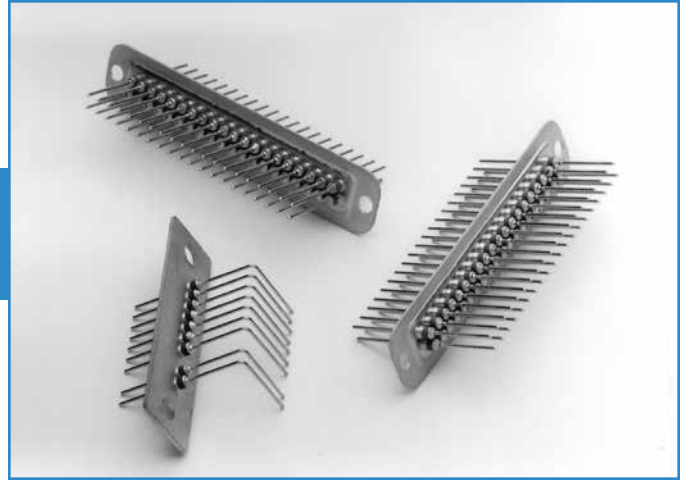


Bolt-in Style Filter Plates

The Bolt-in style plate provides an excellent method for electronic system interface and EMI filtering. Bolt-in filter plates are available in a variety of plate sizes and up to 74 lines per plate in high-density (2mm) and 60 pins per plate in standard density (.100"). On the larger plate sizes, API ensures structural integrity through a unique, coining process. The drawing on page FA10 shows an electronic system utilizing Bolt-in style filter plates.



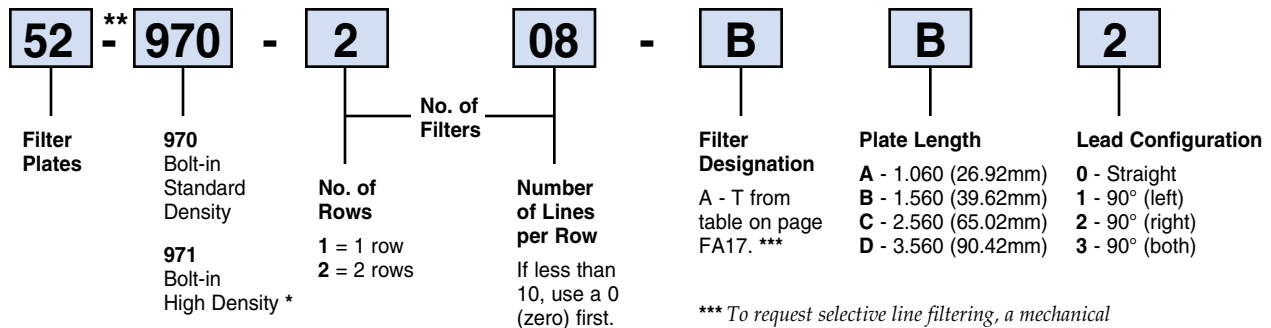
Bolt-in Filter Plate Advantages

- Eliminates the need to assemble filters into a bulkhead
- Excellent filtering from 5 MHz to 1 GHz
- Total cost savings vs. customer installed discrete filter elements
- Ideal for isolation of electronic compartments to suppress EMI
- Outperforms surface mount filters over 50 MHz
- Improved reliability
- Mixed capacitance values and schematics
- Maximize real estate on PCB
- Available in RoHS compliant versions

Ordering Information

Example: 52-970-208-BB2

The part number shown represents a Bolt-in style filter plate with 2 rows, 8 filters per row. Filters are C style with a capacitance value of 100pF. The plate length is 1.560", and the leads are bent 90° to the right side.

