A Be support film will reduce background interference to a minimum and it is particularly useful where analyses for C or Si are required, so that these alter-native supports cannot be used. Another advantage of the Be support is its very fine grain size which produces a very sharp ring pattern for in-situ calibration.

76030 Beryllium Support Film, 25x25mm — each

TECHNICAL TIP

THE PREPARATION OF ADHESIVE COATED GRIDS FOR PICKING UP CARBON FILM TO MAKE CARBON COATED GRIDS

The following steps should be followed in the preparation of adhesive coated grids:

1. Submerge about 2" of Scotch clear tape (3M) into 10ml of Dichloroethane (Ethylene Dichloride); shake and discard the tape.
2. The solution now becomes "grid-glue"
3. Place the grids (dull side up) on a piece of filter paper (dust-free room).
4. Take a pipette and place a drop of "grid-glue" on top of each grid.
5. Let the grids dry.
6. The grids are now ready to pick up the carbon foil and make the carbon coated grids.

TECHNICAL TIP

How do Nickel and Copper grids react with Periodic Acid?

Periodic Acid + Ni
Ni-Periodate + H_2
Periodic Acid + Cu
Cu-Periodate + H_2
In this case you should use Gold Grids.

➤ C-flat™ Holey Carbon Grids for cryo-TEM

The premier holey carbon grid for cryo-transmission electron microscopy

C-flat™ is an ultra-flat, holey carbon-coated TEM support grid for transmission electron microscopy (TEM). Unlike competing holey carbon films, C-flat™ is manufactured without plastics, so it is clean upon arrival and the user has no residue to contend with.

The C-flat™ Advantage

C-flat™ leads to better data sets.

Made with patent pending technology, C-flat™ provides an ultra-flat surface that results in better particle dispersion and more uniform ice thickness. Patterning is done using deep-UV projection lithography, ensuring the most accurate and consistent hole shapes and sizes down to submicron features. The precise methods by which C-flat™ is manufactured eliminate artifacts such as excess carbon and edges around holes.

C-flat™ is affordable

C-flat™ is available in 25, 50, and 100 packs at a per-grid price less than competing products.

Applications

C-flat™ holey carbon grids provide the ideal specimen support to achieve high resolution data in cryo-TEM making them an ideal choice for single particle analysis, cryo electron tomography and automated TEM analysis.

Cryo-electron tomography (cryoET) and Single Particle Analysis (SPA):

Numerous researchers have reported that the ultra-flat surface of C-flat™ leads to even ice thickness and uniform particle distribution within the hole areas. This optimal particle distribution results in superior data being collected as compared with other holey support films. 2µm hole sizes are standard but custom hole sizes are available so C-flat™ can accommodate the common magnifications used for quantitative TEM analysis.

Automated TEM:

C-flat™ provides a regular array of analysis sites compatible with automated data collection software such as Leginon. This compatibility, in combination with the more uniform ice thickness and particle distribution reported by numerous researchers, results in more high-quality target sites per grid.

Publications using C-flat™:

Does contamination buildup limit through put for automated cryoEM, Journal of Structural Biology, Volume 154, Issue 3, June 2006, Pages 303-311, Anchi Cheng, Denis Fellmann, James Pulokas, Clinton S. Potter and Bridget Carragher

Automated cryoEM data acquisition and analysis of 284 742 particles of GroEL, Journal of Structural Biology, In Press, Uncorrected Proof, Available online 22 May 2006, Scott M. Stagg, Gabriel C. Lander, James Pulokas, Denis Fellmann, Anchi Cheng, Joel D. Quispe, Satya P. Mallick, Radomir M. Avila, Bridget Carragher and Clinton S. Potter

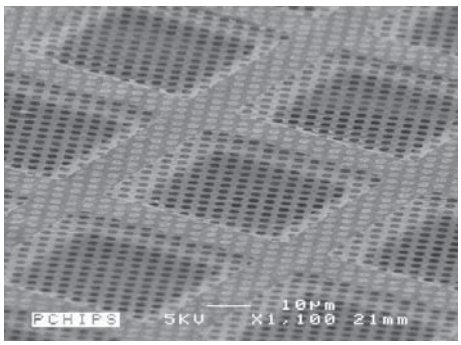
Product Line

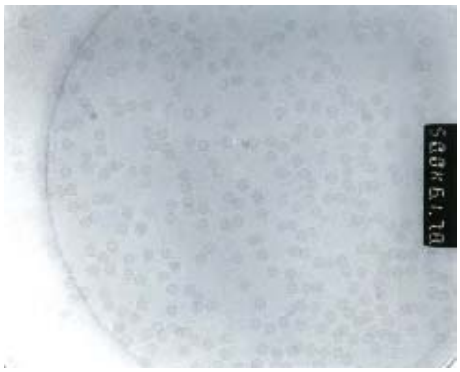
C-flat™ is a holey carbon film supported by a standard TEM grid. C-flat™ products are fully specified by 4 parameters: the hole diameter and pitch of the holey carbon film and the material type and mesh size of the TEM grid. The image at right illustrates these parameters

Standard Products

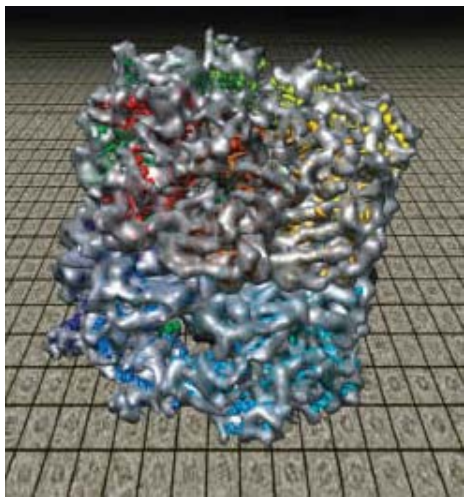
The breadth of applications in cryoTEM necessitates a wide range of holey carbon film patterns. And now, with the recent expansion of the product line, a C-flat™ holey carbon film is available for almost any application. Whether 600nm holes are needed for very high magnifications with ultra-high resolution cameras or large open areas are needed for larger specimens, C-flat™ is the perfect holey carbon grid.

C-flat™ is immediately available in several standard array patterns including hole diameters/hole spacings of 0.6/2, 1/1, 1/2, 1/4, 1.2/1.3, 2/1, 2/2, 2/4, 4/2, and a multihole pattern. C-flat™ is supported by your choice of a 200 mesh or 400 mesh copper TEM grid and sold in quantities of 25, 50, or 100.

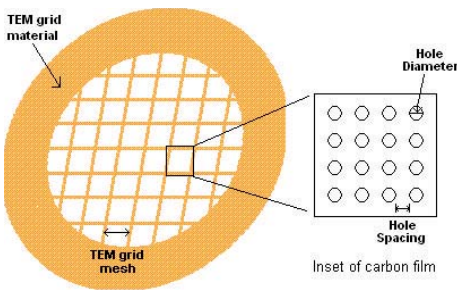




Frozen-Hydrated Bacteriophange Capsid
(data acquired on CF-1.2/1.3-4C)



250,000 particles of GroEL in 24 hours.
Image Courtesy of Scott Stagg and Mike Pique
NRAMM, The Scripps Research Institute
(data acquired on CF-2/2-4C)



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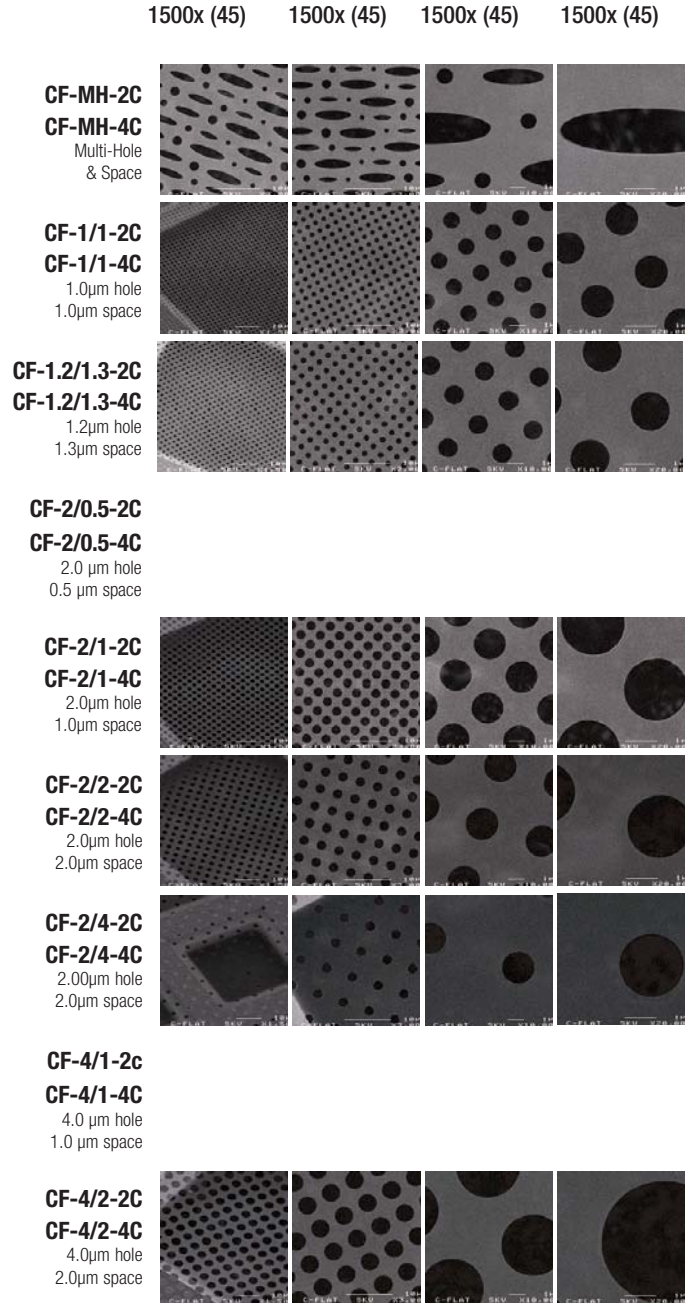
C-flat™

Product Code	Cat. #	Hole Size	Hole Spacing	TEM Mesh	TEM Grid	Qty.
CF-1.2/1.3-2C	**CF213-25**	1.2 µm	1.3 µm	200	Cu	25/pk.
	CF213-50	1.2 µm	1.3 µm	200	Cu	50/pk.
	CF213-100	1.2 µm	1.3 µm	200	Cu	100/pk.
CF-1.2/1.3-4C	**CF413-25**	1.2 µm	1.3 µm	400	Cu	25/pk.
	CF413-50	1.2 µm	1.3 µm	400	Cu	50/pk.
	CF413-100	1.2 µm	1.3 µm	400	Cu	100/pk.
CF-2/0.5-2c	**CF205-Cu-25**	2.0 µm	0.5 µm	200	Cu	25/pk
	CF205-Cu-50	2.0 µm	0.5 µm	200	Cu	50/pk
	CF205-Cu-100	2.0 µm	0.5 µm	200	Cu	100/pk
CF-2/0.5-4C	**CF405-Cu-25**	2.0 µm	0.5 µm	400	Cu	25/pk
	CF405-Cu-50	2.0 µm	0.5 µm	400	Cu	50/pk
	CF405-Cu-100	2.0 µm	0.5 µm	400	Cu	100/pk
CF-2/1-2C	**CF212-25**	2.0 µm	1.0 µm	200	Cu	25/pk.
	CF212-50	2.0 µm	1.0 µm	200	Cu	50/pk.
	CF212-100	2.0 µm	1.0 µm	200	Cu	100/pk.
CF-2/1-4C	**CF412-25**	2.0 µm	1.0 µm	400	Cu	25/pk.
	CF412-50	2.0 µm	1.0 µm	400	Cu	50/pk.
	CF412-100	2.0 µm	1.0 µm	400	Cu	100/pk.
CF-2/2-2C	**CF-222C-25**	2.0 µm	2.0 µm	200	Cu	25/pk.
	CF-222C-50	2.0 µm	2.0 µm	200	Cu	50/pk.
	CF-222C-100	2.0 µm	2.0 µm	200	Cu	100/pk.
CF-2/2-4C	**CF-224C-25**	2.0 µm	2.0 µm	400	Cu	25/pk.
	CF-224C-50	2.0 µm	2.0 µm	400	Cu	50/pk.
	CF-224C-100	2.0 µm	2.0 µm	400	Cu	100/pk.
CF-2/4-2C	**CF242-25**	2.0 µm	4.0 µm	200	Cu	25/pk.
	CF242-50	2.0 µm	4.0 µm	200	Cu	50/pk.
	CF242-100	2.0 µm	4.0 µm	200	Cu	100/pk.
CF-2/4-4C	**CF442-25**	2.0 µm	4.0 µm	400	Cu	25/pk.
	CF442-50	2.0 µm	4.0 µm	400	Cu	50/pk.
	CF442-100	2.0 µm	4.0 µm	400	Cu	100/pk.
CF-4/1-2C	**CF241-Cu-25**	4.0 µm	1.0 µm	200	Cu	25/pk
	CF241-Cu-50	4.0 µm	1.0 µm	200	Cu	50/pk
	CF241-Cu-100	4.0 µm	1.0 µm	200	Cu	100/pk
CF-4/1-4C	**CF441-Cu-25**	4.0 µm	1.0 µm	400	Cu	25/pk
	CF441-Cu-50	4.0 µm	1.0 µm	400	Cu	50/pk
	CF441-Cu-100	4.0 µm	1.0 µm	400	Cu	100/pk
CF-4/2-2C	**CF422-25**	4.0 µm	2.0 µm	200	Cu	25/pk.
	CF422-50	4.0 µm	2.0 µm	200	Cu	50/pk.
	CF422-100	4.0 µm	2.0 µm	200	Cu	100/pk.
CF-4/2-4C	**CF424-25**	4.0 µm	2.0 µm	400	Cu	25/pk.
	CF424-50	4.0 µm	2.0 µm	400	Cu	50/pk.
	CF424-100	4.0 µm	2.0 µm	400	Cu	100/pk.
CF-MH-2C	**CF2MH-25**	Multihole*		200	Cu	25/pk.
	CF2MH-50	Multihole*		200	Cu	50/pk.
	CF2MH-100	Multihole*		200	Cu	100/pk.
CF-MH-4C	**CF4MH-25**	Multihole*		400	Cu	25/pk.
	CF4MH-50	Multihole*		400	Cu	50/pk.
	CF4MH-100	Multihole*		400	Cu	100/pk
CF-1/1-2C	**CF21-25**	1.0 µm	1.0 µm	200	Cu	25/pk.
	CF21-50	1.0 µm	1.0 µm	200	Cu	50/pk.
	CF21-100	1.0 µm	1.0 µm	200	Cu	100/pk.
CF-1/1-4C	**CF41-25**	1.0 µm	1.0 µm	400	Cu	25/pk.
	CF41-50	1.0 µm	1.0 µm	400	Cu	50/pk.
	CF41-100	1.0 µm	1.0 µm	400	Cu	100/pk.



