ECO OUTDOOR | PRODUCT TECH DATA

			WEIGHT PER Sq Ft	SIZE TOLERANCE		SLIP RESISTANCE (UNSEALED)			FLEXURAL STRENGTH (PSI)		MODULUS OF RUPTURE (PSI)		SALT RESISTANCE (% MEAN WEIGHT LOSS)		WATER ABSORPTION (MEAN)		BULK SPECIFIC GRAVITY (KG/M³)
			lbm / (thickness)	Dimension	Thickness	Oil-Wet Ramp	Mean BPN/ SRV	Classification	Dried Strength	Soaked Strength	Dried	Soaked	Not Sealed	Dry Treat 40SK	% by Weight	% by Volume	
FLOORING																	
BLUESTONE	Bluestone	Sawn	11.26 (0.79")	+/-0.08"	+/-0.08"	R11	64	V	2857.243	2886.251					0.44	1.19	2710
		Honed				R10	35	X									
		Bush Hammered					68	V									
		Sandblasted					63	V									
		Scratched					51	W									
	Euro Bluestone	Sawn	11.47 (0.79")	+/-0.08"	+/-0.08"		68	P5			2175.57	1798.468	< 0.10 (AA Grade)		1.19	3.10	2604
		Honed					33	P2									
		Heavily Distressed					29	P2									
	Heron	Exfoliated & Trp Br	11.88 (0.79")	+/-0.08"	+/-0.08"		42	X			3060.296	2929.762	0.35 (A Grade)		0.50	1.44	2890
		Exfoliated & Sgl Br					49	W									
	Pacific Bluestone	Antique	11.26 (0.79")	+/-0.11"	+/-0.11"		52	P4			3147.319	2625.183	< 0.10 (AA Grade)		0.09	0.24	2707
	Torino	Brushed anti-slip	9.63 (0.79")	+/-0.08"	+/-0.08"		51	P4	928.242	667.174			1.9% (B Grade)		3.46	8.00	2310
		Brushed					26	Y									
		Sawn					62	V									
COTTO	Antico Luce	Cast	6.2 (0.91")								667.174 Post freeze-thaw cycles: 754.196						
	Antico Arrotato		9.63 (1")														
	Antico Carbone		9.63 (1")														
	Antico Nero		9.63 (1")														
	Antico Notte		9.63 (1")														
	Antico Panna		9.63 (1")														
FLAGSTONE	Bolzano	Sawn	14.54 (1.18")	N/A	+/-0.08"				986.257	667.174			0.14 (A Grade)		3.46	8.17	2365
	Harvest	Natural split	11.06 (0.79")	N/A	+/-0.11"		67	V	1015.26	1566.408			0.03 (AA Grade)		0.09	0.25	2695
	Mist	Natural split		N/A	+/-0.11"		49	W									
	Saddle	Natural split	8.19 (0.59")	N/A	+/-0.11"		57	V	4075.56	2842.74					0.90	2.4	2691
GRANITE	Buffalo	Burnished	10.86 (0.79")	+/-0.08"	+/-0.08"		55	V	1899.994	1537.4	1595.42	1319.84			0.29	0.76	2636
	Emu	Burnished		+/-0.08"	+/-0.08"												
		Exfoliated					61	P5									
		Sandblasted					67	P5									
	Fallow	Exfoliated	10.86 (0.79")	+/-0.08"	+/-0.08"		60	P5			1754.957	1464.881	0.06 (AA Grade)		0.27	0.72	2636
		Exfoliated & Sgl Br					55	P5									
		Exfoliated & Dbl Br					51	P4									
		Exfoliated & Trp Br					49	P4									
	Forest	Exfoliated	12.9 (0.79")	+/-0.08"	+/-0.08"		57	V	2480.145	2451.138			0.06 (AA Grade)	0.06 (AA Grade)	0.05	0.16	3151
		Honed															
	Heron	Exfoliated & Trp Br	11.88 (0.79")	+/-0.08"	+/-0.08"		42	X			3060.296	2929.762	0.35 (A Grade)		0.50	1.44	2890