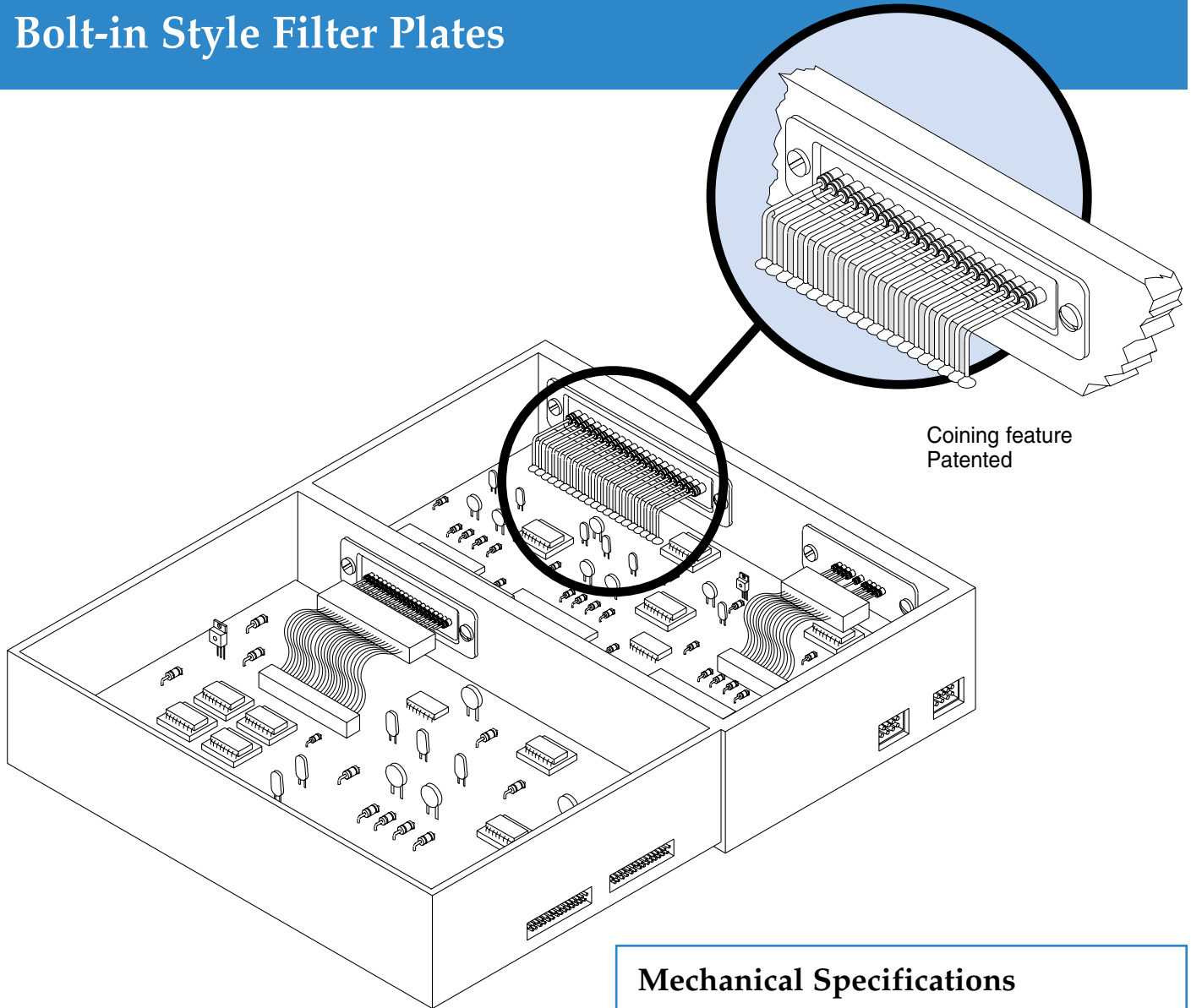


* Maximum capacitance up to 4000pF C style filter

**Replace "-" with "F" for RoHS compliant version

*** To request selective line filtering, a mechanical configuration or material specification not shown in this catalog, please complete and forward the design inquiry form on page FA18. We will review your request and provide you with a part number.

Bolt-in Style Filter Plates



Coining feature
Patented

Mechanical Specifications

Base Plate

Material..... Brass UNS C26000/C27000

Base Plate

Thickness..... .020 inches (.51mm)

Plating

Tin,
RoHS version will be silver

Lead Material

Copper alloy

Lead Plating

Gold plate

Lead Diameter

ø .025" (.64mm)
for 0.100" centers (2.54mm)

ø .020 (.51mm)
for 0.079" centers (2.00mm)