C-flat™ mounted on a stub using carbon tape and imaged with a Field Emission Scanning Electron Microscope

* The Multihole device has a staggered pattern of six features consisting of three circle patterns of 1 micron, 1.4 micron and 2 micron diameter and three ellipse patterns of 1x4 microns, 1.4x5.6 microns and 2x8 microns.

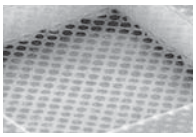
➤ QUANTIFOIL®–Holey Carbon Films

QUANTIFOIL® is a perforated support foil with pre-defined hole size, shape and arrangement. It has advantages in electron microscopy (EM) or low-energy electron point source (LEEPS) microscopy when compared with conventional holey film.

QUANTIFOIL® is offered with circular and square, orthogonal arranged holes. Films with different hole sizes and bar widths are available. Carbon is the standard material that makes the foil.

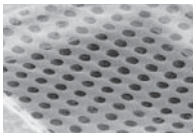
QUANTIFOIL® is a superior quality of holey carbon film, which facilitates the use of automation in TEM. (The Imaging Technology Group of Dr. Bridget Carrageen, University of Illinois at Urbana-Champaign, has developed a system, called Leginon, for automatically acquiring images from a transmission electron microscope)

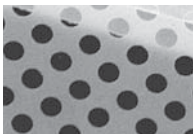
QUANTIFOIL®® with circular holes is used in cryo-electron tomographic reconstruction. The roundness of the holes is advantageous with respect to the formation of an ice layer of constant thickness. The whole size chosen depends on the magnification used, and on whether or not one wishes to include support film in the image. Assessment of the image quality is easier when foil is included in the picture, because the power spectrum of a foil is stronger than that of unsupported ice.



QUANTIFOIL®
R 1.2/1.3

The surface properties of QUANTIFOIL® holey carbon support film, especially the wetting properties, may have to be adapted according to one's particular requirements. Untreated aging QUANTIFOIL® tends to be hydrophobic. Hydrophillicity of the foil can be achieved by glow discharging in residual air or by metal coating.



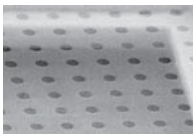


QUANTIFOIL®
R 2/2

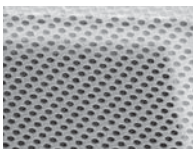
QUANTIFOIL® in low-energy electron point source (LEEPS) microscopy. Quantifoil® with a regular pattern is required in order to be able to distinguish an object, which is spanned over a hole. An object cannot be discriminated from the support in the case of conventional holey support film. (H.W. Fink & C. Schonenberger, University of Basel, used **QUANTIFOIL®** for the measurement of electrical current through DNA molecules.)

The foil is ~12 nm thick and mounted on either copper, nickel or gold grids with either square or round holes of different sizes.

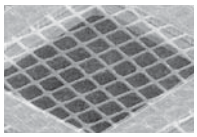
Holey films with 2µ round holes are used at magnifications between 30,000x and 40,000x.



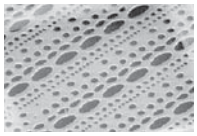
- **QUANTIFOIL® R 2/4** may be preferred over R 2/2, when an increased tolerance with respect to the position of beam, and a larger beam diameter are desired, such as in the case of automated image acquisition.



- **QUANTIFOIL® R 2/1** has more open area than R 2/2. It is used when focusing is carried out on the edge of a hole burnt in the ice in a neighboring hole instead of on the foil adjacent to the hole.
- **QUANTIFOIL® with square holes** and relatively narrow bars can be used in EM to support a thin carbon film, which by itself is too fragile to span a grid square. Alternatively, this holey film can directly support an object that is larger than the holes.



- **QUANTIFOIL® S 7/2** constitutes an optimum between a maximum of open area on the one hand, and mechanical stability on the other hand.



- **QUANTIFOIL® Multi A** is a holey film, which consists of various pattern hole sizes, shapes and arrangements is repeated. In addition to round holes, the pattern includes oval-shaped ones, which appear round at high tilt angles (~70°). The diameters of the round holes are about 1, 1.4 and 2µ, and the bar widths range from 0.5 to 4µ. The oval holes in the foil have a dimension of 8 x 2µ and 4 x 1µ.

ORDERING INFORMATION:

QUANTIFOIL® *is generally delivered as a carbon foil; it can be reinforced with plastic film. The standard thickness for the carbon foil is 12 nm; other thicknesses between 10 and 25 nm can be made upon request.*

QUANTIFOIL® *is supplied with 200 mesh copper, nickel or gold grids. Other meshes are also available upon request as a special order. All special orders are made available within two to three weeks, and the quantity is a minimum of 100 grids or multiples of 100.*

Cat. #	Hole Shape	Hole Size	Period	200 Mesh Grid Type	Pack
Q225-CS7	S7/2	7x7µ	9µ	Copper	25/pk.
Q250-CS7	S7/2	7x7µ	9µ	Copper	50/pk.
Q225-NS7	S7/2	7x7µ	9µ	Nickel	25/pk.
Q250-NS7	S7/2	7x7µ	9µ	Nickel	50/pk.
Q225-AS7	S7/2	7x7µ	9µ	Gold	25/pk.
Q250-AS7	S7/2	7x7µ	9µ	Gold	50/pk.
Q225-CR1	R2/1	2µ	3µ	Copper	25/pk.
Q250-CR1	R2/1	2µ	3µ	Copper	50/pk.
Q225-NR1	R2/1	2µ	3µ	Nickel	25/pk.
Q250-NR1	R2/1	2µ	3µ	Nickel	50/pk.
Q225-AR1	R2/1	2µ	3µ	Gold	25/pk.
Q250-AR1	R2/1	2µ	3µ	Gold	50/pk.
Q225-CR2	R2/2	2µ	4µ	Copper	25/pk.
Q250-CR2	R2/2	2µ	4µ	Copper	50/pk.
Q225-NR2	R2/2	2µ	4µ	Nickel	25/pk.
Q250-NR2	R2/2	2µ	4µ	Nickel	50/pk.
Q225-AR2	R2/2	2µ	4µ	Gold	25/pk.
Q250-AR2	R2/2	2µ	4µ	Gold	50/pk.
Q225-CR4	R2/4	2µ	6µ	Copper	25/pk.
Q250-CR4	R2/4	2µ	6µ	Copper	50/pk.
Q225-NR4	R2/4	2µ	6µ	Nickel	25/pk.
Q250-NR4	R2/4	2µ	6µ	Nickel	50/pk.
Q225-CR1.3	R1.2/1.3	~1.2	~2.5	Copper	25/pk.
Q250-CR1.3	R1.2/1.3	~1.2	~2.5	Copper	50/pk.
Q225-NR1.3	R1.2/1.3	~1.2	~2.5	Nickel	25/pk.
Q250-NR1.3	R1.2/1.3	~1.2	~2.5	Nickel	50/pk.
Q225-CMA	Multi A	–	–	Copper	25/pk.
Q250-CMA	Multi A	–	–	Copper	50/pk.
Q225-NMA	Multi A	–	–	Nickel	25/pk.
Q250-NMA	Multi A	–	–	Nickel	50/pk.

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DuraSiN™

Introduction

DuraSiN™ Film and Mesh products have revolutionized the way samples are prepared for and analyzed in the transmission electron microscope.

DuraSiN™ Film and Mesh products are affordably-priced, durable, nonorganic, low scatter support grids for quantitative TEM and X-ray analysis. DuraSiN™ products are made of a thin, high quality, low-stress silicon nitride membrane supported around its perimeter by a rigid silicon substrate.

Unlike other support films and grids, DuraSiN™ Film and Mesh products can withstand harsh chemical and temperature environments. For example, DuraSiN™ Film or Mesh products could be used as a substrate onto which nanowires could be directly grown from a strong acidic solution. Once the nanowires are grown, the specimen is immediately ready for imaging and analysis in the TEM. With direct deposition, no longer will you have to prepare a sample on one substrate only to then have to transfer it to a support grid for imaging.

Overview

DuraSiN™ Film and Mesh products are affordably-priced, durable, nonorganic, low scatter support grids for quantitative TEM and X-ray analysis. When seeking the highest possible resolution, DuraSiN™ Film and Mesh products provide the ideal platform for imaging and analysis.

DuraSiN™ Film

The DuraSiN™ Film support grids are composed of two materials. The area for specimen observation is fabricated from chemically robust, low-stress, planar silicon nitride films and this area is supported by a rigid silicon frame where the frame thickness available for these products ranges from 200 - 600 microns. The DuraSiN™ Film support grids provide a cost-effective and durable platform for sample preparation, cleaning, imaging and analysis.

Perfect for the analysis of colloids, powders, aerosols and polymers. The DuraSiN™ Film provides durable, non-organic, low scatter substrates for quantitative TEM and X-ray analysis at affordable prices. DuraSiN™ Film substrates are fabricated from high quality, low-stress silicon nitride and supported on a rigid silicon substrate. DuraSiN™ Film products are robust to most cleaning procedures, including acetone, alcohol and oxygen plasma/UV ozone. Products are available in sizes ranging from standard TEM (2.65mm diameter) to greater than 10mm for x-ray applications.

DuraSiN™ Mesh

DuraSiN™ Mesh support grids are also fabricated from chemically robust, low-stress, planar silicon nitride films and are supported by a rigid silicon frame. However, DuraSiN™ Mesh has a regular array of small, dense holes fabricated across the observation area thereby providing truly electronbeam transparent regions for specimen imaging and analysis. DuraSiN™ Mesh support substrates offer the unique combination of an inorganic support film and regions completely transparent to an electron beam.

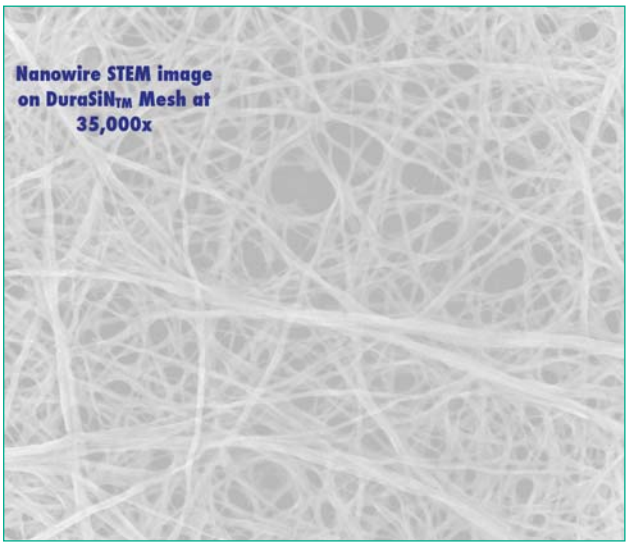

Image courtesy of Mike Salmon, NCSU AIF

These two features provide the microscopist and micro-analyst with unparalleled capability for imaging and analysis. Like other holey or lacey support films, DuraSiN™ Mesh support substrates provide regions completely unobstructed by the support film. However, the fact that the DuraSiN™ Mesh is made from inorganic silicon nitride provides the ability to thoroughly clean (e.g. with an aggressive oxygen plasma) a specimen already fixed to the support substrate and to assure that the imaging and analysis is done only upon on the specimen rather than unintended contamination. For example, when analyzing carbon nanotubes, DuraSiN™ provides a clean, carbon-free support to isolate the specimen from carbon contamination.

Features & Advantages

DuraSiN™ Films and Mesh products are chemically and mechanically robust support films for X-ray and TEM microscopy and they are available at more affordable prices than any other product in their class. DuraSiN™ offers unparalleled advantages over the traditional carbon-based support grids. If your research involves materials that are grown or deposited in harsh environments, DuraSiN™ may be the perfect support film for you. Capable of withstanding virtually any acid, base or solvent, DuraSiN™ allows the deposition or growth of colloids, fibers, nanoparticles, powders, polymers or wires directly onto the support film itself. Its temperature stability up to 1000 ˚C even allows direct deposition using standard physical and vapor deposition techniques common in the semiconductor industry, including CVD, sputtering, e-beam and resistive evaporation. With direct deposition or growth onto DuraSiN™, any ambiguity introduced from sample transfer to a less robust support film is eliminated. The temperature stability of DuraSiN™ also allows the observation of dynamic processes when several samples are removed for analysis at various times in the deposition, growth or anneal process.

