ECO OUTDOOR® | PRODUCT TECH DATA

			WEIGHT PER FT²	SIZE TOLERANCE		SLIP RESISTANCE (UNSEALED)			FLEXURAL STRENGTH (MPa)		MODULUS OF RUPTURE (MPa)		SALT RESISTANCE (% MEAN WEIGHT LOSS)		WATER ABSORPTION (MEAN)		BULK SPECIFIC GRAVITY (KG/M³)
			lbs / (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 (3/4")	+/-2mm	+/-2mm	R11	64	V	19.7	19.9					0.44	1.19	2710
	Euro Bluestone	Tumbled	12 (1 1/4")	+/-2mm	+/-2mm						15.0	12.4	< 0.10 (AA Grade)		1.19	3.10	2604
	Pacific Bluestone	Tumbled	11 (3/4")	+/-3mm	+/-3mm		52	P4			21.7	18.1	< 0.10 (AA Grade)		0.09	0.24	2707
	Torino	Brushed anti-slip	9.5 (3/4")	+/-2mm	+/-2mm		51	P4	6.4	4.6			1.9% (B Grade)		3.46	8.00	2310
		Sawn					62	V									
COTTO	Antico Luce	Natural	8 (1")	+/-8mm							4.6 Post freeze-thaw cycles: 5.2						
	Antico Arrotato	Natural	9.5 (1")	+/-2mm	+/-2mm												
	Antico Carbone	Natural															
	Antico Nero	Natural															
	Antico Notte	Natural															
	Antico Panna	Natural															
FLAGSTONE	Beauford*	Sandblasted	10 (3/4")		+/-2mm												
	Bluestone	Sawn	11 (3/4")		+/-2mm	R11	64	V	19.7	19.9					0.44	1.19	2710
	Bolzano	Sawn	15 (1 1/4")		+/-2mm				6.8	4.6			0.14 (A Grade)		3.46	8.17	2365
	Brannon	Sawn	13.5 (1 1/4")		+/-3mm		68	P5			7.9	3.6	88.6 (D Grade)		6.30	13.98	2219
	Bullen	Sawn	14 (1 1/4")		+/-3mm		66	P5			13.3	8.3	1.0 (B Grade)		4.82	11.13	2309
	Endicott	Split	10 (5/8"- 1 1/4")		+/-10mm		59	P5	18.98 N/mm² EN 12372						0.50 EN 13755		2700 Test Method: EN 1936
	Luca	Split	16 (3/4"-1 1/2")		+/-10mm				22.9 N/mm² EN 12372						0.31 EN 13755		
	Osprey	Sawn	13.5 (1 1/4")		+/-2mm		53	P4			6.5	4.9	34.4 (D Grade)	0.2 (A Grade)	6.54	14.08	2153
	Porphyry	Split	14 (3/4"-1 1/2")		+/-10mm				25.1 Post freeze-thaw cycles: 22.4 UNI EN 12372:2007		20.4				1.00 UNI EN 13755:2008		Average apparent density: 2555 UNI EN 1936:2007
	Scala	Sawn	9.5 (3/4")		+/-3mm		58	V							0.90	2.4	2691
FILETTI	Garonne	Tumbled	11 (3/4")	+/-2mm	+/-2mm		51	P4			12.7	8.1	2.7 (B Grade)		2.07	5.26	2544
	Pacific Bluestone	Tumbled	14 (1")								21.7	18.1	< 0.10 (AA Grade)		0.09	0.24	2707
	Pendell	Tumbled	11 (3/4")				51	P4			13.1	10.8	0.7 (A Grade)		2.32	5.77	2488
	Scala	Tumbled	9.5 (3/4")								12.0	10.6	0.12 (A Grade)		2.19	5.07	2330
GRANITE	Buffalo	Exfoliated	12.5 (3/4")	+/-2mm	+/-2mm										0.10		
	Emu	Exfoliated	11 (3/4")	+/-2mm	+/-2mm		61	P5	13.1	10.6	11.0	9.1			0.29	0.76	2636
		Sandblasted					67	P5									
	Fallow	Exfoliated	11 (3/4")	+/-2mm	+/-2mm		60	P5			12.1	10.1	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	12.5 (3/4")	+/-2mm	+/-2mm		57	V	17.1	16.9			0.06 (AA Grade)	0.06 (AA Grade)	0.05	0.16	3151
