CUNO®

Electronics

CUNO Filter Systems for Electronics and Electronic Component Manufacturing

Filtration Applications for the Manufacture of:

- Printed Circuit Boards
- Compact Discs
- Hard Disc Drives
- Flat Panel Displays
- Cathode Ray Tubes
- Ceramic Capacitors

CUNO is a leader in advanced filter systems and membrane based separations, offering a range of products for semiconductor and electronic component manufacturing

Quality

CUNO Filter Systems deliver worldwide QUALITY for consistent operation.

- ISO 9002 manufacturing facilities
- Worldwide manufacturing and distribution
- Rigorous in-house validation and qualification of all products
- Customer support labs

Performance

CUNO Filter Systems offer superior PERFORMANCE and support

- Highest flow rates of all competitive charge modified cartridges for water filtration
- Industry leading classification depth filters for slurry applications
- Broad range of filtration and housing products for optimizing customer process performance
- Market specific technical expertise from SASS personnel

Innovation

CUNO Filter Systems provides INNOVATION and state-of-the-art filtration.

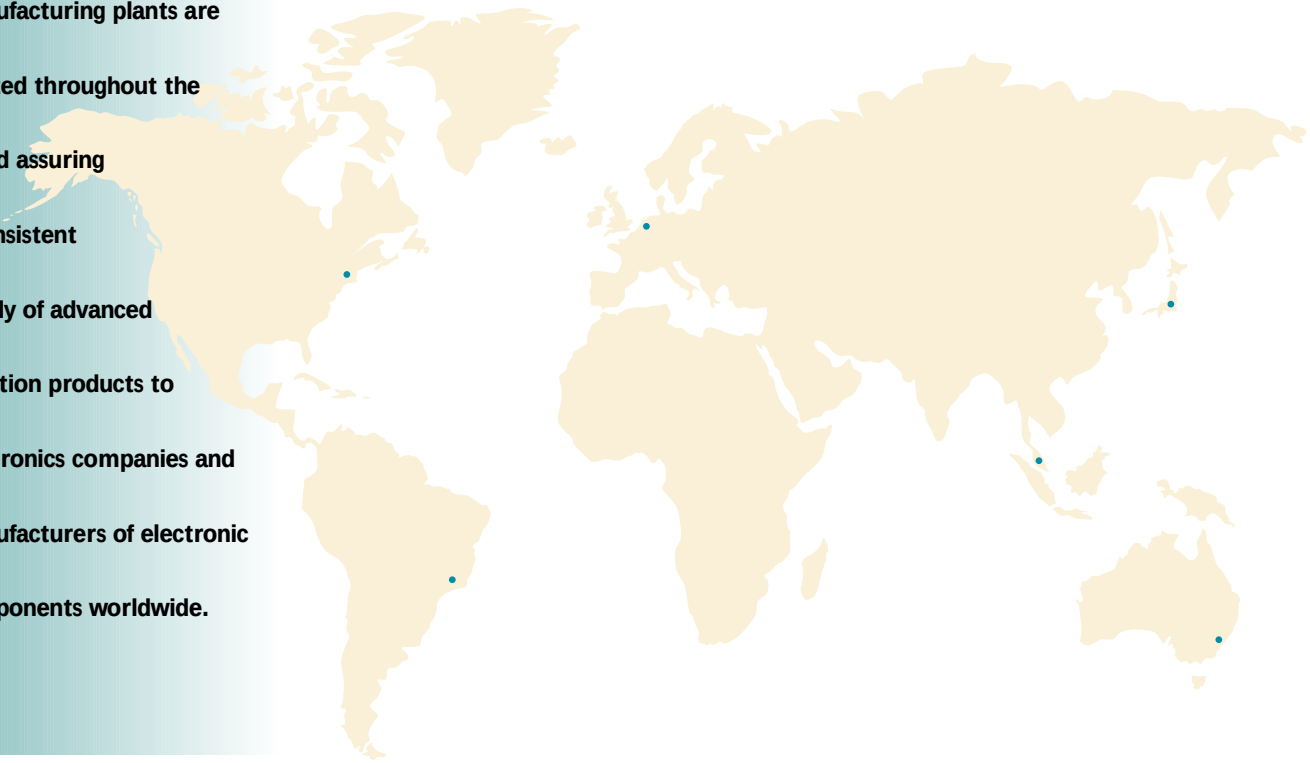
- Advanced electrokinetic technology
- First with 0.04 µm microfiltration
- SuperFinish enhanced surface finish technology for metal housings

Contents

CUNO . . . A World Leader In Fluid Purification

CUNO is a U.S. based multinational, high technology company with worldwide distribution and manufacturing facilities. The majority of CUNO's manufacturing sites have ISO 9002 registered quality systems. Global manufacturing sites together with trained stocking distributors and state-of-the-art laboratory support bring quality solutions to challenging electronic manufacturing applications.

CUNO's world-class manufacturing plants are located throughout the world assuring a consistent supply of advanced filtration products to electronics companies and manufacturers of electronic components worldwide.



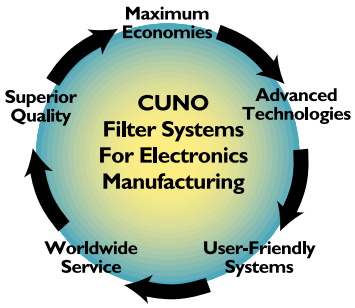
CUNO has maintained its leadership in fluid filtration and purification by continually providing superior products and technical support. CUNO filtration systems are designed and manufactured to the most stringent industry standards to assure the reliability of CUNO systems that electronic component manufacturers have come to expect.

Total Quality Management & ISO 9002

ISO 9002 Registered Quality System

CUNO has established a Total Quality Management (TQM) program for all facets of its operations. An essential part of the CUNO TQM program is the creation of multi-function teams whose combined expertise is devoted to continuous improvement of processes, procedures, and quality systems. Another important element of the CUNO TQM system is active senior management support and participation. CUNO is fully committed to the tenets of the TQM program and provides a support system for the quality process. The principal CUNO manufacturing plants are ISO 9002 registered. At CUNO, Quality is defined by the never ending pursuit for continuous improvement in products, services, and personnel.

CUNO Engineered Filtration Solutions



CUNO is a world class manufacturer of innovative filtration products with engineers, scientists, and filtration specialists serving customer's needs worldwide. A dedicated staff of market specialists provides engineered filtration solutions to accommodate a wide range of contamination control problems.

With multiple manufacturing facilities located in the United States, Australia, Brazil, France, and Japan, CUNO supplies filtration products to industries as broad ranging and diverse as microelectronics, bio-technology, pharmaceutical, defense, power generation, petrochemical-chemical, and many other demanding industrial and consumer markets. Established in 1912, CUNO Incorporated is headquartered in Meriden, Connecticut, where the primary U.S. manufacturing plants, principal R&D facilities, and full scale customer support laboratories are located.

CUNO is renowned for its technical expertise and continues to invest aggressively in research and development, expand laboratory facilities, and develop pilot plant capabilities. Pursuit of innovation has yielded advances in filtration technology and resulted in a multitude of engineered contamination control solutions for a variety of applications.

Such innovation is responsible for the development of many of the filtration products for electronics applications. These products dramatically improve process fluid purity, enabling customers to achieve increased process efficiency, yield improvement, and reduced manufacturing costs.

Scientific Applications Support Services (SASS)

The cornerstone of CUNO's philosophy is service to customers, not only in product quality and prompt delivery, but also in validation, application support and in the sharing of scientific information.

CUNO's Scientific Applications Support Services works closely with customers to solve difficult filtration challenges and to recommend the most efficient, economical filter systems. SASS specialists can perform on-site testing and utilize filtration applications expertise to partner with customers.

CUNO resolves filtration problems promptly and efficiently in a cost-effective, confidential manner with a commercial support group consisting of CUNO's in house customer service staff, application specialists, and engineering services. CUNO's broad distributor base and sales offices provide worldwide customer service, local inventory, and field support in virtually every major center of manufacturing for the general electronics industry.

Filtration & Purification Solutions for the Electronics Industry

Many electronics components, from discrete capacitors to state-of-the-art microprocessors, benefit from CUNO process solutions. The exploding worldwide demand for electronics products has placed stricter requirements on device manufacturing. Fluid purity, a critical component of the manufacturing process, can be increased and maintained with CUNO filter products. CUNO's filtration products can provide:

- Increased product yields and throughputs
- Decreased raw materials usage
- Reduced systems downtime and maintenance
- Economical fluid waste treatment and disposal

Innovative products from CUNO address many electronics applications. Electropor charge modified membrane filters remove "killer defect" particles as small as 40 nanometers from process water, while still maintaining high flow rates. Severe etching chemical conditions demand the Microfluor product line, an economical PTFE membrane filter cartridge. CUNO's complete range of depth filter products handle long-term particle loading in slurries and bulk chemicals without contaminant release. Whatever the application, from gross contaminants to sub-micron particles, CUNO is committed to providing an engineered filtration solution.

Customer Commitment

Contamination control expertise is part of CUNO's responsibility to the electronics industry. SASS scientists and engineers, as well as field based support personnel, are filtration specialists prepared to identify process issues, propose solutions, and assist in their implementation. Every CUNO product used in a facility represents a strong customer/supplier partnership. CUNO is not just an equipment supplier – we are a part of your process team, providing filtration solutions. Customers call on CUNO to be their process partner.

High Purity Water (HPW) Filtration Applications

The Electronics Industry's demand for large quantities of high purity deionized (DI) water continues to increase at dramatic rates. Today's largest facilities process upwards of 1000 gallons per minute, and, as electronics fabrication plants multiply, water consumption will increase. Current standards for HPW filtration have progressed far beyond the basic need for particulate removal. More common standards today include the increasingly stringent requirement that filter systems must not contribute the smallest amounts of organic and ionic contaminants to the High Purity Water.

In order to meet the needs of today's electronics manufacturer, a filter system must deliver high flow rates, effective during a wide range of operating fluctuations, have enhanced particle removal capabilities, be easily sized into a variety of configurations, be cost effective and simple to install and service.

