Ted Pella, Inc. pioneered the use of microwave systems to process tissue in electron microscopy, and followed through with applications in several other disciplines. The PELCO BioWave® Pro is the preeminent processor in the field, demonstrating quality, repeatability and flexibility in use.

Index: Microwave Tissue Processor

PELCO BioWave® Pro: Introduction

speed, quality, versatility

The PELCO BioWave® Pro is a microwave tissue processor with unmatched flexibility for your specimen preparation needs. This unit brings the advantage of more than 15 years of microwave development experience as well as many published journal articles describing multiple uses.

It offers many benefits, both for the research and clinical laboratory:

- Supports many applications:
  - TEM standard specimen processing
  - TEM staining and labeling
  - Standard histological tissue processing from fixation into paraffin
  - Immunohistochemical staining
  - Fluorescent Labeling
  - Confocal Microscopy specimen preparation
  - EDTA decalcification of mineralized tissue for TEM and LM/Histology
- Produces dramatic savings in overall process turnaround time, generally by factors of 5x-10x
- Uses our patented PELCO Coldspot® , which creates a uniform processing surface in the microwave cavity
- Allows for lower temperature specimen processing, allowing for better specimen preservation and thus better results. Wattages and temperatures generally don't need to be high with the PELCO BioWave® Pro!
- Yields precise temperature control for repeatable procedures
- Produces uniform, repeatable and quality results comparable to, and often better than bench
- Uses touchscreen control
- Includes protocol storage and exchange
- Has a diverse set of microwave/application-specific accessories
- Capable of remote process monitoring
- Includes built-in, strong safety measures for venting the processing cavity and protection against microwave exposure
- Built-in magnetic stirrer

Ordering Information:

Basic Unit, without application kit

36500 PELCO BioWave® Pro Standard System 110V
36500-230 PELCO BioWave® Pro Standard System 110V

Includes: Temperature Probe and Stand, Exhaust Connectors and Tubing, 2 Quick-Disconnect Fittings, USB and Ethernet Cables, Manual, Safety Instructions

"Microwave 101": Putting Together A Processor For Your Needs

Microwave processing is the only advance in tissue processing in the last 15 years that really saves time! So how do you take advantage of it? The following table will guide you in how to set up a PELCO Biowave® Pro that works for your needs.

PELCO BioWave® Pro Application Kits

TEM Tissue Processing (36500-10)	Immunolabeling (36500-20)	Formaldehyde Fixation and EDTA Decalcification (36500-30)	Paraffin Tissue Processing (36500-40)	Confocal Microscopy and *in situ* Hybridization (36500-50)
PAGE 414	PAGE 418	PAGE 421	PAGE 424	PAGE 426
PELCO Coldspot® Pro (36116-10)	PELCO Coldspot® Pro (36116-10)	- - -	PELCO Coldspot® Plus (36116-20)	PELCO Coldspot® Pro (36116-10)
Microwave Vacuum Chamber (3435)	Microwave Vacuum Chamber (3435)	- - -	- - -	Microwave Vacuum Chamber (3435)
- - -	- - -	PELCO® SteadyTemp™ Digital Plus (50061)	- - -	PELCO® SteadyTemp™ Digital Plus (50061)
- - -	- - -	- - -	PELCO® TissueVac® (36160)	- - -
- - -	12 & 24-Wellplate Inserts (36170 & 36172)	- - -	- - -	12 & 24-Wellplate Inserts (36170 & 36172)
PELCO® Prep-Eze™ 6 & 12-Well Kits (36157 & 36158)	- - -	- - -	- - -	- - -
Microwave Capsule Holder (36131-2)	- - -	- - -	- - -	- - -
Microwave Microcentrifuge Tube Holder (36134)	- - -	- - -	- - -	- - -
Microwave Polymerization Tray (36133)	- - -	- - -	- - -	- - -
- - -	Sequenza™ Slide Rack (36105) with Coverplate™ Assemblies (36107)	- - -	- - -	- - -
Bubbler Probe (36137)	Bubbler Probe (36137)	- - -	Bubbler Probe (36137)	- - -
- - -	- - -	DFR Insert with PTFE Cassette Rack (36200)	- - -	- - -
- - -	- - -	Vapor Trap (50050-10)	- - -	- - -
- - -	- - -	- - -	PELCO® HistoWave® Cassette System (36150)	- - -
- - -	- - -	- - -	Paraffin Heating Tile (36150-1)	- - -

■ PELCO BioWave® Pro:

Time Comparison of Routine Microwave Processing vs Vacuum Microwave Processing

Table 1: The Effect of Microwaves/Vacuum on the Sample Processing Times for Electron Microscopy

Processing Step	Routine Microwave Processing	Vacuum Microwave Processing	Routine Processing
1. Primary Fixation (aldehyde)	10 minutes	6 minutes	1 hour
2. Buffer Rinse	6 minutes	4 minutes	30 minutes
3. Secondary Fixation (osmium)	10 minutes	6 minutes	1 hour
4. Dehydration (acetone/ethanol)	7 minutes	7 minutes	2 hours
5. Resin Infiltration	50 minutes	8 minutes	18 hours
6. Tissue to Embedding Capsules	15 minutes	15 minutes	15 minutes
7. Resin Polymerization	45-75 minutes	45-75 minutes	18 hours
TOTALS	**~170 minutes**	**~120 minutes**	**~2,400 minutes**

Giberson, et al., 1997. J. Vet. Diagn. Invest. 9:61-67.

Air Safe System

The microwave cavity is continuously vented to guard against fume buildup.

The unit is fully compliant with US safety requirements for laboratory equipment and is ETL and CE certified.

PELCO ColdSpot® Technology

The unique and proprietary PELCO ColdSpot® technology for the PELCO BioWave® Pro has been developed specifically to:

- Reduce energy density differences in the microwave cavity
- Absorb reflected energy within the microwave cavity
- Remove heat (in conjunction with the included integrated load cooler or optional PELCO SteadyTemp™ system)
- Reduce sample heating rates to enable increased microwave processing times

The PELCO ColdSpot® enables excellent control of the microwave environment and is a critical component in delivering high quality and consistent tissue processing results.

Be sure to include an application kit to fit your purposes.

PELCO® BioWave® Pro System Specifications	
Microwave power range	Continuous power setting from 100-750 watts (higher wattages are deleterious to tissue samples being processed)
Microwave frequency	2.45 Ghz
Microwave power control	Programmable controller with 10 modifiable presets
Function control	6" touch screen user interface
Temperature control	±1°C for most aqueous solutions
Cooling internal	Integrated ambient water cooling system
Cooling external (optional)	PELCO SteadyTemp™; 500W chilled cooling system
Magnetic stirrer	Integrated, 0-300rpm speed
Exhaust	110cfm capacity
Venting	Automatic when door is opened
Vacuum system	20" Hg, 3 selectable modes
Bubbler Probe	Up to 0.8ltr/min with 2.5" Column of water pressure
Protocol management	Protocols can be stored, using a total of 200 steps
Certification	ETL/CE
Dimensions	53.3 W x 52.4 D x 54.6 H cm (21.75" x 20.25" X 21.5")
Weight	37.7kg (83 lbs)
Power required	36500: 15A/115VAC; 36500-230: 10A/230VAC

Application Kits

The PELCO BioWave® Pro system offers Application Kits designed to process specimens from microwave to microscope for:

- **Electron Microscopy (36500-10)**
- **Immunolabeling (36500-20)**
- **Formaldehyde Fixation EDTA Decalcification (36500-30)**
- **Paraffin Processing (36500-40)**
- **Confocal Microscopy and *in situ* hybridization (36500-50)**

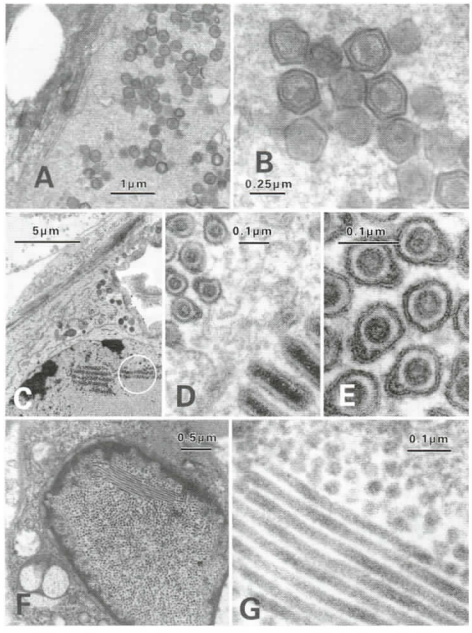
Transmission Electron Microscopy Specimen Processing

Ted Pella, Inc. has pioneered microwave TEM specimen processing since 1994. Our PELCO® BioWave Pro represents the most refined, versatile, tested and accepted solution for TEM specimen processing. The following kit is made for standard TEM specimen processing.

continued on next page

Routine Electron Microscopy Kit

36500-10 Routine Electron Microscopy Tissue Processing Kit
PELCO ColdSpot® Pro Glass (36116-10)
PELCO® EM Microwave Vacuum Chamber (3435)
PELCO Prep-Eze™ 6-Well Kit (36157)
PELCO Prep-Eze™ 12-Well Kit (36158)
PELCO® Microwave Capsule Holder with Lid (36131)
PELCO® Microcentrifuge Tube Holder (36134)
Microwave Polymerization Tray (36133)
Bubbler Probe (36137)
Capsule Preparation Station (36131)



Electron Microscopy
A-B is cytoplasmic iridovirus from the skin of a sturgeon. C-E is an intranuclear baculovirus from the hepatopancreas of a crayfish from Northern California. F-G is an endothelial cell polyoma virus from a blood vessel in the liver of a parakeet. Infected tissues were processed directly from 10% NBF by the microwave methods of Nordhausen and Barr (2001) and Nordhausen et al. (2002). Micrographs from Bob Nordhausen, Univ. of California, Davis, California Animal Health and Food Safety Lab, School of Veterinary Medicine, Davis, CA 95616.