➤ DuraSiN™

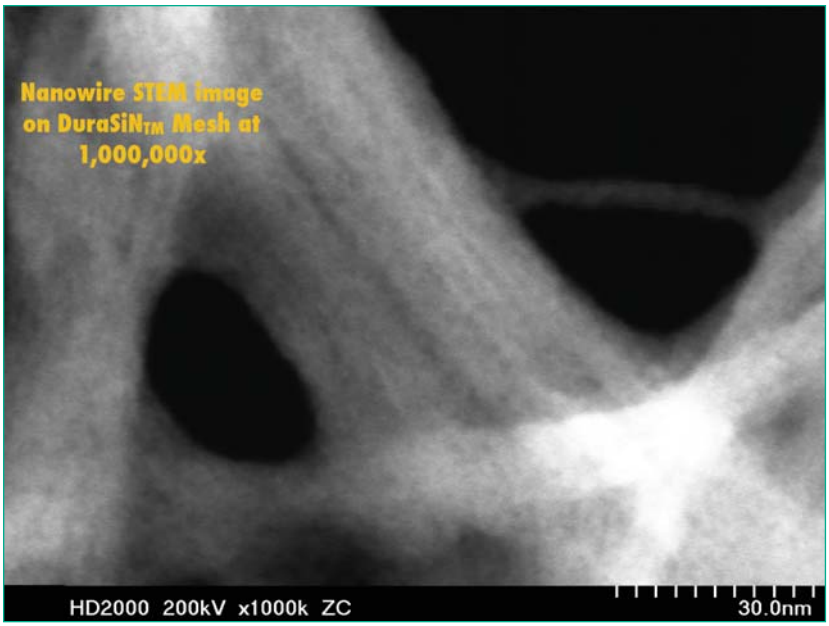

Image courtesy of Mike Salmon, NCSU AIF

The mechanical stability of DuraSiN™ offers a support film that is ideal for multi-analysis, in particular, TEM or X-ray and AFM. DuraSiN™ Film and Mesh products are not only robust enough to allow direct deposition and growth, but are also strong enough to allow AFM directly on the membrane, giving microscopists the ability to analyze both internal structure and surface detail in the exact same viewing area. In addition, DuraSiN™'s mechanical strength offers wide area membranes without the need for underlying grid bars eliminating the unwanted roughness, contamination or obstruction of other support grids.

Where cleanliness is a concern, particularly for compositional analysis using EDAX, etc., DuraSiN™ can be vigorously cleaned using processes previously not possible with carbon-based supports. DuraSiN™ can be cleaned in sulfuric acid to remove organics, as well as glow-discharge and high-energy oxygen plasma. Using these techniques, a pristine, carbon-free surface can be obtained for subsequent specimen deposition or growth and analysis.

DuraSiN™ is available in both continuous films and patterned meshes, in a variety of shapes and sizes, many customizable. DuraSiN™ Mesh is the only support available with hole sizes down to 1 micron in diameter, allowing the observation of the shortest fibers or wires. It is the highest quality, most affordable product in its class.

➤ Applications

Quantitative analysis of carbon containing specimens

- photoresists
- polymers
- foods
- oils
- dyes

Chemical deposition and growth

- nanowires
- carbon nanotubes
- colloids
- self-assembled monolayers

Particle analysis

- powders
- aerosols
- nanoparticles
- airborne particles

Chemical reactions

- catalysis
- active sites

New material discovery

- multianalysis
- high temperature
- acidic/basic sample prep

Top 10 Reasons to Use DuraSiN™ Film and Mesh Products

1. DuraSiN™ products are affordable

Since they are sold in sold in single grid quantities and in multi-grid packs, customers can try several different products at an affordable cost to optimize sample preparation and imaging conditions

2. DuraSiN™ products allow multiple microscopy techniques to be performed on the same specimen

The mechanical stability of DuraSiN™ products allow direct deposition and growth of specimens and are strong enough to allow AFM directly on the membrane giving microscopists the ability to analyze both internal structure and surface detail in the exact same viewing area

3. DuraSiN™ products are robust to solvents, bases and acids

Samples grown under strong acidic or basic conditions can be grown, deposited or synthesized directly onto a DuraSiN™ Film or Mesh

4. DuraSiN™ products can withstand high temperatures (up to 1000°C)

Samples grown or deposited directly onto DuraSiN™ can be annealed or cured at elevated temperatures while mounted to a support grid

5. DuraSiN™ products are robust to glow discharge high energy plasma cleaning

Glow discharge can be used to modify the surface of DuraSiN™ products and high energy plasmas can be used to aggressively remove any organic residuals from the sample preparation process

6. DuraSiN™ has an ultra-flat surface

Reduce both specimen preparation time and imaging artifacts introduced by other non-planar support grids

7. DuraSiN™ provides a large viewing area free of grid bars

Examine specimens through large tilt angles without losing data from grid bars

8. DuraSiN™ can be produced with extended functionality integrated onto the support film

In-situ characterization is possible with advanced features such as integrated electrodes

9. DuraSiN™ Mesh products provide a regular array of micron-scale holes

The regular array of micron-scale holes available only with DuraSiN™ Mesh enables the highest resolution possible for nanowires, carbon nanotubes, fibers, powders and colloids

10. DuraSiN™ can be manufactured with fully customizable frame & window dimensions, hole patterns and membrane thickness

The DuraSiN™ product family offers the maximum flexibility to meet specific customer needs

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DuraSiN™

Applications

DuraSiN™ Film and Mesh products are robust over extreme temperatures and in harsh chemical environments making them an ideal choice for many applications

1. Quantitative analysis of carbon containing specimens

-- DuraSiN™ Film and Mesh provide a carbon-free support allowing more accurate compositional analysis of carbon-containing compounds

-- The continuous, ultra-planar surface of DuraSiN™ Film is ideal for the deposition of polymers allowing the nanostructure of ordered polymer layers to be quantified

2. Chemical deposition and growth

-- Surface modification of DuraSiN™ Film or Mesh silicon nitride membranes allows attachment and analysis of target materials

-- Liquid samples can be dried on and supported by DuraSiN™ Film

-- The large, regular array of holes for imaging on DuraSiN™ Mesh provides numerous electron-transparent analysis sites

3. Nanoparticle analysis

-- Fine powders can be deposited and imaged over the electron-transparent holes of DuraSiN™ Mesh

-- Atomized nanoparticles can be deposited and imaged at near-atomic resolution on continuous DuraSiN™ Film

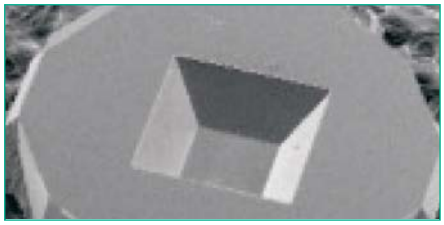
4. Chemical reactions

-- The impact of particle size & separation can be quantified with DuraSiN™

-- Oxidation and reduction reactions can be observed in-situ or ex-situ with DuraSiN™ Film and Mesh

5. New material discovery

-- Multiple analysis techniques (e.g. TEM, STEM, XRAY, SEM, XPS, AES and AFM) can all be performed on the same specimen when it is supported by DuraSiN™ Film or Mesh

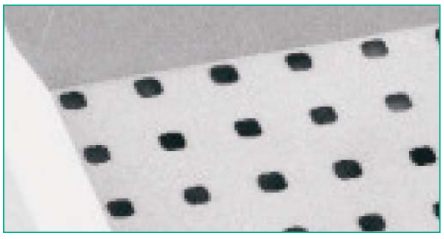


SEM image of a DuraSiN™ Film (taken from the back side)

DuraSiN™ Film

DuraSiN™ Film products are specifically designed to give TEM/STEM and X-ray microscopists a support film that can withstand virtually any environment needed to grow or deposit a specimen. If your specimen requires exposure to high temperatures, acids, bases and/or solvents, consider growing them directly on DuraSiN™ Film - samples will not need to be transferred to another support for imaging and the presence of imaging artifacts introduced by specimen preparation can be virtually eliminated. Self-assembled monolayers can be formed on a DuraSiN™ Film membrane for subsequent attachment of nanoparticles.

Perfect for the analysis of colloids, powders, aerosols and polymers. The DuraSiN™ Film products provide a durable, non-organic, low scatter substrate for TEM and X-ray analysis at affordable prices. Sandwich them together and form a closed environment for wet cell applications. Our films are even robust enough to allow multianalysis, including AFM and TEM using the same grid.



SEM image of a DuraSiN™ Mesh (taken from the back side)

DuraSiN™ Mesh

DuraSiN™ Mesh products are a completely novel product, offering all the advantages of the Film products but with the benefit of having completely electron transparent regions (holes) in the film. Holes are available in a variety of shapes and sizes, down to even submicron features.

DuraSiN™ support films are ideal for **multianalysis of samples**, including fibers, colloids, nanowires and powders. The rigid silicon frame provides an area for AFM analysis, just microns from the transparent window regions for TEM,STEM and X-ray. Remove the experimental ambiguity of analyzing different specimens when combining microscopy techniques. A specimen can be deposited or grown directly on DuraSiN™ Films and then a single specimen can be analyzed with TEM, STEM, AFM and X-ray. Depending upon the DuraSiN™ window thickness and AFM stylus force, some users have even been able to AFM their specimen directly on the membrane itself.

Product Line

Based upon low-Z, inert silicon nitride, the DuraSiN™ Film and Mesh products are specifically designed to give TEM/STEM and X-ray microscopists a support film that can withstand virtually any environment needed to grow, deposit and/or image a specimen. DuraSiN™ Film and Mesh products are ideal if your specimen requires exposure to high temperatures, acids, bases and/or solvents. If your samples are grown in these conditions, consider synthesizing them directly on support films to prevent transferring to another support for imaging.

DuraSiN™ Film products are fully specified by 4 parameters: window size, frame thickness, film thickness and frame size. DuraSiN™ Mesh products require two additional parameters: hole size and center-center hole pitch. There are several standard and immediately available DuraSiN™ products specifically designed for TEM and X-ray applications as outlined below. Of course given their mechanical durability and robustness to temperature and chemicals, all of the DuraSiN™ products make ideal substrates for performing and then correlating the results from multiple microscopy techniques all on the same specimen.

DuraSiN™ Film for TEM

Description	DTF-05523	DTF-1523	DTF-2523
Film Thickness	50nm	100nm	200nm
Window Area	0.5mm	0.5mm	0.5mm
Frame Diameter	2.65mm	2.65mm	2.65mm
Frame Thickness	300µm	300µm	300µm

DuraSiN™ Film for X-ray

Description	DX-2513	DX-2253
Film Thickness	200nm	200nm
Window Area	2.5mm	5mm
Frame Diameter	5mm	10mm
Frame Thickness	300µm	300µm

DuraSiN™ Mesh for TEM

Description	DTM-25231	DTM-25232	DTM-25233
Film Thickness	200nm	200nm	200nm
Window Area	0.5mm	0.5mm	0.5mm
Frame Diameter	2.65mm	2.65mm	2.65mm
Frame Thickness	300µm	300µm	300µm
Hole Size	2µm	1µm	2µm
Hole Pitch	12µm	12µm	4µm

DuraSiN™

Customization

We realize that each customer has unique needs. Because specimens vary greatly in composition and size, and because DuraSiN™ finds use in numerous analytical and imaging techniques, there is no "ideal" product shape and size. To meet the diverse and demanding needs of the research community, DuraSiN™ Film and Mesh products were designed to facilitate customization and meet a user's specific requirements. For example, X-ray microscopists may be interested in DuraSiN™ products with a larger window area and with a thicker silicon nitride membrane. Users with microscopes that have a unique sample support fixturing may be interested in DuraSiN™ products with a larger frame diameter. Finally, for the most demanding applications, ultra-thin silicon nitride membranes (<50nm) may be required.

DuraSiN™ products can be customized to target a specific silicon nitride membrane thickness, silicon frame thickness, window area, and/or frame area. Most custom dimensional changes can be accommodated in only 3-4 weeks, and most other custom requests can be completed within 4-6 weeks. Please note that customized products may be more expensive, and minimum quantities may apply.

While almost any parameter defining the structure of DuraSiN™ products can be customized, there are ranges for these parameters that generally need to be considered:

Description	DuraSiN™ Film for TEM	DuraSiN™ Mesh for TEM	DuraSiN™ Film for X-ray
Film Thickness	30nm - 200nm	30nm - 200nm	100nm - 200nm
Window Area	0.2mm - 0.7mm	0.2mm - 0.7mm	0.5mm - 10mm
Frame Diameter	2.65mm	2.65mm	2.65mm - 15mm
Frame Thickness	200µm - 600µm	200µm - 600µm	200µm - 600µm
Hole Size	N/A	>0.8µm	N/A
Hole Pitch	N/A	depends on hole size and shape	N/A

Membrane Thickness

Standard DuraSiN™ products are available with 50nm, 100nm, and 200nm silicon nitride membrane thickness. Custom membranes can be manufactured with silicon nitride film thickness ranging from 20nm up to several microns thick. Typically, very thin windows (<50nm) are compatible with small window area while thicker windows can be used with any window area, including large area windows. It should be noted that extremely thin windows must be handled very carefully due to their fragile nature.

Window Area

Standard DuraSiN™ products have square windows are available with edge length ranging from 500um to 5mm. Custom window areas can be manufactured with window area ranging from um to mm. The maximum window area is a function of the membrane thickness, and larger windows can produced from thicker nitride. Very small windows can also be manufactured, but, due to process constraints, these small windows may exhibit a larger window size variation among samples, for example 50um +/- 20um. Rectangular windows (sometimes known as "slot grids") with custom dimensions can also be produced.