A generalized HPW system schematic is shown in Figure 1. Each filtration point in a HPW system has unique attributes, requiring critically engineered filtration and housing solutions. CUNO filter systems offer the most technically advanced, cost effective solutions from pre-RO to point-of-use (POU) water applications. CUNO filtration products meet the stringent particle, TOC and resistivity requirements required for electronics manufacturing.

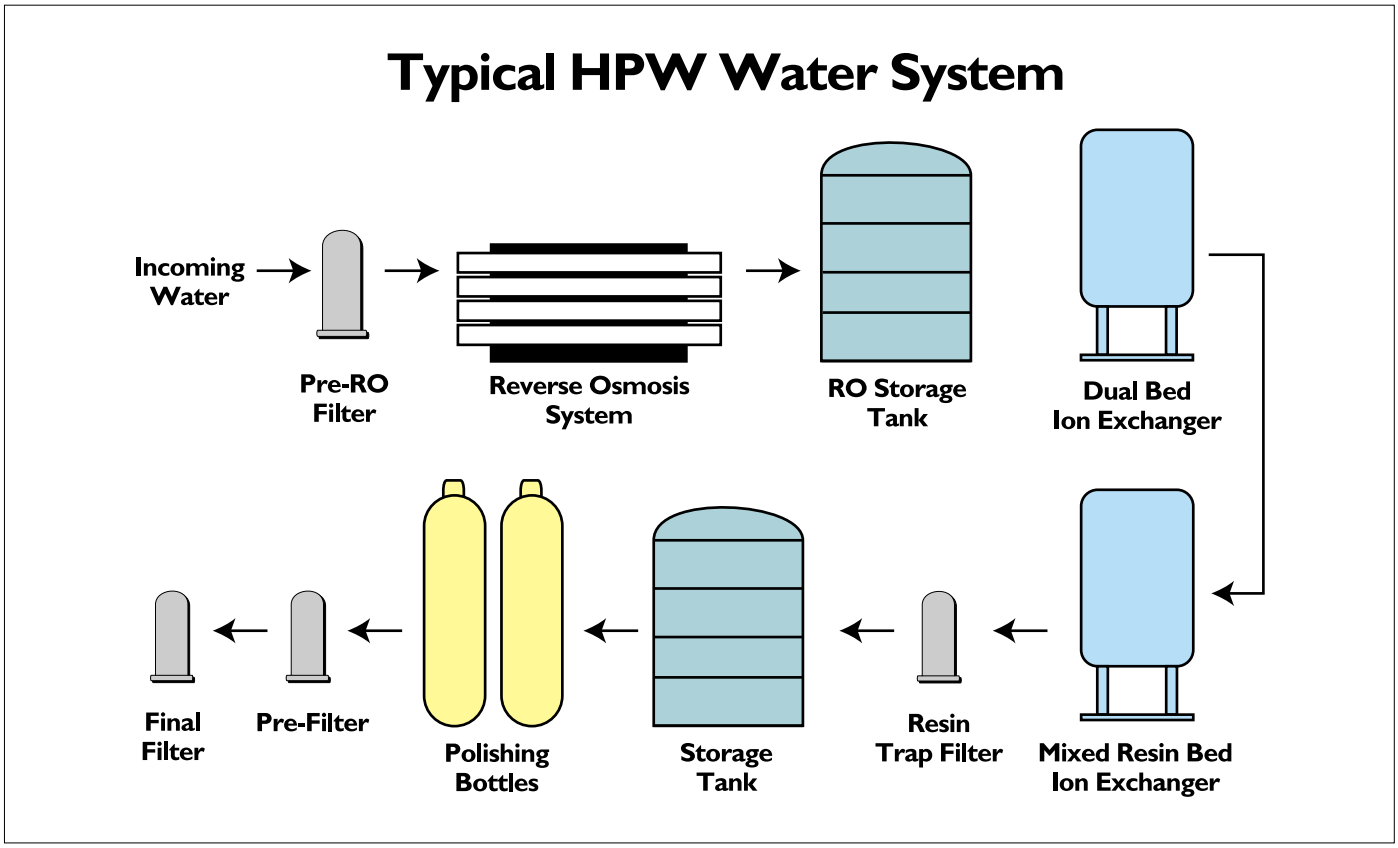


Figure 1

Pre-RO Filtration Requirements

In order to achieve the ultimate DI water purities required at point-of-use and also to reduce the contaminant burden on downstream purification processes, an appropriate Pre-RO filtration system is essential. The filtration systems that protect expensive Reserve Osmosis membranes are the work horses of any DI Water system. These systems are the front line defenses to frequent or seasonal variations with incoming feed sources. Pre-RO filtration must be robust enough to endure operating pressure and flow fluctuations without adverse effect on filtrate quality.

Resin Trap Filtration Requirements

During bed regeneration, system upsets and the day-to-day wear and tear on ion exchange resins, fine particulate matter is generated. Resin trap filters, strategically placed, protect both the efficiency and the life of critical downstream components and membranes.

Point of Distribution & Final Filtration

Requirements at this stage in the DI water distribution system call for the finest level of filtration. Filter systems at this juncture must not only stand up to the task of removing harmful contaminants, but also must be clean and inert so as not to contribute harmful contaminants, such as particles, organics, or ionic extractables.

In summary, the more efficient the filter system, the higher the purity of the water. Extremely low filter media extractables reduce the time to achieve baseline cleanliness of the DI water system after filter change out. These attributes are paramount in selecting the best suited final filter system for the DI Water system.

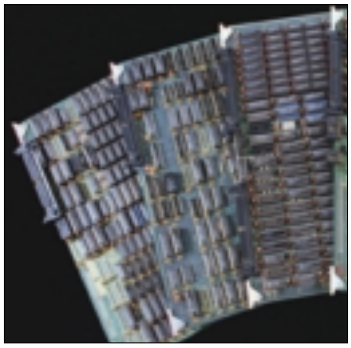
Table 1
Recommended CUNO Filters & Housings for High Purity Water Systems

Application	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Pre Reverse Osmosis Filter	Betapure Z	2 to 15 micron	LITBP.003	18
	PolyPro XL	1.2 to 10 micron	LITPXLEL	15
	Micro-Wynd II	1 to 10	LITCMW.001	20
Resin Trap Filter	Electropor	0.45 micron	LITZREL02	14
	Betafine D	0.5 to 1 micron	LITCBFD.001	17
	PolyPro XL	0.6 to 1.2 micron	LITPXLEL	15
Point of Distribution Prefilter	Electropor ER	0.20 to 0.45 micron	LITCER.001	14
Point of Distribution Final Filter	Electropor II	0.04 to 0.10 micron	LITCER.001	14
Final Filtration	Electropor II	0.04 micron	LITZREL02	14

Application	Recommended CUNO Filter Housing	Literature Reference No.	Refer to Page:
Pre Reverse Osmosis Filter	Model DC	LITHS.DC1	24
	Model SD	LITHS.SD1	24
Resin Trap Filter	Model SD	LITHSSD1	24
	Model ZM	LITZRH.105	23
Point of Distribution Prefilter	Flex Line (Fluoropolymer Coated)	LITFL1	24
	Model ZMCMP	LITZRH.105	23
Point of Distribution Final Filter	Flex Line (Fluoropolymer Coated)	LITFL1	24
	Model ZMCMP	LITZRH.105	23

Request Filter Datasheets for Product Ordering Guides and Specifications

Printed Circuit Board Filtration Applications



Advanced printed circuit board (PCB) manufacturing requires contamination control. Multi-circuit pattern or layer boards require additional attention to particulate control to ensure high yields. Surface mount technology provides the highest packing density and speed performance of current assembly techniques and is the leading technology. PCB boards manufactured for surface mount assembly require a finer level of filtration for all process fluids.

A typical Printed Circuit Board Manufacturing process is represented in Figure 2. The two most significant processing steps where filtration is readily applied are recirculating plating baths and board cleaning operations. Removal of harmful contaminants from plating baths and the deionized water system is crucial for the effective production and high yields of PCBs. Common plating bath contaminants are metal oxides, insoluble salts, air borne particles, and particles introduced by the circuit boards as they are being processed. Contaminants typically found in the DI water distribution system are resin fines, metal colloids, and bio-film. CUNO filter systems offer a wide range of cost effective filtration solutions for the removal of these harmful contaminants.

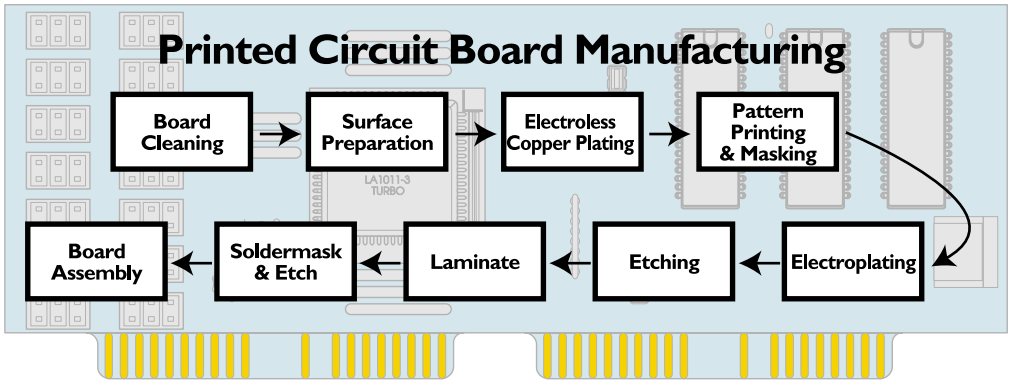


Figure 2

A summary of process fluids and CUNO product recommendations for these applications is listed in Table 2. For more detailed product information, request the referenced product literature below or refer to the Products section of this brochure.

