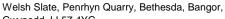




Tel: +44(0)1248 600 656 www.welshslate.com

		EN 12326-1:	2014		Page 1 of 4
Reference of this commercial document:	IMSD 8.	2.4-22c	Date of	of issue	May 2018 (Issue 2)
commercial document issued by: Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom					
Location of mine quarry : Penrhyn Quarry, Beth	esda, Bangor, Gv	vynedd			
This document records the conformity of the pro-			-	-	
the meaning of the test results and the requiren are contained in EN 12326-1:2014 and EN 123:		6-1:2014. The te	sts referred to ar	nd the criteria	
Date of sampling	December 2017 Date of testing			Jan - April 2018	
Product description and	Penrhyn Celtic Roofing Slate				
commercial name	300x200mm				Conformity
Relation between bedding and cleavage	Beds parallel to	cleavage			,
Dimensional tolerances					
Format	Rectangular				
Deviation from declared length				±0mm	YES
Deviation from declared width				±0mm	YES
Deviation from declared squareness	1.0%				YES
Deviation from straightness of edges	1.0mm				YES
Slate type for deviation of flatness	Very flat	Flat (Capital)	Normal (County)	Non-flat (Celtic)	
Deviation from flatness				0.1%	YES
2. Thickness					
Nominal thickness and variation of individual thickness against nominal thickness	9.0mm, ± 35%			YES	
3. Strength					
Characteristic MoR	Transverse	54.9 N/mm²	Longitudinal	79.1 N/mm²	NR
4. Water absorption	Code W1 (≤0.6): 0.21%		YES		
5. Freeze thaw					NR
6. Thermal cycle test	Thermal cycle test T1			T1	YES
Apparent calcium carbonate content 0.0%			YES		
8. Sulfur dioxide ≤ 20% apparent calcium carbonate	S1			YES	
exposure tests > 20% apparent calcium carbonate					NA
9. Non-carbonate carbon content				0.9%	YES
10. External fire exposure	Deemed to satisfy class BROOF				YES
11. Reaction to fire	Deemed to satisfy class A1				YES
12. Release of dangerous substances  None in conditions of use as roofing or external cladding  NR				NR	



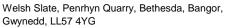
Gwynedd, LL57 4YG Tel:+44(0)1248 600 656 www.welshslate.com



			EN 12326-1	:2014			Page 2 of 4
Date of sampling and testing		If more than one date is applicable to sampling or testing they should be indicated against the individual test results					
Product description		Slate for roofing and external cladding or carbonate slate for roofing and external cladding.					
		Slate type and origin					
1. Dimensional tolerances							
Length and width		Maximum deviation ± 5mm					
Deviation from squareness		Maximum deviation ± 1% of the length					
Deviation from straightness of edges		Slate length ≤	500mm Permit	ted deviation ≤	5mm		
Doviduomioni	oualgruness of sages	Slate length > 500mm Permitted deviation ≤ 1% of the length					
Flatness : The I	imits of deviation from the	Slate type	Maximum deviation from flatness as a % of the slate length				th
flatness are def	ined for four types of	Very flat	< 0.9				
applied to the c	slate. The bevelled edges shall be applied to the convex face. Slates with		< 1.0				
	latness in excess of the ed for special applications.	Normal	< 1.5				
2. Thickness:	limit may be used for special applications.		< 2.0				
3. Strength:	local climate conditions a relation to the slates perf  Longitudinal and transve the basic nominal thickne climate conditions and tra	rse characteristies is determine	appropriate su c modulus of r d as a functior	Ifur dioxide test upture; there is n of the bend st	t (if required) as no limit for cha	shown in 7 an	d 8 below. Iulus. However
$eI = X \sqrt{\frac{I}{RcI}}$ and $et = X \sqrt{\frac{b}{Rct}}$		Where el is the longitudinal thickness, (in mm); et is the transverse thickness, (in mm);  l is the length of the slate, (in mm); b is the width of the slate, (in mm); Rcl is the characteristic longitudinal modulus of rupture, (in N/mm²); Rct is the characteristic transverse modulus of rupture, (in N/mm²); X is a constant determined as a function of climate and the traditional construction techniques (in N½.mm-½). NOTE: It may be different for each formula and is selected for the member state of use according to the table below.					
et = X	$\sqrt{\frac{b}{Rct}}$	X is a cor techniques (in	N½.mm-½). N	ned as a function	different for each		
	onal X Factors:	X is a cor techniques (in	N½.mm-½). N	ned as a function	different for each		
	•	X is a cor techniques (in for the membe	N½.mm-½). N r state of use a	ned as a function OTE: It may be according to the	different for each table below.	ch formula and	l is selected
	•	X is a contechniques (in for the member Member state	N½.mm-½). N r state of use a	ned as a function one as a function one of the leading to the lead	different for each table below.  Member state	ch formula and	Longitudinal
	•	X is a contechniques (in for the member Member state Belgium	N½.mm-½). N r state of use a Transverse 1.0	ned as a function one according to the Longitudinal	different for each table below.  Member state  Czech Repub.	Transverse	Longitudinal