Frame Diameter

Standard DuraSiN™ products have frame diameter ranging from 2.65mm to 10mm. Custom frame diameters can be manufactured with frame diameter ranging from 2.65mm to 10mm. Typically, larger window areas require a larger frame diameter. The minimum frame diameter than can be produced is the TEM size (2.65mm), presently offered through EMS along with 5mm and 10mm frame sizes. However, any size between 2.65mm and 15mm can be custom ordered.

Product Comparisons

DuraSiN™ vs. copper, molybdenum, formvar and carbon TEM grids

DuraSiN™ silicon nitride membranes are the "high-tech" alternative to standard metal TEM grids. Using the tools and techniques of semiconductor manufacturing, DuraSiN™ is created as a silicon nitride membrane supported by a silicon frame. Samples deposited on to the membrane can be imaged using TEM, X-ray, STEM, SEM and other techniques. Compared to standard TEM grids, DuraSiN™ offers the user several advantages. DuraSiN™ membranes are extremely thin – from 200nm down to 50nm and thinner. DuraSiN™ products are extremely planar. DuraSiN™ products are resistant to acids, bases, solvents, and plasma cleaning.

DuraSiN™ products can withstand a wide temperature range. These attributes are critical in a variety of applications. The planarity and strength of the silicon nitride membrane allows the user to perform multi-analysis (i.e. the use of several complementary microscopy and analytical techniques on the same sample, for example AFM/TEM or SEM/ TEM). DuraSiN™ silicon nitride membranes also allow imaging of wet samples via SEM/TEM/XRM by placing the sample between two membranes (this configuration is commonly known as a "wet cell"). Since silicon nitride can withstand acids, bases, solvents and high temperatures, DuraSiN™ membrane supports can be used to image a wide variety of reactions on the membrane surface in-situ. In short, DuraSiN™ allows the user to obtain high-quality images in ways that are impossible with standard TEM grids.

DuraSiN™ vs. competing silicon nitride TEM grids

DuraSiN™ silicon nitride membranes have properties similar to competing silicon nitride sample supports. They are offered in standard form factors, are based on low-stress silicon nitride membrane technology, and have similar chemical resistance/temperature properties. DuraSiN™, however, offers customers two key differences.

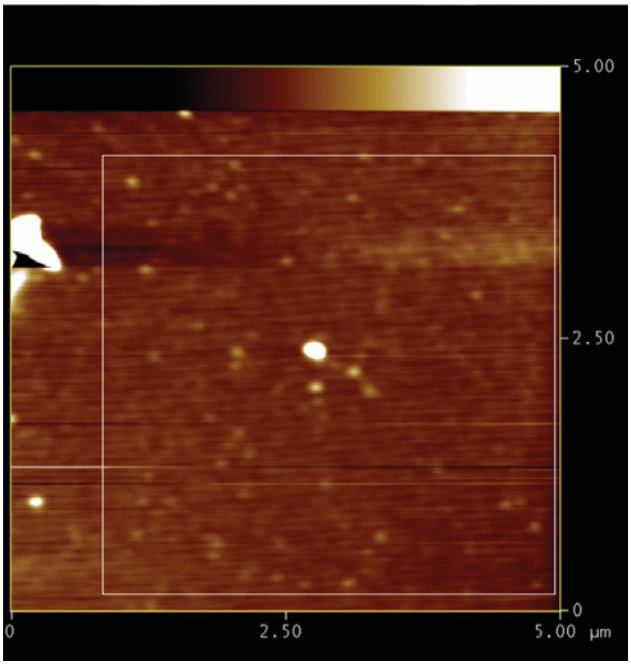
DuraSiN™ is available through EMS in quantities as small as a single grid – this enables users to sample a variety of grids at reasonable cost without the constraint of large minimum orders. More importantly, the availability of singlegrid packs allows customers to quickly and inexpensively determine which product is ideal for their particular application.

DuraSiN™ products also offer the customer the highest level of customization. Frame size, window size, and nitride thickness can all be adjusted to meet specific research needs using a set of proprietary manufacturing techniques. Moreover, since DuraSiN™ is designed and manufactured in the United States, we can provide customization of all products faster than the competition, whose products are manufactured elsewhere. This flexibility and rapid response makes DuraSiN™ the ideal choice for silicon nitride membrane supports.

DuraSiN™

Property	DuraSiN™ silicon nitride support films	Copper TEM Grids	Molybdenum TEM Grids	Formvar/Carbon coated TEM grids
enables AFM and TEM on the same region of specimen	✔	✘	✘	✘
robust to glow discharge & high energy plasma cleaning	✔	✔	✔	✘
robust to solvents, bases and acids	✔	✔	✔	✘
robust to high temperatures (up to 1000 ˚C)	✔	✘	✔	✘
ultra-flat	✔	✘	✘	✘
capable of integrated functionality directly on support film	✔	✘	✘	✘
sold in single grid quantities	✔	✘	✘	✘
fully customizable frame and window dimension, hole patterns and membrane thickness	✔	✘	✘	✘

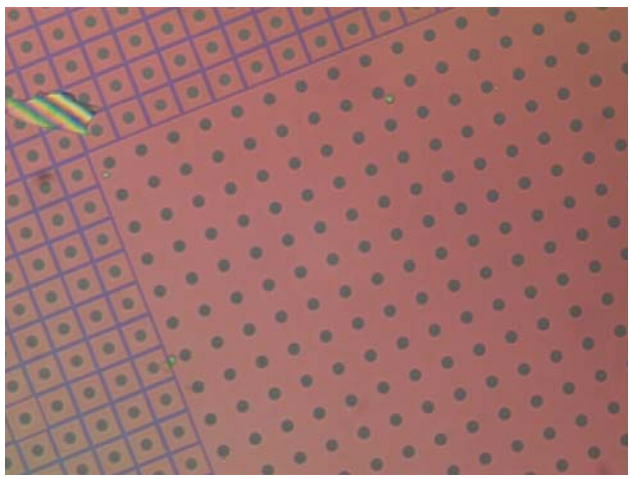
Technical Data



SURFACE ROUGHNESS
DuraSiN™ (100nm thick) AFM data

Surface Roughness

Surface roughness AFM data for 100nm thick DuraSiN™ films is shown below. The data was acquired from a 5µm scan across the surface. The average surface roughness in the boxed area (ignoring the dust particle to the left) is 3.39 angstroms. Although some variation is expected from device to device, DuraSiNTM 100 and 200nm films typically have an average surface roughness in the 3.0-angstrom range.



SURFACE FLATNESS
DuraSiN™ Mesh image taken through a DI 20x objective, white light source

DuraSiN™ products with 50nm films typically have a slightly larger average roughness than the 100nm and 200nm films. As determined by AFM, the 50nm DuraSiN™ films typically exhibit average surface roughness of about 1.2nm.

Surface Flatness

Flatness is a measure of how warped or bowed the surface is. As measured though a 20X DI microscope objective, the images do not demonstrate any measurable deformations. The regions around the 2-micron holes are completely flat, without any lip or curl around the edge of the hole allowing specimens to lay flat across the holes. The image of the film also does not show any deformations. As a reference, the pieces of dust viewable in the image stands out because of the difference in surface height with respect to the film.

DuraSiN™

Solvent and Acid Robustness

DuraSiN™ Films and Meshes are robust to most solvent and acid treatments, and can be cleaned with virtually any process required by your specimen preparation protocol. Solvents such as methanol, ethanol and acetone have no effect on the film. Acids, including sulfuric and nitric, also do not affect the film. Other common cleaning procedures such as the J.T. Baker solution and RCA cleaning are also acceptable.

Plasma and Glow Discharge Robustness

DuraSiN™ Film and Mesh products are made from silicon nitride and are extremely robust to glow discharge cleaning and high-energy oxygen plasma. This is particularly useful when there is a need to completely remove organic residues that could either affect the image quality or EDAX measurements. The products have been exposed to high-energy, 300W oxygen plasma systems typically used for removing up to microns of photoresist in the semiconductor industry, and no etching was observed in spectroscopic thickness measurements. In addition, no degradation was observed when inspected through a high-power optical microscope.

Electron Transparency

Monte Carlo simulations on models of 100nm thick DuraSiN™ films, under the presence of a 120 and 200keV electron beam and probe size of 1 angstrom show almost zero electron scattering even after 10,000 trajectories are simulated. With standard available thicknesses from 50nm to 200nm and because of the amorphous structure of the film, atomic-scale resolution has been obtained with DuraSiN™ products, depending on the exact specimens under evaluation.

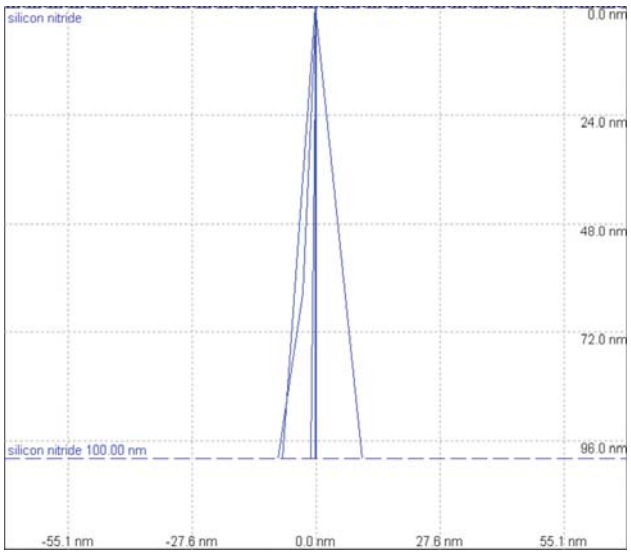
Chemical Robustness

The only acids which might adversely affect the films are 49% hydrofluoric acid when exposed for several minutes, or phosphoric acid when heated to temperatures greater than 150 ˚C. The need for these chemicals at these conditions is generally quite rare.

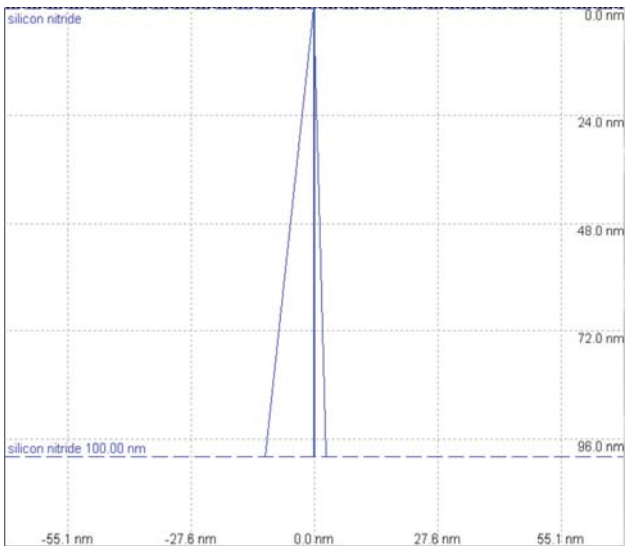
Because the films are in the nanometer thickness range, it is also not recommended that the grids be exposed to an ultrasonic bath. Cleaning for 30 minutes in concentrated sulfuric acid will generally remove organics and dust particles. Sometimes a final treatment in oxygen plasma or glow discharge is also applied.

Temperature Robustness

DuraSiN™ has been tested to temperatures near 500 ˚C in ambient, and near 800 ˚C in vacuum. No degradation, warping or bowing was observed using a 20X DI microscope objective. DuraSiN™ is expected to be stable at temperatures up to 1000 ˚C, which make the grids well suited for high temperature deposition steps.



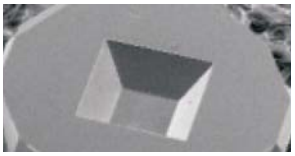
ELECTRON TRANSPARENCY
120keV electron beam, 100nm DuraSiN™ Film



ELECTRON TRANSPARENCY
200keV electron beam, 100nm DuraSiN™ Film

DuraSiN™ Film and Mesh Products provide the ideal platform for TEM imaging and analysis

- designed to aid microscopists and micro-analysts in TEM and multi-analysis work
- fully customizable frame & window dimensions, hole patterns and membrane thickness
- affordable
- ultra-flat
- robust to glow discharge high energy plasma cleaning
- robust to solvents, bases, acids & high temperatures (up to 1000 °C)
- large viewing area free of grid bars
- compatible with integrated functionality



SEM image of a DuraSiN™ Film (taken from the back side)

SEM image of a DuraSiN™ Mesh (taken from the back side)

DuraSiN™

DuraSiN™ Part Number Reference Guide

DuraSiN™ Film for TEM

COMMON FEATURES:

- 2.65mm diameter
- 300µm thick frame
- 500µm viewing window

UNIQUE FEATURES:

DTF-05523
- 50nm membrane

DTF-1523
- 100nm membrane

DTF-2523
- 200nm membrane

DuraSiN™ Film for X-ray

COMMON FEATURES:

- 300µm thick frame
- 200nm membrane

UNIQUE FEATURES

DX-2513
- 2.65mm diameter
- 500µm viewing window

DX-2253
- 2.65mm diameter
- 500µm viewing window

DuraSiN™ Mesh for TEM

COMMON FEATURES:

- 2.65mm diameter
- 300µm thick frame
- 500µm viewing window
- 200nm membrane

UNIQUE FEATURES:

DTM-25231
- array of 2µm holes
- 12µm center-center pitch

DTM-25232
- array of 1µm holes
- 12µm center-center pitch

DTM-25233
- array of 2µm holes
- 4µm center-center pitch

Ordering Information

Catalog numbers that are stated are for each and for packs of 10 just add a -25 after the part number.

