


## DECLARATION OF PERFORMANCE EN 12326 ROOFING AND CLADDING SLATE EC CONSTRUCTION PRODUCTS REGULATION

DOP Number		DOP 372013			
1. Unique identification code of the product-type:		<b>SIGA 37</b>			
2 Type, batch or serial number or any other element allowing identification of the construction product as required		<b>300x200-600x450 Villarmartin de Valdeorras, Orense, Spain</b>			
3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:		Slate for discontinuous Roofing and Cladding			
4. Name, registered trade name or registered trade mark and contact address of the manufacturer		<b>SIG Roofing Supplies, Harding Way, St Ives, Cambs.</b>			
5. Where applicable, name and contact address of the authorised representative.		NA			
6. System or systems of assessment and verification of constancy of performance of the construction product		AVCP System 4			
7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:		The manufacturer has carried out both:  a) determination of the product-type on the basis of type testing, type calculation, tabulated values or descriptive documentation of the product;  b) factory production control in accordance with EN 12326-1 and EN12326-2			
8. In case of the declaration of performance concerning a construction product covered by a European Technical Assessment:		N/A			
<b>9. Declared Performance</b>					
Essential Characteristic For pitched Roof Coverings		Performance		Harmonised Technical Specification	
Mechanical resistance	Mean failure load:		EN12326-2:2000		
	Transverse: <b>489N</b>	Longitudinal: <b>587N</b>			
	Characteristic MOR:				
	Transverse: <b>51MPa</b>	Longitudinal: <b>57MPa</b>			
External fire performance	Deemed to satisfy		(EC Decision 2000/553/EC)		
Reaction to fire	Deemed to satisfy Class A1		(EC Decision 96/603/EC, as amended)		
Water permeability	<b>A1 (0.25%)</b>		EN12326-2:2000		
Dimensional variation:  Slate type.  Deviation from flatness: Nominal thickness and variation: Deviation from declared width: Deviation from declared length: Deviation from straightness of edges: Deviation from rectangularity:	Very Smooth	Smooth	Normal	Textured	EN12326-2:2000
		<1.0%			
		<b>5.5mm</b>			
				< +-5mm	
				< +-5mm	
				<5mm or 1%	
				<+-1 %	
Durability: Water Absorption: Freeze thaw: Thermal cyclic test: Carbonate content:  Sulphur dioxide exposure tests: Non-carbonate carbon content: Defects:	<b>A1 (0.22%)</b>		EN12326-2:2000		
	<b>Not required</b>				
	<b>T1</b>				
	<b>0.19%</b>				
	<20%		<b>S1</b>		
	>20%		Depth of softening <b>NA</b>		
	<b>0.43%</b>				
Release of dangerous substances	None in conditions of use as roofing or external cladding		EN12326-1		
<b>10. Declaration</b>					
I declare on behalf of the manufacturer in point 4 that the product(s) in points 1 and 2 is in conformity with the declared performance under point 9. This declaration is the sole responsibility of the manufacturer in point 4.					
Place and date of issue:  SIG Roofing Supplies Harding Way St. Ives PE27 3YJ 05/07/13		Position: Commercial Director SIG Roofing & Roofline  Name: Andrew Wakelin    Signature:			