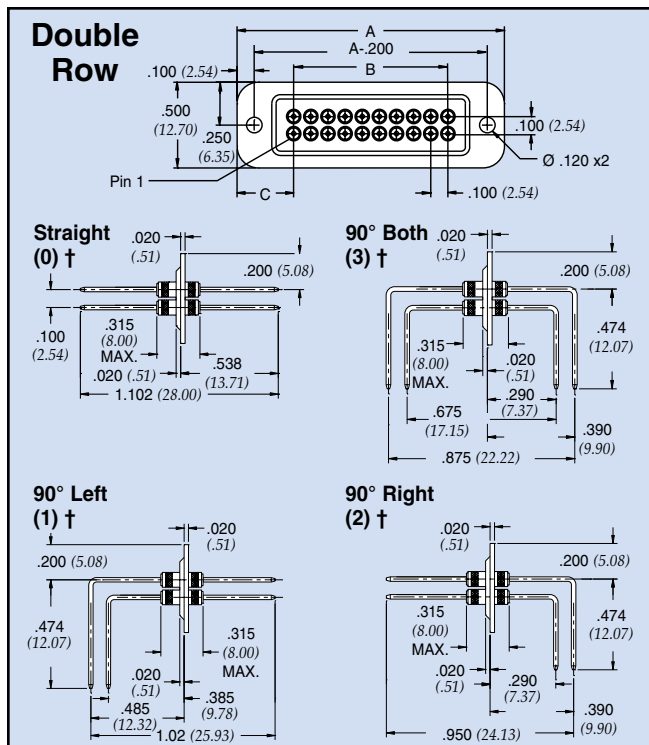
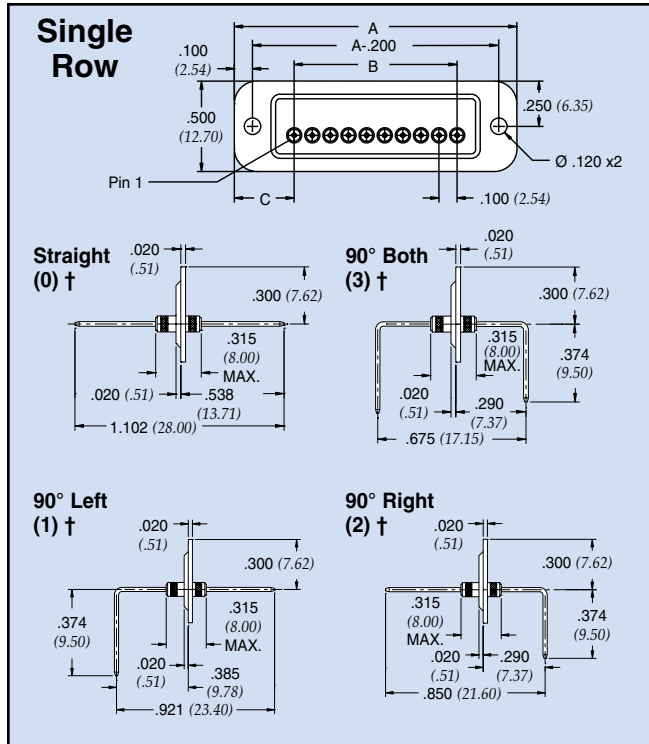
Current Rating

5 Amps for .025" (.64mm) ø
3 Amps for .020" (.51mm) ø

Bolt-in Style Filter Plates

Standard Density Centers .100"

Dimensions: inches and (mm)
Lead Spacing: .100" (2.54 mm)



Coining feature patented
† Refers to lead configuration for part number/ordering information