Table 2
Recommended CUNO Filters for Printed Circuit Board Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Board Cleaning	DI Water	PolyPro-Klean	3 micron	LITCPK.001	19
	Alkaline Baths	Micro-Wynd II	10 micron	LITCMW.001	20
		MPF II	10 micron	LITMPF.001	20
Surface Preparation	Abrasive Alkalines	MPF II	5 micron	LITMPF.001	20
Electroless Plating	Copper Sulfamate	PolyPro XL	10 micron	LITPXLEL	15
	Cupric Chloride	MPF II	10 to 25 micron	LITMPF.001	20
Electroplating	Plating Solutions	Micro-Wynd II	25 micron	LITCMW.001	20
Etching	H_2O_2 / H_2SO_4	MPF II	25 micron	LITMPF.001	20
	Sodium Persulfate	PolyPro-Klean	5 micron	LITCPK.001	19
	Chromic Acid	Micro-Wynd II	10 micron	LITCMW.001	20
DI Rinse	DI Water	Micro-Wynd II	1 micron	LITCMW.001	20
		Electropor	.45 micron	LITZREL02	14

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Compact Disc Filtration Applications

Just as the Compact Disc (CD) has revolutionized the music industry, new Digital Video Disc (DVD) technology promises to do the same for films, multimedia and computer memory storage. This startling new technology, adopted as an industry standard, brings with it many new and challenging contamination control requirements.

Standard CD manufacturing employs many process steps dependent on filtration to remove contaminants that shorten electroplating bath life, cause film stressing, and warp discs during processing. A simplified disk manufacturing process is shown in Figure 3. The new DVD technology will increase conventional CD capacity by a factor of 10 and require greater pattern density with dual layer manufacturing. Diminished pit sizes and finer features require filtration of submicron particles and contaminants from all critical CD manufacturing process fluids.

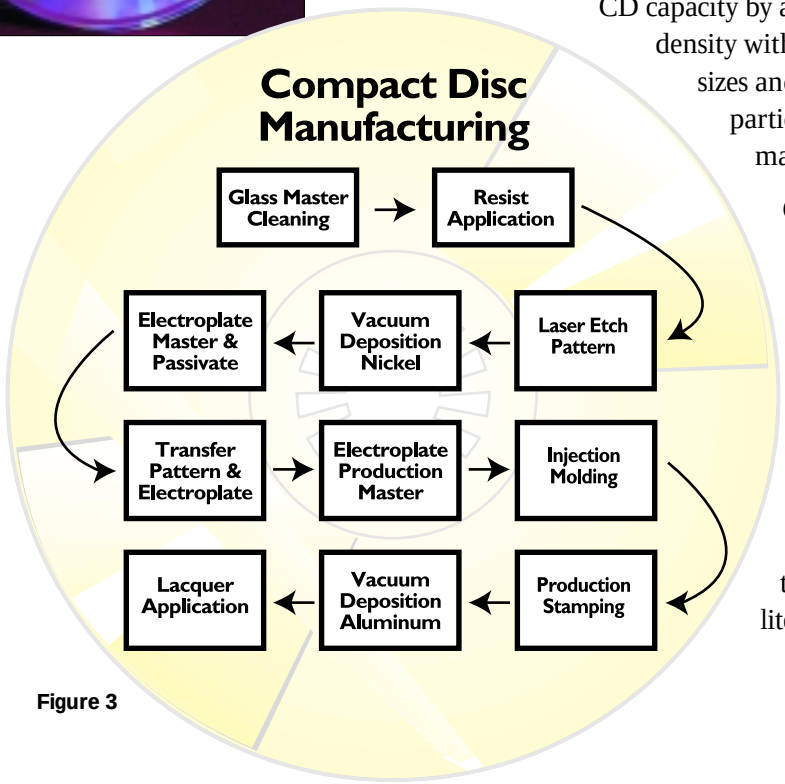

Figure 3

CUNO filtration systems offer a wide range of mechanical and adsorptive filtration products which remove harmful contaminants from the cleaning solutions, nickel sulfamate baths and DI rinse stations used in CD manufacturing. Table 3 lists a summary of process fluids and CUNO product recommendations for these applications. For additional information, refer to the product section at the back of this brochure and the referenced product literature.

Table 3
Recommended CUNO Filters for Compact Disc Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Glass Cleaning	Cleaning Solutions	Microfluor	0.2 micron	LITMR.FA3	15
DI Rinse	DI Water	Electropor II	0.1 micron	LITZREL02	14
Resist Application	Photoresist	SCF-020FA Capsules	0.2 micron	LITECAP.001	17
Plating-					
Prefiltration	Ni Sulfamate	PolyPro-Klean Betapure Z	3 micron 12 micron	LITCPK.001 LITCBP.001	19 18
Final Filtration	Ni Sulfamate	PolyPro XL Microfluor	0.6 micron 0.2 micron	LITPXLEL LITMR.FA3	15 15
Aluminum Deposistion	Cooling Water	PolyPro-Klean	5 micron	LITCPK.001	19
Protective Coating	Lacquer	SCF-020FA Capsules	0.2 micron	LITECAP.001	17

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Hard Disc Drive Filtration Applications

The Hard Disc Drive (HDD) industry is in an era of unprecedented growth. Improvements in media quality coupled with reductions in line spacing demand increased attention to contamination control in the hard disc manufacturing process. As read/write technologies progress from thin film transistor (TFT) heads to magnetoresistive (MR) devices, manufacturing steps will require progressively advanced filtration.

The Hard Disc Drive manufacturing process, depicted in Figure 4, employs filtration of varying degrees. The most critical steps include disc preparation, disc cleaning and electroless nickel plating. Given the abundant use of DI water in disc manufacture, dependable and consistent water filtration systems are needed to remove ever present colloidal silica, bacteria fragments, and process contaminants.

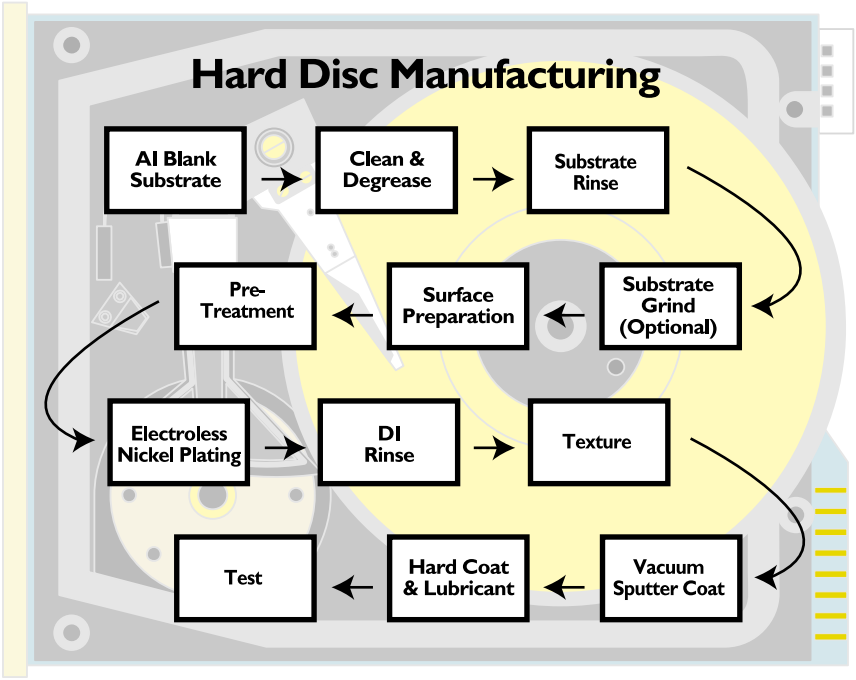

Figure 4

Cost effective filtration of plating baths is critical to ensure consistent coating quality and high yield disc production. Air borne contaminants and particles generated by the plating process must be removed without stripping the bath of proper concentrations of acid.

CUNO filter systems offer a range of solutions for Hard Disc Drive contamination control requirements. Refer to Table 4 for the recommended CUNO product for specific disc manufacturing applications. For additional information, refer to the product ordering guides at the back of this brochure and the product literature referenced below.

Table 4
Recommended CUNO Filters for Hard Disc Drive Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Substrate Cleaning & Degrease	DI Water Detergent	PolyPro Klean Betapure Z	1 micron 5 micron	LITCPK.001 LITCBP.001	19 18
Substrate Rinse	DI Water	Betafine D Electropor ER	0.5 micron 0.2 micron	LITCBFD.001 LITCER.001	17 14
Substrate Grinding	Tool Coolant	Betapure Z	3 micron	LITCBP.001	18
Surface Preparation	Alkaline Clean Phosphoric Etch	Microfluor PolyPro XL	0.2 micron 0.6 micron	LITMR.FA3 LITPXLEL	15 15
Pre-Treatment	Nitric Acid, Zincate	Microfluor	0.2 micron	LITMR.FA3	15
Electroless Nickel Plating	Nickel Sulfate	Microfluor PolyPro XL	0.2 micron 0.6 micron	LITMR.FA3 LITPXLEL	15 15
Rinse	DI Water	Electropor	0.45 micron	LITZREL02	14
Vacuum Sputter	Tool Cooling Water	PolyPro-Klean	5 micron	LITCPK.001	19

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Flat Panel Displays

Flat Panel Display (FPD) production incorporates many common processing technologies used in semiconductor fabrication which require enhanced contamination control (see Figure 5). The most common display technology is Active Matrix Liquid Crystal Display (AMLCD), found on most high end laptop computers. In the manufacturing process outlined in Figure 5, thin film transistors (TFT) are formed on prepared glass substrates. The larger size of substrates dictate higher process fluid flow rates, increasing the demand on filtration. Circuit integrity is directly related to particulate levels in the process fluids. Optimized filtration reduces pixel defects caused by particle induced short circuits. Precise contamination control is necessary to maintain adequate process yields of FPD.

The complexity of LCD/FPD manufacturing demands a wide range of filtration products for deionized water, photoresists, developers and etchants. CUNO filter systems provide quality, cost effective filter products for FPD contamination control requirements (Table 5). A description of each product and ordering information is located in the product section of this catalog. For additional technical information, request the referenced product literature.

