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Physical Property Comparison of Expanded Polyethylene (EPE) and Extruded Polyethlyene (PE)

Physical Properties	Test Method	Units	Expanded Polyethlyene (EPE)							Extruded Polyethlyene (PE)				
Density (Grade)	ASTM-D3575	pcf	1.3	1.5	1.9	2.3	2.8	4.2	4.6	1.7	2.0	4.0	6.0	9.0
Compressive Strength @ 10%	ASTM-D3575	psi	6	8	10	13	17	29	35	n/a	n/a	n/a	n/a	n/a
Compressive Strength @ 25%		psi	9	10	13	17	21	36	43	6	7	17	28	60
Compressive Strength @ 50%		psi	17	18	22	28	33	56	70	15	16	28	45	90
Compressive Strength @ 75%		psi	43	48	56	64	75	113	130	n/a	n/a	n/a	n/a	n/a
Tensile Strength	ASTM-D3575	psi	40	45	52	62	70	98	120	35	40	50	80	160
Tensile Elongation	ASTM-D3575	%	38	35	32	31	30	22	22	n/a	n/a	n/a	n/a	n/a
Tear Strength	ASTM-D3575	lbs/in	14	16	17	19	21	28	34	11	13	19	30	54
Compressive Set @ 25%	ASTM-D3575	%	3	4	4	4	4	7	7	< 21	< 19	< 15	< 15	< 15
Compressive Set @ 50%	ASTM D3575	%	14	13	12	12	12	15	15	n/a	n/a	n/a	n/a	n/a
Buoyancy	ASTM-D3575	lbs/ft^3	61	60	60	59	59	58	57	n/a	n/a	n/a	n/a	n/a
Thermal Conductivity	ASTM-C177	(K) $BTU\text{-}in/ft^2\text{-}hr\text{-}°F$	0.26	0.24	0.24	0.24	0.24	0.28	0.30	0.43	0.43	0.43	0.43	0.43
Thermal Resistance	ASTM-C177	(R) @70°F	4.0	4.2	4.2	4.2	4.1	3.6	3.3	2.9	2.9	2.3	2.3	2.3
Coeff. of Lin. Thermal Expansion (CLTE)	ASTM-D696	$in/in/°F \times 10^{-5}$	8.2	7.2	6.2	5.5	4.8	4.2	4.0	n/a	n/a	n/a	n/a	n/a
Service Temperature	ASTM-D3575	°F (Max.)	176	176	176	176	176	176	176	160	160	160	160	160
Water Absorption (7 Day)	ASTM-D1667	% (vol) / lb/ft^2	<5.0 / <0.01	<5.0 / <0.01	<5.0 / <0.01	<5.0 / <0.01	<5.0 / <0.01	<5.0 / <0.01	<5.0 / <0.01	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2
Compressive Creep	ASTM-D3575	1000hr, % (psi)	2.8 (1)	3.0 (1)	3.3 (1)	3.5 (1.5)	3.0 (1.5)	5.5 (10)	4.0 (10)	10 (1.25)	10 (2.0)	< 10 (5.0)	< 10 (10)	< 10 (20)
Flammability	FMVSS-302	Pass/Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Chemical Resistance	Various	1 hr exposure (solvents, acids, and alkalines)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	n/a	n/a	n/a	n/a	n/a
Fuel Immersion Coast Guard/SOLAS	Fuel B per 33 CFR §183.114	<5% (chg in vol)	Complies	Complies	Complies	Complies	Complies	Complies	Complies	n/a	n/a	n/a	n/a	n/a
Melt Reprocessable Recyclability	n/a	n/a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes