



Fundación Centro Tecnológico
do Granito de Galicia

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NATURAL STONE LABORATORY

TEST REPORT

N: 20/016

Customer: GLOBAL NATURAL STONE COMPANY, S.L.

Date:06/08/2020

page 1 of 12




BASIC INFORMATION		
CUSTOMER	Name	GLOBAL NATURAL STONE COMPANY, S.L.
	Address	Areal, 18-3º Oficina 8 36201 Vigo Pontevedra España
LABORATORY	Name	FUNDACIÓN CENTRO TECNOLÓGICO DO GRANITO DE GALICIA
	Address	C/Ribeira, s/n Torneiros CP 36410 O PORRIÑO (Pontevedra)
REPORT INFORMATION		
Test report number	20/016	
Commercial name	ITAKUMBO	
Reception sample date	06/05/2020	
Provider	PAVESTONE, Lda (GRUPO DFG)	
TESTS		
<p>UNE-EN 12372:2007. DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD.</p> <p>UNE-EN 13755: 2008. DETERMINATION OF WATER ABSORPTION AT ATMOSPHERIC PRESSURE.</p> <p>EN 16140:2011. DETERMINATION OF SENSITIVITY TO CHANGES IN APPEARANCE PRODUCED BY THERMAL CYCLES</p> <p>EN 14066 : 2013. DETERMINATION OF RESISTANCE TO AGEING BY THERMAL SHOCK</p> <p>UNE-EN 12371: 2011. DETERMINATION OF FROST RESISTANCE.</p> <p>UNE-EN 1936: 2007. DETERMINATION OF REAL DENSITY AND APPARENT DENSITY, AND OF TOTAL AND OPEN POROSITY. 8.1. AND 9.2. APPARENT DENSITY, 9.3. OPEN POROSITY.</p> <p>UNE-EN 12407:2007. PETROGRAPHIC EXAMINATION (EXCEPT CHARACTERISATION OF OPAQUE)</p>		
ANNEX: TEST REPORT		

Customer: GLOBAL NATURAL STONE COMPANY, S.L.

Date: 06/08/2020

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 Fundación Centro Tecnológico do Granito de Galicia	FUNDACIÓN CENTRO TECNOLÓXICO DO GRANITO	Code: I3/PE 01
	TEST REPORT	Page: 3 of 12 Date: 13/05/2020

TEST NO.	20/016
STANDARD	EN 12372: 2007. DETERMINATION OF FLEXURAL STRENGTH UNDER CONCENTRATED LOAD.
CUSTOMER	Global Natural Stone Company, SL

DATA PROVIDED BY THE PETITIONER			
COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, SL
QUARRY SITE	Uruguay		

LABORATORY DATA			
SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 01
TEST START DATE	13/05/2020	TEST IDENTIFICATION	X
TEST END DATE	13/05/2020	TECHNOLOGICAL TEST	

SPECIMEN DIMENSIONS (mm)										
SPECIMEN	1	2	3	4	5	6	7	8	9	10
CODE	20/016/01/01/01	20/016/01/01/02	20/016/01/01/03	20/016/01/01/04	20/016/01/01/05	20/016/01/01/06	20/016/01/01/07	20/016/01/01/08	20/016/01/01/09	20/016/01/01/10
LENGTH	301,2	301,0	301,5	301,0	301,3	301,4	301,3	301,4	301,0	301,7
WIDTH	48,2	48,5	51,9	49,0	49,1	48,9	48,5	49,1	51,9	48,4
HEIGHT	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	47,6

INDIVIDUAL VALUE OF SPECIMENS										
SPECIMEN	1	2	3	4	5	6	7	8	9	10
SUPPORT DISTANCE (mm)	244,0	244,0	244,0	244,0	244,0	244,0	244,0	244,0	244,0	238,0
BREAKING LOAD (N)	11550	12030	11580	12670	11620	11750	12150	11440	11640	11840
FLEXURAL STRENGTH (MPa)	36,8	38,1	34,3	39,7	36,4	36,9	38,5	35,8	34,5	38,5
BREAK LOAD TO CENTRE DISTANCE (mm)	4	2	10	4	1	6	6	20	5	5

MEAN VALUE OF FLEXURAL STRENGTH (MPa)	37,0
LOWER EXPECTED VALUE (E_L) OF FLEXURAL STRENGTH (MPa)	33,3
LOAD SPEED (MPa/s)	0,25
STANDARD DEVIATION (MPa)	1,8


COMMENTS
The force applied perpendicular to the wear surface of the stone, as factory cut.