Application Kit Components

PELCO ColdSpot® Pro

designed as a temperature controlled surface
will enhance most tissue processing steps

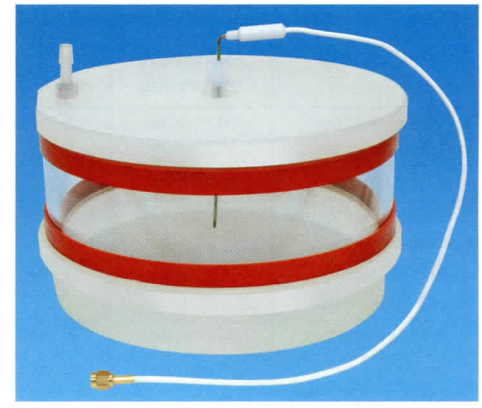
The PELCO ColdSpot® Pro is designed for microwave processing techniques that benefit from an efficient heat transfer between the PELCO ColdSpot® Pro surface (tempered glass) and the sample. This improved product design provides excellent temperature control for electron microscopy tissue processing, immunolabeling and *in situ* hybridization protocols. The glass surface dissipates heat quickly and efficiently and can be easily cleaned. This new design creates a flat surface across the whole top. Filling the PELCO ColdSpot® Pro with water has been simplified. Designed for use with 3435 PELCO® EM Microwave Vacuum Chamber. Ⓣ

Dimensions:
Glass plate area: 223mm W x 291mm D (8.78" W x 11.34" D)
Overall dimensions: 267 W x 381 D x 108mm H (10.5" W x 15" D x 4.25" H)

36116-10 PELCO ColdSpot® Pro . . . . . .each

PELCO® EM Microwave Vacuum Chamber

microwave vacuum chamber for microscopy sample preparation chemical infiltration with reduced fixation times



Features

- Made of chemically-resistant, microwave-transparent materials and designed for vacuum down to 1 torr (1mm Hg).
- Able to run a continuous vacuum during microwave processing.
- Improves ultrastructural preservation during microwave-assisted chemical fixation. Reduced fixation time by 95% when compared to conventional protocols.
- Reduces resin infiltration times by 99% compared to conventional processing and 85% when compared to established microwave protocols.

Dimensions:
Inside chamber: 178mm diameter x 77mm height (7" diameter x 3" height)
Overall dimensions: 200mm diameter x 98mm height (7-⅞" diameter x 3-⅞" height)

3435 PELCO® EM Microwave Vacuum Chamber. . . . .each

The PELCO® EM Microwave Vacuum Chamber is comprised of the following components: glass chamber, gaskets, vacuum ports and 2 caps (with and without Temperature Probe feedthrough). **Note:** Includes all as shown in the picture above except the temperature probe. Temperature probe shown for placement only.

Optional Accessories for Vacuum Chamber

36145-T Temperature Restrictive Temperature Probe with PTFE Coating for use with PELCO® Microwave Processors . . . . . .each
3435-1 Replacement Vacuum Chamber L Gaskets .pkg/2
3435-2 Replacement Glass Cylinder . . . . . .each

Ⓣ = Tech Note on web page

■ PELCO Prep-Eze™ Microwave Specimen Holders

for sample preparation / tissue fixation / tissue processing for microscopy / microwave processing

36157-1

36158-1

The specimen holders accommodate 6 or 12 specimen batches from fixation through resin infiltration. They reduce handling and save time and costly chemicals. The holders fit our 36135 polypropylene petri dishes.

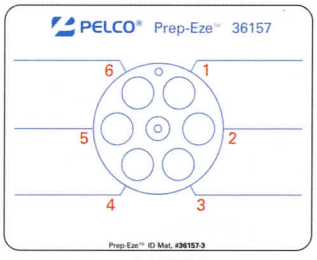
The outside dimensions of the holders are: 50.8mm diameter x 19mm high (44.5mm high with rod handle), (2" dia. x .75" H [1.75" H with handle]).

No. 36157-1 has 6 wells, 12.7mm diameter x 17mm deep (.5" diameter x .67" D).

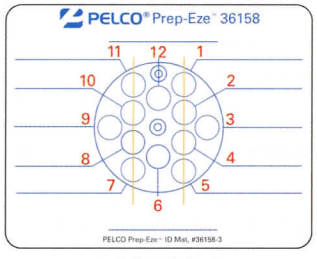
No. 36158-1 has 12 wells, 9.5mm diameter x 17mm deep (.375" diameter x .67" D).

The mesh openings are 420µm.

The small hole in the side of the base is intended to receive the temperature probe while processing tissue in the microwave.



36157-3



36158-3

Numbered mats, available for both sizes, are plastic laminated to resist chemicals and may be written on with a marker. With the holder placed on the mat, easy identification of specific wells is possible. The kits include one specimen holder, one ID mat and 20 polypropylene petri dishes (58 x 15mm, Prod. No. 36135) suitable for use in the microwave.

Note: Petri Dishes on page 609.

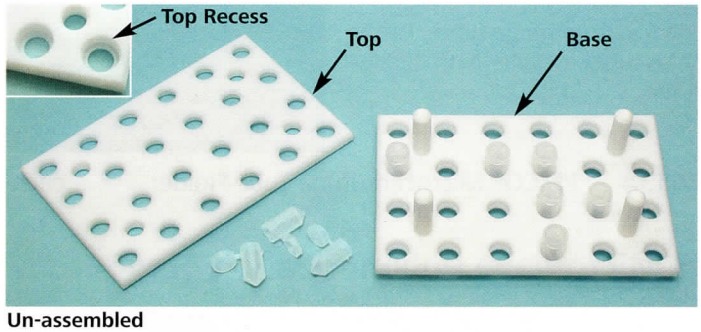
36157 PELCO Prep-Eze™ 6-well Kit . . . . . .each
36158 PELCO Prep-Eze™ 12-well Kit . . . . . .each

Optional Replacement Accessories

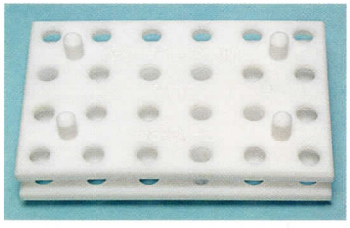
36157-1 PELCO Prep-Eze™ 6-well Holder . . . . . .each
36157-3 PELCO Prep-Eze™ 6-well I.D. Mat . . . . . .each
36158-1 PELCO Prep-Eze™ 12-well Holder . . . . . .each
36158-3 PELCO Prep-Eze™ 12-well I.D. Mat . . . . . .each

Microwave Processor Accessories and Replacements

■ PELCO® Microwave Capsule Holder with Lid



Un-assembled



Assembled

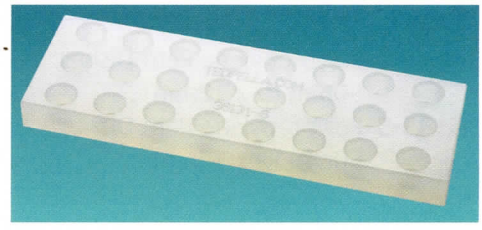
The improved PELCO® Microwave Capsule Holder has 3 new design features that set it apart from a previous design.

- "Stops" on the legs to keep the capsule base level during loading
- A hole with a stop in the base allows the 00 embedding capsule to be set in place easily
- The new capture top has a recess to keep the embedding capsule lid in place throughout the polymerization process in the microwave

The new design eliminates the need to use Parafilm in the capsule cap (Prod. No. 130) during the microwave polymerization process.

36131-2 PELCO® Microwave Capsule Holder with Lid . . . . . .each

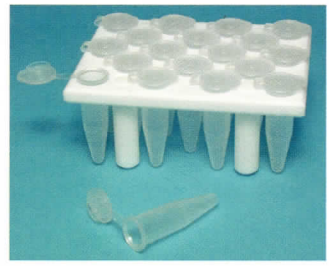
■ Capsule Preparation Station



This Preparation Station is a capsule loading platform designed to maintain cleanliness from epon resin spillovers from the PELCO® Microwave Capsule Holder 36131-2 (page 598). This pre-loading Station avoids a potential situation of water contamination in the microwave polymerization procedure. Spillage of unpolymerized epon in the water container during the microwave procedure can be avoided. The 36131-6 permits the technician to pre-load 00 capsules. Capsules are then transferred to 36131-2 for the polymerization step in the microwave oven.

36131-6 Capsule Preparation Station . . . . . .each

■ PELCO® Microwave Microcentrifuge Tubes PTFE Holder



Made from PTFE, designed to hold 18 conventional polyethylene microcentrifuge tubes. Firmly holds tubes in water bath during curing.

36134 PELCO® Microcentrifuge Tube Holder . . . . .each

■ Microwave Polymerization Tray

This tray is used with the Holder, 36134, on previous page. Water in the tray then acts to equilibrate the temperature during curing of the resin. Shown with Capsule Holder, not included.

36133 Microwave Polymerization Tray . . . . . .each
36133-10 Insulating Pad pkg/3

Other TEM Microwave Accessories

■ Polypropylene Petri Dishes

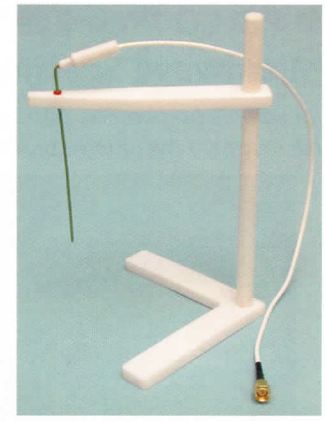
exclusive from Ted Pella Inc.
Suitable for use in the Microwave Systems. Very sturdy. Bottom inside dimensions: 50mm diameter x 12mm deep
Lid inside dimensions: 56mm diameter x 10mm deep

36135 Polypropylene Petri Dishes, 50mm ID x 12mm pkg/100
36135-5 Polypropylene Petri Dishes, 50mm ID x 12mm pkg/500

■ Temperature-Restrictive Temperature Probe with PTFE Coating

This PTFE-coated probe is supplied with the PELCO® BioWave® Pro and is a replacement probe for all the previous PELCO® Microwave systems as well.

It is used to monitor and/or maintain preset temperature maximums during microwave processing. The temperature probe is accurate to ±1°C (from 0°C to 100°C) and will maintain ±1°C in water and most fixative solutions. The 10cm probe is protected with a PTFE coating for decalcification and special stain applications. It has a 40cm long lead and is designed to fit into 36138 PTFE Probe Stand. This "all-PTFE" stand is microwave-safe and has a 12cm long arm that can be adjusted up and down over an 18cm range to allow precise location of the probe into processing vessels or an individual wellplate opening. The 3435 PELCO® EM Microwave Vacuum Chamber is designed for use with this temperature probe as well.