		Honed															
	Lizard	Exfoliated	12 (3/4")	+/-2mm	+/-2mm												
		Bush Hammered															
	Mallard	Exfoliated & Trp Br	11.5 (3/4")	+/-2mm	+/-2mm		43	X			16.3	12.6	0.08 (AA Grade)		0.21	0.62	2900
		Exfoliated					57	V									
	Raven	Exfoliated	12 (3/4")	+/-2mm	+/-2mm	R13			21.8	22.2					0.11	0.33	2971
		Honed				R9											
	Tawny	Exfoliated	11 (3/4")	+/-2mm	+/-2mm												
	Tortoise	Bush Hammered & Sgl Br	11 (3/4")	+/-2mm	+/-2mm		53	W									
	Sable	Exfoliated	11 (3/4")	+/-2mm	+/-2mm		57	P5			14.7	12.1	< 0.10 (AA Grade)		0.22		2839
HAND PRESSED CEMENT	All Colors	Standard finish	8 (5/8")				28	P2									
		Sandblasted					55	P5									
LIMESTONE	Andorra	Brushed	11 (3/4")	+/-2mm	+/-3mm		43	P3			15.6	9.8	0.5 (A Grade)		1.25	3.27	2617
	Arbon	Tumbled	7.5 (5/8")	+/-2mm	+/-3mm		51	P4			13.1	10.8	0.7 (A Grade)		2.32	5.77	2488
	Calcetta	Heavily Distressed	9.5 (3/4")	+/-2mm	+/-3mm		59	P5			12.7	8.1	2.7 (B Grade)		2.07	5.26	2544
	Chalford	Heavily Distressed	9.5 (3/4")	+/-2mm	+/-3mm		55	P5			15.6	9.8	0.5 (A Grade)		1.25	3.27	2617
		Sandblasted					57	P5									
	Colmar	Brushed	10 (3/4")	+/-2mm	+/-3mm		35	P3			9.6	7.2	3.0 (B Grade)		2.84	7.02	2478
	Dover	Antique	6.5 (1/2")	+/-2mm	+/-3mm		27	P2			14.8	11.8	0.10 (A Grade)		0.08	0.23	2702
		Sandblasted					52	P4									
	Duro	Sandblasted	10.5 (3/4")	+/-2mm	+/-3mm		62	P5			16.6	12.3	0.29 (A Grade)		1.56	4.01	2565
	Garonne	Tumbled	7.5 (5/8")	+/-2mm	+/-3mm		51	P4			12.7	8.1	2.7 (B Grade)		2.07	5.26	2544
		Sandblasted & Brushed	11 (3/4")				40	P3									
	La Roche	Heavily Distressed	11 (3/4")	+/-2mm	+/-3mm		38	X	14.1	13.1			0.15 (A Grade)		0.94	2.47	2615
	Linton	Lightly Distressed	9.5 (3/4")	+/-2mm	+/-3mm		60	P5			13.1	10.8	0.7 (A Grade)		2.32	5.77	2488
	Nettle	Antique	11 (3/4")	+/-2mm	+/-3mm		28	P2					0.15 (A Grade)		0.94	2.47	2615
	Rhone	Sandblasted	12 (3/4")	+/-2mm	+/-3mm		54	P4			9.7	8.7	0.20 (A Grade)		0.71		2773
		Sandblasted & Brushed					39	P3									
	Sarelle	Hand Sandblasted	9.5 (3/4")	+/-2mm	+/-3mm		57	P5			12.7	8.1	2.9 (B Grade)		2.07	5.26	2544
	Winbourne	Tumbled	11.5 (3/4")	+/-2mm	+/-3mm		41	P3					0.10 (A Grade)		1.11	2.90	2611
	Woodford*	Antique	10 (3/4")	+/-2mm	+/-3mm												
	Wyndam	Lightly Distressed	9.5 (3/4")	+/-2mm	+/-3mm		39	P3			15.6	9.8	0.5 (A Grade)		1.25	3.27	2617
SANDSTONE	Beauford*	Heavily Distressed	15 (1 1/4")	+/-2mm	+/-2mm												
	Bolzano	Sawn	15 (1 1/4")	+/-2mm	+/-2mm				6.8	4.6			0.14 (A Grade)		3.46	8.17	2365
	Brannon	Sawn	13.5 (1 1/4")	+/-2mm	+/-3mm		68	P5			7.9	3.6	88.6 (D Grade)		6.30	13.98	2219
		Lightly Honed					54	P4									