Note: The results of these tests are only related to the samples tested. This report cannot be partially reproduced without the express authorisation of the testing laboratory.

O Porriño, 13/05/2020

Approval: The Laboratory Director

José Ángel Lorenzo Ramirez

 Fundación Centro Tecnológico do Granito de Galicia	FUNDACIÓN CENTRO TECNOLÓXICO DO GRANITO	Code: I3/PE 03
	TEST REPORT	Page: 4 of 12 Date: 15/05/2020

TEST NO.	20/016
STANDARD	EN 13755: 2008. DETERMINATION OF WATER ABSORPTION AT ATMOSPHERIC PRESSURE
CUSTOMER	Global Natural Stone Company, SL

DATA PROVIDED BY THE PETITIONER			
COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, SL
QUARRY SITE	Uruguay		

LABORATORY DATA			
SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 03
TEST START DATE	12/05/2020	TEST IDENTIFICATION	Not applicable
TEST END DATE	15/05/2020	TECHNOLOGICAL TEST	Not applicable

SPECIMEN DIMENSIONS (mm)						
SPECIMEN	1	2	3	4	5	6
CODE	20/016/01/03/01	20/016/01/03/02	20/016/01/03/03	20/016/01/03/04	20/016/01/03/05	20/016/01/03/06
LENGTH	50,9	50,8	48,0	50,9	50,5	49,0
WIDTH	40,3	48,4	48,2	48,4	48,2	48,6
HEIGHT	50,9	50,9	48,5	48,7	51,2	50,4

INDIVIDUAL VALUE OF SPECIMENS						
SPECIMEN	1	2	3	4	5	6
WATER ABSORPTION (%)	0,3	0,2	0,2	0,2	0,2	0,2

MEAN VALUE OF WATER ABSORPTION (%)	0,2
HIGHER EXPECTED VALUE (E_H) OF WATER ABSORPTION AT ATMOSPHERIC PRESSURE (%)	0,28

COMMENTS

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O Porriño, 15/05/2020
Approval: The Laboratory Director

José Ángel Lorenzo Ramirez

TEST NO.	20/016
STANDARD	EN 16140:2011. DETERMINATION OF SENSITIVITY TO CHANGES IN APPEARANCE PRODUCED BY THERMAL CYCLES
CUSTOMER	Global Natural Stone Company, S.L.

DATA PROVIDED BY THE PETITIONER			
COMMERCIAL NAME	ITAKUMBO	SURFACE	Polished /Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, S.L.
QUARRY SITE	Uruguay		
LABORATORY DATA			
SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 11
TEST START DATE	04/06/2020	TEST IDENTIFICATION	X
TEST END DATE	29/07/2020	TECHNOLOGICAL TEST	
FECHA FINALIZACIÓN ENSAYO	29/07/2020	ENSAYO TECNOLÓGICO	

SPECIMEN DIMENSIONS (mm)						
SPECIMEN	1	2	3	4	5	6
LENGTH	199,7	199,8	199,6	200,0	199,8	200,4
WIDTH	199,8	199,8	199,9	199,6	199,7	199,3
HEIGHT	19,2	18,7	19,2	18,9	19,1	19,1
INDIVIDUAL VALUE OF SPECIMENS AFTER TEST						
CODE	1	2	3	4	5	6
ALTERATIONS	0	0	0	0	0	0

IMAGE REGISTRATION AND CHANGES		
BEFORE CICLES	AFTER CICLES	CHANGES DESCRIPTION
		<p>No significant changes were noted after cycles. A slight variation of color can be observed on the polished surface.</p>

REMARKS: Lab tests with a sawn surface do not show any changes. A modification in the color of the scanned images has been appreciated due to a technical failure during the scan process.

