

MPC

SOUTHERN

FILM CAPACITORS

F-Dyne Electronics Company has been devoted exclusively to manufacturing wound film dielectric capacitors for over 25 years.

F-Dyne is known for producing precision close tolerance capacitors, custom designs as well as standard types with excellent quality and fast delivery.

Southern Electronics Company, located in Burbank, California, was purchased by F-Dyne in 1973 and has been in the precision film capacitor business for over 30 years. Product lines manufactured at Southern include molded rectangular encased capacitors with radial or axial leads, dip coated capacitors/RC networks, metal cased types as well as standard tape wrap and fills.

In 1981 F-Dyne purchased the Precision Film Capacitor Division of Arco Electronics and moved this very

specialized product line to the Southern Electronics facility in Burbank. Precision Film Capacitor products are illustrated in the second section of this catalogue. They include polystyrene capacitors with a very special construction recognized to be the most stable available, precision decade standards and other ultra stable capacitors.

With manufacturing plants on both coasts and large stocks of finished capacitors at each location, F-Dyne/Southern offer rapid delivery of standard and special film capacitors.

The capacitor listing which follows illustrates standard popular products. More than 50% of F-Dyne production consists of non-standard capacitors. Prompt engineering and sales attention will be given to special requirements.

F-DYNE ELECTRONICS COMPANY

SOUTHERN ELECTRONICS COMPANY
726 SOUTH FLOWER ST., BURBANK, CA 91502
(818) 845-2458 FAX (818) 845-6348

FILM CAPACITORS

F-Dyne film capacitors are designed and manufactured to provide optimum electrical characteristics in the minimum volume consistent with reliable performance.

All F-Dyne capacitors are of the extended foil design which insures the least possible inductance. Aluminum foil capacitors are made with the leads directly welded to the extended foils. High series resistance or high dissipation factor are never a problem with this method of construction. The welded lead connection can not be effected in any way by subsequent soldering in fact, the lead may be burned off near the capacitor end without harm to the welded junction.

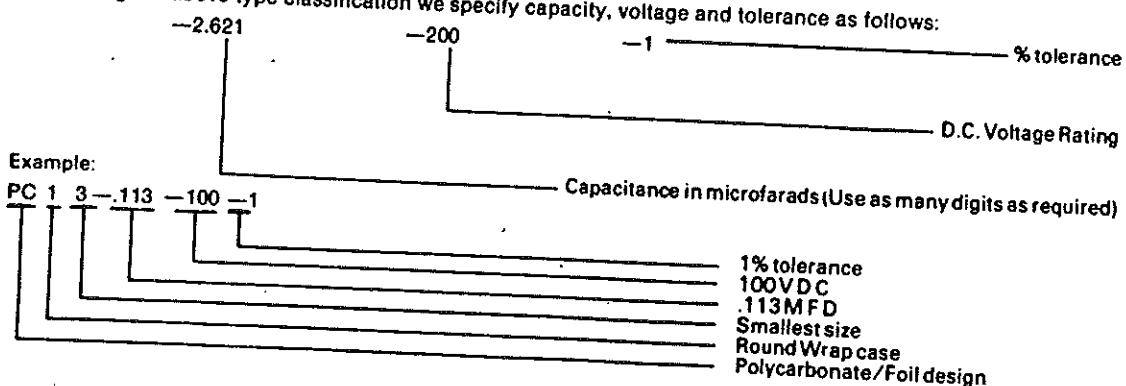
Where tin-lead composition foil is used with polystyrene or polypropylene and also in metallized film capacitors the lead wires are soldered directly to the ends of the capacitors.

Copper clad steel leads with a minimum conductivity at least 30% of the International annealed copper standard are used on all F-Dyne standard capacitors. The leads are solder or tin coated to provide excellent solderability under all conditions.