DuraSiN™ Film for TEM

Catalog Number	DTF-05523	DTF-1523	DTF-2523
Film Thickness	50nm	100nm	200nm
Window Area	0.5mm	0.5mm	0.5mm
Frame Diameter	2.65mm	2.65mm	2.65mm
Frame Thickness	300µm	300µm	300µm

DuraSiN™ Film for X-ray

Catalog Number	DX-2513	DX-2253
Film Thickness	200nm	200nm
Window Area	2.5mm	5mm
Frame Diameter	5mm	10mm
Frame Thickness	300µm	300µm

DuraSiN™ Mesh for TEM

Catalog Number	DTM-25231	DTM-25232	DTM-25233	DTM-25234
Film Thickness	200nm	200nm	200nm	200nm
Window Area	0.5mm	0.5mm	0.5mm	0.5mm
Frame Diameter	2.65mm	2.65mm	2.65mm	2.65mm
Frame Thickness	300µm	300µm	300µm	300µm
Hole Size	2µm	1µm	2µm	7µm
Hole Pitch	12µm	12µm	4µm	9µm

Pyrolytic Graphite Stripper Film

Smooth pyrolytic graphite stripper film is used in radiation sources, nuclear particle high energy density research, and medical diagnostic imaging instruments

Pyrolytic graphite film offers major customer benefits relative to alternative materials such as amorphous carbon film or polycrystalline graphite films.

Pyrolytic graphite film is:

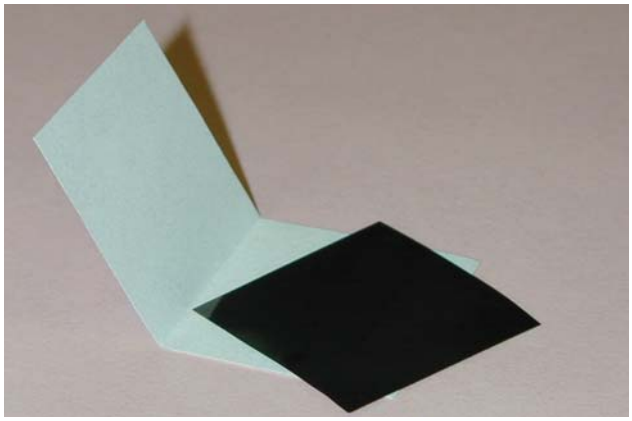
- Stable at high temperature and vacuum.
- Easy to flex due to inherent higher flexural modulus.
- Erodes very slowly.

Resulting in:

- Higher strength than alternative materials.
- Last 5 times longer than alternative materials.

PYROID® Pyrolytic Film Thickness/Real Size Conversion

Thickness, in.	Wt/sq in.	Thickness, µm	Wt/sq cm
0.0002	0.0065 g	5	1.0 mg
0.0004	0.0129 g	10	2.0 mg



Ordering:

EMS #	Film Size, in. (mm)	Thickness, µm	Pack
76040-05	0.75 x 0.75 (19 x 19)	5	each
76040-10	0.75 x 0.75 (19 x 19)	10	each
76041-05	1.0 x 1.0 (25.4 x 25.4)	5	each
76041-10	1.0 x 1.0 (25.4 x 25.4)	10	each

We can custom make foils up to 1.5 inch wide and 3 inches long from 5µm and up thicknesses.

Omniprobe Accessories and Consumables

This section is dedicated to the accessories and consumables from the Omniprobe family of Nanomanipulation Systems, including AutoProbe™ 200, AutoProbe™ AutoProbe™ 250, 300, Short-Cut™, OmniGIS™ and SST™ 400-1

Probe Tips

Tungsten /Nickel Probe Tips

Custom tip designed with a nickel tube shank and tungsten tip. Tip radius is 0.5µm with 13˚ taper angle for maximum lifetime service.

75960-01	Tungsten/Nickel Probe Tip	10/bx

Tungsten Probe Tips

Custom tip designed from tungsten. Tip radius is 0.5µm with 13˚ taper angle for maximum lifetime service.

75960-02	All Tungsten Probe Tip	10/bx

In-Situ Probe Tips

Custom tungsten tip with a stainless steel shank, for use with AutoProbe™ 300, in-situ probe tip exchange systems and Short-Cut™. Tip radius is 0.5µm with 8 –10˚ taper angle.

[This tip is also Short-Cut™ compatible]

75960-03	n-Situ Probe Tip	20/bx

Xtreme Access ½" Tungsten Probe Tips

Custom tip designed from tungsten. Tip radius is < 0.5µm with 13˚ taper angle for maximum lifetime service.

75960-04	XA ½" Tungsten Probe Tip	10/bx

Autoprobe 250 Tungsten Probe Tips

Custom tip designed from tungsten. Tip radius is < 0.5µm with 6˚ taper angle for maximum lifetime service. [Compatible with Short-Cut™ system for direct conversion to TEM grid]

75960-05	AP250 Tungsten Probe Tip	10/bx

Xtreme Access Short-Cut™ Probe Tips

Custom tip designed from tungsten. Tip radius is < 0.5µm with 6˚ taper angle for maximum lifetime service. [Compatible with Short-Cut™ system for direct conversion to TEM grid]

75960-06	XA Short Cut Tungsten Probe Tip	10/bx

Omni Grids

Copper Lift-Out Grids

Custom copper lift-out grids specifically designed for in-situ lift-out. These grids include multiple indexed mounting locations with both vertical bars and "V" shaped attachment surfaces. 3 mm diameter

75964-01	Copper Lift-Out Grids	100/vial

Molybdenum Lift-Out Grids

Custom molybdenum lift-out grids specifically designed for in-situ lift-out. These grids include multiple indexed mounting locations with both vertical bars and "V" shaped attachment surfaces. 3 mm diameter.

75964-02	Molybdenum Lift-Out Grids	25/vial

Beryllium Haft-Ring Grids

Custom beryllium haft ring grids, 3mm diameter.

75964-03	Beryllium Haft Ring Grids	

Copper 5-Post Lift-Out Grids

Custom copper 5-post lift-out grids specially designed for in-situ lift-out. These grids include multiple indexed mounting locations, all with vertical bars attachment surfaces. Now with lower profile sides for easier access to utermost posts 3mm diameter

75964-04	Copper 5-Post Lift-Out Grids	100/vial

Copper 4-Post Lift-Out Grids

Custom copper 4-post lift-out grids specially designed for in-situ lift-out. These grids include multiple indexed mounting locations, two with vertical bars attachment surfaces and two with "V" shaped alignment surfaces. Sides have lower profile for easier access to outermost posts. 3mm diameter

75964-05	Copper 4-Post Lift-Out Grids	100/vial

Molybdenum 4-Post Lift-Out Grids

Custom Molybdenum 4-post lift-out grids specially designed for in-situ lift-out. These grids include multiple indexed mounting locations, two with vertical bars attachment surfaces and two with "V" shaped alignment surfaces. Sides have lower profile for easier access to outermost posts. 3mm diameter.

75964-06	Mo 4-Post Lift-Out Grids	25/vial

Electron Microscopy Sciences *In PA: (215) 412-8400 • Toll-Free (800) 523-5874*
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Omniprobe Accessories and Consumables (continued)

Omni Grid Storage Box

Storage box for 100 standard or haft grids—3 mm diameter –TEM grids. Box comes complete with base, lid and clips.

75965-01	Grid Storage Box	each

Grid & Sample Holders

TEM Grid Dual Holders

Post Base TEM Grid Holder. Available with two versions: stainless steel (SS—very slightly magnetic), can affect imaging in UHS mode; and aluminum (Al-non-magnetic). Short post – standard is ⅛" (3.2mm) diameter x 0.15" (4mm) length.

75968-SS	EM, Grid Dual Holder, SS	each
75968-Al	TEM, Grid Dual Holder, Al	each

TEM Grid & Sample Holders

TEM grid holder with stations for 2 TEM grids and 2 sample stubs. Available with two versions: stainless steel (SS – very slightly magnetic), and aluminum (Al-non-magnetic). Long post – standard is ⅛" (3.2mm) diameter x 0.32" (8.1mm) length. Comes with 2 sample stubs

75969-SS	TEM Grid & Sample Holder, SS	each
75969-Al	TEM Grid & Sample Holder, Al	each

Single Stub & Two TEM Grids Holders

This station is meant for 2 TEM grids and 1 sample Pin Stub. Available in two versions: Stainless Steel (SS – very slightly magnetic), and Aluminum (Al – non-magnetic). Long post – standard is ⅛" (3.2mm) diameter x 0.32" (8.1mm) length. Comes with an aluminum sample stub.

75971-SS	TEM Grid & Sample Holder, SS	each
75971-Al	TEM Grid & Sample Holder, Al	each

Single TEM Grid Holders & Holder Base

Single TEM Grid Holder is made from aluminum with steel spring, holds one 3 mm TEM grid by the spring loaded vise, and has a raised edge whichprotects the sample from accidental damage. The holder has a ⅛" (3.2 mm) diameter x 0.32" pin (8.1 mm) length pin. It fits most standard pin stub holders.The Sample Holder Base securely holds the Single TEM Grid Holder above, under a stereomicroscope and permits viewing from two angles without changing focus.

75970-01	Single TEM Grid Holder	each
75970-50	Single TEM Grid Holder Base	each

Short-Cut™ Coupons

Frontside Thinning, 45˚

Frontside Thinning, 45˚, TEM sample grid coupon designed specially for use in the Short-Cut™ tool. The center portion is a standard 3 mm grid into which the sample loaded needle is swaged and cut 45˚. Available in two versions: One make from pure copper and the other is molybdenum coated copper.

75974-Cu	Frontside Thinning Copper, 45˚	20/pk
75974-Mo	Frontside Thinning Mo/Cu, 45˚	20/pk

Backside Thinning, 45˚

Backside Thinning, 45˚, TEM sample grid coupon designed specially for use in the Short-Cut™ tool. The center portion is a standard 3 mm grid into which the sample loaded needle is swaged and cut 45˚. Available in two versions: One made from pure copper and the Other is molybdenum coated copper.

75975-Cu	Backside Thinning Copper, 45˚	20/pk
75975-Mo	Backside Thinning Mo/Cu, 45˚	20/pk

Frontside Thinning, 26.5˚

Frontside Thinning, 26.5˚, TEM sample grid coupon designed specially for use in the Short-Cut™ tool. The center portion is a standard 3 mm grid into which the sample loaded needle is swaged and cut 26.5˚. Available in two versions: One made from pure copper and the other is molybdenum coated copper.

75976-Cu	Frontside Thinning Copper, 26.5˚	20/pk
75976-Mo	Frontside Thinning Mo/Cu, 26.5˚	20/pk

Backside Thinning, 26.5˚

Backside Thinning, 26.5˚, TEM sample grid coupon designed specially for use in the Short-Cut™ tool. The center portion is a standard 3 mm grid into which the sample loaded needle is swaged and cut 26.5˚. Available in two versions: One made from pure copper and the other is molybdenum coated copper.

75977-Cu	Backside Thinning Copper, 26.5˚	20/pk
75977-Mo	Backside Thinning Mo/Cu, 26.5˚	20/pk

Omniprobe Accessories and Consumables (continued)

Xtreme Access Compatible

XA Probe Point Holder

Xtreme Access Probe Tip Holder for use with ½" tungsten probe tip, #75960-04 and #75960-06. Comes with a storage vessel.

75961-10	XA Probe Point Holder	each

AP250 Probe Tip Holder

AutoProbe™ 250 probe tip holder uses the tungsten probe tip 75960-05. Compatible with the Short-Cut™ for direct conversion to TEM Grid. Comes with a storage vial and handle

75961-05	AP250 Probe Tip Holder	each

XA ½" Tungsten Probe Tips

Custom tip designed from tungsten. Tip radius is < 0.5µm with 13˚ taper angle for maximum lifetime service.

75960-04	XA ½" Tungsten Probe Tip	10/bx

XA Short-Cut™ Probe Tips

Custom tip designed from tungsten. Tip radius is < 0.5µm with 6˚ taper angle for maximum lifetime service. [Compatible with Short-Cut™ system for direct conversion to a TEM grid]

75960-06	AP250 Tungsten Probe Tip	10/bx

End Effector Type 2 (Curved)

Curved End Effector is designed for low attack angle manipulation and lift-out. The shank is curved to permit low angle approach and solid attachment beneath the sample plane without collision with the surrounding matrix. Available in two versions: Copper (Cu) Curved End Effector and Molybdenum (Mo) Curved End Efflector

75980-Cu	Cu Curved End Effector Type 2	12/bx
75980-Mo	Mo Curved End Effector Type 2	12/bx

End Effector Type 3 (Straight)

Straight End Effector for Xtreme Access probe shaft. Available in two versions: Copper (Cu) and Molybdenum (Mo)

75981-Cu	Cu Straight End Effector Type 3	2/bx
75981-Mo	Mo Straight End Effector Type 2	12/bx

Grid-Stick Kit

A helpful device for multi grid staining. If the instructions are followed carefully you can say good-bye to precipitate and dirt. The Grid Stick is made from a thin, but rigid alloy that does not react with commonly used organic solvents or stains. The stick itself measures 4mm wide, 75mm long and has a slot along its center with small undercut notches on one side to make grid removal simple. A small area on the top of each stick is reserved for identification.
The Grid Stick is coated with a specially-formulated pressure-sensitive adhesive. This adhesive is resistant to solvents used in conventional staining methods (e.g., water, alcohol, ethanol) and aggressively holds the grids in place during staining, emulsion coating, carbon coating, shadow casting, serial section collection, etc., yet will not remain on the grid once it is removed from the stick. During staining the grids are held in the same plane as the solution flow, minimizing the risk of breaking the formvar film and, or collecting surface debris. Grids may be stored, handled, and examined with minimal effort. For example, if your grids are on SynapTek Grid Sticks you can simply place the stick on the stage of a phase microscope, identify the material (you will see outlines of large cells), and determine its condition (i.e., holes in material, dirt on grids) in only a few seconds without disturbing a single grid. In short, you will find that the SynapTek Grid Stick is simple, easy to use, and most importantly, highly reliable.

