

APPENDIX J

Manufacture Specifications

E SERIES

TECHNICAL DATASHEET

Product	Needlepunched nonwoven short staple fibers geotextile
Composition	Polypropylene ¹
Main function	Protection

Property	Test Method	Unit	TEXEL060E	TEXEL080E	TEXEL100E	TEXEL120E	TEXEL140E	TEXEL160E	TEXEL200E	TEXEL240E	TEXEL280E	TEXEL320E	TEXEL430E											
Physical																								
Weight	ASTM D5261	g/m² oz/yd²	203	6	271	8	340	10	407	12	475	14	542	16	675	20	810	24	950	28	1085	32	1470	43
Thickness	ASTM D5199	mm mils	1.7	65	2.3	90	2.7	105	3.0	120	3.8	150	4.1	160	4.5	177	5	200	5.3	209	5.5	217	6	236
Mechanical																								
Tensile strength	ASTM D4632	N lbs	712	160	979	220	1200	270	1470	330	1730	390	1891	425	2045	460	2220	500	2500	562	2670	600	3300	742
Elongation at break	ASTM D4632	%	50-105		50-105		50-105		50-105		50-105		50-105		50-105		50-105		50-105		50-105		50-105	
Trapezoid tear	ASTM D4533	N lbs	289	65	400	90	444	100	556	125	600	135	667	150	800	180	910	205	1010	227	1200	270	1350	304
CBR puncture	ASTM D6241	N lbs	2000	450	2670	600	3220	725	4000	900	4650	1045	5340	1200	6200	1394	8000	1800	8000	1799	8800	1978	9500	2136
UV resistance	ASTM D4355	%/500h	70		70		70		70		70		70		70		70		70		70		70	
Hydraulic																								
Flow rate	ASTM D4491	L/min/m² G/min/ft²	5080	125	4074	100	3055	75	2544	60	2037	50	1833	45	1050	26	1019	25	-		-		-	
Permittivity	ASTM D4491	s ⁻¹	1.60		1.26		0.94		0.90		0.64		0.57		0.30		0.40		-		-		-	
Permeability	ASTM D4491	cm/sec	0.3		0.3		0.3		0.3		0.25		0.25		0.15		-		-		-		-	
AOS²	ASTM D4751	µm us sieves	212	70	180	80	150	100	150	100	150	100	150	100	150	100	150	100	-		-		-	
Dimensions																								
Width	N/A	m ft	3.81 - 4.57 - 5.25 12.5 - 15 - 17.2											3.9 m 12.8 ft										
Length	N/A	m ft	91.44 300											50 m 164 ft										

Our quality management system is certified by ISO-9001 standard. Our internal laboratory is certified by the Geosynthetic Accreditation Institute - Laboratory Accreditation Programm (GAI-LAP).

All values are MARV except when specified.

The values entered are values obtained at the time of manufacture. Handling and storage conditions may change some properties.

1-May contain polyester / 2- Maximum average roll value

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Texel reserves the right to modify existing properties contingent on the evolution of technical knowledge. Each user is invited to verify if this document represents the most recent update. Texel offers no guarantee and assumes no responsibility regarding usage, installation and/or convenience of usage. Texel must be informed of all product defects or product nonconformity prior to installation. Responsibility is limited to replacement of non-compliant or defective product.

PRODUCT DATA SHEET

COLETANCHE ES 2



DESCRIPTION

COLETANCHE ES 2 is an SBS elastomeric modified bituminous geomembrane.

USE

Moderate level of mechanical resistance, for use an environmental protection and groundworks waterproofing, in particular :

- To cover landfill,
- Hydraulic ponds,
- Containment of Industrial liquid wastes,
- Canals ,
- Contaminated land.

Product use must be validated by Axter

APPLICATION METHOD

By torch welding or other similar technique

STORAGE

Rolls must not be stored directly on the ground. Provide suitable supports (blocks, slides, wooden planks) with a minimum height of 35 cm to be placed under the ends of the mandrel.

COMPOSITION

(indicative)

Reinforcement (g/m ²) :	Glass mat	50
Reinforcement (g/m ²) :	Non-woven geotextile	250
Binder (g/m ²) :	Elastomeric SBS	4300
Surface finish (g/m ²) :	Sand	250
Under surface finish (g/m ²) :	Polyester antirroot film	15