F-DYNE PART NUMBERING SYSTEM FOR ORDERING INFORMATION OR SPECIFICATION REFERENCE

Prefix: Dielectric P.E.	Case Style 1	Size Class 1
PE — Polyester* (Mylar)	1 — Round wrap	1 — Std. size (lowest cost)
MPE — Metallized Polyester	2 — Flat wrap	2 — Miniature
PC — Polycarbonate	3 — Round phenolic	3 — Smallest size (Usually highest cost)
MPC — Metallized Polycarbonate	4 — Rectangular epoxy axial	
PP — Polypropylene	5 — Rectangular epoxy radial	X — Special size per customers dwg or spec
MPP — Metallized Polypropylene	6 — Round Metal	
PS — Polystyrene	7 — Rectangular Metal	
PF — Polysulfone	8 — Round steatite	
MPF — Metallized Polysulfone	D — Dip coated radial	
TF — Teflon**		
MTF — Metallized Teflon		

Following the above type classification we specify capacity, voltage and tolerance as follows:



Where customer requirements deviate from our standard catalogued part, a drawing number may be referenced or the deviation may be detailed such as:

PE 1X — .01 — 100 — 2
size .187 x .500 all max

or
PE 1X — .01 — 100 — 2
per our P/N 14866

To specify a clear type wrapper to protect the marking from solvents used in cleaning, a "C" may be added to the part number such as:
PE11C — .01 — 100 — 2

* Dupont's trade name for polyester film

** Dupont's trade name for tetrafluoroethylene film

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ELECTRICAL AND MECHANICAL CHARACTERISTICS

A. Dielectric Strength

All F-Dyne foil/film capacitors will withstand a D.C. voltage test of 200% rated voltage for one minute.

All F-Dyne metallized dielectric capacitors will withstand a DC voltage test of 150% rated voltage for one minute.

B. Capacitance Tolerance

All F-Dyne capacitors will be within their specified tolerance when measured at 25° C with a frequency of 1000 Hz.

C. Dissipation Factor

Dissipation limits are as follows:

Dielectric	Foil Types		Metallized Types	
	Typical	Spec Limit	Typical	Spec Limit
Polyester (*Mylar)	.45	.75%	.55	1.0%
Polycarbonate	.05	.3	.15	.3
Polystyrene	.03	.1		Not Available
Polypropylene	.03	.1	.05	.1 (see note)
*Polysulfone	.05	.3	.15	2
Teflon	.01	.05	.1	.2

Note: Capacitor up to 1 mfd are tested at 1 KHz. Over 1 mfd a frequency of 60 HZ is used for D.F. measurement except for metallized polypropylene types where capacitors over 1 mfd are measured at 1 KHz to a .2% max D.F. limit

D. Insulation Resistance

When measured at rated voltage after 2 minutes of voltage application the following limits apply:

Dielectric	Foil Types		Metallized Types		
	Typical	Megohm Mfds	Need Not	Typical	Megohm Mfds
Polyester (*Mylar)	100,000	50,000	100,000	50,000	25,000
Polycarbonate	400,000	75,000	500,000	80,000	30,000
Polystyrene	800,000	100,000	500,000		Not Available
Polypropylene	800,000	100,000	500,000	100,000	50,000
*Polysulfone	400,000	75,000	500,000	80,000	30,000
Teflon	1,500,000	1,000,000	2,000,000	750,000	500,000

E. Humidity Resistance

All F-Dyne foil type capacitors will meet the requirements of Mil-C-27287 and Mil-C-19978.

All F-Dyne metallized film type capacitors will meet the requirements of RS-164.

Hermetically sealed metal cased capacitors will meet applicable Mil spec requirements.

F. Accelerated Life Test

All F-Dyne capacitors are designed to pass 85° C life tests at 140 percent of their rated voltage. Where it is desired to operate or perform life tests at higher temperatures the following voltage derating is recommended:

85°C 100%	95°C 88%	105°C 75%	115°C 62%	125°C 50%
Rated Voltage				

An exception to the above schedule is polysulfone which may be operated up to 150° with no derating.