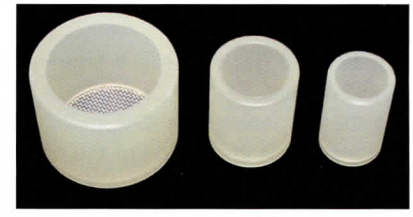


Because of the high precision of the thermistor transducer, no temperature recalibration is necessary when replacing temperature probes.

36145-T Temperature Restrictive Temperature Probe with PTFE Coating . . . . . .each
36138 PTFE Temperature Probe Stand . . . . . .each

■ Individual Wells

also used to replace damaged wells on Wellplate Inserts
Great for processing individual specimens or keeping specimens separate from others. Same wells as used in the Wellplate Inserts above but on an individual basis. Made entirely from polypropylene.
Also available in 590µm and 840µm screen.



36169 Individual Well, 24.1mm diameter x 22.3mm D, 420µm opening screen, all polypropylene . . .each
36171 Individual Well, 14.2mm diameter x 22.3mm D, 420µm opening screen, all polypropylene . . .each
36173 Individual Well, 11.2mm diameter x 22.3mm D, 420µm opening screen, all polypropylene . . .each

■ Flat Bottom Capsules

For processing specimens in the PELCO® Microwave Systems. Inside dimensions are 00 size: 7.92mm dia x 18.87 mm deep (.312 x .743"). Polyethylene (up to 75°C) or Polypropylene (up to 100°C). Outside diameter 9.6mm.

133 Flat Bottom Capsules, Polyethylene, 00 . . .pkg/100
133-P Flat Bottom Capsules, Polypropylene, 00 . .pkg/100

■ 1.5ml Microcentrifuge Tubes

Micro sample tubes, made from polypropylene.

Microwave transparent, 1.5ml, graduated 0.5, 1.0, 1.5ml.

20836 Microcentrifuge Tubes pkg/100

■ 1.5ml Microcentrifuge Tubes

Made of high clarity polypropylene that withstands forces up to 30,000xG. Easy open caps with needle insertion spot and textured marking or labeling area. Graduated 0.1 and 0.25ml on the other side. These are high quality tubes. Available in natural or an assortment of colors: Red, yellow, blue, green and orange. They are packaged in bags of 100 for each of five colors, totaling 500. Microwave transparent.

20838 Natural Microcentrifuge Tubes pkg/500
20840 Assorted Colors, Microcentrifuge Tubes . .pkg/500

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Immunolabeling

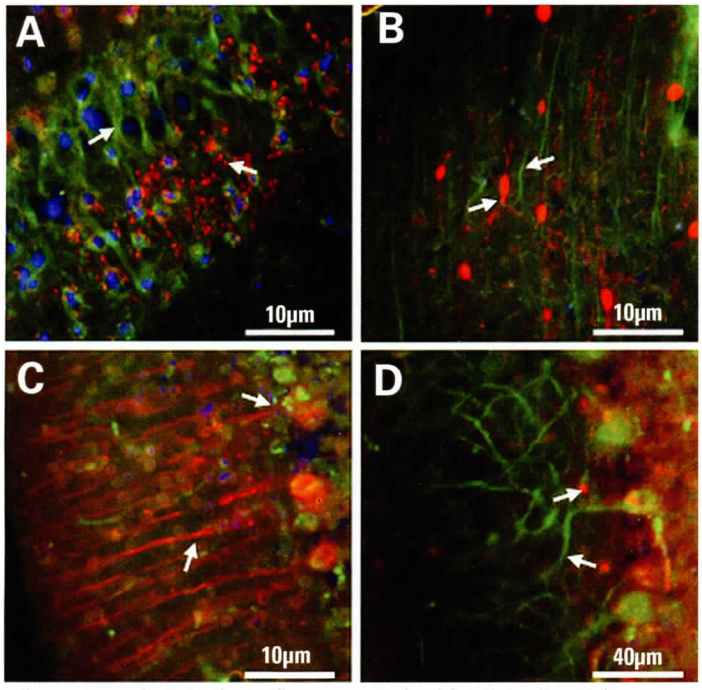
Principle:

The immunolabeling of slides, coverslips or free-floating sections is a time consuming process. On the bench the whole process will take a few hours or days. Immunolabeling can be direct, indirect or a sandwich assay and can use fluorescent or enzyme based chromogens. Various blocking steps are employed and numerous rinses are incorporated in the overall process. Many steps and different reagents are therefore being used in a typical immunoassay.

Microwave-assisted immunolabeling has demonstrated the ability to greatly shorten turn-around times regardless of the labeling protocol used. This statement has been validated through numerous workshops and publications. The ability to use microwave energy effectively has evolved through control of the power output of the magnetron (true wattage) and the virtual elimination of "hot and cold spots" in the microwave cavity (PELCO ColdSpot®). This combination of control is unique to the PELCO BioWave™ Pro and makes complex immunolabeling protocols possible in a microwave environment.

Immunolabeling Kit

36116-20 PELCO ColdSpot® Pro Glass (36116-10)
PELCO® EM Microwave Vacuum Chamber (3435)
PELCO Prep-Eze™ 12-Wellplate Insert (36170)
PELCO Prep-Eze™ 24-Wellplate Insert (36172)
Sequenza™ Slide Rack (36105)
Coverplate™ Assemblies (36107)
Bubbler Probe (36137)



Above, panels A-D show fluorescent double stains in rat hippocampus (A), cerebrum (B) and cerebellum (C & D) utilizing microwave protocols. Arrows indicate specific sites of immunoreactivity. Panel A shows hippocampal neurons labeled with anti-beta tubulin (green) and synapsin 1a (red). Picture B shows calretinin staining in GABAergic neurons (red cells) and beta-tubulin expressing neurons (green cells). Panel C shows immunoreactive NMDA R1 (green) on granule cell fibers stained with anti-beta-tubulin (red). Panel D shows NMDA R2a2b labeling (red) on purkinje cells with beta-tubulin III staining (green). Nuclei in brain slices are stained blue with bis-Benzimide. Reprinted with permission. Ferris, AM, Giberson, RT, Sanders, MA, Day JR (2009) Advanced laboratory techniques for sample processing and immunolabeling using microwave radiation. J. Neurosci. Methods (in press).

Microwave Immunolabeling Protocol

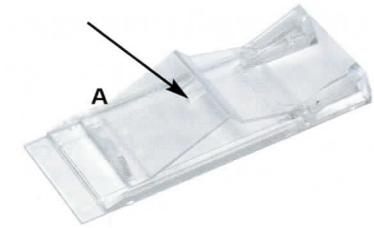
Start at the step that is appropriate for the labeling protocol being used.

No.	Step	Microwave Settings Wattage/ Temp. Restriction	Time
1.	Coplin Jar - 50 ml. xylene - deparaffinization	250 W	4 min.
2.	Coplin Jar - 50 ml. 95% ethanol - rehydrate	250 W	4 min.
3.	Coplin Jar - Wash in tap water - rehydrate		30 sec.
4.	Antigen Retrieval (if required)	No specific method is recommended	
5.	Transfer Slides to Coverplate System[1] Tissues to wellplates or petri dish		
6.	Block Endogenous Peroxidase - 3 drops (~100µl) Enzyme based chromogens	150-250 W	1 min.
7.	Buffer Rinse - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
8.	Blocking Step - 3 drops to ~1 ml Use Triton X or protease for thick sections >6µm	150-250 W	3 min.[2]
9.	Primary Antibody - 3 drops (~100µl) Vacuum + increased time for thick tissues (>20µm)	150-250 W 15-20" Hg	6 min.[3] 12 min.[4]
10.	Buffer Rinse - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
11.	Secondary Antibody - 3 drops (~100µl) Vacuum + increased time for thick tissues (>20µm)	150-250 W 15-20" Hg	6 min.[3] 12 min.[4]
12.	Buffer Rinse - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
13.	Tertiary Attachment - 3 drops (~100µl) Vacuum + increased time for thick tissues (>20µm)	150-250 W 15-20" Hg	6 min.[3] 12 min.[4]
14.	Buffer Rinse - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
15.	Chromagen - 100-500µl	150-250 W	1-6 min.
16.	Rinse in D.I. water - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
17.	Counter Stain - 100-500µl	150-250 W	1-3 min.
18.	Rinse in D.I. water - ~1 ml (1 to 3 x 1 min.)	150-250 W	1 min.
19.	**Remove Slides from Coverplate System**		
20.	Mount Coverslip and View		

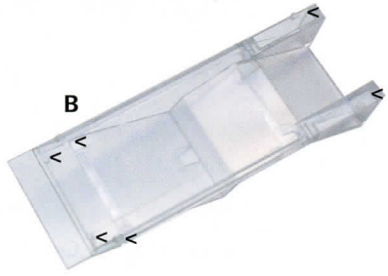
[1]The Coverplate™ System is described on the next page.
[2]3 min. corresponds to a preprogrammed time sequence (1 min. on - 1 min. off - 1 min. on)
[3]6 min. corresponds to a preprogrammed time sequence (2 min. on - 2 min. off - 2 min. on)
[4]12 min. corresponds to a preprogrammed time sequence (4 min. on - 4 min. off - 4 min. on)

Microwave Assisted-Immunolabeling

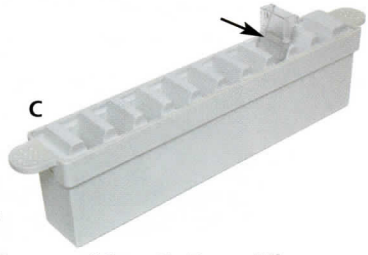
continued



Front View of Coverplate™



Rear View of Coverplate™



Sequenza® Cassette Base - Microwave Holder for Sequenza® Coverplate and Slide

Sequenza® Cassette Base - With Lid on (not needed for processing in microwave)

A. A front view of the Coverplate™ that is placed on the glass slide to form a capillary gap for the staining reagents to flow through. The arrow indicates the notch in the front clip of the coverplate that connects with the tab in **C** (arrow).

B. The rear view of the Coverplate™ showing the tabs (<) that position and hold the slide (tissue side down) in position prior to placing the coverplate and slide into the cassette base. Place approximately 2ml of buffer on the coverplate prior to placement of the slide. Check to see that the capillary gap is completely filled with fluid (no bubbles). If bubbles are present rewet the surface and repeat slide placement.

C. The Sequenza™ Cassette™ Base holds the coverplate and slide complex together to maintain the capillary gap during microwave. The lid is not needed for microwave protocols.