	Bullen	Sawn	14 (1 1/4")	+/-2mm	+/-3mm		66	P5			13.3	8.3	1.0 (B Grade)		4.82	11.13	2309
		Lightly Honed					52	P4									
	Camelhaas*	Antique	9.5 (3/4")	+/-2mm	+/-3mm												
	Osprey	Sawn	13 (1 1/4")	+/-2mm	+/-2mm		53	P4			6.5	4.9	34.4 (D Grade)	0.2 (A Grade)	6.54	14.08	2153
	Toolara	Distressed	9 (3/4")	+/-2mm	+/-2mm		57	P5			8.2	5.1	14.0 (D Grade)	0.1 (A Grade)	3.22	7.91	2458
SPLIT STONE	Abyss	Natural Split	6.5 (1/2")	+/-2mm	+/-3mm		54	W	46.1	31.6					0.29	0.79	2730
	Atlantic	Natural Split	6.5 (1/2")	+/-2mm	+/-3mm		54	W	46.1	31.6					0.23	0.63	2733
	Endicott	Natural Split	14 (1")	+/-10mm	+/-10mm		59	P5	18.98 N/mm² EN 12372						0.50 EN 13755		2700 Test Method: EN 1936
	Lichen	Natural Split	6.5 (1/2")	+/-2mm	+/-3mm		53	P4	46.1	31.6					0.31	0.85	2725
	Luca	Natural Split	16 (1 1/4")	+/-10mm	+/-10mm				22.9 N/mm² EN 12372								
	Porphyry	Natural Split	15.5 (1 1/4")	+/-10mm	+/-10mm				25.1 Post freeze-thaw cycles: 22.4 UNI EN 12372:2007		20.4				1.00 UNI EN 13755:2008		Average apparent density: 2555 UNI EN 1936:2007
		Tumbled															
TRAVERTINE	Chambon	Lightly Distressed	9.5 (3/4")	+/-2mm	+/-3mm		54	P4			17.4	14.8	0.09 (A Grade)		1.40	3.55	2544
	Ravello	Tumbled	6 (1/2")	+/-2mm	+/-3mm		41	X	9.5	10.3	13.3	10.0	0.11 (AA Grade)		1.43	3.48	2439
	Scala Cross Cut	Sawn	9.5 (3/4")	+/-2mm	+/-3mm		58	V			12.0	10.6	0.12 (A Grade)		2.19	5.07	2330
		Honed & Filled					35	X									
	Tolfa	Tumbled	6 (1/2")	+/-2mm	+/-3mm		41	X	9.5	10.3	13.3	10.0	0.11 (AA Grade)		1.43	3.48	2439
WALLING																	
DRY STONE	Alpine	Natural Split	15.5 (3/4"-1 1/2")														
	Baw Baw	Natural Split	33 (1 1/2"-3")														
	Jindera	Natural Split	15 (3/4"-1 1/2")														
	Mitta Mitta	Natural Split	15.5 (3/4"-1 1/2")														
	Siltstone	Natural Split	10 (1 1/4"-2")														
FREEFORM	Bodega	Natural Split	15 (3/4"-1 1/2")														
	Bokara	Natural Split	15 (1 1/4"-2")														
	Bullhorn	Antique	15.5 (3/4"-1 1/2")														
	Calabor	Natural Split	16.5 (1 1/4"-2")														
	Canyonfell	Natural Split	16.5 (1 1/4"-2")														
	Crackenback	Natural Split	14 (3/4"-1 1/2")														
	Finch	Natural Split	16.5 (1 1/4"-2")														
	Howqua	Natural Split	15 (3/4"-1 1/2")														
	Korora	Natural Split	15 (3/4"-1 1/2")														
	Tilbrook	Natural Split	15 (3/4"-1 1/2")														
	Wamberal	Natural Split	16.5 (1 1/4"-2")														
	Wolfback	Natural Split	16.5 (1 1/4"-2")														
LINEAR WALLING	Abyss	Natural Split	6.5 (1/2")	+/-2mm	+/-3mm		54	W	46.1	31.6					0.31	0.85	2725
	Colmar	Brushed	10 (3/4")	+/-2mm	+/-3mm		35	P3			9.6	7.2	3.0 (B Grade)		2.84	7.02	2478