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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						
1 Dimensional tolerances							
Length and Width	Maximum deviation $\pm 5\text{mm}$						
Deviation from squareness	Maximum deviation $\pm 1\%$ of the length						
Deviation from straightness of edges	Slate length $\leq 500\text{mm}$ permitted deviation $\leq 5\text{mm}$						
	Slate length $> 500\text{mm}$ permitted deviation $\leq 1\%$ of the length						
Flatness: The limits of deviation from flatness are defined for four types of slate. The bevelled edges shall be applied to the convex face. Slates with Deviation from flatness in excess of the limit may be used for special applications	Slate type	Maximum deviation from flatness as a % of the slate length					
	Very Smooth	<0,9					
	Smooth	<1,0					
	Normal	<1,5					
	Textured	<2,0					
2: Thickness: The basic nominal thickness is determined as a function of the bending strength using the equations given in 3, local climate conditions and traditional construction techniques. The basic nominal thickness is increased in relation to the slates performance in the appropriate sulphur dioxide test (if required) as shown in 7 and 8 below							
3. Strength: Longitudinal and transverse bending strength and modulus of rupture; there is no limit for bending strength or modulus. However the basic nominal thickness is determined as a function of the bend strength using the equations below, local climate conditions and traditional construction techniques.							
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <math display="block">e_l = x \sqrt{\frac{l}{R_{cl}}}</math> <p>and</p> <math display="block">e = x \sqrt{\frac{b}{R_{ct}}}</math> </div> <div style="width: 50%;"> <p>Where</p> <p><math>e_l</math> is the longitudinal thickness, in millimetres (mm):</p> <p><math>e_t</math> is the transverse thickness, in millimetres (mm):</p> <p><math>l</math> is the length of the slate, in millimetres (mm):</p> <p><math>b</math> is the width of the slate, in millimetres (mm):</p> <p><math>R_{cl}</math> is the characteristic longitudinal modulus of rupture in megapascals (Mpa):</p> <p><math>R_{ct}</math> is the characteristic transverse modulus of rupture in megapascals (Mpa):</p> <p><math>x</math> is a constant determined as a function of climate and the traditional construction techniques in root newton.millimetres (<math>\text{N}^{1/2} \cdot \text{mm}^{1/2}</math>). It may be different for each equation and is selected for the country of use according to the table below.</p> </div> </div>							
National Factors	x	Country	Transverse	Longitudinal	Country	Transverse	Longitudinal
		Belgium	1,35	1,35	Italy	1,2	1,2
		France	1,25	1,40	Spain	1,2	1,2
		Germany	1,2	1,2	UK	0,9	1,1
Those countries that have not declared a national value should select a value or a 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.							

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4. Water absorption: The water absorption of slates shall not exceed 0,6% unless they can satisfy the requirements of the freeze-thaw test.

5. Freeze-thaw test: slates with a water absorption greater than 0.6% shall show no significant reduction in bending strength using a one-sided Students t-test at the 2,5% significance level (slates with a water absorption of 0,60% or less are not required to undergo a freeze-thaw test.)

6. Thermal cycle test: The following table explains the meaning of the test codes:

Code	Observation in the test	Conformity to the standard
T1	No changes in appearance. Surface oxidation of metallic minerals. Colour changes that neither affect the structure nor form runs of discolouration	Acceptable
T2	Oxidation or appearance changes of the metallic inclusions with runs of discolouration but without structural changes.	Acceptable
T3	Oxidation or appearance changes of metallic minerals which penetrate the slate and risk the formation of holes.	Acceptable subject to the note below

NOTE Slates within code T3, which potentially may result in water penetration should only be used selectively with suitable methods of construction that avoid such penetration. Slates showing exfoliation splitting or other structural changes in this test are not acceptable.

7. Carbonate content: There is no limit on carbonate content. However, the carbonate content determines which sulphur dioxide exposure test procedure should be carried out and, together with the strength, the minimum nominal thickness of the product.

If the carbon content is less than 20% then the sulphur dioxide exposure test procedure in EN 12326-2:2000, 15.2 applies. The minimum thickness is calculated using the table below.

8. Minimal nominal thickness in relation to carbonate content and sulphur dioxide exposure code.

Carbonate content %	SO <sub>2</sub> exposure test code from EN 12326-2:2000, 15.1	Depth of softened layer from EN 12326-2:2000, 15.2	Thickness adjustment
≥ 5,0	S1		None
	S2		$e_{bi} + 5\%$
	S3		$e_{bi} \geq 8,0\text{mm}$ or switch to the test in EN 12326-2:2000, 15.2
> 5,0 < 20,0	S1		$e_{bi} + 5\%$
	S2		$e_{bi} + 10\%$
	S3		$e_{bi} \geq 8,0\text{mm}$ or switch to the test in EN 12326-2:2000, 15.2
≥ 20,0		0 0,70mm	$e_{bi} + 0,50\text{mm} + t^2$

$e_{bi}$  is the basic individual thickness obtained from 3 above in millimetres

$t$  is the thickness of the softened layer obtained from EN 12326-2:2000, 15.2 in millimetres

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