State-of-the-art control is demonstrated by the degree of heating and uniformity of temperature between 2 types of wellplates (6 and 12-well) exposed to two different continuous wattage outputs for 1 minute.

IR Images Demonstrating the Effect of Microwave Processor Wattage and the PELCO ColdSpot® on Sample Temperature Control

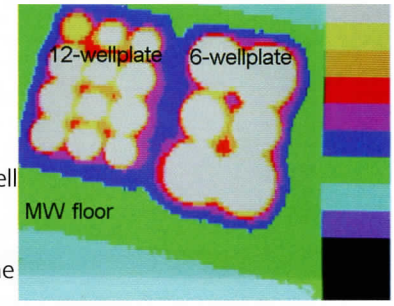


Figure 1. The effect of 630W of microwave energy for 1 minute on a 6 and 12-well plate containing 23°C water and surrounded by 3 800ml water loads. Final well temperature ranges were 32.7-42.5°C for the 6-well plate and 32.3-35.4°C for the 12-well plate.

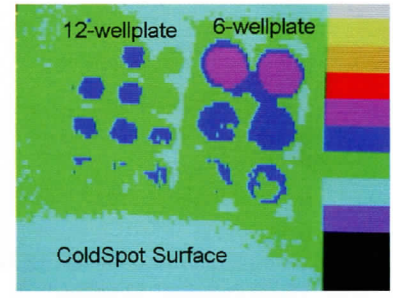


Figure 2. The effect of 212W of microwave energy for 1 minute on a 6 and 12-well plate containing 23°C water placed on the patented PELCO ColdSpot®. Temperature uniformity is greatly improved and the temperature increase was held to 3°C for the 6-well plate and 1-2°C for the 12-well plate. Currently 24-well plates are used routinely for labeling of free floating sections in the microwave and the typical power output used is 150W (Ferris, A.M., Giberson, R.T., Sanders, M.A., Day J.R. 2009. Advanced laboratory techniques for sample processing and immunolabeling using microwave radiation. J. Neurosci. Methods xxx IN PRESS xxx-xxx).

Recent Literature

Munoz TE, Giberson RT, Demaree Jr, RS, 2004. Microwave-assisted immunostaining: a new approach yields fast and consistent results. J. Neurosci. Methods, 137:133-139.

Sanders MA, 2002. Recent Advances in microwave assisted specimen processing: keeping it cool. Microsc. Microanal. 8(Suppl.2):158-159.

Sanders MA, Gartner DM, 2001. In vivo microwave-assisted labeling of Allium and Drosophila nuclei. In: Microwave Techniques and Protocols eds. Humana Press, Inc. Totowa, NJ. pp155-164. RT Giberson and Demaree Jr, RS.

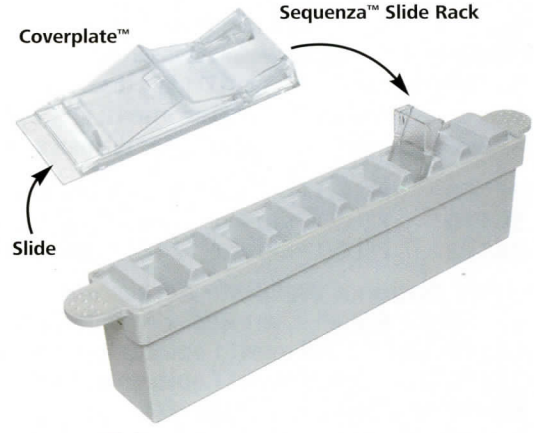
Application Kit & Components

■ Immunostaining on Glass Slides *using the Sequenza™ Slide Rack and Coverplate™ system*

The Sequenza™ Slide Rack, holding 10 glass slides and Coverplate™, is a system designed for the immunolabeling of sections on glass slides. While originally designed for bench techniques, this system is uniquely suited for microwave-assisted applications. The Sequenza™ Slide Rack holds glass slides covered with the Coverplate™. This combination forms a capillary gap between the slide and the plate. Reagent volumes, especially antibody, are greatly reduced using this versatile system. A reagent hopper forms the uppermost part of the plastic Coverplate™ allowing for easy dispensing of reagent into the capillary gap. Using PELCO® Microwave Processor with the PELCO ColdSpot®, rapid immunostaining of sections on glass slides is reliable and easy.

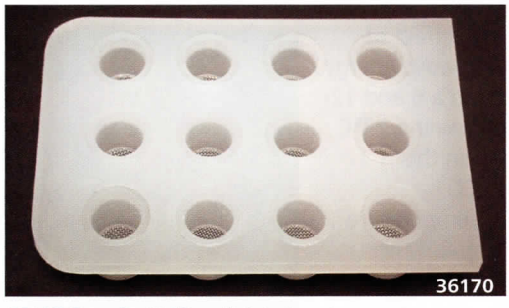
36105 Sequenza™ Slide Rack . . . . . .each

36107 Coverplate™ Assemblies pkg/25

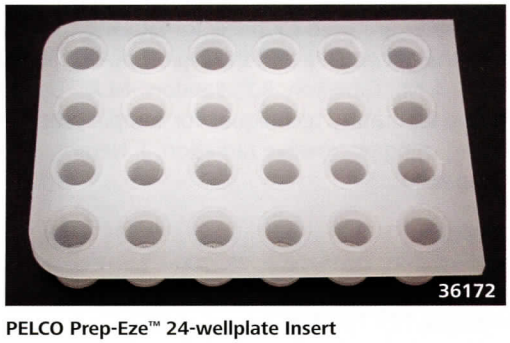


■ PELCO Prep-Eze™ Rectangular Wellplate Inserts *see replacement inserts on page 416*

PELCO Prep-Eze™ 6-wellplate Insert



PELCO Prep-Eze™ 12-wellplate Insert



PELCO Prep-Eze™ 24-wellplate Insert

These rectangular polypropylene wellplate inserts have 6, 12, or 24 wells and will fit into the Corning Costar® Tissue Culture Plates (below right) which is the standard 6/12/24 wellplate design. A 420µm opening, polypropylene mesh is at the bottom of each of the insert wells. Also available in 590µm and 840µm mesh. The outside dimensions of the wellplate inserts are: 81.3mm W x 123.5mm L x 2.4mm H (3.2" W x 4.86" L x .88" H)

Well dimensions of 6-wellplate inserts:
24.1mm diameter x 22.3mm D (.95" diameter. x .88" D)
Well dimensions of 12-wellplate inserts:
14.2mm diameter x 22.3mm D (.56" dia. x .88" D)
Well dimensions. of 24-wellplate inserts:
11.2mm diameter x 22.3mm D (.44" diameter. x .88" D)

36168 PELCO Prep-Eze™ 6-wellplate Insert . . . . . .each
36170 PELCO Prep-Eze™ 12-wellplate Insert . . . . .each
36172 PELCO Prep-Eze™ 24-wellplate, Insert . . . .each

Other Optional Wellplate Accessories
36168-8 6-Well Insert Replacement Mesh pkg/30
36170-14 12-Well Insert Replacement Mesh pkg/36
36170-24 24-Well Insert Replacement Mesh pkg/48
See replacement wells, page 416

Other Wellplate Accessories

■ Corning Costar® Tissue Culture Plates

Tissue Culture-treated Plates are designed for a wide range of applications including general cell growth experiments, cloning studies, virus isolation and *in vitro* testing.

6 cavity Costar® Tissue Culture Plate **36168-6**

12 cavity Costar® Tissue Culture Plate **36170-12**

24 cavity Costar® Tissue Culture Plate **36172-24**

Plate bottoms are of a uniform thickness, allowing for distortion-free observation. Alphanumeric coordinates are placed on the same focal plane as cell growth, for convenient referencing of cell position. Gripping edges make handling easier.

All plates have non-reversible covers with condensation rings to minimize evaporation and the risk of contamination.

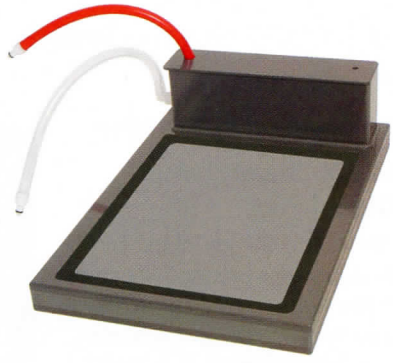
Plates are made of optically clear, medical-grade non-pyrogenic polystyrene, TC-treated, sterile and are used for processing of tissue on the bench or in the microwave. The corresponding Wellplate Inserts (on previous page) are 36168 for the 6 cavity, 36170 for the 12 cavity, and 36172 for the 24 cavity.

Prod No.	No. of Wells	Well Dia.	Well Growth Area	Total Well Vol.	Working Volume	Pkg
36168-6	6	35mm	9.5 cm^2	5 ml	5 ml	cs/50
36170-12	12	22.6mm	3.8 cm^2	7 ml	3 ml	cs/50
36172-24	24	16mm	1.9 cm^2	3.4 ml	2 ml	cs/50

36168-6 Tissue Culture Plate, 6 wells case/50
36170-12 Tissue Culture Plate, 12 wells case/50
36172-24 Tissue Culture Plate, 24 wells case/50

■ PELCO ColdSpot® Pro

designed as a temperature controlled surface will enhance most tissue processing steps



The PELCO ColdSpot® Pro is designed for microwave processing techniques that benefit from an efficient heat transfer between the PELCO ColdSpot® Pro surface (tempered glass) and the sample. This improved product design provides excellent temperature control for electron microscopy tissue processing, immunolabeling and *in situ* hybridization protocols. The glass surface dissipates heat quickly and efficiently. This new design creates a flat surface across the whole top. Filling the PELCO ColdSpot® Pro with water has been simplified. Designed for use with 3435 PELCO® EM Microwave Vacuum Chamber. Ⓣ

Dimensions

Ⓣ = Tech Note on web page

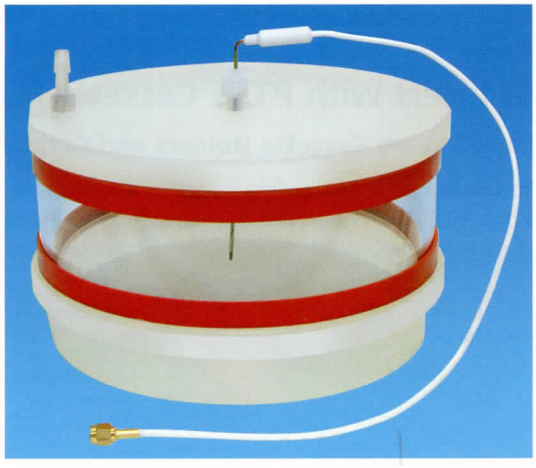
Work Surface area: 223mm W x 291mm D (8.78" W x 11.34" D)

Overall dimensions: 267 W x 381 D x 108mm H (10.5" W x 15" D x 4.25" H)

36116-10 PELCO ColdSpot® Pro . . . . . .each

■ PELCO® EM Microwave Vacuum Chamber

microwave vacuum chamber, for microscopy sample preparation chemical infiltration with reduced fixation times



Features

- Made of chemically resistant microwave transparent materials and designed for vacuum down to 1 torr (1mm Hg).
- Able to run a continuous vacuum during microwave processing.
- Improves ultrastructural preservation during microwave-assisted chemical fixation. Reduced fixation time by 95% when compared to conventional protocols.
- Reduces resin infiltration times by 99% compared to conventional processing and 85% when compared to established microwave protocols.