		Exfoliated & Sgl Br					49	W									
	Lizard	Burnished	11.47 (0.79")	+/-0.08"	+/-0.08"				4365.636	3683.959					0.16	0.46	2820
	Mallard	Exfoliated & Trp Br	11.88 (0.79")	+/-0.08"	+/-0.08"		43	X			2364.115	1827.475	0.08 (AA Grade)		0.21	0.62	2900
		Exfoliated					57	V									
	Raven	Burnished	12.29 (0.79")	+/-0.08"	+/-0.08"		52	W	3161.823	3219.838					0.11	0.33	2971
		Exfoliated				R13											
		Honed				R9											
	Tawny		10.86 (0.787")														
	Tortoise	Bush Hammered & Sgl Br	10.86 (0.787")				53	W									
HAND PRESSED CEMENT	All Colors	Standard finish	8.19 (0.630")				28	P2									
		Sandblasted					55	P5									
LIMESTONE	Allaro	Tumbled	7.99 (0.59")	+/-0.08"	+/-0.11"		45	P4			2407.626	1783.964	0.29 (A Grade)		1.56	4.01	2565
	Andorra	Brushed	10.65 (0.79")	+/-0.08"	+/-0.11"		42	P3			2016.025	1479.385	0.4 (A Grade)		1.58	4.09	2590
		Honed					50	P4									
	New Andorra	Brushed	10.65 (0.79")	+/-0.08"	+/-0.11"		43	P3			2262.589	1421.37	0.5 (A Grade)		1.25	3.27	2617
	Arbon	Tumbled	7.78 (0.59")	+/-0.08"	+/-0.11"		51	P4			1899.994	1566.408	0.7 (A Grade)		2.32	5.77	2488
		Honed					53	P4									
		Light Honed	10.86 (0.787")				41	P3									
		Sandblasted & Brushed					37	P3									
	Calcetta	Distressed	9.42 (0.7")	+/-0.08"	+/-0.11"		59	P5			1841.979	1174.81	2.7 (B Grade)		2.07	5.26	2544
	Chalford	Distressed	9.63 (0.7")	+/-0.08"	+/-0.11"						2016.025	1479.385	0.4 (A Grade)		1.58	4.09	2590
	New Chalford	Distressed	9.63 (0.7")	+/-0.08"	+/-0.11"		55	P5			2262.589	1421.37	0.5 (A Grade)		1.25	3.27	2617
		Sandblasted					57	P5									
	Colmar	Brushed	10.24 (0.79")	+/-0.08"	+/-0.11"		35	P3			1392.36	1044.27	3.0 (B Grade)		2.84	7.02	2478
	Cush	Tumbled	10.24 (0.79")	+/-0.08"	+/-0.11"		49	W	2944.266	1841.979			0.4 (A Grade)		2.51	6.23	2493
	Dover	Antique	6.55 (0.47")	+/-0.08"	+/-0.11"		27	P2			2146.559	1711.445	0.10 (A Grade)		0.08	0.23	2702
		Sandblasted					52	P4									
	Duro	Sandblasted	10.45 (0.79")	+/-0.08"	+/-0.11"		62	P5			2407.626	1783.964	0.29 (A Grade)		1.56	4.01	2565
	Garonne	Tumbled	7.78 (0.59")	+/-0.08"	+/-0.11"		51	P4			1841.979	1174.81	2.7 (B Grade)		2.07	5.26	2544
		Light Honed	10.86 (0.787")				47	P4									
		Sandblasted & Brushed					40	P3									
	Jericho	Tumbled	10.86 (0.79")	+/-0.08"	+/-0.11"		47	W	2161.062	1537.4			0.13 (A Grade)		0.70	1.84	2648
	La Roche	Tumbled	10.65 (0.79")	+/-0.08"	+/-0.11"		38	X	2045.032	1899.994			0.15 (A Grade)		0.94	2.47	2615
	Miramar	Sandblasted	10.65 (0.79")	+/-0.08"	+/-0.11"		59	P5			2233.581	1725.949	0.10 (A Grade)		1.11	2.90	2611
	Nettle	Heavily Distressed	11.26 (0.787")	+/-0.08"	+/-0.11"		28	P2					0.15 (A Grade)		0.94	2.47	2615