G. Lead Strength

All F-Dyne capacitors will withstand a 5 pound pull test and lead bend tests as described in RS-164

H. Vibration

F-Dyne capacitors will withstand the high frequency (grade 3) vibration requirements of Mil-C-19978

*The basic supply of polysulfone film dielectric has been undependable. We suggest checking availability before purchasing.

GENERAL APPLICATION INFORMATION

Dielectric types

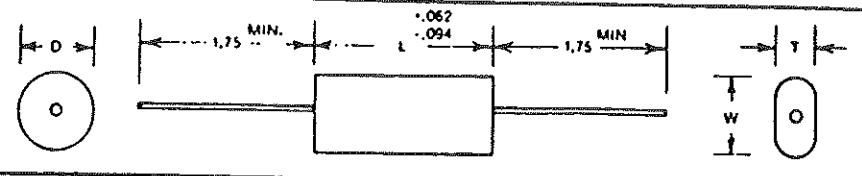
1. Polyester (Mylar) dielectric capacitors are usually the smallest and most economical. Prime consideration should be given these capacitors for general purpose applications with temperature ratings to 125°C.
2. Polypropylene capacitors are slightly larger in size than Mylar but are comparable in price and have superior electrical characteristics. They may be used in place of polystyrene in many applications where a negative TC is desirable. Temperature rating is to 105°C.
3. Polycarbonate capacitors also have superior electrical characteristics with excellent capacitance stability over a wide temperature range. Size is approximately 12% larger than Mylar types. Temperature rating to 125°C.
4. Polystyrene provides the highest quality capacitor with regard to electrical characteristics. Excellent capacitance stability and negative TC make polystyrene capacitors ideal for critical circuits. Size is approximately 3 times that of Mylar. Temperature is limited to 85°C.
5. Polysulfone has electrical characteristics similar to polycarbonate but can be rated to 150°C. Capacitance change with temperature is very stable over a wide temperature range. Size is comparable to polycarbonate.
6. Teflon capacitors have electrical quality equal to polystyrene with temperatures rating to 150°C. Teflon capacitors are very stable with regard to capacitance change with temperature and retain very high insulation resistance and low D.F. at elevated temperatures. Size is approximately 2 times that of Mylar.
7. Metallized dielectric capacitors
Metallized dielectric capacitors are normally much smaller than foil types — There is some sacrifice in electricals and price is usually much higher than foil types — As capacitance decreases, the size of metallized capacitors approaches that of foil types and therefore ratings below .1 mfd — are normally made with foil construction.
8. Flat capacitors
Flattened capacitors are recommended for space advantages. Capacity of flattened types is less effected by pressures in the Mylar wrap construction. Their cost will normally be approximately 10% higher than round types.
9. Molded cased capacitors
Molded cased capacitors provide consistent size and exact lead spacing in the radial lead type. They also provide physical protection where board cleaning solvents, soldering or handling techniques cause a problem with the wrap design.
F. Dyne will provide phenolic, epoxy or diallyl phthalate cases in round axial, round axial single end, rectangular axial or rectangular radial designs.
The cost of molded encasement is normally 5 to 15 cents over the wrap construction.
10. Metal cased capacitors. (Hermetic Seal)
For extreme environmental conditions metal cased capacitors with glass end seals are available. Their cost will normally be 30 to 50 cents higher than the wrap and fill type.
11. Wrap and fill
The wrap and fill construction has proven reliable in capacitor applications where millions of capacitors are used annually. The thin tape wrap provides the smallest encasement known adding less than .010 to the basic capacitor diameter. It is the lowest cost high quality capacitor available on the market today. F-Dyne's stock of wrap and fill capacitors is well over 1 million pieces with special capacitor ratings to 5 places (i.e. .15432) and in tolerances to .25%. Special fire retardant wrap and fill constructions are available.
From reliability and availability standpoints wrap & fill capacitors should be a first consideration.
12. Dip coat
Conformality coated radial lead capacitors are ideally suited for many printed circuit applications. Radial leads may be formed for different spacings. The epoxy coating provides excellent physical protection and is fire resistant.