CHARACTERISTICS

		STANDARD	UNITS	AVERAGE	Minimum
Dimensions	Length	-	m	80	79
	Width		m	5.10	5.01
Thickness (on finished product)		ASTM D 5199	mm	4.00	3.60
Surface mass		ASTM D 3776	kg/m ²	4.85	4.30
Resistance to tearing	Longitudinal	ASTM D 4073	N	825	619
	Cross direction			700	525
Tensile properties : maximum tensile strength	Longitudinal	ASTM D 7275	kN/m	27	20.3
	Cross direction			24	15
Tensile properties : elongation	Longitudinal		%	60	45
	Cross direction			60	45
Static Puncture		ASTM D 4833	N	530	477
Flexibility at low temperature	Longitudinal	ASTM D 5147	°C	-20	-15
	Cross direction			-20	-15
Water permeability (liquid tightness)		ASTM E 96	m/s	6.10 ⁻¹⁴	<
Gas permeability (gas tightness)		ASTM D 1434-82	m ³ /(m ² .j.atm)	2.10 ⁻⁴	<

NOTE: AXTER COLETANCHE INC. may modify the composition and/or utilisation of its products without prior notice. Consequently orders will be filled according to the latest specification.



MicroSpike® Liner

LINEAR LOW DENSITY POLYETHYLENE

AGRU America's structured geomembranes are manufactured on state-of-the-art manufacturing equipment using the flat die calender manufacturing process, a method that produces a more consistent core thickness than other processes, such as the blown film extrusion process. AGRU uses only the highest-grade HDPE and LLDPE resins manufactured in North America.

PRODUCT DATA

Property	Test Method	Frequency	Minimum Average Values			
Thickness (nominal), mil (mm)	ASTM D5994	Per Roll	40 (1.0)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (min avg), mil (mm)			38 (0.95)	57 (1.43)	76 (1.9)	95 (2.38)
Thickness (min 8 of 10), mil (mm)			36 (0.90)	54 (1.35)	72 (1.8)	90 (2.25)
Thickness (lowest individual), mil (mm)			34 (0.85)	51 (1.28)	68 (1.7)	85 (2.13)
Asperity Height mils, (mm)	ASTM D7466	2nd Roll	20 (0.51)	20 (0.51)	18 (0.46)	18 (0.46)
Density, g/cc, maximum	ASTM D792, Method B	200,000 lb	0.939	0.939	0.939	0.939
Tensile Properties (both directions)	ASTM D6693, Type IV 2 in/minute	20,000 lb	112 (19.6)	168 (29.4)	224 (39.2)	280 (49)
Strength @ Break, lb/in width (N/mm)			400	400	400	400
Elongation @ Break, % (GL=2.0in)			400	400	400	400
Tear Resistance, lb.s. (N)	ASTM D1004	45,000 lb	25 (111)	36 (160)	50 (222)	60 (267)
Puncture Resistance, lbs. (N)	ASTM D4833	45,000 lb	50 (222)	70 (310)	90 (400)	115 (512)
Carbon Black Content, % (range)	ASTM D4218	20,000 lb	2-3	2-3	2-3	2-3
Carbon Black Dispersion (Category)	ASTM D5596	45,000 lb	Only near spherical agglomerates: 10 views Cat.1 or 2			
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O ₂	200,000 lb	≥140	≥140	≥140	≥140

AGRU America's geomembranes are certified to pass Low Temp. Brittleness via ASTM D746 (-80°C), Dimensional Stability via ASTM D1204 (±2% @ 100°C). Oven Aging and UV Resistance are tested per GRI GM 17. These product specifications meet or exceed GRI's GM17.

SUPPLY INFORMATION (STANDARD ROLL DIMENSIONS)

THICKNESS		WIDTH			LENGTH		AREA (APPROX.)	
mil	mm	ft	m		ft	m	ft²	m²
40	1.0	23	7	Double-Sided	750	229	17,250	1,603
				Single-Sided	800	244	18,400	1,709
60	1.5	23	7	Double-Sided	540	165	12,420	1,154
				Single-Sided	560	171	12,880	1,197
80	2.0	23	7	Double-Sided	410	125	9,430	876
				Single-Sided	425	130	9,775	908
100	2.5	23	7	Double-Sided	335	102	7,705	716
				Single-Sided	340	104	7,820	726

Note:

Average roll weight is 3,900 lbs (1,770 kg). All rolls are supplied with two slings. Rolls are wound on a 6" core. Special length available upon request. Roll length and width have a tolerance of ±1%. The weight values may change due to project specifications (i.e. average or absolute minimum thickness) or shipping requirements (i.e. international containerized shipments).

All information, recommendations and suggestions appearing in this literature concerning the use of our products are based upon tests and data believed to be reliable; however, it is the users responsibility to determine the suitability for their own use of the products described herein. Since the actual use by others is beyond our control, no guarantee or warranty of any kind, expressed or implied, is made by AGRU America as to the effects of such use or the results to be obtained, nor does AGRU America assume any liability in connection herewith. Any statement made herein may not be absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. Nothing herein is to be construed as permission or as a recommendation to infringe any patent.

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