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► 3M™ Dyneon™ Fluoroplastics

Product Comparison Guide.



3M™ Dyneon™ Fluoroplastic Dispersions.

Nominal values, not for specification purposes

Properties (average values)	Method	Unit	PFA 6900GZ	PFA 6910GZ	FEP 6300GZ	THV 340Z
Solid Content	DIN EN ISO 12086	%	50	50	55	50
Emulsifier			non-ionic	non-ionic	non-ionic	ionic
Emulsifier Content	Dyneon internal	%	7	9	7	5
Viscosity	DIN EN ISO 3219	MPas	9	12	18	7
pH Value	DIN ISO 976		> 9	> 9	> 9	> 9
Density	DIN 51757	g/cm ³	1.4	1.4	1.4	1.4
Particle size	DIN ISO 13321	nm	200	90	125	100



3M™ Dyneon™ Fluoroplastics.

Nominal values, not for specification purposes

1) Melt Index is measured at the following conditions	
265 °C/5kg	All THV products
297 °C/5kg	All ETFE products
372 °C/5kg	All FEP and PFA products

2) Chemical Resistance - % change in tensile properties	
0 – 10%	minimal
10 – 15%	some
> 15%	noticeable

Physical Properties	Test Method	Test Condition	Unit	PFA 6502NZ PFA 6502TZ PFA 6502UHPZ	PFA 6503PAZ PFA 6503PBZ	PFA 6505TZ	PFA 6515NZ PFA 6515TZ PFA 6515UHPZ	PFA 6525TZ	PFA 8502ESDZ	PFA FLEX 8502UHPZ	PFA FLEX 8515UHPZ
Physical Form, G = Granules (Pellets), P = Powder				G	P	G	G	G	G	G	G
Specific Gravity	DIN EN ISO 12086		g/cm ³	2.15	2.15	2.15	2.15	2.15	2.11	2.15	2.15
Melting Point	DIN EN ISO 12086		°C	308	308	308	308	308	278	290	290
Melt Index ¹⁾	DIN EN ISO 1133		g/10 min	2	3	5	15	25	2	2	15
Mechanical Properties											
Hardness	ISO 868	Shore D		60	60	60	60	60	-	-	-
Tensile Strength (23 °C)	DIN EN ISO 12086	test speed 50 mm / min	MPa	34	30	34	29	27	30	35	34
Elongation at Break (23 °C)	DIN EN ISO 12086	test speed 50 mm / min	% (l/l)	360	380	385	400	380	290	330	350
Flexural Modulus (23 °C)	ASTM D 790	injection molded bars 127 by 12.7 by 3.2 mm	MPa	550	550	550	620	630	-	600	600
Izod Impact Strength	ASTM D 256	23 °C notched	J/m	-	-	-	-	-	-	-	-
		-40 °C notched	J/m	no break	-	-	no break	-	-	-	-
		-40 °C unnotched	J/m	no break	-	-	no break	-	-	-	-
Electrical Properties											
Dielectric Constant (23 °C)	ASTM D 150	@ 1 MHz		< 2.10	-	-	< 2.05	-	-	2.02 - 2.08	2.02 - 2.08
		@ 9.4 GHz		-	-	-	2.05	-	-	-	-
Dissipation Factor	ASTM D 150	@ 1 MHz		< 0.0005	-	-	< 0.0005	-	-	< 0.0003	< 0.0003
		@ 9.4 GHz		-	-	-	-	-	-	-	-
Dielectric Strength	ASTM D 149	0.25 mm film	kV/mm	-	-	-	-	-	-	-	-
Thermal Properties											
Limiting Oxygen Index (LOI)	ASTM D 2863		%	> 95	> 95	> 95	> 95	> 95	-	> 95	> 95
Thermal Glass Transition (Tg)	ASTM D 4591		°C	-	-	-	-	-	-	-	-
Heat Deflection Temperature	ASTM D 648	0.45 MPa	°C	-	-	-	-	-	-	-	-
Vertical Burn	UL Bulletin 94			V-0	-	-	-	-	-	-	-
Optical Properties											
Refractive Index	ASTM D 542	100 µm film		1.346	-	-	1.345	-	-	-	-
UV-Vis Light Transmission	straight light only	300 nm, 100 µm film	%	79	-	-	65	-	-	-	-
		600 nm, 100 µm film	%	95	-	-	90	-	-	-	-
Chemical Resistance²⁾											
Biodiesel				■	-	■	■	■	-	■	■
Sulfuric Acid (H ₂ SO ₄)				■	-	■	■	■	-	■	■
Sodium Hydroxide				■	-	■	■	■	-	■	■
Ethanol				■	-	■	■	■	-	■	■
Acetone				■	-	■	■	■	-	■	■
Toluene				■	-	■	■	■	-	■	■
Reference Fuel C				■	-	■	■	■	-	■	■
Reference Fuel C/MeOH (85/15)				■	-	■	■	■	-	■	■
							Also available as glass filled grade (PFA 6510GV15WZ)				
							Also available as black pigment grade (PFA 6515NZS)				