Those member states that have not declared a national value should select a value or pair of values in relation to their countries climate and traditional construction techniques. It should not be less than the minimum value or pair of values given above.

el and et are determined by using the length / and the width b of the slates. The maximum value determined is the basic individual thickness of the slate, ebi. The basic individual thickness is increased in relation to the slates performance in the appropriate sulphur dioxide test as shown in 7 and 8 below.



WELSH SLATE

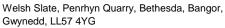
ebi is the basic individual thickness obtained from 3 above (in mm)

t is the thickness of the softened layer obtained from EN 12326-2:2011, 14.2 (in mm)

9. Non-carbonate carbon content: The non-carbonate carbon content shall be less than 2%

Tel: +44(0)1248 600 656 www.welshslate.com

			EN 12326-1:2014		Page 3 of 4	
4. Water Absorption:		Code W1 (≤0.6), W1 (>0.6), or W2				
5. Freeze-thaw test:		Slates tested indicate the mean value of the modulus of rupture after 50 cycles in transverse and longitudinal directions before and after the freeze/thaw test, if relevant (test (if W1(>0.6)), or not required).				
6. Thermal cycle test:		The following table explains the meaning of the test codes				
Code	Observa		tion in the test	Conformity to the standar		
T1	No changes in appearant that neither affect the stru			ion of metallic minerals. Colour changes		
T2	Oxidation or appearance changes of the metallic inclusions with runs of discolouration but without structural changes.			of	Acceptable	
Т3	Oxidation or appearance changes of the metallic minerals which penetrate the slate			Acceptable subject to the note below		
not acceptable.  7. Apparent calcium carbonate content:		There is no limit on apparent calcium carbonate content. However, the apparent calcium carbonate content determines which sulfur dioxide exposure test procedure should be carried out and, together with the strength, the minimum nominal thickness of the product.				
7. Apparent ca	alcium carbonate content:	carbonate con carried out and	tent determines which sulfur d	ioxide exposure	e test procedure should be	
7. Apparent ca	alcium carbonate content:	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu	tent determines which sulfur d	ioxide exposure ne minimum no I to 20% then the plies. If the carb lure in EN 1232	e test procedure should be minal thickness of the ne sulfur dioxide exposure conate content is more than	
		carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 apper ar dioxide exposure test process	ioxide exposure ne minimum no I to 20% then the plies. If the carb dure in EN 1232 able below.	e test procedure should be minal thickness of the ne sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The	
		carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 apper and dioxide exposure test procedures is calculated using the ta	ioxide exposurence minimum normal to 20% then the plies. If the carbure in EN 1232 able below.	e test procedure should be minal thickness of the ne sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The	
. Minimal nom Carbonate	inal thickness in relation to SO2 exposure test	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposurence minimum normal to 20% then the plies. If the carbure in EN 1232 able below.	e test procedure should be minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code	
. Minimal nom  Carbonate  content %	inal thickness in relation to SO2 exposure test EN 12326-2:201	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposurence minimum normal to 20% then the plies. If the carbure in EN 1232 able below.	e test procedure should be minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code	