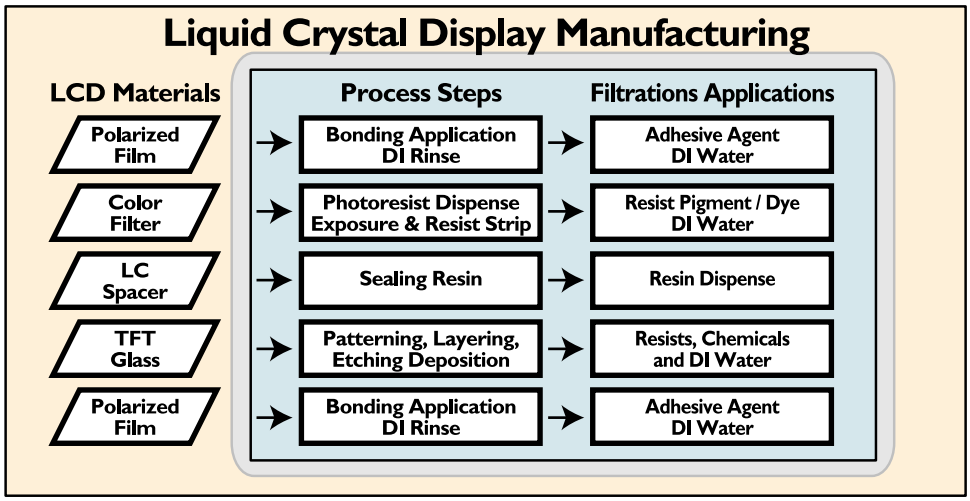

Figure 5

Table 5
Recommended CUNO Filters for Flat Panel Display Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature ReferenceNo.	Refer to Page:
Substrate Cleaning	Alkaline Solutions	PolyPro-Klean	3 micron	LITCPK.001	19
Rinse Stations	DI Water	Electropor ER	0.45 micron	LITCER.001	14
Resist Coating	Photoresist	SCF 120 PP Capsule	1.2 micron	LITCAPEL.001	17
Resist Developing	Developer Solution	PolyPro XL	1.2 micron	LITPXLEL	15
Etching	Etch Solution	Betafine D	3 micron	LITCBFD.001	17
Color Filter	Pigment/Dye	PolyPro-Klean	5 micron	LITCPK.001	19
Panel Cleaning	Alkaline Solutions	PolyPro-Klean	3 micron	LITCPK.001	19
Panel Rinse	DI Water	PolyPro-Klean	3 to 5 micron	LITCPK.001	19
Panel Bonding	Adhesive Agents	PolyPro XL	1.2 micron	LITPXLEL	15
Air Knife/Wand	Clean Dry Air (CDA)	SCF 120 PP Capsule	1.2 micron	LITCAPEL.001	17

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Cathode Ray Tube Filtration Applications

Advancements in cathode tube manufacturing, such as high definition television (HDTV) and demand for Super VGA computer monitors, have increased the need for improved filtration and contamination control of manufacturing processes. Proper filter selection and application will improve process efficiency and decrease reject levels, particularly for tube masks.

CUNO filter systems offer a range of filtration products for CRT contamination control requirements. Refer to Figure 6 and Table 6 for the recommended CUNO product. For additional information, refer to the product ordering guides at the back of this brochure and request the product literature referenced in Table 6.

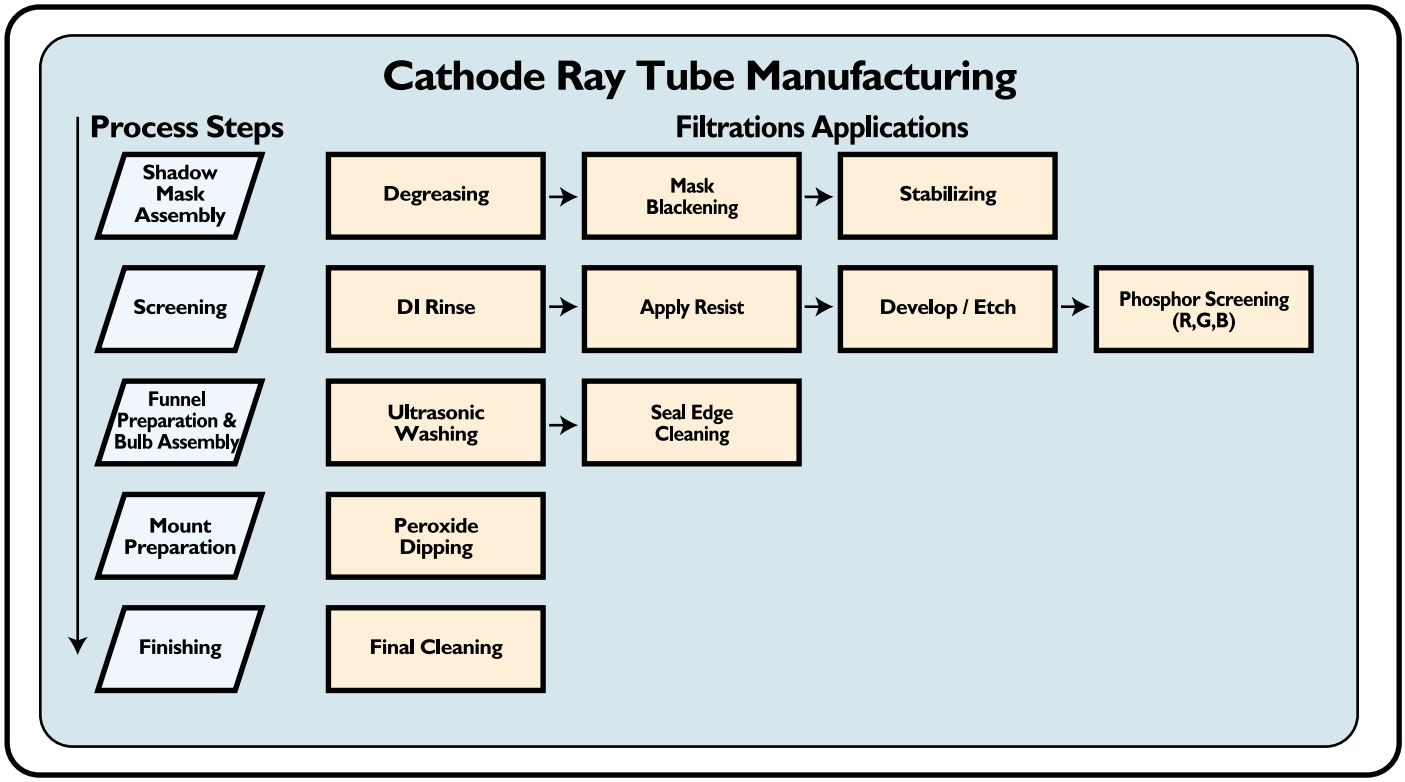

Figure 6

Table 6
Recommended CUNO Filters for Cathode Ray Tube Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Mask Coating	Graphite Slurry	Betapure Z Micro-Wynd II	5 micron 1 micron	LITCBP.001 LITCMW.001	18 20
Mask Cleaning	Solvents	Micro-Wynd II	5 micron	LITCMW.001	20
Screening	Resist / Developer	PolyPro XL	1.2 micron	LITPXLEL	15
Ultrasonic Washing	Washing Solution	PolyPro-Klean	3 micron	LITCPK.001	19
DI Rinse	DI Water	PolyPro-Klean Electropor	3 micron 0.45 micron	LITCPK.001 LITZREL02	19 14

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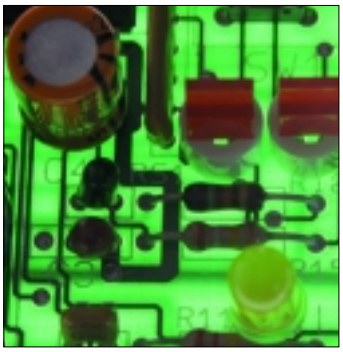
Ceramic Capacitor Filtration Applications



Cost effective manufacturing of ceramic capacitors requires uniformity of the ceramic slurry. Classification filtration technology is essential to selectively removing unwanted agglomerates while allowing the ceramic suspension to pass through. The resultant slurry can be processed into more uniform and consistent coating. Clarification filtration systems will strip out significant percentages of specified particulates.

CUNO filter systems offer a selection of classification systems for ceramic capacitor manufacturing, as illustrated in Figure 7. Refer to Table 7 for the recommended CUNO product. For additional product information, request the corresponding publication, or refer to the Products section of this brochure.