SynapTek Grid-Stick consists of:

- 5 coated Grid Sticks
- 2 flow-limiting Plugs and Bulbs
- 10 Staining Pipettes (modified)
- Instructions

71175	Grid-Stick Kit	each

Replacement Components:

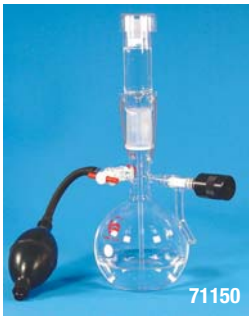
71176	Grid-Stick, uncoated	10/pk
71177	Staining Pipettes with 2 plugs	20/pk
71178	Grid-Stick Glue (For recoating GridStick)	5ml

Electron Microscopy Sciences In PA: (215) 412-8400 • Toll-Free (800) 523-5874
Fax (215) 412-8450 or 8452 • email: sgkcck@aol.com or stacie@ems-secure.com • www.emsdiasum.com

➤ Film Casting Device

EMS EXCLUSIVE

An all glass apparatus. It casts uniformly thin films of parlodion, formvar, or butvar directly onto 1x3 microscope slides. The film casting solution can be used repeatedly. A built-in fine-pressure-release valve helps control the speed of drainage. The thickness of the film is controlled by the concentration of the film solution and the rate of the drainage. The unit requires 100mls of film casting solution to start.



The unit comes complete with:

- 500 ml capacity flask with built-in valves; Air-in and Air-out.
- Film casting Cylinder with Cover.
- 75 cc Atomizer.

71305-01	Complete Film Casting Device	each
71305-04	500 ml Flask Replacement	each
71305-06	Film Casting Cylinder Replacement	each
60804	Atomizer Replacement	each

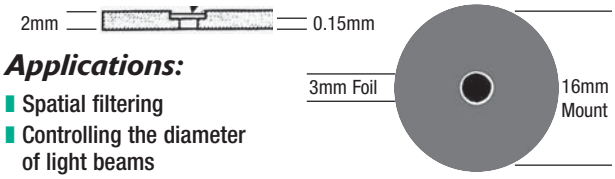
➤ All Glass Nebulizer

An all glass unit for the simple pro-duction of microdroplets. An object is held vertically in front of the nebulizer outlet and by squeez-ing the atomizer a fine spray is created. The nebulizer set comes with an All Glass Nebulizer bulb and Atomizer.

70505-01	Nebulizer Set	set
70505-05	Nebulizer Set	5 sets
70506-01	Nebulizer Only	each
70506-05	Nebulizer Only	5/pk
60804	Atomizer	each

➤ Pinholes

These pinholes are prepared from pure copper foil, 3mm in diameter, 25 microns thick. They possess very high roundness and edge retention. Blackened on one surface. Mounted in black anodized aluminum discs. Mounted in a recessed hole in an anodized holder, 16 mm in diameter.



Applications:

- Spatial filtering
- Controlling the diameter of light beams
- Creating point light sources
- Image analysis
- Etc.

Hole Range	Tolerance
101-500µm	+/- 2µm
25-100µm	+/- 1µm
1-25µm	+/- 0.5µm

PH-C1	Pin Hole 0.001mm	(1µm) diameter	each
PH-C2	Pin Hole 0.002mm	(2µm) diameter	each
PH-C5	Pin Hole 0.005mm	(5µm) diameter	each
PH-10	Pin Hole 0.01mm	(10µm) diameter	each
PH-C25	Pin Hole 0.025mm	(25µm) diameter	each
PH-C50	Pin Hole 0.05mm	(50µm) diameter	each
PH-100	Pin Hole 0.1mm	(100µm) diameter	each
PH-C250	Pin Hole 0.25mm	(250µm) diameter	each
PH-C1000	Pin Hole 1.0mm	(1000µm) diameter	each

➤ TEM-Specimen Grid Box – SB50

This newly designed TEM grid storage box, for routine handling and long term storage of 50 standard size TEM grids. This new ergonomic design incorporates several features that overcome the disadvantages associated with storage boxes of the more conventional 'sliding cover' design. This new box has a unique number on the face and on one end.

FEATURES:

- The blue arrow at the 12:00 o'clock position indicates the park position for the cover when not it is not in use. This is a firm grip 'click' position and it cannot be moved accidentally thus preventing spillage.
- The clear cover can be rotated smoothly through 360 degrees once the slight initial resistance of the park position has been overcome exposing a maximum of 2 or 3 diamond shaped slots at any one time.
- The 50 diamond shaped slots have an alphanumeric referencing system. Each box is supplied with an index record card for addi-tional information.
- The material the bases are made from have been chosen due to their anti-static properties. The clear cover has self-lubricating properties, which reduces friction, enabling the cover to move freely while remaining in close contact with the face of the base.
- The storage boxes are designed to be stacked, the base locating precisely over the face of another box.

Specifications:

Size .....75mm (L) x 65mm(W) x 6.5mm(D)

Weight .....22 grams

Materials: Base: .....ABS-PHAT (Acrylonitrile Butadiene Styrene .....+ Anti-Static Additive)

Cover: .....CAB (Cellulose Acetal Butyrate)

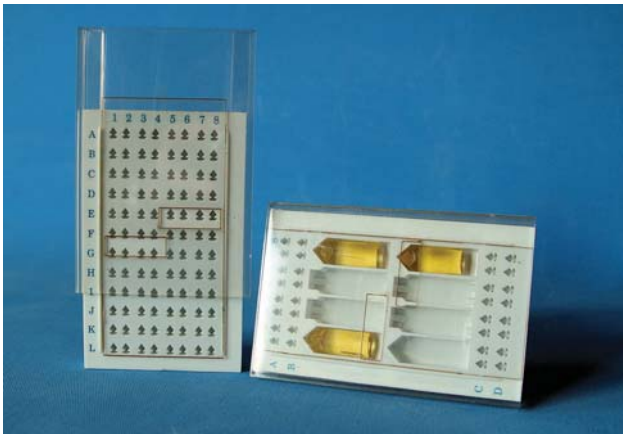
71135-01	SB50 Grid Storage Box	each
71135-12	SB50 Grid Storage Box	12/bx
71136-01	SB50N Grid Storage Box with Unique Number	each
71136-12	SB50N Grid Storage Box with Unique Number	12/bx

➤ Multipurpose Electron Microscope Specimen Box – MEM Grid Box

A newly designed Grid Box with safety, ease and convenience in mind – this multipurpose electron microscope specimen grid box is one of the most desirable boxes on the market.

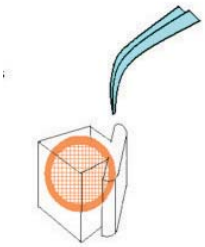
- **Eliminates the chances of tweezers insertion damaging the grids – The 'tweezers slot' and 'grid slot' are in a separate location. The tweezers are only able to grip the edge of the grid enabling it to be picked up**
- **Grids stored no longer jump out of the box while you remove the cover – Between the body of the box and the sliding lid, there is a separate plastic cover, which allows for only four slots being exposed at a time**
- **The Grid Record Card is stored safely by insertion along the reverse side of the box**
- **MEM-96 – will able to store up to 96 grids**
- **MEM-32 – will able to store up to 32 grids with 8 Blocks**
- **Measures: 81mm L x 54mm W x 6mm thick**

Cat. #	Description	Qty.
71164-01	MEM-96 Grid Storage Box	Each
71164-10	MEM-96 Grid Storage Box	10/pk.
71165-01	MEM-32 Grid Storage Box	Each
71165-10	MEM-32 Grid Storage Box	10/pk.



1. Pick up a grid

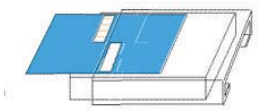
Removes the problem of inserting the tweezers too deep or damaging the tissues. The tweezers slot and grid hole connect. The tweezers insertion slot grips the edge of the grid, so does not damage the tissues and membrane.



2. Move Plastic sheet

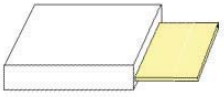
Prevents grids from jumping out of the grid hole and mixing together. Between the body of the box and lid, there is a plastic cover piece so that when you pick up the grid, only four grid holes are exposed at once; the others remain covered by the plastic cover piece and lid.

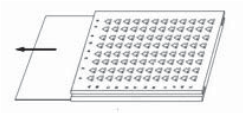
Safeguards against loss of samples, or information of stored samples becoming separated.



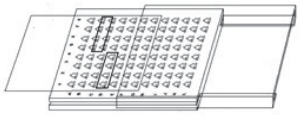
3. Record Card

Three different components (semi-thin section, thin section, block) and record card are all stored in one box (MEM-32grid-8block). You can find everything and store all of your samples in one box.

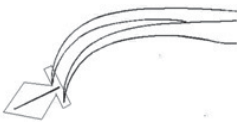




1. Record card is stored underneath the box

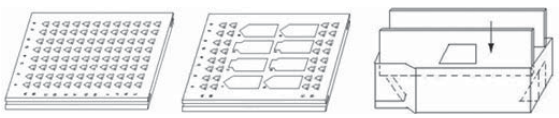


2. When moving lid and plastic cover pieces only four holes are exposed at once



3. The tweezers insertion slot grips the grid edge

4. Slot grids should best be gripped by curved tweezers. Mesh grids can be gripped by straight or curved tweezers.



5. MEM-96grid contain 96 grids (left) MEM-32grid-8block contain 32 grids and 8 blocks (middle).
6. Small semi-thin section can be stored by sliding into the block cavity (right).

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➤ Cryogenic Grid Storage Box

This specimen grid box is a tool for storing or transferring cryogenic TEM specimen grids.

- Four diamond shaped slots
- Non-static cover is held in place with stainless steel screw, which is tapped in the center of the box.
- Box fits the FEI VitrobotTM, Gatan 626TM, Gatan 3500TM.
- Available with lid or without lid.

Cat. #	Description	Qty	Price
71166-10	Cryo Grid Box, Round, w/Lid	each	**$9.25**
71166-20	Cryo Grid Box, Square, w/Lid	each	**$9.75**
71166-30	Cryo Grid Box, Round, wo/lid	each	**$6.90**

➤ Cryogenic Grid Box Handling Tool

This tool has one end which is threaded and fits into the center hole of the Cryogenic Grid Storage Box (where the screw goes in to secure the lid) for moving the box in and out of the cryogenic chamber.

Cat. #	Description	Qty	Price
71165-50	Cryogenic Grid Box Handling Tool	each	**$19.50**

➤ Grid Storage Box, 50 Capacity

Storage for 50 grids in deep diamond-shaped wells. All wells are identified. The base is resistant to organics and reactions can be carried out on grid-mounted samples in the wells. Complete with grid recording card. Measures: 3"(L)x1 1/16(W)x 5/16"(H) (77x40x8mm)

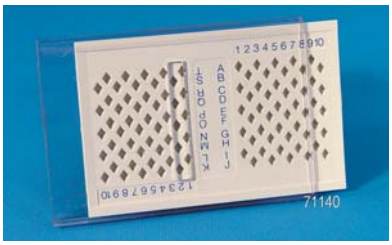
71150	Grid Storage Box, 50 Capacity	each
71152	Grid Storage Box, 50 Capacity	1 dozen

71150

➤ Grid Storage Box, 100 Capacity

100 grids can be stored in identified diamond-shaped wells for daily handling or long-term storage. Complete with grid recording card. Measures: 3 3/16"(L)x2 5/16(W)x 3/32"(H) (85x58x7mm)

71140	Grid Storage Box, 100 Capacity	each
71142	Grid Storage Box, 100 Capacity	1 dozen



71140

➤ Numbered Grid Storage Box, 100 Capacity

The standard 100 capacity grid storage box with a unique number printed on the face and on one end.

Advantages:

- Eliminates the placement of the specimen grid in the wrong box.
- Easy retrieval of grid box from storage.
- Complete with grid recording card.

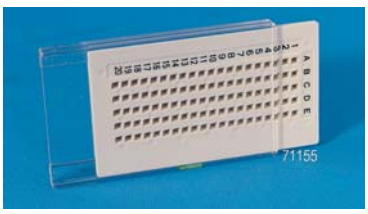
71137	Numbered Grid Storage Box, 100 Capacity	each
71138	Numbered Grid Storage Box, 100 Capacity	10/lot
71139	Numbered Grid Storage Box, 100 Capacity	100/lot

➤ Grid Storage Box, 100 Capacity

A newly designed grid storage box similiar to the original LKB box. Made from a special plastic that minimizes static. Complete with grid recording card.

Measures: 8cm(L) x 5cm(W) x7mm(T)

71155	Grid Storage Box, 100 Capacity	each
71156	Grid Storage Box, 100 Capacity	1 dozen



71155

➤ Newly Designed Grid Storage Box, 50 Capacity

The most preferable diamond shaped wells grid storage box ever. With a white bottom and a clear and smooth sliding cover all of the wells are identified and arranged in such a way that prevents any damage to the grid when you slide the cover back and forth. The box also has on both ends of the bottom extra tabs which makes it easy to grasp and hold the box while sliding the cover.

The Grid Storage Box fits perfectly in a 25-capacity slide box (#71455-) for filing. It comes packed 12 each in a slide box. The Grid Box measures: 3"(75mm)(L) x 1"(25mm)(W) x ¼"(6mm)(H).