	Sabero	Bush Hammered	10.65 (0.79")	+/-0.08"	+/-0.11"				2045.032	1899.994			0.15 (A Grade)		0.94	2.47	2615
	Vardo	Antique Brushed	9.42 (0.79")	+/-0.08"	+/-0.11"		36	P3			1421.4	841.2	2.0 (B Grade)		4.22	9.64	2290
	Winbourne	Heavily Distressed	11.47 (0.787")	+/-0.08"	+/-0.11"		41	P3					0.10 (A Grade)		1.11	2.90	2611
	Wyndam	Antique Brushed	9.63 (0.7")	+/-0.08"	+/-0.11"		39	P3			2262.589	1421.37	0.5 (A Grade)		1.25	3.27	2617
PEBBLES																	
PORPHYRY	Porphyry	Natural Split	15.77 (1.18") UNI EN 1936:2007	+/-0.39"	+/-0.39"						2958.77				1.00 UNI EN 13755:2008		Average apparent density: 2555 UNI EN 1936:2007
		Sawn				Mean SRV dry = 73 : Mean SRV wet = 60 UNI EN 14231:2004			3640.447 Post freeze-thaw cycles: 22.4 UNI EN 12372:2007								
		Flamed				Mean SRV dry = 85 : Mean SRV wet = 65 UNI EN 14231:2004											
	Torino	Brushed anti-slip	9.63 (0.79")	+/-0.08"	+/-0.08"		51	P4	928.242	667.174			1.9% (B Grade)		3.46	8.00	2310
		Brushed					26	Y									
		Sawn					62	V									
SANDSTONE	Beauford	Cathedral	15.36 (1.18")	+/-0.08"	+/-0.08"												
	Bolzano	Sawn	14.54 (1.18")	N/A	+/-0.08"				986.257	667.174			0.14 (A Grade)		3.46	8.17	2365
	Brannon	Sawn	13.72 (1.18")	+/-0.08"	+/-0.11"		68	P5			1145.8	522.1	88.6 (D Grade)	0.1 (A Grade)	6.30	13.98	2219
		Lightly Honed					54	P4									
	Bullen	Sawn	14.34 (1.18")	+/-0.08"	+/-0.11"		66	P5			1929.0	1203.8	1.0 (B Grade)	0.1 (A Grade)	4.82	11.13	2309
		Lightly Honed					52	P4									
	Dax	Distressed	10.45 (0.79")	+/-0.08"	+/-0.11"		57	P5			1841.979	1174.81	2.7 (B Grade)		2.07	5.26	2544
	Iluka	Sawn	13.52 (1.18")	+/-0.08"	+/-0.08"		64	P5			899.234	536.64	80.3 (D Grade)	73.2 (D Grade)	6.66	14.52	2179
	Marcoola	Sawn	14.13 (1.18")	+/-0.08"	+/-0.08"		70	P5			913.738	478.625	4.6 (B Grade)	2.0 (B Grade)	4.42	10.10	2288
	Osprey	Sawn	13.31 (1.18")	+/-0.08"	+/-0.08"		53	P4			942.745	710.685	34.4 (D Grade)	0.2 (A Grade)	6.54	14.08	2153
	Toolara	Distressed	9.22 (0.7")	+/-0.08"	+/-0.08"		57	P5			1189.31	739.692	14.0 (D Grade)	0.1 (A Grade)	3.22	7.91	2458
	Tonnay	Distressed	10.45 (0.79")	+/-0.08"	+/-0.11"		61	P5			1899.994	1566.408	0.7 (A Grade)		2.32	5.77	2488
SPLIT STONE	Abyss	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		54	W	6686.24	4583.193					0.29	0.79	2730
	Atlantic	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		54	W	6686.24	4583.193					0.23	0.63	2733
	Cobb & Co	Natural Split	11.06 (0.79")	+/-0.11"	+/-0.11"		67	V	1015.26	1566.408			0.03 (AA Grade)		0.09	0.25	2695
	Endicott	Natural Split	13.93 (0.98")	+/-0.11"	+/-0.11"	Mean SRV dry = 87 : Mean SRV wet = 64 EN 14231			18.98 N/mm² EN 12372						0.50 EN 13755		2700 Test Method: EN 1936
	Lichen	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		53	P4	6686.24	4583.193					0.31	0.85	2725