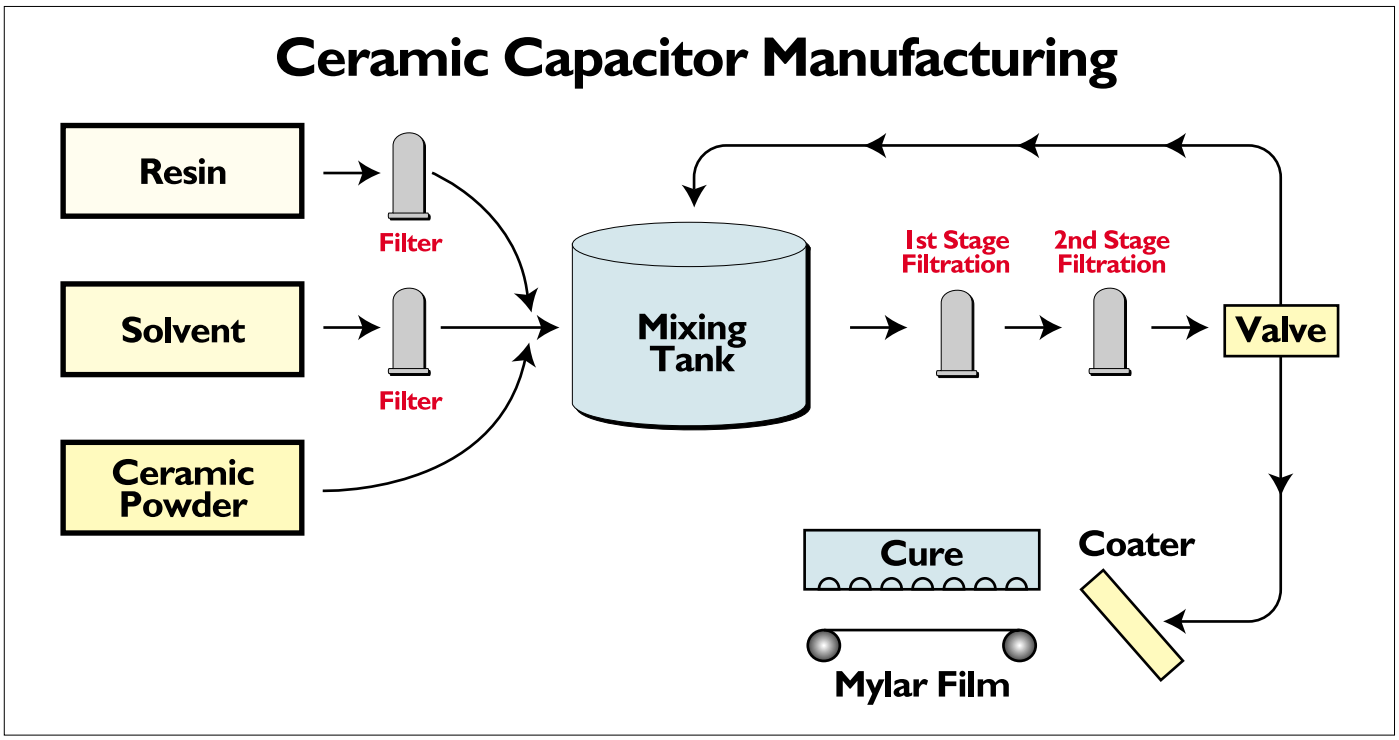


Figure 7

Table 7
Recommended CUNO Filters for Ceramic Capacitor Manufacturing

Application	Process Fluid	Recommended CUNO Filter	Rating	Literature Reference No.	Refer to Page:
Slurry Formulation	Resin	Betapure Z Micro-Wynd II	10 micron 1 micron	LITCBP.001 LITCMW.001	18 20
Slurry Mixing					
Prefiltration	Ceramic Slurry	CTG-Klean With Betapure	30 micron	LITCCK.001	21
Final Filtration	Ceramic Slurry	CTG-Klean With Betapure	10 micron	LITCCK.001	21

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CUNO Products For Electronic Manufacturing

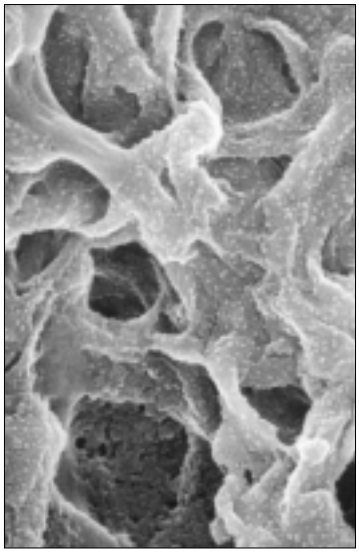

Figure 8 - The Electropor nylon membrane filter showing the capture of 0.021 micron monodispersed latex beads in DI water. The electrokinetic charge technology allows the capture of particles smaller than the pore diameter.

CUNO offers a comprehensive range of filtration products from ultra-inert PTFE and patented charge modifed nylon membrane filters (see Figure 8) to high efficiency depth filters for prefiltration and clarification. All filter cartridges are available in a variety of industry standard configurations; CUNO's broad line of housing products ensures comple filtration system compatability.

Products recommended for the previously discussed applications include:

- Electropor Nylon 66 Membrane Cartridges
- Microfluor PTFE Membrane Cartridges
- SCF Small Capsule Filters
- PolyPro XL Pleated Polypropylene Media Cartridges
- Betafine D Pleated Media Cartridges
- Betapure Rigid Media Cartridges
- CTG-Klean Filtration Systems
- PolyPro-Klean Depth Filter Cartridges
- Micro-Wynd II Media Cartridges
- MPF II Filter Cartridges
- Filter Housings
- Standard and Custom Filter Housings

CUNO Membrane Cartridge Filtration

CUNO offers a variety of proprietary membrane products for the critical purification of process fluids requiring hydrophillic media (aqueous based fluids, pre-RO water), hydrophobic media (gas, high temperature etch baths, aggressive solvents) and charged modified media (final and POU water). CUNO's range of membrane filtration products includes Electropor cartridge and SCF capsules, Microfluor cartridge and SCF capsules. All membrane products are manufactured in clean room environments using advanced thermo-plastic welding techniques without adhesives and surfactants. They are 100% integrity tested during manufacturing to assure that the filter is defect-free and will perform to specifications. Each product is marked with lot and serial number for full traceability.

Electropor II Cartridges

The Electropor II cartridges deliver superior performance in high purity water systems. Innovative *single layer* Nylon membranes are incorporated into an optimized, all-polypropylene cartridge to yield unmatched filter efficiency. CUNO's patented charge modification technology remains the most effective deterrent to contamination for discerning water applications. Combined with over 11 ft^2 of membrane per cartridge, long life and high flow rates are realized with Electropor II. A quantum leap in process economies is now within the reach of every Electropor II user.

For more information please contact your CUNO representative.

Table 8
Electropor II Filter Cartridges

Cartridge Designation	Nominal Cartridge Length Code	Inches	mm	End Modification	Gasket /O-Ring
EF004A - 0.04 µm	**01**	10	250	**B** - 226 Locking O-Ring & Spear	**B** - Fluorocarbon
EF010A - 0.1 µm	**02**	20	500	**C** - 222 O-Ring & Spear	**H** - Clear Silicone
EF020A - 0.2 µm	**03**	30	750	**F** - 222 O-Ring & Flat Cap	**K** - Teflon Endcap Viton*
	04	40	1000		

*Available with C & F End-Modifcations only
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Electropor ER Cartridges

Electropor ER filters offer the optimum in particle removal efficiency and unsurpassed DI water effluent quality. The pleated, positively charged Nylon 66 membrane removes submicron size particles, colloidal silica, and bacterial fragments well into nanometer size range. Membrane and cartridge manufacturing in a controlled environment and pre-flushing with high purity DI water ensures rapid particle, resistivity, and TOC rinse up after filter installation and DI system start up. All Electropor filters are 100% integrity tested during manufacture and meet stringent performance and cleanliness standards. Electropor filters, with 0.1 micron and 0.04 micron ratings, are recommended for the most critical applications which demand the highest purities. All pore sizes are available in a variety of cartridge sizes and configurations to meet a wide range of flow requirements.

For more information please ask for CUNO literature number LITCER.001

Table 9
Electropor ER Filter Cartridges

Cartridge Style	Nominal Cartridge Length Code	Inches	mm	Gasket /O-Ring	Rating (Micron)	Formulation
70002	**01**	10	25	**A** - Silicone	**045** - 0.45	**ER**
70003	**02**	20	50	**B** - Fluorocarbon	**020** - 0.20	
70005	**03**	30	75	**C** - EPR	**010** - 0.10	
70006	**04**	40	100	**D** - Nitrile	**004** - 0.04	
70007				**H** - Natural Silicone		
70012						
70022						
70025						
70048						

Request Filter Datasheets for Product Ordering Guides and Specifications

Microfluor Cartridges

Microfluor pleated filter cartridges are well suited for the filtration of most aggressive chemicals. Microfluor filters are constructed of PTFE medium with polypropylene support layers and cartridge components. Microfluor cartridges provide the high flow capacity with low pressure loss required for a wide range of liquid and gas filtration applications. Microfluor cartridges, with removal ratings of 0.2 µm and 0.1 µm, are offered in either single (222 & 226 o-rings) or double open ended cartridges, and in lengths ranging from 10" to 40".

For more information please ask for CUNO literature number LITMR.FA3

Table 10
Microfluor Filter Cartridges

Catalog Number	Nominal Cartridge Length* Code	Inches	mm	Gasket /O-Ring	Rating (Micron)	Formulation
70002	**01**	10	250	**A -** Silicone	**010 -** 0.10	**FA**
70003	**02**	20	500	**B -** Fluorocarbon	**020 -** 0.20	
70005	**03**	30	750	**C -** EPR		
70006	**04**	40	1000	**D -** Nitrile		
70007						
70012						
70022						
70025						
70048						

* See page 16 Pleated Media Cartridge Styles for Specific Lengths

PolyPro XL Cartridges *with* MaxMedia

The PolyPro XL *with* MaxMedia is a significant cartridge innovation for longer filter life and greater reliability in process filtration. CUNO combines patented MaxMedia construction, which dramatically increases media area over any conventional cartridge, with graded density media to increase filter filter lifetime in even the most difficult conditions. Absolute retention performance, including a 0.2µm PolyPro XL, delivers the lowest contaminant levels necessary for Pre-RO, resin trap, bulk chemical, and demanding plating bath applications. CUNO PolyPro XL with MaxMedia is perfect for protecting final membrane filters from premature plugging.

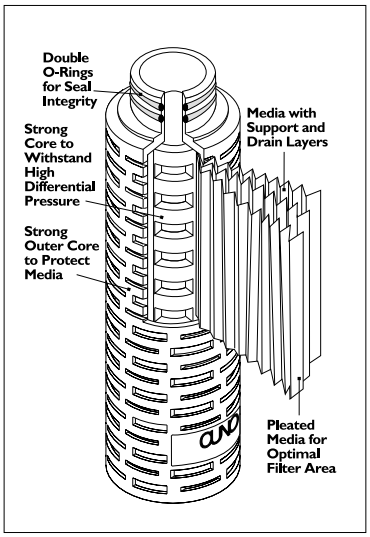
A wide range of fluid compatibility makes PolyPro XL an excellent solution for general fluid process problems. PolyPro XL options include 6 absolute retention ratings from 0.2µm to 10 µm, a variety of lengths, and end fittings to suit application requirements and hardware suitable for a 2.75" OD cartridge.