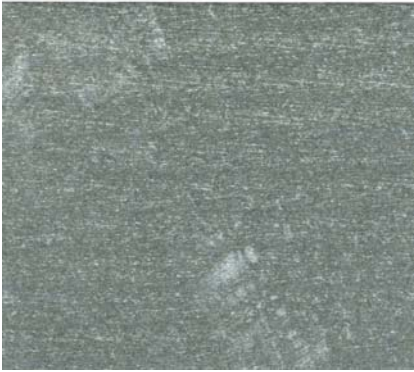











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Approval: The Laboratory Director

José Ángel Lorenzo Ramírez

TEST NO.	20/016
STANDARD	EN 16140:2011. DETERMINATION OF SENSITIVITY TO CHANGES IN APPEARANCE PRODUCED BY THERMAL CYCLES
CUSTOMER	Global Natural Stone Company, S.L.

IMAGE RECORD AND DESCRIPTION OF CHANGES (CONTINUED II) - Essay code:20/016

	SPECIMEN 1 - SAWN FACE	SPECIMEN 2 - SAWN FACE	SPECIMEN 3 - SAWN FACE
BEFORE CYCLES			
AFTER CYCLES			
	SPECIMEN 4 - SAWN FACE	SPECIMEN 5 - SAWN FACE	SPECIMEN 6 - SAWN FACE
BEFORE CYCLES			
AFTER CYCLES			



FUNDACIÓN CENTRO TECNOLÓGICO DO GRANITO

TEST REPORT

Code: I3/PE 11
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Date: 30/07/2020

TEST NO.	20/016
STANDARD	EN 16140:2011. DETERMINATION OF SENSITIVITY TO CHANGES IN APPEARANCE PRODUCED BY THERMAL CYCLES
CUSTOMER	Global Natural Stone Company, S.L.

REGISTRO DE IMAGEN Y DESCRIPCIÓN DE CAMBIOS (CONTINUACIÓN II) - Código ensayo: 20/016

	SPECIMEN 2 - POLISHED FACE	SPECIMEN 3 - POLISHED FACE	SPECIMEN 4 - POLISHED FACE
BEFORE CYCLES			
AFTER CYCLES			
	SPECIMEN 5 - POLISHED FACE	SPECIMEN 6 - POLISHED FACE	
BEFORE CYCLES			
AFTER CYCLES			



FUNDACIÓN CENTRO TECNOLÓXICO DO GRANITO

TEST REPORT

Code: 13/PE 12
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Date: 30/07/2020

TEST NO.	20/016
STANDARD	EN 14066 : 2013. DETERMINATION OF RESISTANCE TO AGEING BY THERMAL SHOCK
CUSTOMER	Global Natural Stone Company, S.L.

DATA PROVIDED BY THE PETITIONER

COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, S.L.
QUARRY SITE	Uruguay		

LABORATORY DATA

SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 12
TEST START DATE	08/06/2020	TEST IDENTIFICATIONS	Not applicable
TEST END DATE	30/07/2020	TECHNOLOGICAL TEST	Not applicable

SPECIMEN DIMENSIONS (mm)

SPECIMEN	1	2	3	4	5	6	7	8	9	10
LENGTH	301,0	300,5	301,4	300,7	300,7	300,8	300,7	301,0	300,9	301,5
WIDTH	48,7	48,8	48,8	48,7	48,8	48,6	48,9	48,8	49,1	49,1
HEIGHT	48,6	51,6	48,6	48,8	51,3	52,0	48,6	50,8	48,6	50,9
SPECIMEN	11	12	13	14	15	16	17	18	19	20
LENGTH	301,2	301,0	301,5	301,0	301,3	301,4	301,3	301,4	301,0	301,7
WIDTH	48,2	48,5	51,9	49,0	49,1	48,9	48,5	49,1	51,9	48,4
HEIGHT	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	47,6

INDIVIDUAL VALUE OF SPECIMENS AFTER TEST

SPECIMEN	11	12	13	14	15	16	17	18	19	20
VARIATION OF DYNAMIC ELASTIC MODULUS OF ELASTICITY (%)	-1,07	-1,10	-0,78	-0,63	-0,14	-2,02	-1,98	-1,55	-0,33	-0,57
VARIATION OF SOUND SPEED PROPAGATION (%)	-0,6	-1,0	-0,4	-0,8	-1,0	-1,9	-1,4	-1,6	-0,4	-1,0
VARIATION OF OPEN POROSITY (%)	40,2	39,0	21,8	120,8	0,1	39,5	-12,9	-37,1	8,2	32,6
ALTERATIONS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

MEAN VALUE OF DYNAMIC ELASTIC MODULUS OF ELASTICITY VARIATION	-1,0 %
MEAN VALUE OF SOUND SPEED PROPAGATION	-1,0 %
MEAN VALUE OF OPEN POROSITY VARIATION ⁽¹⁾	25,2 %
MEAN VALUE OF DRY MASS	0,0 %
MEAN VALUE OF FLEXURAL STRENGTH VARIATION ⁽²⁾	1,2 %

COMMENTS

Note: The batch of 1-10 specimens has been subjected to the 20 aging cycles. The specimens with code 11-20 correspond to the batch of untested reference specimens


⁽²⁾ The bending strength value before cycling is 37 MPa and after 37,4 MPa.