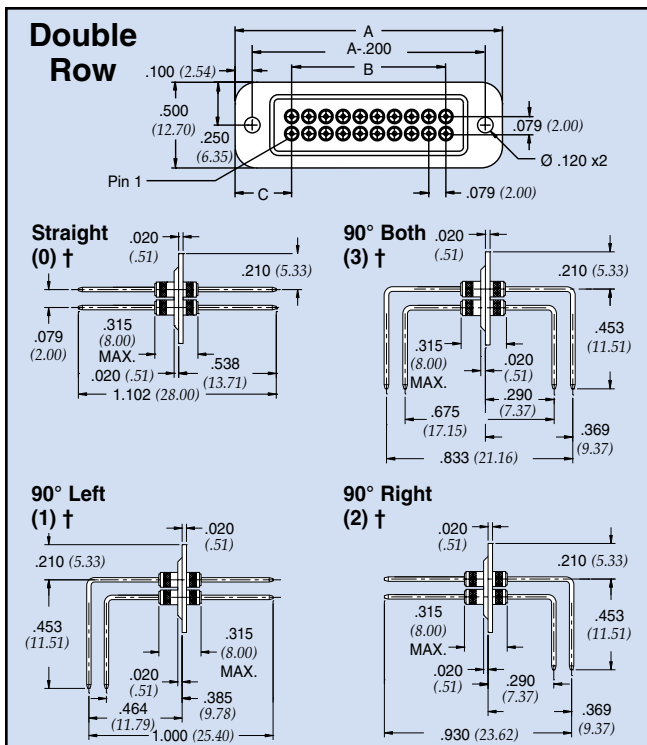
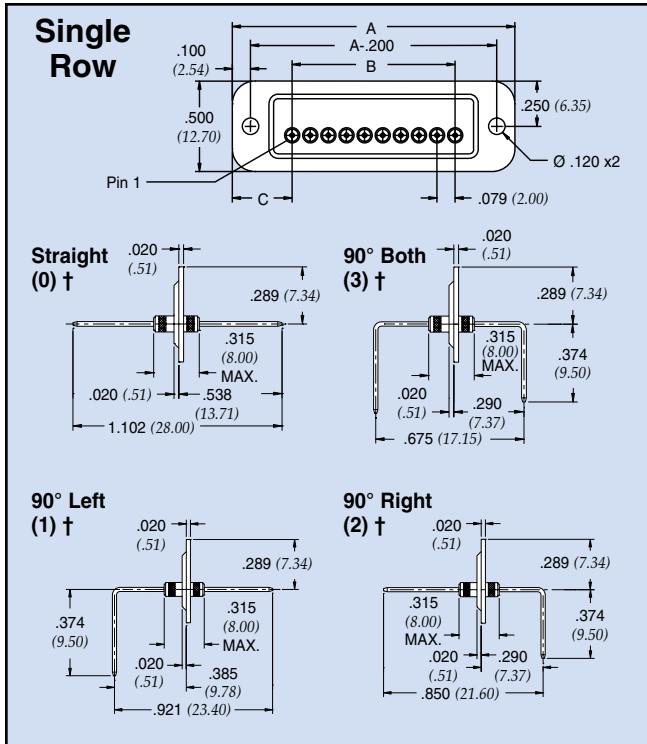
Plate length (A)	No. of filtered lines per row	52-970-XXX-XXX	
		B	C
1.060 * (26.92)	1	0 (0.00)	0.53 (13.46)
	2	0.1 (2.54)	0.43 (10.92)
	3	0.2 (5.08)	0.43 (10.92)
	4	0.3 (7.62)	0.33 (8.38)
	5	0.4 (10.16)	0.33 (8.38)
1.560 * (39.62)	1	0.0 (0.00)	0.73 (18.54)
	2	0.1 (2.54)	0.73 (18.54)
	3	0.2 (5.08)	0.63 (16.00)
	4	0.3 (7.62)	0.63 (16.00)
	5	0.4 (10.16)	0.53 (13.46)
	6	0.5 (12.70)	0.53 (13.46)
	7	0.6 (15.24)	0.43 (10.92)
	8	0.7 (17.78)	0.43 (10.92)
	9	0.8 (20.32)	0.33 (8.38)
	10	0.9 (22.86)	0.33 (8.38)
2.560 (65.02)	5	0.4 (10.16)	1.03 (26.16)
	6	0.5 (12.70)	1.03 (26.16)
	7	0.6 (15.24)	0.93 (23.62)
	8	0.7 (17.78)	0.93 (23.62)
	9	0.8 (20.32)	0.83 (21.08)
	10	0.9 (22.86)	0.83 (21.08)
	11	1.0 (25.40)	0.73 (18.54)
	12	1.1 (27.94)	0.73 (18.54)
	13	1.2 (30.48)	0.63 (16.00)
	14	1.3 (33.02)	0.63 (16.00)
	15	1.4 (35.56)	0.53 (13.46)
	16	1.5 (38.10)	0.53 (13.46)
	17	1.6 (40.64)	0.43 (10.92)
	18	1.7 (43.18)	0.43 (10.92)
	19	1.8 (45.72)	0.33 (8.38)
20	1.9 (48.26)	0.33 (8.38)	
3.560 (90.42)	13	1.2 (30.48)	1.13 (27.70)
	14	1.3 (33.02)	1.13 (27.70)
	15	1.4 (35.56)	1.03 (26.16)
	16	1.5 (38.10)	1.03 (26.16)
	17	1.6 (40.64)	0.93 (23.62)
	18	1.7 (43.18)	0.93 (23.62)
	19	1.8 (45.72)	0.83 (21.08)
	20	1.9 (48.26)	0.83 (21.08)
	21	2.0 (50.80)	0.73 (18.54)
	22	2.1 (53.34)	0.73 (18.54)
	23	2.2 (55.88)	0.63 (16.00)
	24	2.3 (58.42)	0.63 (16.00)
	25	2.4 (60.96)	0.53 (13.46)
	26	2.5 (63.50)	0.53 (13.46)
	27	2.6 (66.04)	0.43 (10.92)
28	2.7 (68.58)	0.43 (10.92)	
29	2.8 (71.12)	0.33 (8.38)	
30	2.9 (73.66)	0.33 (8.38)	

* For plate widths 1.060 and 1.560 there will be no coining.
For these plates, increase dimensions to the right .020".
Thus, any dimension on left will be reduced by .020.