BASIC PROPERTIES OF FILM DIELECTRICS USED IN F-DYNE CAPACITORS

Film Property	Poly-propylene	Polyester (Mylar)	Poly-carbonate	Poly-sulfone	Poly-styrene	Teflon
Dielectric Constant	2.3	3.2	3.0	3.1	2.5	2.0
Density	0.905	1.395	1.20	1.24	.95	2.3
Area Factor in lb./mil^2	30,600	19,800	23,100	22,400	26,500	12,800
Use Temperature °C (for capacitors)	105	125	125	150	85	200
Dissipation Factor % at 10^6 Hz	0.02	1.6	1.0	0.3	.01	.01
Flatness of Electrical Properties	Excellent	Fair	Good	Excellent	Excellent	Excellent
Dielectric Strength V/mil at 1 mil	7,000	7,000	4,000	4,000	5,000	4,200
Tensile Strength lbs./in ²	28,000	30,000	8,000	10,000	5,000	4,300
Moisture Sensitivity	None	Small	Moderate	Very Small	None	None
Dielectric Absorption	.02	.20	.08	.08	.02	.02

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**METALLIZED
POLYCARBONATE**
Wrap & Fill • Axial Lead


ROUND	MPC 13		MPC 12		MPC 11		MPC 11		MPC 11		MPC 11		MPC 11	
	50 VDC		100 VDC		150 VDC		200 VDC		300 VDC		400 VDC		600 VDC	
CAPACITANCE	D	L	D	L	D	L	D	L	D	L	D	L	D	L
.010	.156	.375	.156	.375	.187	.375	.187	.375	.187	.500	.187	.500	.218	.687
.012	.156	.375	.156	.375	.187	.375	.187	.375	.187	.500	.203	.500	.234	.687
.015	.156	.375	.156	.375	.187	.375	.187	.437	.187	.500	.218	.500	.265	.687
.022	.156	.375	.156	.375	.187	.375	.187	.437	.187	.500	.250	.500	.281	.687
.027	.156	.375	.156	.375	.203	.375	.187	.500	.203	.500	.281	.500	.265	.812
.033	.156	.375	.156	.375	.187	.437	.203	.500	.250	.500	.250	.625	.328	.812
.039	.156	.375	.156	.375	.203	.437	.203	.500	.265	.500	.281	.625	.312	.937
.047	.156	.375	.156	.375	.203	.437	.203	.500	.250	.625	.312	.625	.343	.937
.056	.156	.375	.187	.375	.203	.437	.218	.500	.281	.625	.328	.625	.375	.937
.068	.156	.375	.187	.375	.218	.437	.234	.500	.296	.625	.375	.625	.406	.937
.082	.156	.375	.187	.437	.218	.437	.250	.500	.328	.625	.343	.750	.406	1.125
.10	.171	.375	.187	.437	.234	.500	.265	.500	.359	.625	.375	.750	.437	1.125
.12	.171	.375	.234	.437	.250	.500	.296	.500	.343	.750	.328	1.062	.484	1.125
.15	.187	.375	.265	.437	.265	.500	.328	.500	.375	.750	.375	1.062	.500	1.250
.18	.203	.375	.234	.500	.281	.500	.296	.625	.328	1.062	.406	.531	.531	1.250
.22	.203	.375	.250	.500	.265	.625	.328	.625	.443	1.062	.437	1.062	.593	1.125
.27	.203	.437	.281	.500	.296	.625	.375	.625	.407	1.062	.484	1.062	.625	1.375
.33	.218	.437	.312	.500	.328	.625	.296	.875	.453	1.062	.468	1.312	.687	1.375
.39	.234	.437	.328	.500	.343	.625	.328	.875	.500	1.062	.500	1.312	.703	1.500
.47	.234	.437	.312	.625	.390	.625	.359	.875	.453	1.187	.546	1.312	.765	1.500
.56	.234	.500	.328	.625	.359	.750	.390	.875	.515	1.312	.609	1.312	.750	1.750
.68	.250	.500	.343	.625	.406	.750	.421	.875	.546	1.312	.562	1.687	.828	1.750
.82	.281	.500	.343	.750	.421	.875	.437	.875	.593	1.312	.609	1.687		
1.00	.312	.500	.375	.750	.437	.875	.437	.875	.562	1.687	.687	1.750		
1.25	.343	.500	.421	.750	.390	1.312	.437	1.187	.625	1.687	.750	1.750		
1.50														
2.00														
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45.00														
50.00														