	Myrtle	Natural Split	13.93 (0.98")	+/-0.11"	+/-0.11"		57	V	4075.56	2842.74					0.90	2.4	2691
TRAVERTINE	Capri	Tumbled	10.45 (0.79")	+/-0.11"	+/-0.11"		45	W	1841.979	1435.87			0.76 (A Grade)		1.16	2.95	2560
	Chambon	Sandblasted	9.42 (0.7")	+/-0.08"	+/-0.11"		54	P4			2523.657	2146.559	0.09 (A Grade)		1.40	3.55	2544
	Ravello	Tumbled	6.14 (0.47")	+/-0.08"	+/-0.11"		41	X	1377.86	1493.889	1929.002	1450.38	0.11 (AA Grade)		1.43	3.48	2439
	Scala	Sawn	9.63 (0.79")	+/-0.08"	+/-0.11"		58	V			1740.45	1537.4	0.12 (A Grade)		2.19	5.07	2330
		Honed & Filled					35	X									
	Tolfa	Tumbled	6.14 (0.47")	+/-0.08"	+/-0.11"		41	X	1377.86	1493.889	1929.002	1450.38	0.11 (AA Grade)		1.43	3.48	2439
WALLING																	
DRY STONE	Alpine	Natural Split	16 (0.79"-1.58")														
	Badger	Natural Split	15 (0.79"-1.58")														
	Baw Baw	Natural Split	33 (1.77"-3.15")														
	Jindera	Natural Split	15 (0.79"-1.58")														
	Mitta Mitta	Natural Split	16 (0.79"-1.58")														
FREE FORM	Bodega	Natural Split	15 (0.79"-1.58")														
	Calabor	Natural Split	17 (1.18"-1.97")														
	Crackenback	Natural Split	14 (0.79"-1.58")														
	Howqua	Natural Split	15 (0.79"-1.58")														
	Korora	Natural Split	15 (0.79"-1.58")														
	Wamberal	Natural Split	17 (1.18"-1.97")														
LINEAR WALLING	Abyss	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		54	W	6686.24	4583.193					0.31	0.85	2725
	Andorra	Brushed	10.65 (0.79")	+/-0.08"	+/-0.11"		42	P3			2016.025	1479.385	0.4 (A Grade)		1.58	4.09	2590
	Atlantic	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		54	W	6686.24	4583.193					0.31	0.85	2725
	Bolzano	Sawn	14.54 (1.18")	N/A	+/-0.08"				986.257	667.174			0.14 (A Grade)		3.46	8.17	2365
	Colmar	Brushed	10.24 (0.79")	+/-0.08"	+/-0.11"		35	P3			1392.36	1044.27	3.0 (B Grade)		2.84	7.02	2478
	Lichen	Natural Split	6.76 (0.47")	+/-0.08"	+/-0.11"		53	P4	6686.24	4583.193					0.31	0.85	2725
	Roda	Sawn	11.26 (0.79")	+/-0.08"	+/-0.08"		62	P5			2567.168	2364.115	0.08 (AA Grade)		0.16	0.43	2729
	Sancerre																
RANDOM ASHLAR	Clancy	Natural Split	18 (0.59"-1.38")														
	Coolum	Natural Split	12 (0.59"-1.38")														
	Newport	Natural Split	17 (1.18"-1.97")														
STONE WALL PANELS	Flinders		21.51 (0.79"-1.58")														
	Grampians		20.89 (0.79"-1.58")														
	Lang Lang		20.89 (0.79"-1.58")														
	Macedon		20.89 (0.79"-1.58")														
	Otway		20.89 (0.79"-1.58")														
TRADITIONAL FORMAT	Barlow	Sandblasted	9.22 (0.7")	+/-0.08"	+/-0.11"						1189.31	739.692	14.0 (D Grade)		3.22	7.91	2458