Bolt-in Style Filter Plates

High-Density Centers 2mm

Dimensions: inches and (mm)
Lead Spacing: .079" (2.00 mm)



Coining feature patented
† Refers to lead configuration for part number/ordering information

Plate length (A)	No. of filtered lines per row	52-971-XXX-XXX	
		B	C
1.060 * (26.92)	2	0.079 (2.00)	0.487 (12.38)
	3	0.157 (4.00)	0.409 (10.38)
	4	0.236 (6.00)	0.409 (10.38)
	5	0.315 (8.00)	0.330 (8.38)
	6	0.394 (10.00)	0.330 (8.38)
1.560 * (39.62)	3	0.157 (4.00)	0.662 (16.81)
	4	0.236 (6.00)	0.662 (16.81)
	5	0.315 (8.00)	0.583 (14.81)
	6	0.394 (10.00)	0.583 (14.81)
	7	0.472 (12.00)	0.504 (12.81)
	8	0.551 (14.00)	0.504 (12.81)
	9	0.630 (16.00)	0.426 (10.81)
2.560 (65.02)	10	0.709 (18.00)	0.886 (22.51)
	11	0.787 (20.00)	0.886 (22.51)
	12	0.866 (22.00)	0.807 (20.51)
	13	0.945 (24.00)	0.807 (20.51)
	14	1.024 (26.00)	0.729 (18.51)
	15	1.102 (28.00)	0.729 (18.51)
	16	1.181 (30.00)	0.650 (16.51)
	17	1.260 (32.00)	0.650 (16.51)
	18	1.339 (34.00)	0.571 (14.51)
	19	1.417 (36.00)	0.571 (14.51)
	20	1.496 (38.00)	0.492 (12.51)
	21	1.575 (40.00)	0.492 (12.51)
3.560 (90.42)	22	1.654 (42.00)	0.414 (10.51)
	23	1.732 (44.00)	0.414 (10.51)
	24	1.811 (46.00)	0.335 (8.51)
	25	1.890 (48.00)	0.335 (8.51)
	20	1.496 (38.00)	0.993 (25.22)
	21	1.575 (40.00)	0.993 (25.22)
	22	1.654 (42.00)	0.914 (23.22)
	23	1.732 (44.00)	0.914 (23.22)
	24	1.811 (46.00)	0.835 (21.22)
	25	1.890 (48.00)	0.835 (21.22)
3.560 (90.42)	26	1.969 (50.00)	0.757 (19.22)
	27	2.047 (52.00)	0.757 (19.22)
	28	2.126 (54.00)	0.678 (17.22)
	29	2.205 (56.00)	0.678 (17.22)
	30	2.283 (58.00)	0.599 (15.22)
	31	2.362 (60.00)	0.599 (15.22)
	32	2.441 (62.00)	0.520 (13.22)
	33	2.520 (64.00)	0.520 (13.22)
	34	2.598 (66.00)	0.442 (11.22)
	35	2.677 (68.00)	0.442 (11.22)
	36	2.756 (70.00)	0.363 (9.22)
	37	2.835 (72.00)	0.363 (9.22)

* For plate widths 1.060 and 1.560 there will be no coining.
For these plates, increase dimensions to the right .020".
Thus, any dimension on left will be reduced by .020.

