

ASTM GM13 HDPE Smooth Geomembrane

Properties	Test Method	Test Value							Testing Frequency (minimum)
		0.75 mm	1.00 mm	1.25 mm	1.50 mm	2.00 mm	2.50 mm	3.00 mm	
Thickness ~ (min. ave.) ~ mm lowest individual of 10 values - %	D5199	nom. -10	nom. -10	nom. -10	nom. -10	nom. -10	nom. -10	nom. -10	per roll
Formulated Density (min. ave.) - g/cc	D 1505/D 792	0.940	0.940	0.940	0.940	0.940	0.940	0.940	90,000 kg
Tensile Properties (1) (min. ave.) yield strength - kN/m break strength - kN/m yield elongation - % break elongation - %	D 6693 Type IV	 11 20 12 700	 15 27 12 700	 18 33 12 700	 22 40 12 700	 29 53 12 700	 37 67 12 700	 44 80 12 700	9,000 kg
Tear Resistance (min. ave.) - N	D1004	93	125	156	187	249	311	374	20,000kg
Puncture Resistance (min. ave.) - N	D4833	240	320	400	480	640	800	960	20,000kg
Stress Crack Resistance (2) - hr.	D 5397 (App.)	500	500	500	500	500	500	500	per GRI GM-10
Carbon Black Content (range) - %	D4218 (3)	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	9,000 kg
Carbon Black Dispersion	D 5596	note (4)	note (4)	note (4)	note (4)	note (4)	note (4)	note (4)	20,000 kg
Oxidative Induction Time (OrT) (min. ave.)(5) (a) Standard OIT - min. — or — (b) High Pressure OIT - min.	D 3895 D 5885	100 400	100 400	100 400	100 400	100 400	100 400	100 400	90,000 kg
Oven Aging at 85°C (5), (6) (a) Standard OIT (min. ave.) - % retained after 90 days — or — (b) High Pressure OIT (min. ave.) - % retained after 90 days	D 5721 D 3895 D 5885	 55 80	 55 80	 55 80	 55 80	 55 80	 55 80	 55 80	per each formulation
Uv Resistance (7) (a) Standard OIT (min. ave.) — or — (b) High Pressure OIT (min. ave.) - % retained after 1600 hrs (9)	D 7238 D 3895 D 5885	 N.R. (8) 50	 N.R. (8) 50	 N.R. (8) 50	 N.R. (8) 50	 N.R. (8) 50	 N.R. (8) 50	 N.R. (8) 50	per each formulation

ASTM GM13 HDPE Textured Geomembrane

Properties	Test Method	Test Value							Testing Frequency (minimum)
		30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils	
Thickness mils (min. ave.) - mils lowest individual for 8 out of 10 values - % lowest individual for any of the 10 values - %	D 5994	nom. -5% -10 -15	nom. -5% -10 -15	nom. -5% -10 -15	nom. -5% -10 -15	nom. -5% -10 -15	nom. -5% -10 -15	nom. -5% -10 -15	per roll
Asperity Height mils (min. ave.) - mils	D 7466	16	16	16	16	16	16	16	every 2Dd roll(1)
Formulated Density (min. ave.) - g/cc	D 1505/D 792	0.940	0.940	0.940	0.940	0.940	0.940	0.940	200,000 lb
Tensile Properties (min. ave.) (2) yield strength - lb/in. break strength - lb/in. yield elongation - % break elongation - %	D 6693 Type IV	 63 45 12 100	 84 60 12 100	 105 75 12 100	 126 90 12 100	 168 120 12 100	 210 150 12 100	 252 180 12 100	20,000 lb
Tear Resistance (min. ave.) -lb	D 1004	21	28	35	42	56	70	84	45,000 lb
Puncture Resistance (min. ave.)-lb	D 4833	45	60	75	90	120	150	180	45,000 lb

Stress Crack Resistance (3) - hr.	D 5397 (App)	500	500	500	500	500	500	500	per GRI GM10
Carbon Black Content (range) - %	D 4218 (4)	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	2.0-3.0	20,000 lb
Carbon Black Dispersion	D 5596	note (5)	note (5)	note (5)	note (5)	note (5)	note (5)	note (5)	45,000 lb
Oxidative Induction Time (OIT) (min. ave.) (6)	D 3895	100	100	100	100	100	100	100	200,000 lb
(a) Standard OIT - min. — or —	D 5885	400	400	400	400	400	400	400	
(b) High Pressure OIT - min.									
Oven Aging at 85°C (6), (7)	D 5721								per each fomulation
(a) Standard OIT (min. ave.) - % retained after 90 days — or —	D 3895	55	55	55	55	55	55	55	
(b) High Pressure OIT (min. ave.) - % retained after 90 days	D 5885	80	80	80	80	80	80	80	
UV Resistance (8)	D 7238								per each fomulation
(a) Standard orr (min. ave.) — or —	D 3895	N.R. (9)	N.R. (9)	N.R. (9)	N.R. (9)	N.R. (9)	N.R. (9)	N.R. (9)	
(b) High Pressure OIT (min. ave.) - % retained after 1600 hrs (10)	D 5885	50	50	50	50	50	50	50	



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