. Minimal nom Carbonate	inal thickness in relation to SO2 exposure test EN 12326-2:201 S1	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposure ne minimum nor I to 20% then the plies. If the carb dure in EN 1232 able below.  ur dioxide expo  Thice ebi ≥ 8.0mm comes	e test procedure should be minal thickness of the minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code ckness adjustment	
. Minimal nom Carbonate content %  ≤ 5.0	SO2 exposure test EN 12326-2:201 S1 S2	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposure ne minimum nor I to 20% then the plies. If the carb dure in EN 1232 able below.  ur dioxide expo  Thice ebi ≥ 8.0mm comes	e test procedure should be minal thickness of the minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code ckness adjustment  None ebi + 5% or switch to the test in El	
6. Minimal nom  Carbonate  content %	SO2 exposure test EN 12326-2:201 S1 S2 S3	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposure ne minimum nor I to 20% then the plies. If the carb dure in EN 1232 able below.  ur dioxide expo  Thice ebi ≥ 8.0mm comes	e test procedure should be minal thickness of the minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code ckness adjustment  None  ebi + 5% or switch to the test in El 326-2:2011, 14.2	
S. Minimal nom  Carbonate content %  ≤ 5.0	inal thickness in relation to  SO2 exposure test EN 12326-2:201 S1 S2 S3 S1	carbonate con carried out and product.  If the carbonat test procedure 20%, the sulfu minimum thick apparent calcius code from	tent determines which sulfur d d, together with the strength, the te content is less than or equal e in EN 12326-2:2011, 14.1 appur dioxide exposure test proceduness is calculated using the talum carbonate content and sulful Depth of softened layer	ioxide exposure ne minimum nor I to 20% then the plies. If the carb dure in EN 1232 able below.  ur dioxide expo  Thic  ebi ≥ 8.0mm c  12	e test procedure should be minal thickness of the minal thickness of the me sulfur dioxide exposure conate content is more than 26-2:2011, 14.2 applies. The sure code ckness adjustment  None ebi + 5% or switch to the test in 326-2:2011, 14.2 ebi + 5%	





Tel: +44(0)1248 600 656 www.welshslate.com

## CE Marking

Page 4 of 4

Welsh Slate roofing products conform to the requirements of the CE mark.

The following table provides the necessary information required to demonstrate conformity of Penrhyn Celtic Roofing Slate

CE				
Welsh Slate Ltd, Penrhyn Quarry, Bethesda, Near Bangor, Gwynedd, Wales, UK, LL57 4YG				
weish State Ltd, Penrhyn Quarry, Bethesda, Near Bangor, Gwynedd, Wales, UK, LL57 41G				
003PQ-DoP2015-05-28				
EN 12326-1:2014				
Penrhyn Celtic				
Intended to be used as discontinuous roofing and external cladding				
Dimensional variation				
Nominal thickness	9.0mm			
Individual thickness	9.0mm (< +/- 35%)			
Deviation of length and width	Complies			
Deviation of edge straightness	Complies			
Deviation of rectangularity	Complies			
Mechanical resistance (Characteristic modulus of rupture)				
Transverse	54.9 N/mm²			
Longitudinal	79.1 N/mm²			
Water permeability - water absorption	<b>W1</b> (≤0.6%)			
Apparent calcium carbonate content	≤ 5%			
Durability				
Water absorption	<b>W1</b> (≤0.6%)			
Freeze-thaw cycling	Not required			
Thermal cycling	Т1			
Sulfur dioxide exposure	S1			
Non-carbonate carbon content Complies: ≤ 2%				
Release of dangerous substances: None in conditions of use as roofing or external cladding				
External fire performance: Deemed to satisfy				