Custom Filter Plates

High Volume Industrial

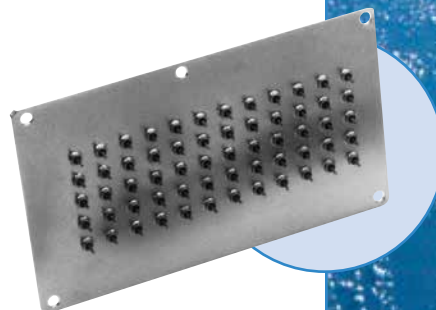
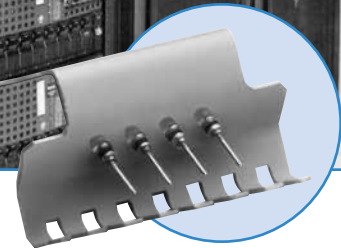
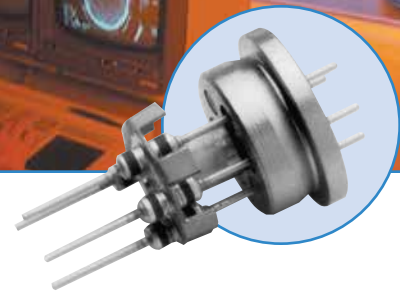
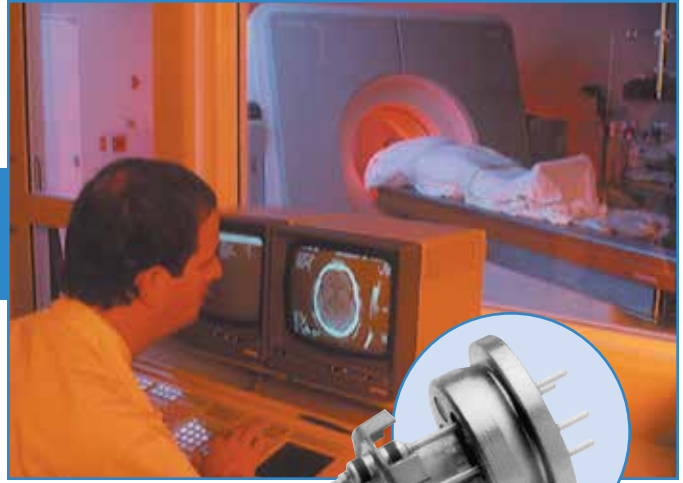
As a long-term producer of filter plates for industrial applications, API Technologies understands the cost requirements of this market. In turn, we have established a program to develop and manufacture custom designed filter plates for cost sensitive industrial applications.

We have engineered a variety of capacitive only filter elements that provide excellent RF isolation from 5 MHz to 1 GHz and beyond. To determine the available capacitance values, contact API. Our technical staff will work with you to develop a solution that meets your system and budget needs.

Military/High Reliability

Improving the electromagnetic compliance (EMC) of electronic systems is an area of intense focus within the defense and avionics industries. To achieve this goal, many companies are replacing discrete filter elements and surface mount filters with feed-through filter plate assemblies for higher frequency isolation.

API will custom design a filter plate that meets your size, material and filtering requirements. We are capable of providing stringent testing and analysis of our filter plate assemblies to MIL-F-15733 and MIL-F-28861.



Custom Capabilities

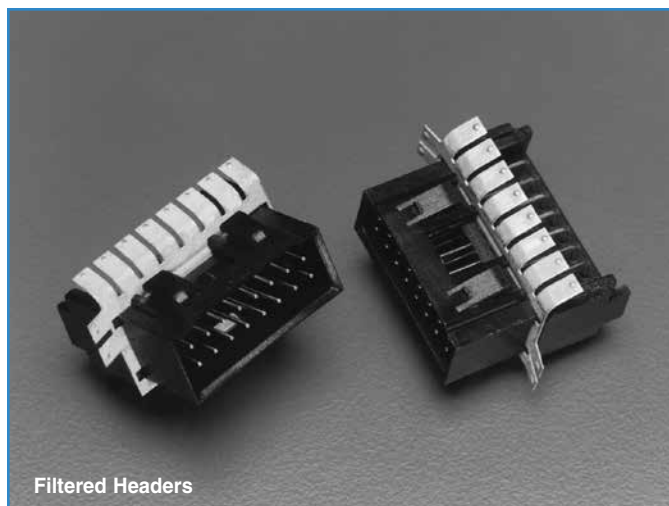
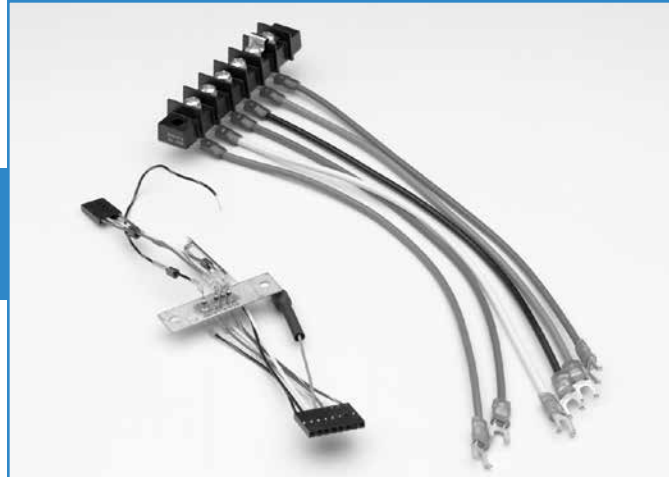
In addition to our custom filter plates, API Technologies' Spectrum Control brand offers a number of value-added features designed to complement your manufacturing operation. Our marketing and engineering staff will evaluate your design or manufacturing parameters and develop a filter solution which provides increased filtering performance economically.