71157-01	50-Sliding Grid Storage Box	each
71157-12	50-Sliding Grid Storage Box	10/pk

71157

➤ THE ORIGINAL LKB Grid Storage Box

For years, The LKB Grid Storage Box is the one that everyone is looking for. Now it is available again from EMS. The box is made from ABS (a copolymer of Acrylonitrile, Butadien and Styrene) which will not tolerate temperatures above 70°C, while the lid is made of Polymethacrylate (Flexiglas, Perspex), which should not be exposed to temperatures above 45°C. Neither the box or the lid will resist organic solvents. The box consists of 100 diamond shaped holes for storing up to 100 EM grids, either 3.05mm or 2.3mm in diameter. The box measures 3" (75mm)(L) x 2⅛"(55mm)(W) x ¼"(7mm)(H) and it comes complete with 10 index cards.

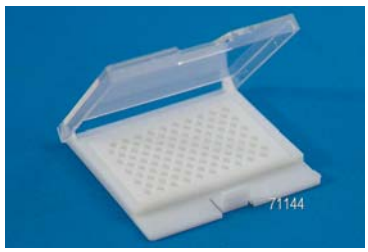
71147-01	LKB 100-Grid Storage Box	each
71147-12	LKB 100-Grid Storage Box	10/pk

71147

➤ Hinged Grid Storage Box, 100 Capacity

Compact (2½x2½x¼"). Lift-up, hinged, clear cover with thumb-cut-snap-in-lock. The box is designed to minimize air and moisture damage to stored specimens.

71144	Hinged Grid Storage Box, 100 Capacity	each
71146	Hinged Grid Storage Box, 100 Capacity	1 dozen



71144

➤ Dial-A-Grid Storage Modules

A two tone color coded plastic box with insert which has 24 letter-labeled crossed slots, where the grids can be stored. A rotating protection plate covers the slots and allows for exposure of one grid at a time.

Measures: 2⅓"(L)x1¾"(W)x½"(H) (57x45x12.5mm)

71148-01	BEEM® Dial-A-Grid Storage Box	each
71148-05	BEEM® Dial-A-Grid Storage Box	50/pk
71148-10	BEEM® Dial-A-Grid Storage Box	100/pk

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71148-01

➤ EMS Dial-Grid-N-Block-Storage

24 slots labeled with letters from A-X where the grids can be stored and rotated for easy access as well as 3 additional cavities for block storage . Avaialble with and without a unique identification number.

71158-01	EMS Dial-Grid-N-Block Storage	each
71158-05	EMS Dial-Grid-N-Block Storage	50/pk
71158-10	EMS Dial-Grid-N-Block Storage	100/pk
71158-15	EMS Dial-Grid-N-Block Storage/With Number	each
71158-20	EMS Dial-Grid-N-Block Storage/With Number	50/pk
71158-25	EMS Dial-Grid-N-Block Storage/With Number	100/pk

71158-01

➤ BEEM® Dial-A-Grid and Block Storage Modules

The same as Dial-A-Grid Module but with two additional cavities for block storage.

71149-01	BEEM® Dial-A-Grid & Block Storage	each
71149-05	BEEM® Dial-A-Grid & Block Storage	50/pk
71149-10	BEEM® Dial-A-Grid & Block Storage	100/pk

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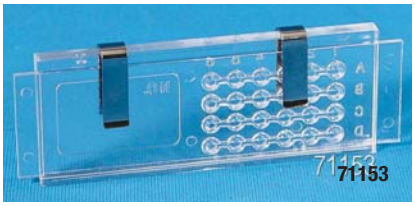
71149-01

Grid Storage Slide Box

A good box for preserving valuable specimens. Each slide is air and moisture-tight, and each cavity is tightly covered. Each slide comes with a top and a bottom, which are held together by two clips. Each slide is the size of a 1x3" glass slide; 24 cavities.



71153	Grid Storage Slide Box	each
71154	Grid Storage Slide Box	1 dozen

Grid Mats

White silicone rubber mats, with numbered compartments. Good for organizing grids. They will not slide or jump between compartments. Also ideal for staining grids. Easy to pick up grids without damaging forcep tips. Mats are available for square and round petri dishes, (100mm diameter, 115mm high).

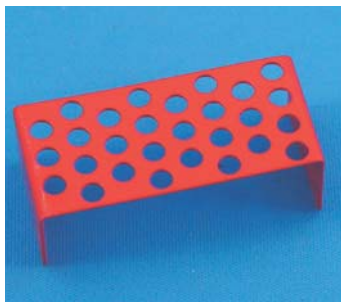
71160	Square Grid Mat	each
71162	Square Grid Mat	1 dozen
71170	Round Grid Mat	each
71172	Round Grid Mat	1 dozen

EMS Domino Rack

The EMS Domino rack is "U" shaped and made from an aircraft alloy sheetstock with serial perforations; thermally bonded spaceage copolymer; 5mm diameter holes, 28 holes per rack. The formvar film cast on the rack will stretch across a series of smooth edged holes forming a flat, wrinkle free film that is ready for grid mounting.

The Domino Rack allows the sections within the slot to dry flat and wrinkle free; it reduces the film and section contamination to negligible levels. The size of the rack is 54mm (L) x 17.5mm(H) x 25.5mm (W)

Moran, D.T., and Rowley, J.C., (1987). "Biological Specimen Preparation for Correlative Light and Electron Microscopy in Biology: Microscopy and Methods, ed. M.A. Hayat. Academic Press, New York./ pg 1-22



70620	EMS Domino Rack	each
70621	EMS Domino Rack	10/lot

Hiraoka Staining Kit

A grid staining device that can stain up to 40 specimen grids at one time. The unit has a flexible plastic plate that has precision cut slits in it which firmly hold the grid rim in position without damaging the sections.

Kit comes complete with staining dish, 5x plates, 1x plate holder.

71560-00	Hiraoka Staining Kit	each
71560-10	Grid Loading Plate	each
71560-20	Grid Loading Plate Holder	each
71560-30	Staining Dish only	each

EFFA Multiple Grid Staining Device

Simple and easy to use for most known EM staining techniques. Filtered, multiple step staining of up to 24 specimen grids in a carbon dioxide free environment. All plastic construction and it is resistant to all EM staining chemicals.

This device is also useful in immunochemical labeling or enzyme localization techniques. Kit includes: Tubing, clamp, filters, syringe, filter adapter, chamber and instructions.

71557-10	EFFA Multi-Grid Staining Device	each

Five-Slide Gripper

- The Five-Slide Gripper accommodates five microscope slides in one staining procedure.
- It fits most coplin and round-open staining jars.
- There is no need to remove slides for drying.
- It is made from a special material which is resistant to all chemicals and solvents which are used in staining.
- It withstands drying temperatures up to 80°C

71410-06	Five-Slide Gripper	6/pk

➤ Micro-Test Staining Dish

This staining dish is made from clear glass and has 10 cells in 2 rows of 5 each. Each cell is 2mm deep and holds 0.15ml of solution. Very useful in specimen preparation, EM staining, and Boerner-Jones-Lukens microfluocculation test.
Measurements: 108 X 57mm (4¼" x 2¼").

71564	Micro-Test/Staining Dish	each

➤ 3-Well Glass Slide – Micro Spot Plate

Pyrex brand Micro Spot Plate is ideal for microchemical applications. With three concave depressions. Cavities measure ⅞" O.D. x ¼" Deep (22 x 7mm). Plate overall measures 3⅜"(L) x1⅜"(W) (85 x 34mm)

Catalog #		Pack
71561-01	3-Well Slide	each
71561-06	3-Well Slide	6/pk

➤ White Porcelain Plate

12 cavities on a white porcelain plate. Used for staining and color reactions.
They measure: 4⅝"(L)x3½"(W) (118x90mm). Cavity depth: ¼" (6.4mm).

71562-01	White Porcelain Plate	each
71562-06	White Porcelain Plate	6/pk

➤ Glazed Porcelain Plate

Our economical glazed porcelain plate is made from high purity raw material, uniform in quality and resistant to acids and alkalis. It can withstand sudden temperature changes without cracks, explosion or deformation. Under normal conditions, the glazed plate can sustain a temperature of up to 1050° C. Available in two models: 1. 6 well with overall measurements of 3¼"(L) x 2⅛"(W) x ⅜"Thick, and 2. 12 wells with overall measurements of 4½"(L) x 3½"(W) x ½" Thick.

Cat. #	Description	Well Measures	Pack
71575-06	6-Well	20mm Dia x 5mm Deep	each
71575-12	12-Well	20mm Dia x 5mm Deep	each

➤ 12 Cavities Spot Plate, Polypropylene

Very similar to the white porcelain plate, this PP plate comprises 12 cavities of approximately 1ml capacity and is economically priced. This plate is very high quality, unbreakable as well as autoclavable.

71572-01	12-cavities Spot Plate, Polypropylene	each
71572-10	12-cavities Spot Plate, Polypropylene	10/cs

➤ 3-Cavities Spot Plates, LDPE

These spot plates have three depressions 21mm diameter x 7mm deep. The tray is 28mm x 85mm. Made from low density polyethylene and will withstand temperatures up to 80° C. The shipping weight is 0.6 lb per case of 40.

71574-05	3-cavities Spot Plate, Polypropylene	5/pk
71574-40	3-cavities Spot Plate, Polypropylene	40/cs

➤ Pyrex® Plate

A 9 cavity Pyrex pressed plate which offers a clear view for observation by transmitted light. The plate measures: 4"(L)x3⅜"(W) (100x85mm). The cavity is ¼" (6.4mm) deep with a ⅞" (22mm) opening.

71563-01	Pyrex Plate	each
71563-06	Pyrex Plate	6/pk

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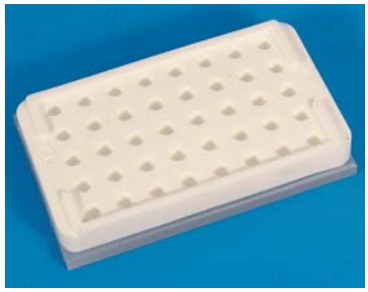
➤ Silicone Staining Pad

EMS EXCLUSIVE

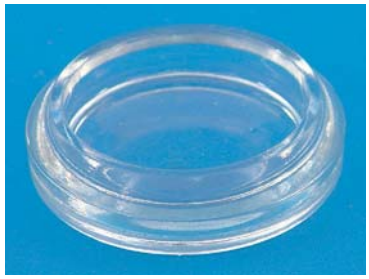
Made from white silicone, a non-reactive material. Pad has 40 cells in 5 rows of 8 each. Each cell is half-sphere shaped with an opening of 6mm dia. and 5mm deep. A few drops of staining solution is added to the wells and grids are then immersed and retrieved as per staining procedure. A watch-glass plate comes with each dish to reduce oxygen and evaporation. Measures: 5"(L)x3"(W)x ½"(T) (127x76x13mm)



71565	Silicone Staining Pad	each

➤ Syracuse Watch Glass

A clear watch glass which measures 65mm(OD)x50mm(ID)x 10mm(Deep). The glass is grooved and has a recessed bottom which allows for stacking and prevents scratching. It is ideal for staining and specimen preparation.



71570-01	Syracuse Watch Glass	each
71570-06	Syracuse Watch Glass	6/pk

➤ The EMS Staining Plate

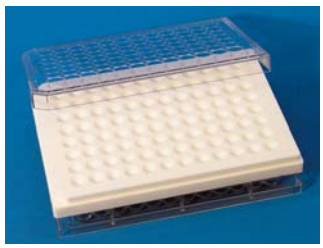
EMS EXCLUSIVE

The EMS Staining plate for Electron Microscopy was developed by Dr. Miguel Berrios, at SUNY at Stony Brook, Dept of Pharmacological Sciences, School of Medicine, New York.
The chemical etching process, antibody incubations and final staining with heavy metal salts of each grid is performed in the small cone-shaped wells on the EMS staining plate.
The EMS Staining Plate for electron microscopy post-embedding staining and immunohistochemistry offers several advantages over all other commercially available staining devices. The base plate is a solid piece of chemical-resistant silicone 127.5mm long, 85.5mm wide, 11.5mm thick with 96 cone-shaped wells organized (like the microtitration plate) in parallel rows of eight, using the lid of a 96-well Falcon 3072 Microtest™ III Plate as a cover. The base has two notches to serve for orientation and a 1.5mm X 4.4mm deep lip where the cover rests. Each well is an inverted cone 7mm in diameter and 2mm deep. Grids either float or rest at the bottom of each well. The wells allow incubation of a grid in 12-60 microliters of solution without reagent loss due to adsorption or cross contamination, even when the plate is tilted up at 70°. Due to the shape of the well, the flat surface of the grids never come into contact with the walls of the well, both facilitating sample staining and grid recovery.

Plates made from silicone offer two advantages:

- **Resistant to all chemicals and solvents**
- **During manipulation of the grids in the well there is no risk of damaging the fine points of the tweezer.**

Reference: Berrios, Miguel; (1991), A Staining Plate For Electron Microscopy. 48: 90-92.



71568	EMS Staining Plate	each

➤ Grid Coating Pen For TEM; Coat Quick "G"

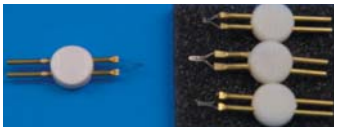
The Coat-Quick "G" pen improves the adherance of tissue sections onto the grids. With a touch of the pen to the grid, a thin layer of coating is applied to the grid. Drying takes place in approximately 1-2 minutes at room temperature. After it has dried the grid is ready for tissue mounting. The pen is also used in pretreating grids prior to mounting supporting films such as formvar and carbon; it minimizes dislodging, widening, or breaking of the support film.

70624	Grid Coating Pen	each

➤ Hot Pen – Wax Pen; A Tool for Separating Sections or Cauterizing

Powered by AA batteries. This pen helps to flatten and separate tissue sections and reduces compression in thin sections.
Available in two models: Wax Pen 1 is powered by one AA battery; Wax Pen 2 is powered by two AA batteries. Both pens are using the same tip. Replacement tip (Cat. #72679-RT) is a straight one. Replacement tip (Cat. #72679-03) is a set of three different configurations: Straight, Hook, and 'U' Shaped Tips.