PVDF Homopolymer

Physical Properties	Test Method	Test Condition	Unit	6000 Series						2000 Series
				6008/0001	6010/0000 6010/0001	6012/0000	6012/0001	6133	6108/0001	2066/0002
Physical Form , G = Granules (Pellets), P = Powder				G	G	G	G	G	G	G
Specific Gravity	ISO 1183			1.78	1.78	1.78	1.78	-	1.78	1.78
Melting Point (Crystallinity by DSC)	ASTM D3418		°C (°F)	174 (345)	173 (343)	173 (343)	173 (343)	-	169 (336)	-
Melt Index	ASTM D1238	230 °C/10 kg	g/10 min	-	-	-	-	6.5	-	4 to 6
	ASTM D1238	230 °C/5 kg	g/10 min	24	6	1.5	1.5	-	24	-
	ASTM D1238	230 °C/2.16 kg	g/10 min	8	2	0.5	0.5	-	8	-
Mechanical Properties										
Tensile Strength at Yield (23 °C)	ASTM D638	test speed 50 mm/min	MPa (psi)	55 (7,975)	55 (7,975)	55 (7,975)	55 (7,975)	46 (6,672)	50 (7,200)	46 (6,674)
Tensile Strength at Break (23 °C)	ASTM D638	test speed 50 mm/min	MPa (psi)	42 (6,090)	42 (6,090)	42 (6,090)	42 (6,090)	33 (4,786)	40 (5,800)	67 (9,717)
Elongation at Yield (23 °C)	ASTM D638	test speed 50 mm/min	%	7	7	7	7	12	8	9
Elongation at Break (23 °C)	ASTM D638	test speed 50 mm/min	%	35	35	35	35	95	35	428
Flexural Modulus (23 °C)	ASTM D790	test speed 2 mm/min	MPa (psi)	2,200 (319,000)	2,100 (340,500)	2,100 (340,500)	2,100 (340,500)	1,420 (206,000)	1,930 (280,000)	1,670 (242,210)
Thermal Properties										
Limiting Oxygen Index (LOI)	ASTM D2863	Sheet 3 mm thick	%	44	44	44	44	-	44	-
Deflection Temperature (4 mm thick)	ASTM D648	Load 0.46 MPa, after annealing	°C (°F)	147 (297)	110 (230)	148 (226)	148 (226)	-	-	-
	ASTM D648	Load 1.82 MPa, after annealing	°C (°F)	112 (234)	110 (230)	-	-	-	112 (234)	-
Brittleness Temperature	ASTM D746A		°C (°F)	-	-	-10 to 0 (14 to 32)	-10 to 0 (14 to 32)	-	-	-10 to 0 (14 to 32)
Molding Shrinkage			%	3	-	-	-	-	2	-
Vertical Burn	UL Bulletin 94		Class	V-0	V-0	-	-	-	-	-

PVDF Copolymers

Physical Properties	Test Method	Test Condition	Unit	11000 Series						
				11008/0001	11008/0003	11010/0000	31508/0003	31508/0009	32008/0009	
Physical Form , G = Granules (Pellets), P = Powder				G	G	G	G	G	G	
Specific Gravity	ISO 1183			1.78	1.78	1.78	1.76	1.76	1.76	
Melting Point (Crystallinity by DSC)	ASTM D3418		°C (°F)	160 (320)	160 (320)	160 (320)	169 (336)	169 (336)	168 (334)	
Melt Index	ASTM D1238	230 °C/5 kg	g/10 min	24	24	6	15	15	15	
	ASTM D1238	230 °C/2.16 kg	g/10 min	8	8	2	5	5	5	
Mechanical Properties										
Tensile Strength at Yield (23 °C)	ASTM D638	test speed 50 mm/min	MPa (psi)	-	-	27 (3,990)	-	-	-	
Tensile Strength at Break (23 °C)	ASTM D638	test speed 50 mm/min	MPa (psi)	47 (6,815)	52 (7,600)	30 (4350)	22 (3,190)	22 (3,190)	22 (3,190)	
Elongation at Yield (23 °C)	ASTM D638	test speed 50 mm/min	%	10 to 12	10 to 12	10 to 12	10 to 12	10 to 12	10 to 12	
Elongation at Break (23 °C)	ASTM D638	test speed 50 mm/min	%	600	800	400	475	475	475	
Flexural Modulus (23 °C)	ASTM D790	test speed 2 mm/min	MPa (psi)	1,000 (145,000)	1,000 (145,000)	900 (130,500)	425 (61,625)	425 (61,625)	200 (29,000)	
Thermal Properties										
Limiting Oxygen Index (LOI)	ASTM D2863	Sheet 3 mm thick	%	-	65	44	65	100	100	
Deflection Temperature (4 mm thick)	ASTM D648	Load 0.46 MPa, after annealing	°C (°F)	-	-	100 (212)	-	-	-	
	ASTM D648	Load 1.82 MPa, after annealing	°C (°F)	-	-	52 (126)	-	-	-	
Brittleness Temperature	ASTM D746A		°C (°F)	-17 (1.4)	-	-	-37 (-35)	-37 (-35)	-53 (-63)	
Vertical Burn	UL Bulletin 94		Class	-	V-0	V-0	V-0	V-0	-	

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General recommendations on health and safety in processing, on work hygiene and on measures to be taken in the event of accident are detailed in our "safety data sheets (SDS)."

You will find further notes on the safe handling of fluoropolymers in the brochure "Guide for the safe handling of Fluoropolymers Resins" by PlasticsEurope, Box 3, B-1160 Brussels, Tel. +32 (2) 676 17 32.

The present edition replaces all previous versions. Please make sure and inquire if in doubt whether you have the latest edition.

Where to go for more information?

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