API Capabilities

- Custom assemblies with varying cable lengths and impedances for high clock speeds associated with digital electronics
- Integrate a filter solution with other components to ensure a completely functional device
- Perform EMC evaluations on your equipment, recommending proper placement of EMI/RFI filtering components

Filtered Headers

Replace the unfiltered connector on your PC board with API's low cost filtered header. This innovative new product allows you to meet EMC emissions and susceptibility standards with minimal or no board change.

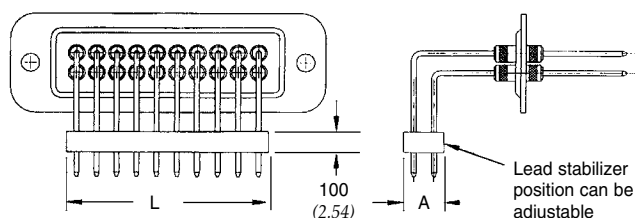
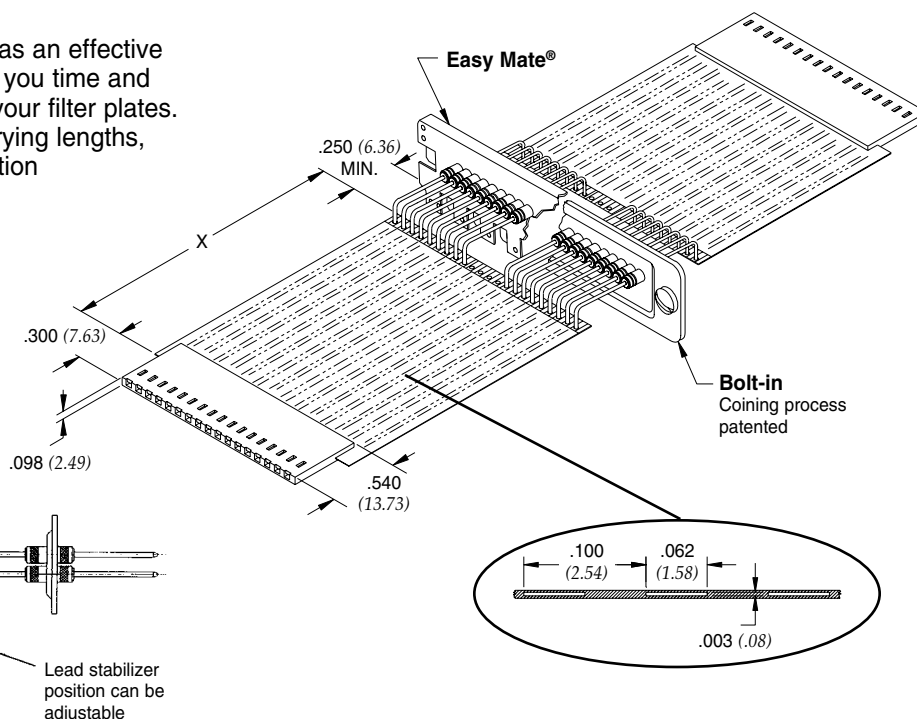


Flat Conductor Cables

Flat conductor cables are often selected as an effective method of interconnection. API can save you time and money by installing conductor cables to your filter plates. Flat conductor cables are available in varying lengths, conductor counts, and in several termination configurations.

Lead Stabilizer

API has developed a filter plate lead stabilizer bar to protect leads during installation and ensure proper alignment to PCB.



Filter Selection

EMI Filter Performance

The electrical characteristics table and insertion loss graphs indicate the performance of feed-through capacitors and Pi type filters. Utilize this information to specify the EMI filtering components included in your filter plate.