FLAT	MPC 23			MPC 22			MPC 21			MPC 21			MPC 21		
	50 VDC			100 VDC			150 VDC			200 VDC			400 VDC		
CAPACITANCE	T	W	L	T	W	L	T	W	L	T	W	L	T	W	L
.1	.109	.218	.375	.140	.234	.437	.140	.250	.500	.171	.281	.500	.290	.437	.750
.12	.109	.218	.375	.156	.250	.437	.171	.281	.500	.234	.343	.500	.250	.375	1.062
.15	.125	.234	.375	.187	.296	.437	.187	.281	.500	.265	.376	.500	.296	.437	1.062
.18	.140	.234	.375	.156	.250	.500	.203	.312	.500	.234	.343	.625	.328	.452	1.062
.22	.140	.265	.375	.171	.281	.500	.187	.296	.625	.265	.375	.625	.359	.484	1.062
.27	.156	.281	.375	.203	.312	.500	.219	.328	.625	.296	.437	.625	.406	.531	1.062
.33	.171	.296	.375	.234	.343	.500	.250	.359	.625	.218	.359	.875	.343	.539	1.312
.39	.187	.328	.375	.250	.359	.500	.250	.390	.625	.250	.390	.875	.375	.578	1.312
.47	.218	.375	.375	.234	.343	.625	.296	.437	.625	.281	.421	.875	.421	.617	1.312
.56	.234	.406	.500	.250	.359	.625	.265	.406	.750	.312	.453	.875	.484	.687	1.312
.68	.218	.453	.500	.250	.390	.625	.312	.453	.750	.359	.500	.875	.437	.640	1.687
.82	.234	.468	.500	.250	.390	.750	.328	.468	.875	.343	.484	.875	.484	.687	1.687
1.00	.250	.500	.500	.281	.421	.750	.343	.484	.875	.359	.500	.875	.562	.765	1.687
1.50	.250	.329	.625	.359	.500	.750	.359	.500	.1.312	.453	.593	.1.187	.687	.890	1.750
2.00	.312	.406	.625	.312	.453	.1.187	.421	.562	.1.312	.531	.671	.1.187	.812	.1.015	1.750
3.00	.312	.546	.750	.390	.531	.1.187	.500	.640	.1.312	.531	.671	.1.187			
4.00	.359	.593	.750	.421	.562	.1.312	.609	.750	.1.312	.531	.671	.1.312			
5.00	.390	.640	.750	.484	.625	.1.312	.609	.750	.1.312	.625	.765	.1.312			
6.00	.437	.687	.750	.531	.671	.1.312	.640	.781	.1.312	.687	.828	.1.312			
8.00	.406	.625	.875	.546	.687	.1.562	.703	.843	.1.812						
10.00	.468	.687	.875	.625	.765	.1.562	.570	.890	.1.812						
20.00	.687	.913	1.062												
30.00	.640	.875	1.562												
40.00	.750	1.00	1.562												
50.00	.843	1.09	1.562												

Lower capacitance values, higher capacitance values and non-standard capacitance values are available.
Alternate case configurations are also available where space problems are encountered.

For dimensional tolerances and lead gauges see pages 10 and 11.

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