	Barrimah		19 (0.79"-1.58")														
	Bluestone	Honed	11.26 (0.79")	+/-0.08"	+/-0.08"	R10	35	X	2857.243	2886.251					0.44	1.19	2710
	Jilliby	Sawn	13.93 (1.18")	+/-0.08"	+/-0.08"		69	P5			652.67	609.158	32 (D Grade)	0.01 (AA Grade)	5.66	12.7	2244
	Dauville		10 (0.79")														
	Moselle		12 (1.18")														
	Osprey	Sawn	13.31 (1.18")	+/-0.08"	+/-0.08"		53	P4			652.67	710.685	34.4 (D Grade)	0.2 (A Grade)	6.54	14.08	2153
	Scala	Bush Hammered	9.63 (0.79")	+/-0.08"	+/-0.11"						1740.45	1537.4	0.12 (A Grade)		2.19	5.07	2330
PROJECT STONE																	
PROJECT STONE	Antoro	Brushed	10.45 (0.79")	+/-0.08"	+/-0.08"		33	P2			2335.108	2117.551	0.4 (A Grade)		1.53	3.92	2559
	Bolzano	Honed	14.54 (1.18")	+/-0.08"	+/-0.08"		54	W	986.257	667.174			0.14 (A Grade)		3.46	8.17	2365
		Sandblasted					64	V									
	Brassica	Exfoliated	10.86 (0.79")	+/-0.08"	+/-0.08"		62	P5			2567.168	2407.626	0.10 (A Grade)		0.68	1.8	2647
		Exfoliated & Brushed					34	P2									
	Brusson	Honed	10.86 (0.79")	+/-0.08"	+/-0.08"		32	Y			3567.928	2349.611	0.06 (AA Grade)		0.69	1.8	2631
		Flamed					62	V									
	Caldare	Silk	10.65 (0.79")	+/-0.08"	+/-0.08"		28	P2			4220.598	3176.326	0.08 (AA Grade)		1.34	3.45	2585
	Cocullo	Honed	9.63 (0.79")	+/-0.08"	+/-0.08"		41	X			1203.81	609.158	4.6 (B Grade)	0.35 (A Grade)	4.12	9.7	2355
		Brushed					27	Y									
	Cullera	Honed	11.06 (0.79")	+/-0.08"	+/-0.08"		36	X			2813.732	1870.987	0.07 (AA Grade)		0.24	0.65	2698
		Flamed					59	V									
		Flamed & Brushed					30	Y									
	Dauville	Sandblasted	10.04 (0.79")	+/-0.08"	+/-0.08"		66	V			2016.025	1363.35	1.2 (A Grade)		3.14	7.72	2455
		Honed					38	X									
	Fonterra	Sawn	11.06 (0.79")	+/-0.08"	+/-0.08"		71	P5			4046.553	2842.74	0.2 (A Grade)		0.31	0.83	2674
		Silk					58	P5									
		Flamed					66	P5									
	Lagano	Flamed	5.53 (0.39")	+/-0.08"	+/-0.08"		52	W	2567.168	3393.883			0.07 (AA Grade)		0.19	0.51	2684
		Flamed & Brushed					47	P4									
		Honed					17	P1									
	Laguna	Honed	10.65 (0.79")	+/-0.08"	+/-0.08"		32	P2			2219.077	2306.1	0.10 (A Grade)		0.78	2.03	2612
		Brushed					43	P3									
	Paci	Tumbled	10.86 (0.79")	+/-0.08"	+/-0.11"		29	P2			2697.702	1987.017	0.28 (A Grade)		0.55	1.46	2658
		Flamed & Brushed					18	P1									
	Seron	Honed	9.01 (0.79")	+/-0.08"	+/-0.08"		48	W			1073.28	580.151	25.8 (D Grade)		6.67	14.63	2193
		Brushed					42	X									
	Seville	Honed	11.06 (0.79")	+/-0.08"	+/-0.08"		39	X			2219.077	1189.31	0.25 (A Grade)		0.57	1.52	2677
		Brushed					36	X									
		Flamed					63	V									
	Trusco	Honed	14.54 (1.18")	+/-0.08"	+/-0.08"		59	V	957.249	768.7			5.7 (C Grade)		3.46	8.17	2365
		Sandblasted					65	V									