Dimensions

Inside chamber 178mm diameter x 77mm height (7" dia. x 3" height)

Overall dimensions 200mm diameter x 98mm height (7-⅞" dia. x 3-⅞" height)

3435 PELCO® EM Microwave Vacuum Chamber. . . . .each

The PELCO® EM Microwave Vacuum Chamber is comprised of the following components: glass chamber, gaskets, vacuum ports and 2 caps (with and without Temperature Probe feedthrough). **Note:** Includes all as shown in the picture above except the temperature probe. Temperature probe shown for placement only.

36145-T Temperature Restrictive Temperature Probe with PTFE Coating for use with PELCO® Microwave Processors . . . . . .each

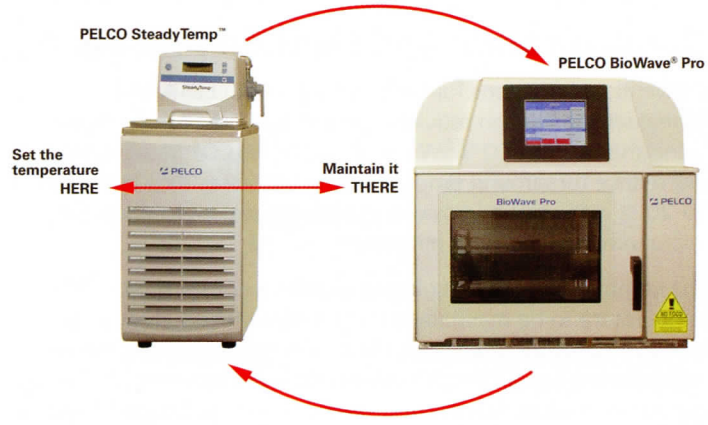
3435-1 Replacement Vacuum Chamber L Gaskets .pkg/2

3435-2 Replacement Glass Cylinder . . . . . .each

Formaldehyde Fixation / EDTA Decalcification

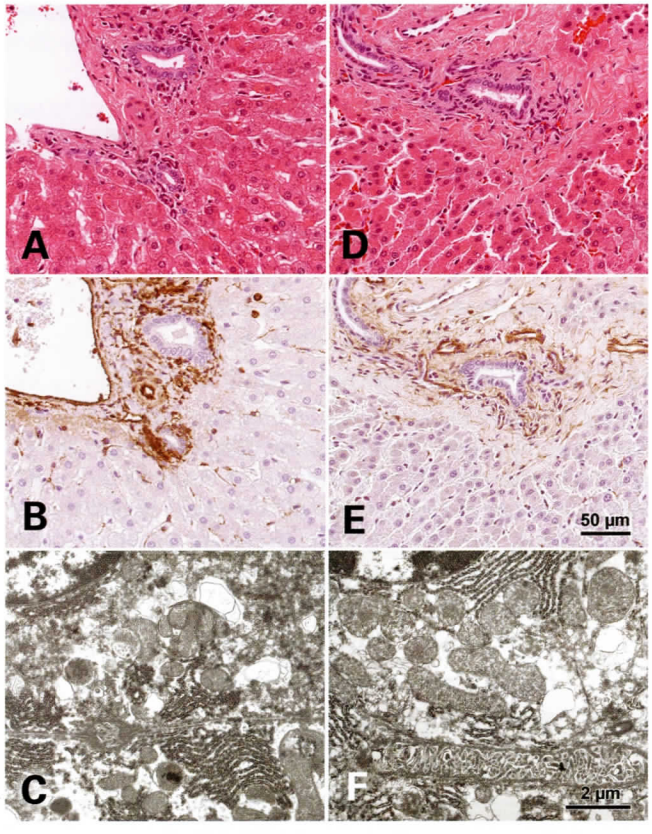
Only the PELCO BioWave Pro® microwave can fix fresh tissue in formalin.

■ Formaldehyde Fixation / EDTA Decalcification Kit



36500-30 Formaldehyde Fixation and EDTA Decalcification Kit
PELCO SteadyTemp® Digital Plus Chiller (50061)
DFR Insert with PTFE Cassette Rack (36200)
Vapor Trap (50050-10)

continued on next page



Figures A-C are of normal mouse liver bench fixed in 10% NBF for 24 hours. Figures D-F are of normal mouse liver fixed in 10% NBF for 20 minutes utilizing microwave radiation. All tissues were prepared for fixation identically and cut to 2mm prior to fixation. Figures A and D are corresponding Hematoxylin and Eosin stained sections and figures B and E are corresponding Vimentin IHC stained sections. Figures C and F are corresponding EM sections demonstrating complimentary ultra-structure. Images are from Dr. Jose Galvez, Center for Comparative Medicine and Department of Medical Pathology, University of California, Davis, CA.

Decalcification and Fixation Processing

Conventional methods for decalcification with EDTA and formaldehyde fixation requires considerable time to complete. Using the new PELCO BioWave® Pro with PELCO® SteadyTemp™ will reduce turnaround times for these processes by a factor of 10-20. It is the first microwave processing system to uncouple microwave heating from microwave energy.

The combination of technologies enables a constant processing temperature to be maintained in concert with continuous microwave exposure. Continuous heat removal during microwave exposure ensures a constant temperature environment (ΔT=0°C) during processing. This environment can be maintained for minutes, hours, days or weeks.

Galvez, JJ, Giberson, RT, Cardiff, RD (2006) The role of microwave radiation in reducing formaldehyde fixation times. The J. Histotechnol. 29:113-121.

Tinling, SP Giberson, RT, Kullar, RS (2004) Microwave exposure increases bone demineralization rate independent of temperature. J. Microsc., 215:230-235.

Application Kit Components

■ PELCO SteadyTemp™ Digital Plus Recirculator

refrigerated bath recirculators

PELCO SteadyTemp™ Digital Plus

PELCO SteadyTemp™ Digital Plus

The PELCO SteadyTemp™ Digital Plus provides precise fully automatic temperature control for a variety of microwave processing applications (e.g. formaldehyde fixation, EM processing, *in situ* hybridization, immunolabeling and decalcification) using the PELCO ColdSpot®. Sample temperature control with Digital Plus is set and monitored via the touch screen on the new PELCO BioWave® Pro tissue processing system. The controls of the PELCO SteadyTemp™ Digital Plus are fully integrated with the PELCO BioWave® Pro system. The ability to control sample temperature in this manner is unique and can provide continuous working temperatures above or below ambient from +10° to +80°C via 500 watts of cooling and 800 watts of heating capacity.

7.21 l (1.9 gal) stainless bath. 27.2 kg (60 lbs)

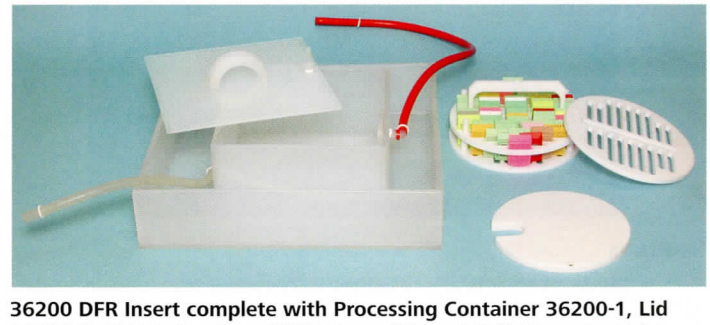
50061 PELCO SteadyTemp™ Digital Plus Recirculator, 115VAC . . . . . .each

50061-220 PELCO SteadyTemp™ Digital Plus Recirculator, 220VAC . . . . . .each

■ DFR Insert with PTFE Cassette Holder

Round and Square Cassette Holders and Components

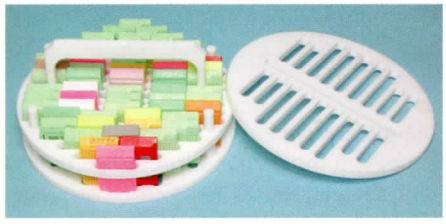
for fixation or decalcification of specimens using standard cassettes in the PELCO BioWave® Pro Microwave Tissue Processor



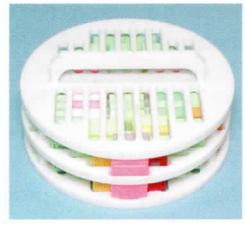
36200 DFR Insert complete with Processing Container 36200-1, Lid 36200-2, DFR Safety Tray 36200-3, and Round PTFE Cassette Holder 36160-3

continued on next page

Designed for use in the PELCO BioWave® Pro for fixation or decalcification. Water, formaldehyde or EDTA can be recirculated around the cassette holder in the inner container. Outer container is to hold any spills and prevent damage to the microwave chamber. Standard round Cassette Holder 36160-3 is designed for easy loading and will hold 58 standard sized cassettes with size of 1.5" (40.6mm) L x 1.1" (28.6mm) W x 0.28" (7mm) D.