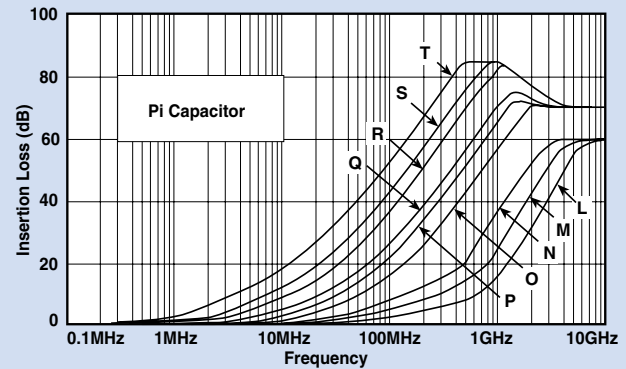
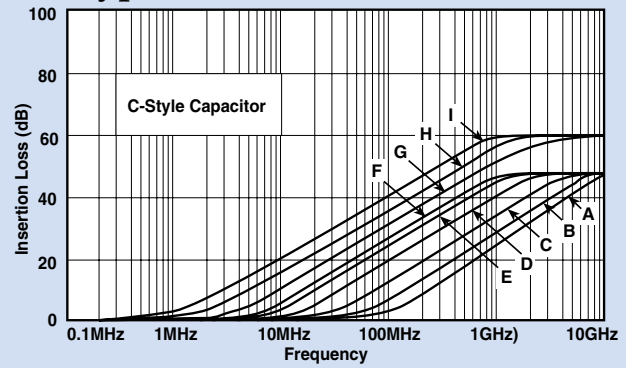
Custom Filtering

API Technologies' Spectrum Control line of filter plates are engineered to accommodate selective line filtering. Several different types of filters may be specified in a single, easy to install filter plate, allowing you to facilitate a wide range of filtering requirements.

For selective line filtering, provide a sketch indicating the filters and positions required. The example below represents a 10 pin, 2 row plate with six 1000 pF feed-through capacitors and four 1700 pF Pi type filters.

Part Number							
Based on front view of plate	10	F	F	F	R	R	6
	1	F	F	F	R	R	5

Typical Insertion Loss



Above curves represent application of proper grounding fundamentals, for assistance consult with API.

Filter Designation	Filter** Circuits	Capacitance		3 dB Max Cut-off Frequency (MHz)*	Working Voltage DC -55°C to +125°C	Minimum Insertion Loss - Decibels (dB) 50 ohm system per MIL-STD-220 (no load)							
		Value	Tolerance			5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz
A	C	68 pF	±20%	77	100V	—	—	—	—	—	3	10	16
B		100 pF	±20%	53	100V	—	—	—	—	1	6	14	19
C		135 pF	+100/-0%	23	100V	—	—	—	1	5	10	16	20
D		470 pF	±20%	11	100V	—	—	2	7	13	19	25	27
E		820 pF	±20%	6	100V	—	2	6	12	18	24	30	33
F		1000 pF	±20%	5	100V	—	3	7	14	20	26	32	35
G		1500 pF	±20%	3.5	100V	1	4	10	16	22	29	36	37
H		2500 pF	+100/-0%	1.3	100V	5	11	17	23	29	35	38	40
I		4000 pF	+100/-0%	.8	100V	9	15	21	27	34	38	42	46
J	Insulated	10 pF	Max.	635	100V	—	—	—	—	—	—	—	
K	Grounded Insert					—	—	—	—	—	—	—	
L	Pi	68 pF	±20%	65	100V	—	—	—	—	1	6	17	23
M		100 pF	±20%	46	100V	—	—	—	—	2	9	22	28
N		135 pF	+100/-0%	25	100V	—	—	—	1	6	17	26	34
O		470 pF	±20%	11	100V	—	—	—	9	18	22	36	43
P		820 pF	±20%	6	100V	—	—	4	13	23	31	45	52
Q		1000 pF	±20%	5	100V	—	2	7	16	24	36	51	59
R		1700 pF	+100/-0%	1.9	100V	1	6	14	28	35	49	64	69
S		2500 pF	+100/-0%	1.3	50V	4	9	16	28	41	54	70	70
T		5000 pF	+100/-0%	.7	100V	9	15	28	41	53	66	70	70

* 3 dB cut-off frequency calculated at the maximum capacitance.

** For Hi-Density centers (2 mm) only C style filters are available, to a maximum of 4000pF.

All high density capacitors are 50 volts @ 125°C.