

Comparison of Prime Virgin Grade & Equivalent FRL Grade FEP

MECHANICAL PROPERTIES

Mechanical Tensile

Group ID	Tensile Modulus [Mpa]	Elongation [%]	Ultimate Tensile Strength [Mpa]	Yield [MPa]	Test Method
Virgin FEP, MFR ~ 3	179	495	21	6	ASTM D638
FRL Reprocessed, MFR ~3	190	556	24	5	ASTM D638
Virgin FEP, MFR 6-9	189	514	20	5	ASTM D638
FRL Reprocessed, MFR, 6-9	194	489	19	4	ASTM D638
Virgin FEP, MFR 28-32	195	503	17	5	ASTM D638
FRL Reprocessed, MFR 28-32	198	520	17	4	ASTM D638

Mechanical Flexural

Group ID	Flexural Modulus [MPa]	Ultimate Flexural Strength [MPa]	Flexural Strength at 2.5% strain [MPa]	Test Method
Virgin FEP, MFR ~ 3	204	16	9	ASTM D790
FRL Reprocessed, MFR ~ 3	241	18	10	ASTM D790
Virgin FEP, MFR 6-9	196	13	7	ASTM D790
FRL Reprocessed, MFR, 6-9	190	14	8	ASTM D790
Virgin FEP, MFR 28-32	226	17	9	ASTM D790
FRL Reprocessed, MFR 28-32	217	16	9	ASTM D790

Electrical Resistivity

Group ID	Volume Resistivity	Test Method
Virgin FEP, MFR ~ 3	3.9E+13	ASTM D257
FRL Reprocessed, MFR ~ 3	7.9E+12	ASTM D257
Virgin FEP, MFR 6-9	1.3E+14	ASTM D257
FRL Reprocessed, MFR, 6-9	5.1E+13	ASTM D257
Virgin FEP, MFR 28-32	1.4E+13	ASTM D257
FRL Reprocessed, MFR 28-32	8.6E+12	ASTM D257

Dielectric Constant (dk) and Dissipation Factor (df)

Group ID	dk (1kHz)	df (1kHz)	Test Method
Virgin FEP, MFR ~ 3	3.00	1.5%	ASTM D150
FRL Reprocessed, MFR ~ 3	1.62	2.6%	ASTM D150
Virgin FEP, MFR 6-9	1.26	2.6%	ASTM D150
FRL Reprocessed, MFR, 6-9	1.19	2.6%	ASTM D150
Virgin FEP, MFR 28-32	1.28	2.7%	ASTM D150
FRL Reprocessed, MFR 28-32	1.19	2.8%	ASTM D150

Dielectric Strength

Group ID	Thickness (mm)	Voltage (kV)	Dielectric Strength (kV/mm)	Test Method
Virgin FEP, MFR ~ 3	0.70	26.7	38.1	ASTM D149
FRL Reprocessed, MFR ~ 3	0.72	25.1	34.8	ASTM D149
Virgin FEP, MFR 6-9	0.61	29.1	33.1	ASTM D149
FRL Reprocessed, MFR, 6-9	0.61	29.9	33.1	ASTM D149
Virgin FEP, MFR 28-32	0.81	26.9	34.1	ASTM D149
FRL Reprocessed, MFR 28-32	0.74	25.9	34.9	ASTM D149