For more information please ask for CUNO literature number LITPXLEL

Table 11
PolyPro XL Filter Cartridges with MaxMedia

Catalog Number	Absolute Rating*	Configuration	Nominal Length	End Modification	Gasket /O-Ring
PEG	**020 -** 0.2 µm **060 -** 0.6 µm **120 -** 1.2 µm **250 -** 2.5 µm **500 -** 5.0 µm **10C -** 10.0 µm	**B -** Cartridge outside diameter 2.8" (7.1 cm)	**01-** 10" **02-** 20" **03-** 30" **04-** 40"	**B -** 226 O-ring & spear **C -** 222 O-ring & spear **D -** DOE, flat gasket, 10" **E -** DOE, flat gasket, 9-3/4" **F -** 222 O-ring & flat cap	**A -** Silicone **B -** Fluorocarbon **C -** EPR **D -** Nitrile **H -** Clear Silicone

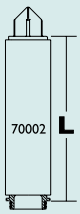
* Retention ratings determined by CUNO test method TP 430.008. The 0.2 micron rating is extrapolated. For details contact your CUNO representative.



Pleated Media Cartridge Styles

CUNO manufactures a variety of cartridge styles to fit almost all filter housings. Included are double o-ring single open end, double open end, and multi-length cartridges. The following tables depict the style and nominal length. Other style end connections are available on request. Consult your local CUNO Distributor for more information.

Table 12
70002 Style (B)

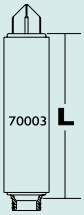


SINGLE OPEN END
CODE 7 (226) O-RING
BAYONET LOCK

PALL

Cartridge Code	Length (in.)
01	10-3/16
02	19-15/16
03	29-11/16
04	39-7/16

Table 13
70003 Style (C)

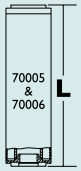


SINGLE OPEN END
CODE 8 (222) O-RING

CUNO & PALL

Cartridge Code	Length (in.)
01	10-7/32
02	19-31/32
03	29-23/32
04	39-15/32

Table 14
70005 & 70006 Styles (D&E)

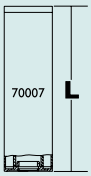


DOUBLE OPEN END
FLAT GASKET

FILTERITE & PALL (70005)
CUNO, PALL,
& GELMAN (70006)

Cartridge Code	Length (in.) 70005	70006
01	10	9-3/4
02	20	19-1/2
03	30	29-1/4
04	40	39

Table 15
70007 Style

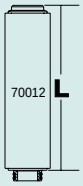


DOUBLE OPEN END
INTERNAL (120) O-RING

NUCLEPORE

Cartridge Code	Length (in.)
01	9-5/8
02	19-5/8
03	29-5/8
04	39-5/8

Table 16
70012 Style

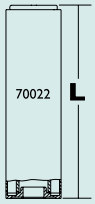


SINGLE OPEN END
(222) O-RING

CUNO & MILLIPORE

Cartridge Code	Length (in.)
01	10-1/4
02	22
03	31

Table 17
70022 Style

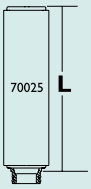


SINGLE OPEN END
INTERNAL O-RING SEAL

GELMAN

Cartridge Code	Length (in.)
01	9-27/32
02	19-19/32
03	29-11/32
04	39-3/32

Table 18
70025 Style (F)

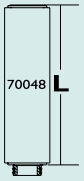


SINGLE OPEN END
CODE 3 (222) O-RING

PALL

Cartridge Code	Length (in.)
01	10-7/32
02	19-31/32
03	29-23/32
04	39-15/32

Table 19
70048 Style



SINGLE OPEN END
(222) O-RING

CUNO

Cartridge Code	Length (in.)
01	9-31/32
02	19-23/32

Betafine D

Betafine D pleated, polypropylene filter elements are made from 100% non-woven, melt blown media and are absolute rated from 0.5 micron to 50 micron. Pleating allows for greater surface area which results in extended filter life and exceptionally high flow rates. Betafine D filters are ideally suited for process and rinse water applications in disc manufacturing and are available in a variety of configurations and lengths.

For more information please ask for CUNO literature number LITCBFD.001

Table 20
Betafine D Filter Cartridges

Cartridge	Cartridge Length Code	Inches	mm	Material	Rating (Micron)	End Style	Gasket /O-Ring
DP	**09***	9-3/4	248	**PP-** Polypropylene	**005 -** 0.5	**B -** Bayonet Lock SOE (226 Style)	**A -** Silicone
	10	10	254		**010 -** 1	**C -** Push-in Spear SOE (222 Style)	**B -** Fluorocarbon
	19*	19-1/2	495		**050 -** 5	**D -** Double Open End	**C -** EPR
	20	20	508		**100 -** 10	**F -** Push-in Flat Cap SOE (222 Style)	**D -** Nitrile
	29*	29-1/4	743		**250 -** 25	**P -** Double Open End with Core	**K -** PTFE Encapsulated
	30	30	762		**500 -** 50	Extender (polypropylene)	Silicone O-Ring
	39*	39	991				
	40	40	1016				

* Available in P & D End Styles only

SCF Capsules

CUNO Small Capsule Filters (SCF) are compact filter assemblies with pleated cartridge elements housed in a polypropylene capsule. SCF Capsules are designed for small volume batch or spin on applications, such as resist and lacquer dispense. SCF capsules minimize hold volume of expensive process fluids and provide a safe and easy means of filtration. SCF capsules are available with either Electropor (Nylon), Microfluor (PTFE), or PolyPro media.

For more information please ask for CUNO literature number LITECAP.001

Table 21
SCF Capsules Ordering Guide

Capsule Number	Filtration Area	Media Grades Available (Micron)
70125 - 13 mm Hose Barb	**03* -** 1100 cm^2 (170.5 in^2)	**004ER -** Electropor 0.04
70126 - 1/4" MNPT	**04** -** 2200 cm^2 (341 in^2)	**010ER -** Electropor 0.10
70128 - 1/2" MNPT		**020ER -** Electropor 0.20
70129 - 1-1/2" Sanitary		**045ER -** Electropor 0.45
		010FA - Microfluor 0.10
		020FA - Microfluor 0.20
		060PP - PolyPro 0.60
		120PP - PolyPro 1.20

* 1200cm^2 for 020FA and 120PP Media
** 2400 cm^2 (372 in^2) for 020FA and 120PP Media

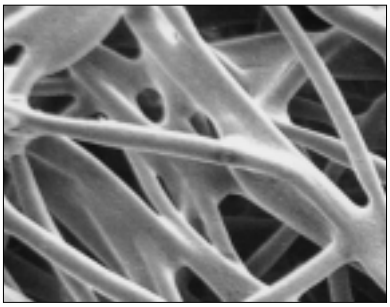


Figure 9 - SEM Photomicrograph of Betapure Z's internal structure. Multiple bond points and the bicomponent fibers produce a rigid depth filter matrix.

Betapure Z

Betapure Z grade performance engineered cartridges are excellent classification type filters, well-suited for slurry applications. The rigid structure eliminates media deformation, unloading, and bypass that are common with other filters used in industry. Betapure Z is supplied in a choice of polyolefin or polyester based materials.

Betapure Z Advantages

- **Rigid structure -** will not unload or bypass
- **Free of media migration -** will not contribute fibers to the filtered fluid
- **Long service life -** reduced filter usage and change-outs

Betapure Z Construction

Betapure Z utilizes state of the art fiber and innovative process technology, to provide a clean, rigid filter structure with consistent and reproducible filtration characteristics. Betapure Z is constructed using long bicomponent fibers; the outer sheath melts at a lower temperature than the inner core. When heated, a matrix of these fibers becomes permanently bonded in a three dimensional network. The high degree of fiber-to-fiber bonding eliminates both the need for a core support and any possibility of media migration. The matrix is consistent and rigid, as seen in the photomicrograph, Figure 9.

For more information please ask for CUNO literature number LITCBP.001

Table 22
Betapure Z Ordering Guide

Cartridge Type	Length	Grade Designation	End Modification	Gasket or 0-Ring Material	Removal Rating
AU - Betapure	**09 -** 9-3/4"*	**Z11-** Polypropylene Insert	**A -** Millipore	**A -** Silicone	**Z13 Material only**
	10 - 10"	**Z13-** Glass Paper Insert	**B -** Code 7 Bayonet Lock	**B -** Fluorocarbon	**020 -** 2 µm Abs.
	19 - 19-1/2"*		**C -** Code 8 Double O-ring	**C -** EPR	**030 -** 3 µm Abs.
	20 - 20"		**D -** Double Open End w/Hard Cap 10" Nom. Length	**D -** Nitrile	**050 -** 5 µm Abs.
	29 - 29-1/4"*			**G -** Polyethylene	**Z11 Material only**
	30 - 30"				**070 -** 7 µm Abs.
	39 - 39"*		**E -** Double Open End w/Hard Cap 9-3/4" Nom. Length		**100 -** 10 µm Abs.
	40 - 40"		**F -** Code 3 Double O-ring		**120 -** 12 µm Abs.
			K - Code 3 Single O-ring w/Snap Ring		**150 -** 15 µm Abs.
			H - Gelman Internal O-ring		
			N - No End Modification**		

* Available in E & N End Modifications only
** Available with "G" Flat Gasket only

PolyPro-Klean

PolyPro-Klean depth polypropylene filter cartridges provide extraordinary long filter life, high contaminant capacity and high retention efficiencies. Used in slurry classification, recirculating baths, and prefiltration applications, these versatile filters remove contaminants using a multi-stage, graded density design.

Graded density construction is achieved by varying the media construction across the cartridge to achieve multiple levels of effective prefiltration in a single filter element. The depth filter matrix removes finer and finer contaminants as the fluid moves from the upstream to the downstream side. This removal results in longer service life, higher throughputs and lower total filtration costs compared to competitive depth-type prefilters.

PolyPro-Klean applications include general clarifying and prefiltration operations such as deionized water loops, reverse osmosis (RO) pretreatment, solvent streams and protection of final membrane filters.

PolyPro-Klean filters are recommended for critical applications requiring extremely low levels of extractables. PolyPro-Klean filter cartridges are available in absolute removal ratings from 1.0 microns to 150 microns. Lengths and end fittings are available to fit a variety of housings.

