

Comparison of Prime Virgin Grade & Equivalent FRL Grade

PFA

MECHANICAL PROPERTIES

Mechanical Tensile

Group ID	Tensile Modulus [Mpa]	Elongation [%]	Ultimate Tensile Strength [Mpa]	Yield [MPa]	Test Method
Virgin PFA, MFR 12-16	168	521	21	5	ASTM D638
FRL Reprocessed, MFR 12-16	185	560	21	4	ASTM D638
Virgin PFA, MFR 4-6	157	471	20	6	ASTM D638
FRL Reprocessed, MFR 4-6	168	521	21	5	ASTM D638
Virgin PFA, MFR 1-3	156	507	24	7	ASTM D638
FRL Reprocessed, MFR 1-3	145	609	22	7	ASTM D638

Mechanical Flexural

Group ID	Flexural Modulus [MPa]	Ultimate Flexural Strength [MPa]	Flexural Strength at 2.5% strain [MPa]	Test Method
Virgin PFA, MFR 12-16	189	13	9	ASTM D790
FRL Reprocessed, MFR 12-16	199	13	9	ASTM D790
Virgin PFA, MFR 4-6	180	11	8	ASTM D790
FRL Reprocessed, MFR 4-6	172	10	7	ASTM D790
Virgin PFA, MFR 1-3	358	6	4	ASTM D790
FRL Reprocessed, MFR 1-3	301	5	4	ASTM D790

Electrical Resistivity

Group ID	Volume Resistivity	Test Method
Virgin PFA, MFR 12-16	8.9E+12	ASTM D257
FRL Reprocessed, MFR 12-16	8.7E+12	ASTM D257
Virgin PFA, MFR 4-6	2.4E+13	ASTM D257
FRL Reprocessed, MFR 4-6	1.5E+13	ASTM D257
Virgin PFA, MFR 1-3	9.4E+10	ASTM D257
FRL Reprocessed, MFR 1-3	9.5E+10	ASTM D257

Dielectric Constant (dk) and Dissipation Factor (df)

Group ID	dk (1kHz)	df (1kHz)	Test Method
Virgin PFA, MFR 12-16	3.42	1.2%	ASTM D150
FRL Reprocessed, MFR 12-16	2.94	1.2%	ASTM D150
Virgin PFA, MFR 4-6	2.81	0.9%	ASTM D150
FRL Reprocessed, MFR 4-6	2.91	1.1%	ASTM D150
Virgin PFA, MFR 1-3	2.71	0.4%	ASTM D150
FRL Reprocessed, MFR 1-3	2.61	0.1%	ASTM D150

Dielectric Strength

Group ID	Thickness (mm)	Voltage (kV)	Dielectric Strength (kV/mm)	Test Method
Virgin PFA, MFR 12-16	0.76	24.0	34.3	ASTM D149
FRL Reprocessed, MFR 12-16	0.71	23.9	33.2	ASTM D149
Virgin PFA, MFR 4-6	0.75	25.1	30.7	ASTM D149
FRL Reprocessed, MFR 4-6	0.70	24.8	38.1	ASTM D149
Virgin PFA, MFR 1-3	0.63	29.4	47.2	ASTM D149
FRL Reprocessed, MFR 1-3	0.51	26.5	52.1	ASTM D149