WATER ABSORPTION > A measure of the porosity of a stone and can also be an indicator of a stone's general durability. A stone that has a greater water absorption will also tend to absorb stains more readily. In general, the lowest water absorption is desired. ASTM C97.

SLIP RESISTANCE > The slip resistance of a stone can vary considerably depending on the density, porosity, grain size, surface roughness and level of finish. As a general rule of thumb the rougher and more porous the stone, the greater the slip resistance. Exfoliated surfaces generally provide a better resistance to slip than a honed or polished finish.

The wet pendulum (BPN test) according to AS 4586 is the most useful slip rating test for common or public areas. The portable device consists of a weighted foot which comprises a spring-loaded rubber test slider that exerts a prescribed force over the stone as it slides across the wetted surface. The results are expressed as a British Pendulum Number (or Skid Resistance Value SRV). An (R) rating refers to a product that has been tested using the Oil-wet Ramp Test. This is usually performed with motor oil being used instead of water and safety boots replacing bare foot. An R11 is generally the minimum required product for external finishes.

SLIP CLASSIFICATIONS
P5 = Very Low (SRV > 54)
P4 = Low (SRV 45-54)
P3 = Moderate (SRV 35-44)
P2 and P1 = High (SRV 25-34 and 12-24 respectively)
P0 = Very High (SRV < 12)

(*Very low* - as contribution to risk of slipping)

STRENGTH TESTING
Compressive Strength > Is the measure of the resistance to crushing loads. The compressive strength is the maximum load per unit area that the stone can bear without crushing. In reference to a stone wall, the stone at the base of the wall would have to withstand the compressive load of the weight of stones above. ASTM C170

Flexural Strength > (or bending strength) is a measure of a stone's tensile strength induced by bending. The test load on top of the stone is not applied to a single location at mid span but rather distributed with half of the load applied at each of two points one quarter of the span from the supports. In this way, the entire centre half of the stone is subjected to the same maximum bending forces. Thus any local weakness such as vein is more likely to be reflected in the flexural strength test. ASTM C880

Modulus of Rupture (MoR) >
In contrast to the flexural strength test, to determine the MoR force is applied directly at the mid point of the span. The stone is more likely to fail directly under the load or point of force rather than at a vein or point of weakness in the material. ASTM C99

SALT RESISTANCE TESTING >
Testing for salt attack involves repeated cycles of full immersion of sample units in a sodium sulphate (or sodium chloride) solution for a period of time and overnight drying, once carried out numerous times the sample/ residue is weighed to determine mean % weight loss. AS/NZS 4586 Method A

NOTE >
As natural stone is inherently variable, testing results are indicative only.

ECO OUTDOOR®
T. (855) 413 1413
ECOOUTDOORUSA.COM