For more information please ask for CUNO literature number LITCPK.001

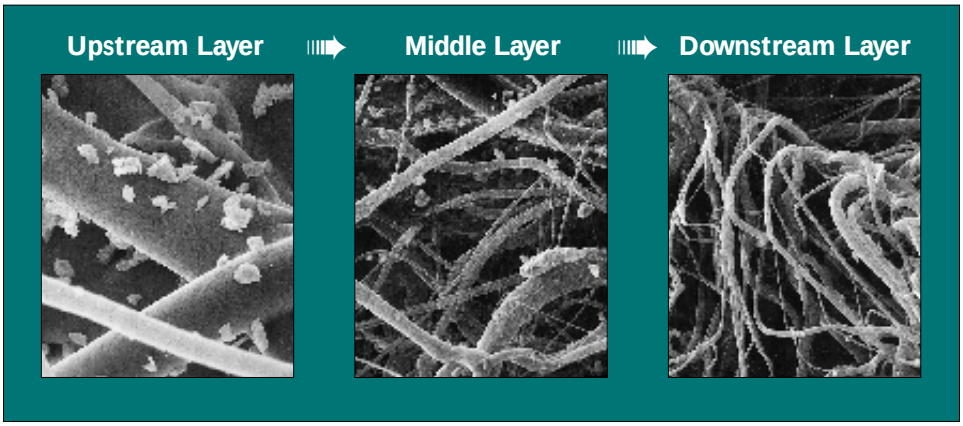


Figure 10 - The SEM pictographs depict the outer, middle and inner sections of a PolyPro-Klean filter cartridge that has been challenged with A.C. Fine Test Dust, a standardized industry challenge contaminant. Shown is the progressive removal of finer and finer contaminant as the process fluid moves from the upstream to the downstream side of the filter cartridge.

Table 23
PolyPro-Klean Ordering Guide

Cartridge	Cartridge Length Type	Inches	mm	End Modification	Gasket /O-Ring	Grade - Rating
PPK	**09***	9-3/4	248	**B -** Bayonet Lock SOE (226 Style with Fin)	**A -** Silicone O-Ring	**0010 -** 1 µm
	10	10	254	**C -** Push-in Spear SOE (222 Style with Fin)	**B -** Fluorocarbon O-Ring	**0030 -** 3 µm
	19*	19-1/2	495	**F -** Push-in Flat Cap SOE (222 Style with Flat Cap)	**C -** EPR O-Ring	**0050 -** 5 µm
	20	20	500	**N -** Double Open End (With Flat Gasket)	**D -** Nitrile O-Ring	**0100 -** 10 µm
	29*	29-1/4	743		**G -** Polyethylene Flat Gasket	**0250 -** 25 µm
	30	30	762			**0500 -** 50 µm
						1000 - 100 µm
						1500 - 150 µm

* Available in Double Open End Style with Polyethylene Flat Gasket only

Micro-Wynd II

Micro-Wynd II filters employ advanced blanketed filter technology. The combination of an internal media blanket with an open wind process produces a filter with exceptional flow capacity, superior filtration efficiency and greater consistency. Media blanket and wind matrix are offered in cotton and polypropylene and are available in nominal ratings 0.5 µm to over 100 micron. Micro-Wynd II filters offer low cost, economical pre-filtration of slurries where high contaminant loading requires frequent filter replacements.

For more information please ask for CUNO literature number LITCMW.001

Table 24
Micro-Wynd II Ordering Guide

Core Type	Media Blanket	Matrix	Core Material	Nominal Rating	Cartridge Length	End Modification*	O-Ring
D - No Extended Core	**C -** Cotton	**C -** Cotton	**P -** Polypropylene	**Z** 0.5	**1** -** 9-7/8"	**C-** Code 8 Double O-ring	**A -** Silicone
S - 316 S.S. Extended Core	**P -** Polypropylene	**P -** Polypropylene	**F -** Tinned Steel	**Y** 1	**2 -** 19-11/16"	**F -** Code 3 Double O-ring	**B -** Fluorocarbon
			S - 304 S.S.	**A** 3	**2x -** 20-3/16"		**C -** EPR
			T - 316 S.S.	**B** 5	**3 -** 29-7/16"		**D -** Nitrile
				C 10	**3x -** 30-3/16"		
				F 25	**4 -** 39-3/16"		
				L 50	**4x -** 40-3/16"		
				Q 75			
				V 100			
				W 350			

*End Modification Requires Polypropylene Core. Omit for Double Open End. **Fits both 9-3/4" and 10" housings.

MPF II

MPF II filters are a major improvement to conventional yarn wound cartridges. Advanced manufacturing steps and controlled materials are used to produce a consistent and high quality cartridge. Standard media include bleached cotton and polypropylene and are available in nominal ratings 0.5 µm to over 100 microns. MPF II filters offer the most cost effective filtration for printed circuit board cleaning and plating bath solutions.

For more information please ask for CUNO literature number LITMPF.001

Table 25
MPF 11 Ordering Guide

Cartridge Type	Wind Pattern	Length (Nominal)	Grade Designation	Media	Core	Options Material
C - MPF 11	**S -** Standard	**09-** 9-7/8"	**Z -** 0.5 µm	**C -** Bleached Cotton	**P -** Polypropylene	**N -** None
		19- 19-1/2"	**Y -** 1 µm	**P -** Polypropylene	**F -** Tinned Steel	**P -** Polypropylene Core Extender
		20- 20"	**A -** 3 µm	**N -** Unbleached Cotton	**S -** 304 S.S.	**X -** 316 S.S. Core Extender
		29- 29-1/4"	**B -** 5 µm	**R -** Rayon	**T -** 316 S.S.	**V -** Voile Core Covering
		30- 30"	**C -** 10 µm			
		39- 39"	**F -** 25 µm			
		40- 40"	**L -** 50 µm			
			Q - 75 µm			
			V - 100 µm			
			W - 350 µm			

Figure 11 - CUNO's CTG-Klean Filter System: The filter pack provides the barrier between the fluid and the housing, reducing change-out times and operator exposure.

CTG-Klean

The CTG-Klean system provides totally enclosed filtration using a separate pressure vessel and filter pack to isolate the fluid from the housing. This unique patented design virtually eliminates extensive time and labor costs involved with filter change-outs and reduces environmental and operator exposure to solvents or other hazardous materials.

CTG-Klean Advantages

- **Rapid change-out -** minimizes labor and time required
- **Totally enclosed pack -** eliminates the need to clean the housing and minimizes operator exposure
- **Available in a range of sizes -** meets all flow requirements
- **ASME Code design to 300 psi -** meets plant and regulatory requirements
- **Reduced solvent usage -** reduces waste, solvent costs and handling

Table 26
CTG-Klean Filter Pack - Reference Guide

Number of Cartridges Around	Pack Designation	Cartridge Configuration	Cartridge and Media Type	Grade Designation*
3 **7**	**GPK -** CTG-Klean Pack	**1 -** 1 High **2 -** 2 High **3 -** 3 High	**AUZ11 -** Betapure Z polyolefin **AUZ13 -** Betapure Z polyolefin/glass **IP01 -** Betafine **PPK -** PolyPro-Klean **DCC -** Micro-Wynd II cotton **DPP -** Micro-Wynd II polypropylene	7 µm - 15 µm 2 µm - 5 µm 1 µm - 25 µm 1 µm - 150 µm 2 µm - 15 µm 0.5 µm - 350 µm

*Grade designations are cartridge specific. Refer to CUNO literature LITCCK001 for complete information.

Table 27
CTG-Klean Housing 300 lb. ASME Code Design Ordering Guide

Housing Model	Catalog Number	Inlet/Outlet	Material	Maximum Operating Pressure & Temperature	Filter Pack Configuration	Nominal Cartridge Length (Inches)
3WTS1	47364-01	1" NPT	304 S.S.	300 psi @ 160°F (20 bar @ 71°C)	3 Cartridge by 1 High	10
3WTS2	47364-02				3 Cartridge by 2 High	20
3WTS3	47364-03				3 Cartridge by 3 High	30
7WTS1	47365-01	1-1/4" NPT	304 S.S.	300 psi @ 160°F (20 bar @ 71°C)	7 Cartridge by 1 High	10
7WTS2	47365-02				7 Cartridge by 2 High	20
7WTS3	47365-03				7 Cartridge by 3 High	30

For applications not requiring ASME Code 300 psi rated housings, a variety of housing styles and cartridge packs, including 1-around cartridge versions, are available. Other media is available upon request.

For complete part numbering and ordering information, request CUNO literature number LITCCK.001

CUNO Filter Housings and Engineered Systems

CUNO offers an extensive range of cartridge filter housings for all electronics fluids applications. From bulk chemical manufacturing to ultra-high purity water pads, CUNO has engineered a solution. Extreme flow conditions, up to 425 gallons per minute at 5 psid (1600 lpm at 0.35 bar), can be handled by the electropolished 316L stainless steel ZMCMP ultra-pure water housing line. Less demanding applications can be handled by the economical DC product line, featuring quick filter change out capabilities and 304 stainless steel wetted surfaces. For all applications, there is a CUNO electronic or industrial filter housing that meets and exceeds the most demanding process conditions. A full range of features and benefits available with CUNO housing products are detailed in Table 28 below.

In-house design and fabrication services deliver standard or customized versions of CUNO housing products. Options available include:

- Mechanical polishing to 10 µ inch Ra
- Certified electropolishing to customer specified Cr:Fe ratios
- Inlet, outlet, and vent configurations
- Alternative housing materials
- Fluoropolymeric linings
- Special cleaning, handling, and packaging

For specific system and housing designs, measured drawings or electronic files can be provided. Contact CUNO to assist in any design services necessary for your application.