72678



72679

Cat #	Description	Length with Tip w/o Cap	w/Cap	Diameter	Pack
72678	Wax Pen 1 (A)	6½"	6¾"	¾", 18mm	each
72679	Wax Pen 2 (B)	8¼"	8¾"	¾", 18mm	each
72679-RT	Replacement Tip				each
72679-03	Replacement Tips			Set of Three Variable Tips	

➤ Vacuum Pick-Up System

Handle delicate miniature objects without scratching, breaking or pinching. The system avoids contamination of parts and performs functions that tweezers does such as sorting, picking up, holding, carrying, and transferring. As well it is an alter-native way for handling cover slips without the use of forceps.

Features:

- Picks up grids faster and easier than tweezers – WARNING: Never use this device on coated grids.
- Quiet operation.
- Eliminates all tweezer damage to grids.
- Good suction (produces 14" Hg vacuum and an air flow of 125 cubic inches/minute); Can pick up aluminum stubs.
- Can be used as a tool to pick up glass slides, cover slips, wafers, thin film samples, etc.

Double-insulated (115–120V, 60Hz, 2-wire). Light weight, completely assembled and ready for immediate operation as soon as the proper tip is selected and installed. Vacuum is created at the tip by placing the finger over the control hole on the anodized aluminum vacuum pen. To break the vacuum, just remove your finger from the hole. The vacuum generator measures 4½" (H) x 2¾" diameter (114 x 70mm), and it has an adjustable vacuum pressure control from 1" Hg to 15" Hg.

Vacuum Pick-up System complete set: Vacuum Generator, Aluminum Vacuum Pen, Five Vacuum Tips, Set of seven Rubber Vacuum Cups (size ranging: 3⁄16", ½", 7⁄16", 3⁄8", 5⁄16", ¼" and 3⁄16"), an In-Line Filter, and 4 ft (122cm) of Vacuum Tubing.

Cat. #	Description	
71894	Vacuum Pick-Up System, 115V/60Hz	each
71895	Vacuum Pick-Up System, 220V/60Hz	each
71896	Vacuum Generator only, 115V/60Hz	each
71897	Vacuum Generator only, 220V/60Hz	each
71894-01	Vacuum Pick-Up Pen only	each
71904-02	In-line Vacuum Filter	each

Replacement Stainless Steel Probe Tips (1.5" Long) and Rubber Suction Cups:

		O.D.		I.D.	
Cat. #	**Description**	**(in)**	**(mm)**	**(in)**	**(mm)**
71898	15 gauge Probe Tip	.071	1.8	.052	1.3
71899	16 gauge Probe Tip	.065	1.7	.045	1.1
71900	21 gauge Probe Tip	.032	0.8	.020	0.5
71901	22 gauge Probe Tip	.028	0.7	.016	0.4
71902	23 gauge Probe Tip	.025	0.6	.013	0.3
71903	3⁄16" (14.27mm) Vacuum Suction Cup				each
71904	7⁄16" (11.12mm) Vacuum Suction Cup				each
71905	3⁄8" (9.53mm) Vacuum Suction Cup				each
71906	5⁄16" (7.94mm) Vacuum Suction Cup				each
71907	¼" (6.35mm) Vacuum Suction Cup				each
71908	3⁄16" (4.76mm) Vacuum Suction Cup				each
71909	Set of 7 Rubber Cups (3⁄16", ½", 7⁄16", 3⁄8", 5⁄16", ¼", and 3⁄16")				7/set

➤ Pen Vac™

Pen-Vac™ is a new improved way to handle small, flat surface objects. Beside the electronics assembly industry, jewelers, model builders etc. Pen-Vac is ideal for EM work as well. It can be used to handle grids, pick up stubs, align membranes, work with glass slides, cover slips and much more. Holds up to one minute.

71915 - PenVac with Deluxe Storage Case

71914 - Complete Pen-Vac System

Features:

- Lifts up to 50 grams.
- Totally self-contained vacuum.
- Light-weight, less than one ounce.
- Fits in your pocket like a pen.
- Brushed aluminum body.
- Optional storage compartment for vacuum tips and cups.
- No power supply needed.
- Available in various sizes.
- Interchangeable vacuum probes.

Pen-Vac™ comes with:

- A variety of Vacuum Probes, complete with a vacuum cup attached and it is available with plastic or aluminum hubs. Straight and angled to suit your applications. The stainless steel needle portion of the probes are one-half inch long.
- Vacuum Cups come in a wide range of materials. We offer the Static Dissipative and the Conductive Cups that provide ESD protection for electrostatic discharge of sensitive components. Cups comes in three sizes: ⅛" (3.17mm); ¼" (6.35mm); and ⅜" (9.52mm).

Set consists of:

One Pen with 6 Probes and Cups. (6 Probes: 3 angled, ⅛", ¼", ⅜" and 3 straight ⅛", ¼", ⅜")

71914	Complete Pen-Vac System	set
71915	Same as 71914 with Deluxe Case	set

Probes and Cups:

71916	⅛" Straight and Bent, Small	2/pk
71917	¼" Straight and Bent, Medium	2/pk
71918	⅜" Straight and Bent, Large	2/pk

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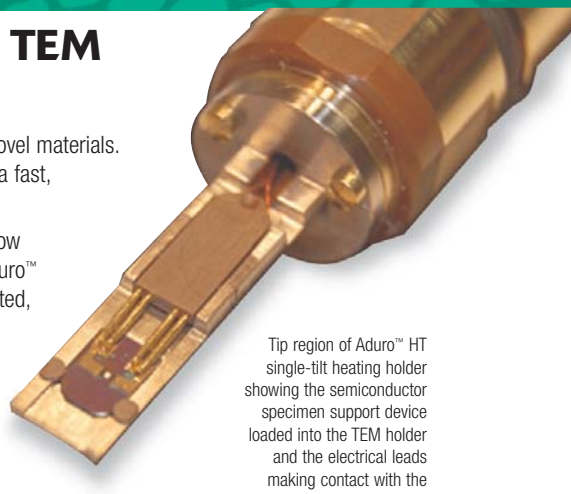
Fax (215) 412-8450 or 8452 • email: sgkcck@aol.com or stacie@ems-secure.com • www.emsdiasum.com

Single Tilt Heating Holder System for STEM, TEM

Aduro™ HT System

In situ microscopy is a critical need in many areas of materials science, including catalysis, coatings, and novel materials. Until now, no commercially viable solutions have existed that enable real- time, dynamic thermal studies in a fast, versatile, high-resolution and easy-to-use package.

Conventional heating stages for electron microscopy use relatively large furnaces as a heat source. Their slow response times and substantial drift often limits their use for high resolution, in situ heating studies. The Aduro™ heating system for high resolution in situ electron microscopy replaces standard furnaces with microfabricated, semiconductor-based heating devices as specimen supports. These devices use an ultra-thin, conductive ceramic membrane to simultaneously support and heat the sample. This approach provides extremely accurate and well-controlled sample heating with virtually no drift. The low thermal mass of the ceramic membrane also allows for extremely fast response times, up to 1,000,000°C per second to temperatures up to 1200°C. With excellent stability and true reaction-rate heating, the software controlled Aduro™ heating system enables novel, in situ experiments on any electron microscope including sintering, rapid thermal cycling and lifetime testing, grain growth, phase changes, surface reactions and quenching - all at the high resolution possible.



Tip region of Aduro™ HT single-tilt heating holder showing the semiconductor specimen support device loaded into the TEM holder and the electrical leads making contact with the support device.

APPLICATION AREAS

- Rapid thermal cycling and lifetime testing
- Quality Assurance
- Ultra-high and high temperature studies
- Grain Growth
- Thin films and Coatings
- Quenching
- Nanoparticle catalysts
- Sintering

IMPORTANT POINTS

The semiconductor devices replace both the normal TEM grid and the furnace of traditional heating holders. The semi-conductor devices simultaneously support and heat the sample.

The semiconductor devices enable customers to have a disposable furnace which eliminates contamination and makes the holder forward-compatible with future consumables.

For the first time ever, atomic resolution at temperatures up to 1200°C is possible.

FEATURES AND BENEFITS

Extremely low thermal mass	High stability and low drift, less than 1ms response time
Direct heating of support film	Very accurate temperature control of sample
Robust ceramic material	Inert, capable of reaching temperatures from RT to 1200°C
MEMS-based design	Consumable design eliminates contamination, compatible with virtually any TEM and STEM instrument

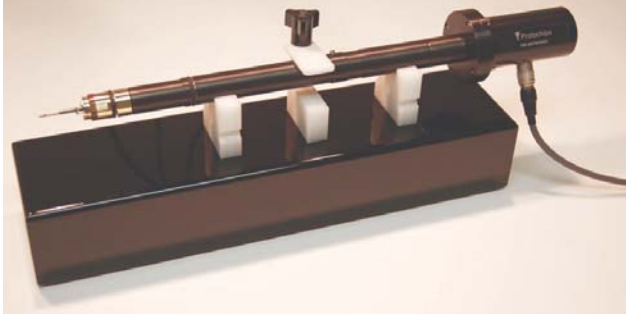
HEATING SYSTEM COMPONENTS

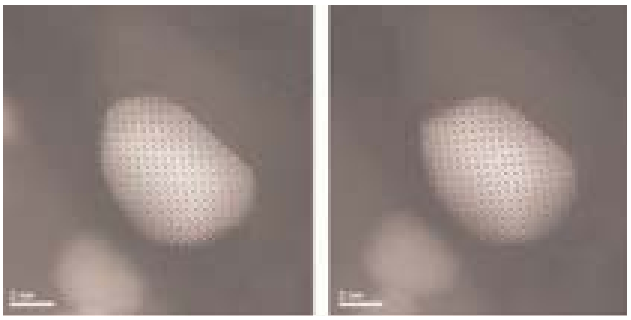
- Custom TEM holder with 4 electrical leads
- Power supply and cables
- Computer
- Software with perpetual license
- Starter pack of 25 semiconductor-based specimen support devices

PRODUCT SPECIFICATIONS

Temperature Range	Ambient to >1200°C
Tilt (Alpha)	Exact tilt dependent on pole-piece; specimen tip approx. 0.9mm thick
Support device size	4.0mm X 5.8mm
Observable Area	500 microns X 500 microns
Power Requirements	100/220 VAC

Aduro™ HT single-tilt heating holder





Pt nanoparticle catalyst on Al2O3 support at 1000°C, 20 second scans imaged approximately 1 minute apart at 10,000,000X. Images collected using a JEOL 2200FS-AC Aberration Corrected TEM. Courtesy of Dr. Larry Allard, Oak Ridge National Laboratories.

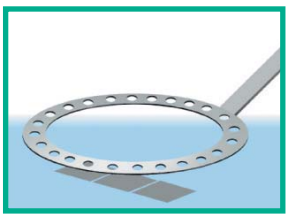
Ordering:

100010	Single tilt heating holder system for STEM, TEM, (S)TEM	each
100011	Semiconductor heating / support device for Aduro™ heating holder	each

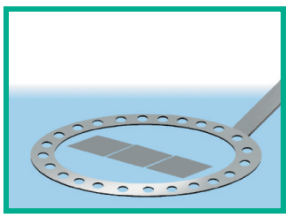
➤ Perfect Loop

Using this PERFECT LOOP, you can place your thin sections, cut on the ultramicrotome, easily on the grid mesh without creases.

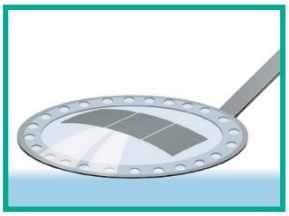
EMS EXCLUSIVE



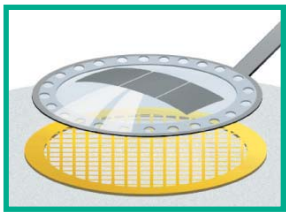
1. Centre the LOOP above the sections



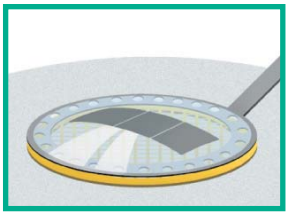
2. Slowly lower the LOOP over the sections and touch the water.



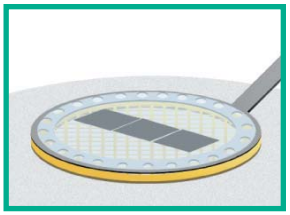
3. Gently lift up the LOOP with the sections in a droplet of water



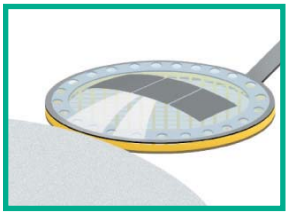
4. Lower the LOOP onto a grid and lift up again.



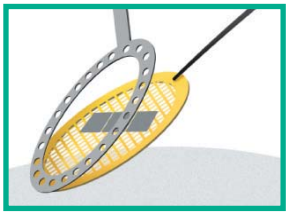
5. The grid holds to the LOOP by surface tension.



6. Lower the LOOP to the filter paper to remove water.



7. For coated grids, touch with filter paper to remove water.



8. Separate the grid from the LOOP with an eyelash.

➤ Perfect Loop for Ultra thin sections

70944	Set of Handle & Loop	set
70945	Loop only	each
70946	Loop only	5/each
70948	Handle only	each

➤ Perfect Loop for Light Microscopy (large sections)

The outside diameter of the loop is 7mm.

70940	LM Set of Handle & Loop	set
70941	LM Loop only	each
70942	LM Loop only	5/each
70943	LM Loop Handle	each

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