	Lichen	Natural Split	6.5 (1/2")	+/-2mm	+/-3mm		53	P4	46.1	31.6					0.31	0.85	2725
	Roda	Sawn	11 (3/4")	+/-2mm	+/-2mm		62	P5			17.7	16.3	0.08 (AA Grade)		0.16	0.43	2729
	Sancerre	Hand Chiselled	11 (3/4")	+/-2mm	+/-2mm												
		Sawn															
	Scala	Sawn	9.5 (3/4")	+/-2mm	+/-3mm												
RANDOM ASHLAR	Apollo	Natural Split	12 (5/8"-1 1/4")														
	Clancy	Natural Split	18 (5/8"-1 1/4")														
	Coolum	Natural Split	12 (5/8"-1 1/4")														
	Newport	Natural Split	16.5 (1 1/4"-2")														
TRADITIONAL FORMAT	Barlow	Sandblasted	9 (3/4")	+/-2mm	+/-3mm						8.2	5.1	14.0 (D Grade)		3.22	7.91	2458
	Barrimah	Antique	15.5 (3/4"-1 1/2")	+/-2mm	+/-10mm												
	Broma	Antique	13 (3/4"-1 1/4")	+/-2mm	+/-10mm												
	Scala	Split	18.5 (1 1/4"-1 1/2")	+/-10mm	+/-10mm						12.0	10.6	0.12 (A Grade)		2.19	5.07	2330
PROJECT STONE																	
PROJECT STONE	Bolzano	Honed	15 (1 1/4")	+/-2mm	+/-2mm		54	W	6.8	4.6			0.14 (A Grade)		3.46	8.17	2365
		Sandblasted					64	V									
	Caldare	Silk	10.5 (3/4")	+/-2mm	+/-2mm		28	P2			29.1	21.9	0.08 (AA Grade)		1.34	3.45	2585
	Ceppo di Gre	Sawn	15 (3/4")	+/-2mm	+/-2mm												
	Cocullo	Honed	9.5 (3/4")	+/-2mm	+/-2mm		41	X			8.3	4.2	4.6 (B Grade)	0.35 (A Grade)	4.12	9.7	2355
		Brushed					27	Y									
	Cullera	Honed	11 (3/4")	+/-2mm	+/-2mm		36	X			19.4	12.9	0.07 (AA Grade)		0.24	0.65	2698
		Flamed					59	V									
		Flamed & Brushed					30	Y									
	Dauville	Sandblasted	10 (3/4")	+/-2mm	+/-2mm		66	V			13.9	9.4	1.2 (A Grade)		3.14	7.72	2455
		Honed					38	X									
	Lagano	Flamed	5.5 (1/2")	+/-2mm	+/-2mm		52	W	17.7	23.4			0.07 (AA Grade)		0.19	0.51	2684
		Flamed & Brushed					47	P4									
		Honed					17	P1									
	Laguna	Honed	10 (3/4")	+/-2mm	+/-2mm		32	P2			15.3	15.9	0.10 (A Grade)		0.78	2.03	2612
		Brushed					43	P3									
	Scala Vein Cut	Sawn	9.5 (3/4")	+/-2mm	+/-3mm												
	Seron	Honed	9 (3/4")	+/-2mm	+/-2mm		48	W			7.4	4.0	25.8 (D Grade)		6.67	14.63	2193
		Brushed					42	X									
	Seville	Honed	11 (3/4")	+/-2mm	+/-2mm		39	X			15.3	8.2	0.25 (A Grade)		0.57	1.52	2677
		Brushed					36	X									
		Flamed					63	V									
	Trusco	Honed	15 (1 1/4")	+/-2mm	+/-2mm		59	V	6.6	5.3			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

mm = inches
2mm = 1/16"
3mm = 1/8"
8mm = 3/8"
10mm = 3/8"

*** Beauford, Camelhaas, & Woodford products are a blend of materials; slip resistance cannot be determined comprehensively.**

**** Due to the variability of natural stone, results are indicative.**

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