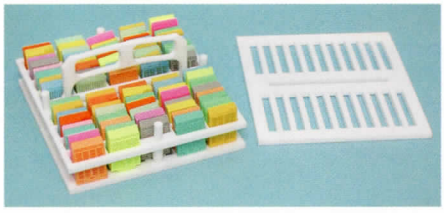
Cassettes loaded into Round Cassette Holder 36160-3



Top piece put in place

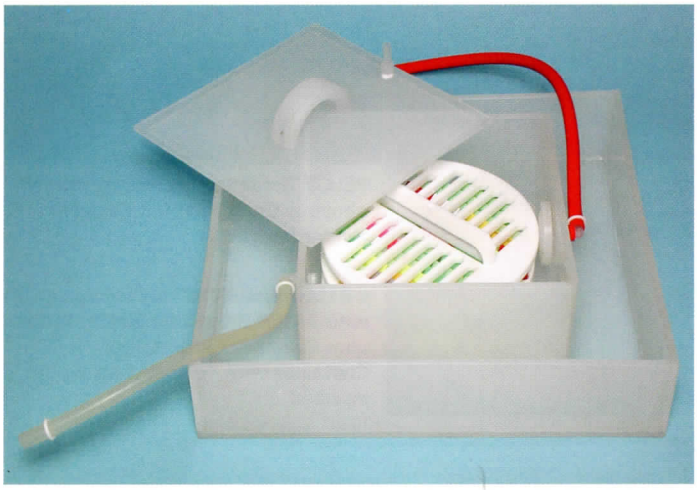
The square-shaped cassette holder is designed to hold up to 78 standard size plastic cassettes, all the same orientation and plane. This assures that every tissue sample will see the same microwave conditions. The design can be used in the existing 36200 system for decalcification and formalin fixation and expands the capacity of the older system by being able to handle 20 more cassettes per processing run.

Red hose is for fluid in, fitted with a nylon screen to limit direct flow, and white hose is for fluid out. A port in the lid is for insertion of the temperature probe.



Cassettes loaded into Square Cassette Holder 36200-4

Top piece put in place



Placement of Round PTFE Cassette Holder in Processing Container within DFR Safety Tray Note: Square Cassette Holder may also be used

Dimensions:

Round Cassette Holder: 7.94cm H (with handle) x 17.5cm diameter (3.125" H x 6.875" diameter)

Square Cassette Holder: 7.94cm H (with handle) x 17.15cm² (3.125" H x 6.75"2)

Inner Container (inside dimensions): 9.53cm H x 19.5cm² (3.75" H x 7.69"2)

Outer Container (inside dimensions): 6.99cm H x 34.3cm² (2.75" H x 13.5"2)

36200 DFR Insert . . . . . .each

The 36200 DFR insert is comprised of the following components: Processing Container 36200-1; Lid 36200-2; DFR Safety Tray 36200-3; Round PTFE Cassette Holder 36160-3

Optional Replacements:

36200-1 Processing Container, square . . . . . .each
36200-2 Lid for Processing Container . . . . . .each
36200-3 DFR Safety Tray . . . . . .each
36160-3 Round Cassette Holder, 58 cassettes . . . . . .each
36200-4 Square Cassette Holder, 78 cassettes . . . . .each

References

Giberson RT, Elliott DE, 2001. Microwave-assisted formalin fixation of fresh tissue: A comparative study. In Giberson RT, Demaree Jr. RS, eds. Microwave Techniques and Protocols, Totowa, NJ, Humana Press, pp191-208.

Galvez JJ, Giberson RT, Cardiff RD, 2006. The role of microwave radiation in reducing formaldehyde fixation times. The J. Histotechnol. 29:113-121.

Galvez JJ, Giberson RT, Cardiff RD, 2004. Microwave mechanisms - the energy/heat dichotomy. Microsc. Today, 12(2):18-23.

Optional Formaldehyde Fixation/EDTA Decalcification Accessories

■ PELCO SteadyTemp™

The PELCO SteadyTemp™, for extended temperature control, providing continuous working temperatures from +4 to +100° C. 500 watts cooling and 800 watts heating capacity. The PELCO BioWave® Pro is designed to utilize this instrument for chamber temperature modulation via the PELCO ColdSpot® Plus or ColdSpot® Pro. Temperature setting controls are on the PELCO SteadyTemp™.

7.21 l (1.9 gal) stainless bath. 27.2 kg (60 lbs)

PELCO SteadyTemp™

50051 PELCO SteadyTemp™ Recirculator, 115VAC . . . . . .each

50051-220 PELCO SteadyTemp™ Recirculator, 220VAC . . . . . .each

Chloramine-T Algicide

A non-corrosive algicide for use with constant temperature bath or recirculation chillers like the PELCO SteadyTemp™ and chillers used for TEM/SEM systems. Chloramine-T Algicide prevents the growth of algae which can be damaging to equipment and instrumentation. The product can be used as a shock treatment, or as a preventative treatment at a dosage of 1 gram per gallon. Best to use distilled water to avoid scaling and shield the bath and cooling lines from light. M

18625 Chloramine-T Algicide, 25gm . . . . . .each

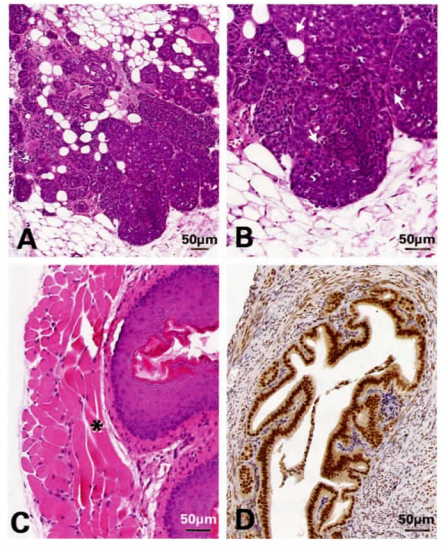
Paraffin Tissue Processing

Ted Pella, Inc. offers a solution that is quick, efficient, and a great value when compared to standard automated tissue processors and , even more so, to automated microwave tissue processors. Our PELCO BioWave® Pro, combined with our Paraffin Application Kit, will get you started in rapid paraffin processing.

Paraffin Tissue Processing Kit

36500-40 Paraffin Tissue Processing Kit
PELCO ColdSpot® Polypropylene (36116-20)
PELCO TissueVac™ System (Vacuum Chamber) and 58 Cassette Holder (36160)
PELCO HistoWave® Cassette System (36150)
Paraffin Heating Tile (36150-1)
Bubbler Probe (36137)

Paraffin Processing
Tissues formalin fixed and paraffin processed by the protocols described in Galvez et al. 2006. Mouse mammary tumor virus induced mammary carcinoma (A, B). Note the mitotic figures (arrows) in B. Mouse esophagus with clearly identifiable muscle striations (*) (C). Mouse uterus stained with mouse anti-estrogen (D). (Center for Comparative Medicine and Department of Pathology, Univ. of Calif., Davis)



Application Kit Components

PELCO ColdSpot® Plus

designed for higher solution temperatures

The PELCO ColdSpot® Plus is designed for microwave processing techniques that benefit from retained heat and higher solution temperatures. The unique construction of this PELCO ColdSpot® Plus is designed for the temperature requirements encountered during paraffin processing applications. The all-welded construction combined with the solvent resistant and thermal properties of the plastic make it the ideal choice when processing solution temperatures of 50°C (122° F) or higher are required. This PELCO ColdSpot® Plus design provides control of the microwave environment (eliminating hot and cold spots) while meeting the demands presented during high temperature processing techniques. T Tech Note on web page

Dimensions

Work Surface area: 267mm W x 286mm D
(10.5" W x 11.25" D)

Overall dimensions: 267 W x 356 D x 105mm H
(10.5" W x 14" D x 4.125" H)

36116-20 PELCO ColdSpot® Plus . . . . . .each

PELCO TissueVac™ Histology Vacuum Accessory

vacuum chamber and embedding - processing cassette holder - for microwave processing

PELCO TissueVac™ accessory shown above without 36160-3 Cassette Holder inserted

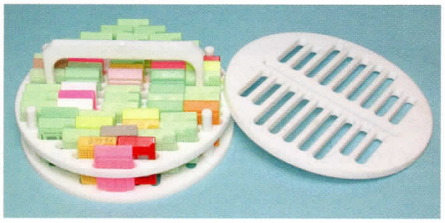
< PELCO TissueVac™ accessory shown with 36160-3 Cassette Holder in Vacuum Chamber / Processing Container with Temperature Probe inserted

continued on next page

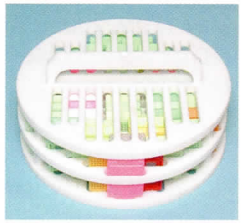
M = MSDS on web page

The PELCO TissueVac™ Histology Vacuum Accessory is designed for the PELCO BioWave® Pro Microwave Processor and can be used in conjunction with the PELCO ColdSpot®. It can be used with any of the three vacuum settings on the PELCO BioWave® Pro (vacuum cycle, vacuum on W/MW, vacuum on) or without the vacuum function.

The container and lid are made from microwave-transparent polypropylene. The integrated temperature probe allows the use of temperature restriction control with vacuum.



Cassettes loaded into Round Cassette Holder 36160-3



Top piece put in place

The cassette holder will hold up to 58 standard size plastic cassettes, all in the same orientation and plane. This assures that every tissue sample will see the same microwave conditions. The granite stone is used as a heat receptor during paraffin infiltration.

Vacuum Chamber outside dimensions:
169.9mm H (with handle) x 277.8mm W (with handles)
(6.69" H x 10.09" W)

Vacuum Chamber inside dimensions (with paraffin heating tile and lid in place):
92.2mm H x 177.3mm diameter (3.63" H x 6.98 diameter)

Cassette Holder dimensions (with handle):
79.4mm H (with handle) x 175mm diameter (3.125" H x 6.875" diameter)

36160 PELCO TissueVac™ System . . . . . .each

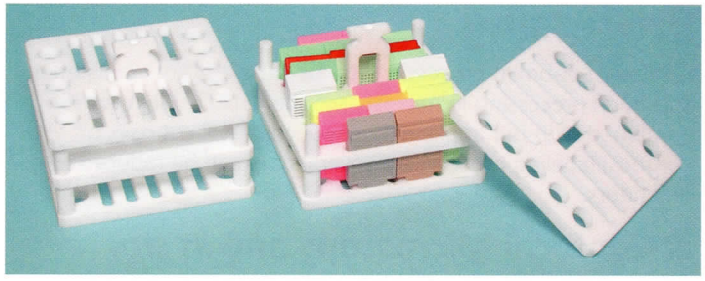
The PELCO TissueVac™ System is comprised of the following components:
Processing Container 36160-1 ; Lid Assembly 36160-2; Cassette Holder (PTFE) for 58 cassettes 36160-3; Paraffin Heating Tile 36160-4; PTFE coated Temperature Probe 36160-5; L-Gasket 36160-6; Nylon Strap 36160-7; Operation Manual

Replacements:

36160-1 Processing Container . . . . . .each
36160-2 Lid Assembly for 36160 . . . . . .each
36160-3 Cassette Holder, round, for 58 cassettes . . .each
36160-4 Paraffin Heating Tile for 36160 . . . . . .each
36160-5 PTFE coated Temperature Probe . . . . . .each
36160-6 L-gasket for 36160 . . . . . .each
36160-7 Nylon Strap for 36160 . . . . . .each

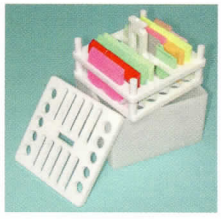
PELCO HistoWave® Cassette System

can be used as a stand-alone system or in the PELCO TissueVac™ accessory



Cassette Rack shown assembled and loaded, note the two over-sized (white) cassettes being accommodated in the center of the rack.