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O Porriño, 30/07/2020

Approval: Laboratory Director

José Ángel Lorenzo Ramirez

 Fundación Centro Tecnológico do Granito de Galicia	FUNDACIÓN CENTRO TECNOLÓGICO DO GRANITO	Code: I6/PE 13
	TEST REPORT	Page: 9 of 12 Date: 19/06/2020

TEST NO.	20/016
STANDARD	EN 12371: 2010. DETERMINATION OF FROST RESISTANCE
CUSTOMER	Global Natural Stone Company, S.L.

DATA PROVIDED BY THE PETITIONER			
COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, S.L.
QUARRY SITE	Uruguay		

LABORATORY DATA			
SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 13
TEST START DATE	12/05/2020	TEST IDENTIFICATION	
TEST END DATE	11/06/2020	TECHNOLOGICAL TEST	X

SPECIMEN DIMENSIONS (mm)										
SPECIMEN	1	2	3	4	5	6	7	8	9	10
LENGTH	301,2	301,0	301,5	301,0	301,3	301,4	301,3	301,4	301,0	301,7
WIDTH	48,2	48,5	51,9	49,0	49,1	48,9	48,5	49,1	51,9	48,4
HEIGHT	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	48,8	47,6
SPECIMEN	11	12	13	14	15	16	17	18	19	20
LENGTH	301,0	300,7	301,4	302,1	301,6	301,3	301,1	301,2	301,1	301,1
WIDTH	48,7	49,5	48,5	51,6	51,4	51,7	51,7	48,7	48,3	52,2
HEIGHT	48,8	48,8	47,7	47,7	48,8	48,8	48,8	48,8	48,8	48,5

INDIVIDUAL VALUE OF SPECIMENS (0 CYCLES)										
SPECIMEN	1	2	3	4	5	6	7	8	9	10
FLEXURAL STRENGTH (MPa)	36,8	38,1	34,3	39,7	36,4	36,9	38,5	35,8	34,5	38,5

INDIVIDUAL VALUE OF SPECIMENS (X CYCLES)										
SPECIMEN	11	12	13	14	15	16	17	18	19	20
FLEXURAL STRENGTH (MPa)	34,1	35,7	36,7	33,9	34,5	35,2	37,7	36,0	34,5	33,3

Nº CYCLES (X)	56
DECREASE OF AVERAGE FLEXURAL STRENGTH AFTER CYCLES (%)	4,8
LOWER EXPECTED VALUE (MPa)	32,4

COMMENTS
The force applied perpendicular to the wear surface of the stone, as factory cut.
The mean value of the flexural strength before cycles is 37,0 MPa, and after freeze-thaw cycles it is 35,2 MPa.

Note: The results of these tests are only related to the samples tested. This report cannot be partially reproduced without the express authorisation of the testing laboratory.

O Porriño, 19/06/2020

Approval: The Laboratory Director

José Ángel Lorenzo Ramirez



FUNDACIÓN CENTRO TECNOLÓXICO DO GRANITO

TEST REPORT

Code: I3/PE 16
Page: 10 of 12
Date: 26/05/2020

TEST NO.	20/016
STANDARD	EN 1936: 2007. DETERMINATION OF REAL DENSITY AND APPARENT DENSITY, AND OF TOTAL AND OPEN POROSITY
CUSTOMER	Global Natural Stone Company, SL

DATA PROVIDED BY THE PETITIONER

COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
PETROGRAPHIC NAME	Gabbro/Diabase	SUPPLIER	Global Natural Stone Company, SL
QUARRY SITE	Uruguay		