Table 28 Feature	Benefit
Mechanical finishing < 10 µ in Ra	Low particle adhesion and agglomeration - reduced downstream particles
Passivation or Electropolishing treatment	High corrosion resistance - fluid compatibility and extended life
ASME Code compliance	Pressure rated - facility & operator safety
Weld seam finishing	Full penetration, high purity welds - no residuals to contaminate process streams
Housing covers, closure, and handling features	Single operator maintenance - ease of use and minimal downtime

ZMCMP Series Filter Housings

ZMCMP housings are designed to meet the most exacting demands of High Purity DI systems and can be found in many state-of-the-art electronics facilities worldwide. The ZMCMP housings are designed to ASME code requirements and are fabricated from high grade 316L SS to exacting quality standards. All ZMCMP Series housings are pickled, passivated and electropolished to achieve a 10 µin Ra microfinish. The housing incorporates cover swing bolts and an "Auto-Lift" spring loaded piston feature which permits single operator maintenance of the system.

Standard ZMCMP housing sizes accommodate either 21, 30 or 41 filter cartridges, typically in lengths of 30" or 40". For custom sizing to meet individual needs, a variety of other housing sizes are available upon request. Maximum recommended flows for the 41ZMCMP housings range up to 425 gpm at 5 psid (1600 lpm at 0.35 bar) for the high flow capacity Electropor II 0.04 µm cartridge.

Table 29
ZM & ZMCMP Series Filter Housings

Housing	Catalog Number	Cartridge Capacity	Cartridge Length	Construction Material	Pressure Rating
21ZMCMP4	70198-01	21	40 In. / 1016 mm	316L Stainless Steel	150 psig @ 250°F (10 bar @ 121°C)
30ZMCMP4	70185-01	30	40 In. / 1016 mm	316L Stainless Steel	150 psig @ 250°F (10 bar @ 121°C)
41ZMCMP4	70213-01	41	40 In. / 1016 mm	316L Stainless Steel	150 psig @ 250°F (10 bar @ 121°C)

Zetapor ZM Series Housings

The ZM Series housings are ideal for DI Water filtration applications. Constructed of all 316L SS (wetted surfaces), Zetapor housings offer corrosion resistance for protection against potential chemical release from ion bed regeneration. All ZM housings are pickled and passivated as a standard practice, and electropolishing is available as an option. Cartridge sealing is accomplished by double 222 sized o-rings and is independent of the housing cover. This provides positive seating and prevents potential bypass of resin fines and particulate.

Table 30
Zetapor ZM Series Housings

Housing Model	Part Number
4ZM1	70027-01
4ZM2	70027-02
4ZM3	70027-03
11ZM2	70013-02
11ZM3	70013-03
11ZM4	70013-04
21ZM2	70028-02
21ZM3	70028-03
21ZM4	70028-04

Zetapor ZM housings are available in 4, 11, and 21 around filter cartridge sizes and can accept up to 40" filter elements. Flow capacities can extend to 320 gpm (1200 lpm), depending on the size and grade of Electropor ER filter cartridges used.

Flex Line Series Housings

The CUNO Flex-Line (FL) Series housings are constructed of 316L SS (wetted surfaces) to ASME Code requirements. The FL housing design allows various diaphragm options to accommodate all standard cartridge styles and sizes. A machine o-ring groove is provided for precise o-ring positioning and sealing. FL Series housings are available upon request with fluoropolymer coatings for Hot DI Water (80°C) systems and other such applications. A complete housing range is offered with seven vessel diameters extending from 8" to 30" and five cartridge diaphragm options including 222 and 226 double o-ring cartridge configurations. The largest designs will accommodate up to 40" filters and will have flow capacities in excess of 300 gpm depending upon the grade of Electropor filter cartridge selected.

Table 31
Flex Line Filter Housings

Housing	Vessel Diameter Code	Inches	mm	Construction Material	Housing Style	Pressure Rating
FL	**08**	8	203	**2 -** 316L Stainless Steel	**VE -** Vertical	**1 -** 150 psig @ 250°F (10 bar @ 121°C)
	12	12	305			**2 -** 195 psig @ 200°F (13 bar @ 93°C)
	14	14	356			**3 -** 300 psig @ 250°F (21 bar @ 121°C)
	16	16	406			
	20	20	508			
	24	24	607			
	30*	30	762			

*30" model rated at 260 psig @ 250ºF (18 bar @ 121ºC)

DC & SD Filter Housings

DC & SD filter housings are constructed of durable, long lasting 304 Stainless Steel and 316L Stainless Steel. Both housings incorporate a seal plate to ensure correct alignment and a positive cartridge seal. Easy maintenance and cleaning is enhanced by the quick release v-band clamp and removable cartridge posts. The DC Model accepts double open end cartridges, while the SD Model accepts both single open end (SOE) and double open end (DOE) style cartridges. The DC & SD filter housings are available in a variety of sizes that accommodate from 4 to 88 filter cartridges with lengths from 10" to 40" and can be sized for flows up to 400 gpm (1500 lpm).

Table 32
DC & SD Filter Housings

DC Filter Housings 304 Stainless Steel		SD Filter Housings 316 Stainless Steel	
Housing Model	**Part Number**	**Housing Model**	**Part Number**
4DC1	44258-01	5SD1	47311-01
4DC2	44258-02	5SD2	47311-02
4DC3	44258-03	5SD3	47311-03
5DC1	44254-01	5SD4	47311-04
5DC2	44254-02	12SD2	47312-01
5DC3	44254-03	12SD3	47312-02
5DC4	44254-04	12SD4	47312-03
12DC2	44078-02	22SD3	47313-01
12DC3	44078-01	22SD4	47313-02
22DC3	44427-01		
22DC4	44427-02		

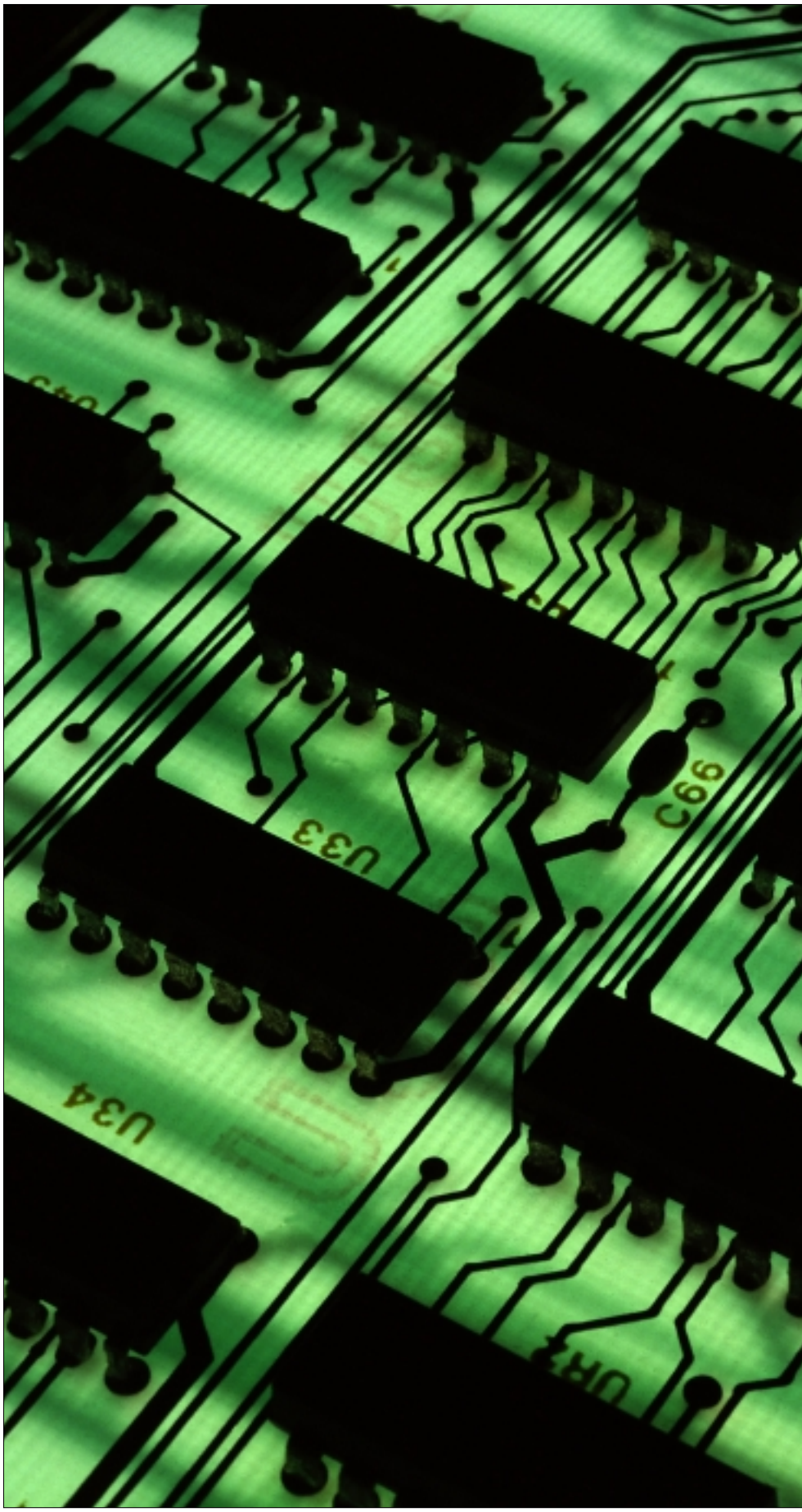
CUNO Over 80 Years of Solutions

When looking for a solution to challenging electronics manufacturing filtration, the industry has turned to CUNO for performance. CUNO has achieved a leadership position by striving to be the best supplier of high quality products designed to provide cost effective solutions.

Some filter manufacturers offer a limited range or a single filter option. CUNO, however, understands that each application is unique and there is always an alternative. CUNO has both the experience and the breadth of products to provide quality improvements and dramatic cost savings for the customer.

The CUNO Commitment

CUNO understands that the best solutions begin with a thorough awareness of the problem and recognizes that each customer's manufacturing process is unique. The goal is to understand both customer objectives and process requirements, and to recommend solutions to meet customer needs.



- **Economy**
  High Performance Filter Systems Provide Optimal Process Economies

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  Easy-to-Use Systems Deliver Low Labor Costs and Minimum Downtime

- **Quality**
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