Cassette Tank



Cassette Holder with cassettes may be rested on the tank to facilitate draining.

PELCO HistoWave® Cassette System loaded and assembled.

The PELCO HistoWave® Cassette System consists of a Cassette Tank and Cassette Rack. The design provides for ease of loading, unloading and fluid exchange during processing. The system will hold 26 standard-sized plastic cassettes or 22 standard and 2 over-sized cassettes. There is a hole in the handle for the temperature probe. The amount of reagent needed to cover 1 or 26 cassettes is approximately 500ml. It is easiest to add solutions when the system is assembled. The system is made of microwave-compatible and solvent-resistant plastics.

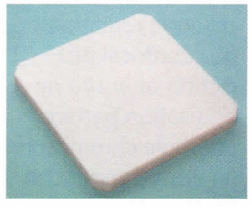
Note: The PELCO HistoWave® Cassette System may also be used in the PELCO TissueVac™ Vacuum Chamber, 36161 and 36160, which is an accessory for the PELCO BioWave® Pro and previous PELCO® Microwave Processors.

Size of Standard Histology Cassette:
Length: 1.6" (4.06cm)
Width: 1.1" (2.86cm)
Depth: 0.28" (0.7cm)

Size of Over-Sized Histology Cassette:
Length: 1.7" (4.30cm)
Width: 1.1" (2.8cm)
Depth: 0.51" (1.30cm)

Dimensions of Cassette Holder (with handle):
79.4mm H x 111.2mm square (3.125" H x 4.375" square)

Inside Dimensions of Cassette Tank:
73mm D x 115.1mm square (2.875" D x 4.53" square)



Paraffin Heating Tile may be used under Cassette Tank when more heat generation is required, in the Microwave Tissue Processor, for paraffin embedding. Order separately.

36150 PELCO HistoWave® Cassette System . . . . . .each
36151 PELCO HistoWave® Cassette Tank only . . . . .each
36151-1 PELCO HistoWave® Cassette Rack only . . . . .each
36150-1 PELCO HistoWave® Paraffin Heating Tile . . . .each

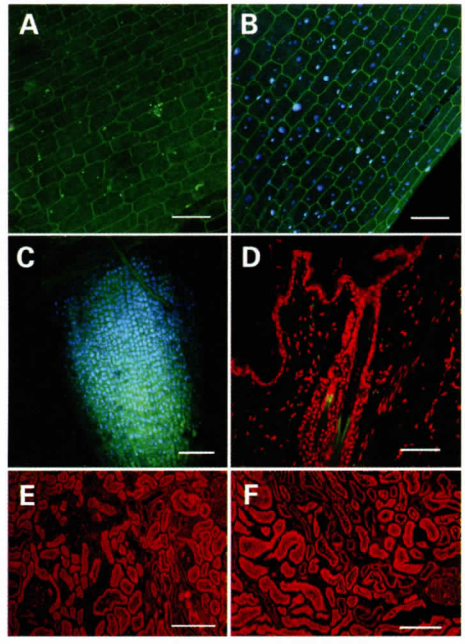
Confocal Microscopy and *in situ* Hybridization Specimen Processing

Confocal specimen processing can be the most time-consuming specimen processing in microscopy. The PELCO® BioWave Pro, combined with our application-specific kit, will cut days off your confocal labeling procedures. Several days can be reduced to several hours.

■ Confocal Microscopy and *in situ* Hybridization Kit

36500-50 Confocal Microscopy and *in situ* Hybridization Kit
PELCO ColdSpot® Pro, Glass (36116-10)
PELCO® EM Microwave Vacuum Chamber (3435)
PELCO SteadyTemp™ Digital Plus Chiller (50061)
PELCO Prep-Eze™ 12-Wellplate Insert (36170)
PELCO Prep-Eze™ 24-Wellplate Insert (36172)

Confocal Microscopy

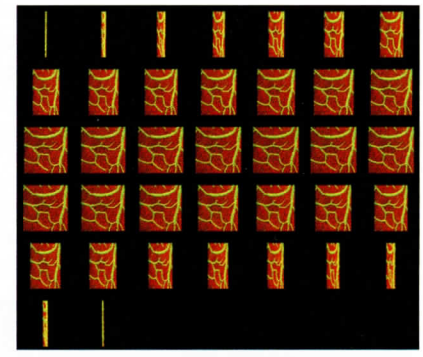


Confocal projection of *Elodea Canadensis* labeled with Hoechst 33258 nucleic acid probe (blue stain) for 6 minutes in the absence (A) and presence (B) of 150W microwave radiation. Confocal projection of *Arabidopsis Thaliana* root tip labeled with Hoechst 33258 nucleic acid probe after 6 minutes of 150W microwave radiation (C). Confocal projection of *in situ* hybridization patters of whole chromosome probes (red) hybridized to nuclei of paraffin embedded rabbit skin (D). Confocal projection of mouse kidney paraffin sections labeled with anti-Factor VIII monoclonal antibody for 60 minutes on the bench (E) and after 6 minutes of 150W radiation (F) (Scale for all bars = 50µm) (Table 1 page 413). (Mark Sanders, Imaging Center, College of Biological Sciences, Univ. of Minnesota, St. Paul, MN). Reprinted with permission of Galvez et al., Microscopy and Analysis, Nov. 2006.

Microwave Assisted Immunolabeling

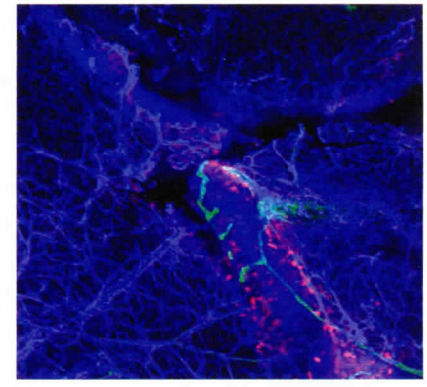
starting point: free floating section/tissue

Retinas were fixed in 4% paraformaldehyde in 0.1M phosphate buffer (pH 7.4) overnight at 4°C. Following labeling the tissue was rinsed 6 x 20 minutes in buffer prior to beginning antibody labeling. The bench labeling protocol requires 7 days. These labeling results were completed in an afternoon using microwave-enhanced labeling (PELCO BioWave® Pro with PELCO® SteadyTemp™) during a workshop held at the Univ. of Minnesota Imaging Center (Mark Sanders, Director - May 17-19, 2006). The retinas were double-labeled for:



- Collagen Type IV (basal lamina surrounding blood vessels) with rabbit anti-type IV collagen and the secondary conjugated to FITC (green label)
- Glutamine Synthetase (enzyme found in retinal Müller glial cells) with mouse anti-glutamine synthetase and the secondary conjugated to Cy3 (red label)

Primary antibody labeling was done at 170W for 12 minutes (4 on - 4 off - 4 on) under vacuum (15" Hg). Secondary antibody labeling was done at 170W for 6 minutes (2 on - 2 off - 2 on) under vacuum (15" Hg). Images were collected on a Nikon C1si Confocal Microscope.



Retinas were fixed in 4% paraformaldehyde in 0.1M phosphate buffer (pH 7.4) overnight at 4°C. Following fixation the tissue was rinsed 6 x 20 minutes in buffer prior to beginning antibody labeling. The bench staining protocol required 7 days. The labeling results were completed in an afternoon using microwave-enhanced labeling during a workshop held at the Univ. of Minnesota Imaging Center (Mark Sanders, Director - May 17-19, 2006). The retinas were triple-labeled for:

- Collagen Type IV (basal lamina surrounding blood vessels) with rabbit anti-type IV collagen and the secondary conjugated to FITC (green label)
- Glutamine Synthetase (enzyme found in retinal Müller glial cells) with mouse anti-glutamine synthetase and the secondary conjugated to Cy3 (red label)
- Glial Fibrillary Acidic Protein (GFAP an intermediate filament protein of astroglial cells) with chicken anti-glial fibrillary acidic protein and the secondary conjugated to Cy5 (blue label)

Primary antibody labeling was done at 170W for 12 minutes (4 on - 4 off - 4 on) under vacuum (15" Hg). Secondary antibody labeling was done at 170W for 6 minutes (2 on - 2 off - 2 on) under vacuum (15" Hg). Images were collected on a Nikon C1si Confocal Microscope.

Components

Chloramine-T Algicide

A non-corrosive algicide for use with constant temperature bath or recirculation chillers like the PELCO SteadyTemp™ and chillers used for TEM/SEM systems. Chloramine-T Algicide prevents the growth of algae which can be damaging to equipment and instrumentation. The product can be used as a shock treatment, or as a preventative treatment at a dosage of 1 gram per gallon. Best to use distilled water to avoid scaling and shield the bath and cooling lines from light. M

18625 Chloramine-T Algicide, 25gm . . . . . .each

PELCO SteadyTemp™ Digital Plus

refrigerated bath recirculator

PELCO SteadyTemp™ Digital Plus

The PELCO SteadyTemp™ Digital Plus provides precise fully automatic temperature control for a variety of microwave processing applications (e.g. formaldehyde fixation, EM processing, *in situ* hybridization, immunolabeling and decalcification) using the PELCO ColdSpot®. Sample temperature control with Digital Plus is set and monitored via the touch screen on the new PELCO BioWave® Pro tissue processing system. The controls of the PELCO SteadyTemp™ Digital Plus are fully integrated with the PELCO BioWave® Pro system. The ability to control sample temperature in this manner is unique and can provide continuous working temperatures above or below ambient from +10° to +80°C via 500 watts of cooling and 800 watts of heating capacity.

PELCO SteadyTemp™ Digital Plus

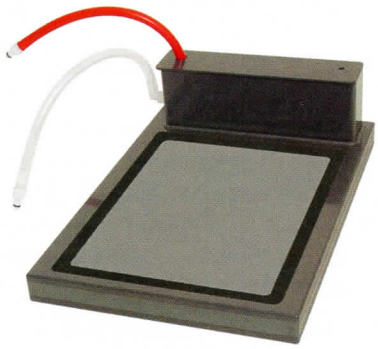
7.21 l (1.9 gal) stainless bath. 27.2 kg (60 lbs)

50061 PELCO SteadyTemp™ Digital Plus Recirculator, 115VAC . . . . . .each

50061-220 PELCO SteadyTemp™ Digital Plus Recirculator, 220VAC . . . . . .each

PELCO ColdSpot® Pro

designed as a temperature controlled surface will enhance most tissue processing steps



The PELCO ColdSpot® Pro is designed for microwave processing techniques that benefit from an efficient heat transfer between the PELCO ColdSpot® Pro surface (tempered glass) and the sample. This improved product design provides excellent temperature control for electron microscopy tissue processing, immunolabeling and *in situ* hybridization protocols. The glass surface dissipates heat quickly and efficiently and can be easily cleaned with a razor blade. This new design creates a flat surface across the whole top. Filling the PELCO ColdSpot® Pro with water has been simplified. Designed for use with 3435 PELCO® EM Microwave Vacuum Chamber. T

T = Tech Note on web page

Dimensions

Work Surface area: 223mm W x 291mm D (8.78" W x 11.34" D)

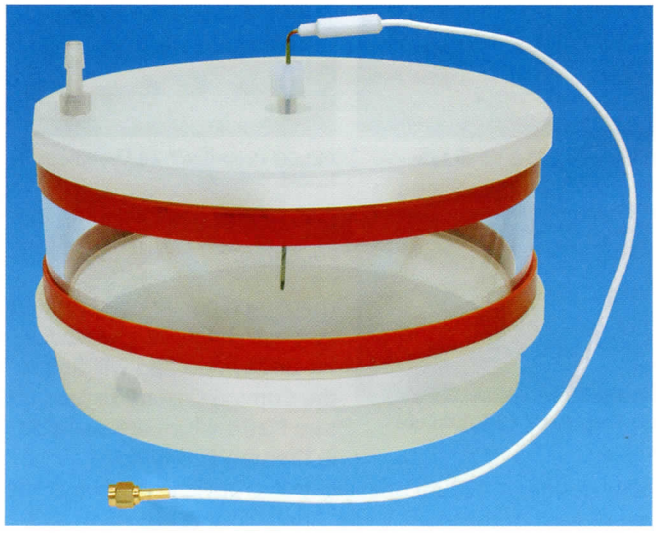
Overall dimensions: 267 W x 381 D x 108mm H (10.5" W x 15" D x 4.25" H)

36116-10 PELCO ColdSpot® Pro . . . . . .each

PELCO® EM Microwave Vacuum Chamber

microwave vacuum chamber, for microscopy sample preparation chemical infiltration with reduced fixation times

continued on next page



■ PELCO® EM Microwave Vacuum Chamber *continued*

Features

- Made of chemically resistant microwave transparent materials and designed for vacuum down to 1 torr (1mm Hg).
- Able to run a continuous vacuum during microwave processing.
- Improves ultrastructural preservation during microwave-assisted chemical fixation. Reduced fixation time by 95% when compared to conventional protocols.
- Reduces resin infiltration times by 99% compared to conventional processing and 85% when compared to established microwave protocols.

Dimensions

Inside chamber: 178mm diameter x 77mm height (7" dia. x 3" height)

Overall dimensions: 200mm diameter x 98mm height (7-⅞" dia. x 3-⅞" height)

3435 PELCO® EM Microwave Vacuum Chamber. . . . .each

The PELCO® EM Microwave Vacuum Chamber is comprised of the following components: glass chamber, gaskets, vacuum ports and 2 caps (with and without Temperature Probe feedthrough).

Note: Includes all as shown in the picture above except the temperature probe. Temperature probe shown for placement only.

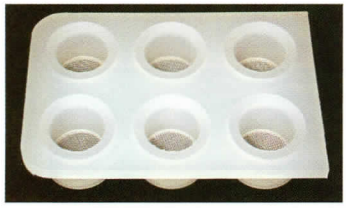
Optional Vacuum Accessories

36145-T Temperature Restrictive Temperature Probe with PTFE Coating for use with PELCO® Microwave Processors . . . . . .each

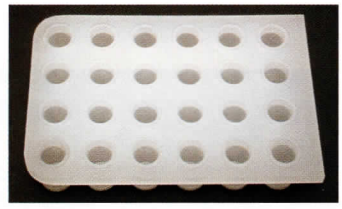
3435-1 Replacement Vacuum Chamber L Gaskets .pkg/2

3435-2 Replacement Glass Cylinder . . . . . .each

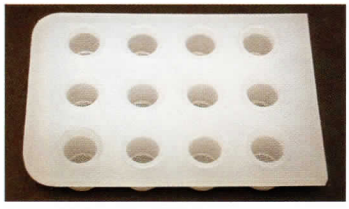
■ PELCO Prep-Eze™ Rectangular Wellplate Inserts



PELCO Prep-Eze™ 6-Wellplate Insert



PELCO Prep-Eze™ 24-Wellplate Insert



PELCO Prep-Eze™ 12-Wellplate Insert

see replacement inserts on page 416

These rectangular polypropylene wellplate inserts have 6, 12, or 24 wells and will fit into the Corning Costar® Tissue Culture Plates which are available in the standard 6/12/24 wellplate design. A 420µm opening, polypropylene mesh is at the bottom of each of the insert wells. Also available in 590µm and 840µm mesh. The outside dimensions of the wellplate inserts are:

81.3mm W x 123.5mm L x 2.4mm H (3.2" W x 4.86" L x .88" H)

Well dimensions of 6-wellplate inserts:
24.1mm diameter x 22.3mm D (.95" diameter x .88" D)
Well dimensions of 12-wellplate inserts:
14.2mm diameter x 22.3mm D (.56" diameter x .88" D)
Well dimensions of 24-wellplate inserts:
11.2mm diameter x 22.3mm D (.44" diameter x .88" D)

36168 PELCO Prep-Eze™ 6-wellplate Insert . . . . . .each
36170 PELCO Prep-Eze™ 12-wellplate Insert . . . . .each
36172 PELCO Prep-Eze™ 24-wellplate, Insert . . . .each

Optional Wellplate Components

36168-8 6-Well Insert Replacement Mesh pkg/30
36170-14 12-Well Insert Replacement Mesh pkg/36
36170-24 24-Well Insert Replacement Mesh pkg/48

Other Optional Wellplate Accessories

■ Corning Costar® Tissue Culture Plates

6 cavity Costar® Tissue Culture Plate (36168-6)

24 cavity Costar® Tissue Culture Plate (36170-24)

12 cavity Costar® Tissue Culture Plate (36170-12)

Tissue Culture-treated Plates are designed for a wide range of applications including general cell growth experiments, cloning studies, virus isolation and *in vitro* testing. Plate bottoms have uniform thickness, allowing for distortion-free observation.

Prod No.	No. of Wells	Well Dia.	Well Growth Area	Total Well Vol.	Working Volume	Pkg
36168-6	6	35mm	9.5 cm²	5 ml	5 ml	cs/50
36170-12	12	22.6mm	3.8 cm²	7 ml	3 ml	cs/50
36172-24	24	16mm	1.9 cm²	3.4 ml	2 ml	cs/50

Alphanumeric coordinates are placed on the same focal plane as cell growth, for convenient referencing of cell position. Gripping edges make handling easier.

All plates have non-reversible covers with condensation rings to minimize evaporation and the risk of contamination.

Plates are made of optically clear, medical-grade non-pyrogenic polystyrene, TC-treated, sterile and are used for processing of tissue on the bench or in the microwave. The corresponding Wellplate Inserts (on previous page) are 36168 for the 6 cavity, 36170 for the 12 cavity, and 36172 for the 24 cavity.

36168-6 Tissue Culture Plate, 6 wells case/50
36170-12 Tissue Culture Plate, 12 wells case/50
36172-24 Tissue Culture Plate, 24 wells case/50

Optional Accessories

■ PELCO SteadyTemp™

The PELCO SteadyTemp™, for extended temperature control, providing continuous working temperatures from +4 to +100° C. 500 watts cooling and 800 watts heating capacity. The PELCO BioWave® Pro is designed to utilize this instrument for chamber temperature modulation via the PELCO ColdSpot® Plus or ColdSpot® Pro. Temperature setting controls are on the PELCO SteadyTemp™.

7.21 l (1.9 gal) stainless bath. 27.2 kg (60 lbs)

PELCO SteadyTemp™

50051 PELCO SteadyTemp™ Recirculator, 115VAC . . . . . .each

50051-220 PELCO SteadyTemp™ Recirculator, 220VAC . . . . . .each

■ Stir Bar PTFE

3260-1 Stir Bar PTFE 51 x 8mm . . . . . .each

3260-2 Stir Bar PTFE 38 x 8mm . . . . . .each

3260-3 Stir Bar PTFE 25 x 8mm . . . . . .each

3260-4 Stir Bar PTFE 8 x 1.5mm pkg/2

Tissue Culture Products for Adherent Cells

■ Tissue Culture Plates and Cell + TC Plates

- Lid with condensation rings
- Wells with raised rims
- Lid can only be placed on plate in one direction
- Stackable
- 50 Plates per case


96 Wells


24 Wells


6 Wells

Prod. No.	Description	Growth Surface cm^2	No. of Wells	Max Vol. per Well	Base Shape
36175	96 FB Well TC Plate, ADH	0.35	96	0.38ml	⌴
36175-1	96 FB Well TC Plate, Cell +	0.35	96	0.38ml	⌴
36176	24 FB Well TC Plate, ADH	2	24	3.6ml	⌴
36176-1	24 FB Well TC Plate, Cell +	2	24	3.6ml	⌴
36177	96 RB Well TC Plate, ADH	0.35	96	0.38ml	∪
36178	96 VB Well TC Plate, ADH	0.35	96	0.38ml	V
36179	6 VB Well TC Plate, ADH	9.5	6	17.2ml	⌴
36179-1	6 VB Well TC Plate, Cell +	9.5	6	17.2ml	⌴