LABORATORY DATA

SAMPLE DELIVERY DATE	06/05/2020	TEST METHOD	PE 16
TEST START DATE	25/05/2020	TEST IDENTIFICATION	Not applicable
TEST END DATE	26/05/2020	TECHNOLOGICAL TEST	Not applicable

SPECIMEN DIMENSIONS (mm)

SPECIMEN	1	2	3	4	5	6
CODE	20/016/01/16/01	20/016/01/16/02	20/016/01/16/03	20/016/01/16/04	20/016/01/16/05	20/016/01/16/06
LENGTH	48,5	48,2	48,8	48,2	48,5	48,4
WIDTH	51,3	48,3	48,5	50,4	51,2	50,8
HEIGHT	50,8	51,1	49,3	48,5	48,8	48,7

INDIVIDUAL VALUE OF SPECIMENS

SPECIMEN	1	2	3	4	5	6
APPARENT DENSITY (kg/m³)	3010	3020	3010	3020	3010	3010
OPEN POROSITY (%)	0,1	0,2	0,2	0,2	0,1	0,2

MEAN VALUE OF APPARENT DENSITY (kg/m³)	3010
MEAN VALUE OF OPEN POROSITY (%)	0,2

COMMENTS


-

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O Porriño, 26/05/2020

Approval: The Laboratory Director


José Ángel Lorenzo Ramirez

 Fundación Centro Tecnológico do Granito de Galicia	FUNDACIÓN CENTRO TECNOLÓGICO DO GRANITO	Code	I2/PE 17
	TEST REPORT	Page	11 of 12
		Date	07/07/2020

TEST NUMBER	20/016
STANDARD	UNE-EN 12407:2007. PETROGRAPHIC EXAMINATION (EXCEPT CHARACTERISATION OF OPAQUE)
CUSTOMER	Global Natural Stone Company, S.L.

DATA GIVEN BY CUSTOMER			
COMMERCIAL NAME	ITAKUMBO	SURFACE	Sawn
QUARRY SITUATION	Uruguay	PROVIDER	Global Natural Stone Company, S.L.

DATA GIVEN BY LABORATORY			
RECEPTION SAMPLE DATE	06/05/2020	TEST METHOD	PE 17
START TEST DATE	29/06/2020	IDENTIFICATION TEST	No aplicable
FINAL TEST DATE	30/06/2020	TECHNOLOGICAL TEST	No aplicable
THIN SECTION			
RECEPTION DATE	26/06/2020	Nº OF THIN SECTIONS	1
DIMENSIONS (WIDTH x LENGTH x THICKNESS)		25 mm x 40 mm x 30 µm	

MACROSCOPIC DESCRIPTION	
COLOUR: Black	
TEXTURE: Granular	
GRAIN SIZE: Medium	
NOTABLE CHARACTERISTICS: Mafic rock, compact rock with irregular fracture.	

MICROSCOPIC DESCRIPTION	
TEXTURA: Sub-olitic with mirmequitic areas	
CONSTITUYENTES: 51 % Plagioclase 38 % Augite 9 % Opaque 1 % Amphibole 1 % Quartz <1 % Accessories (estimated percentages)	
DISCONTINUIDADES: High level of intracrystalline microfractures with no mineral filler in clinopyroxenes.	

TEST REPORT

MINERALOGICAL DESCRIPTION :

Plagioclase (Pla): It has a tabular characteristic, showing polysynthetic twinnings sometimes associated with simple Carlsbad twinnings. They generally appear unaltered or with very incipient sericitization processes. Grain sizes between 0.32 and 1.2 mm. The Michel Levy's test provides an andesite composition.

Augite (Aug): It generally shows subidiomorphic crystals, with slightly pinkish colours (variety titan-augite), sometimes twinned. Incipient uralitization processes with partial substitution for green amphibole (actinolite or hornblende to be identified by other techniques). They show intracrystalline microfractures without mineral fillers. Grain sizes between 0.1 and 0.8 mm

Opaque (Op): they generally show automorphic, scattered grains or sometimes grouped into aggregates that develop skeletal forms

Accessory: Quartz, potassium feldspar. Presence of vermicular quartz intergrowths in plagioclase together with potassium feldspar (stained yellow by sodium cobaltinitrite) developing myrmekitic-type textures. The presence of said quartz indicates that the rock is made up of a tholeiitic-type magm

Secondary: Amphibole (from altered augite), sericite (from altered plagioclase)

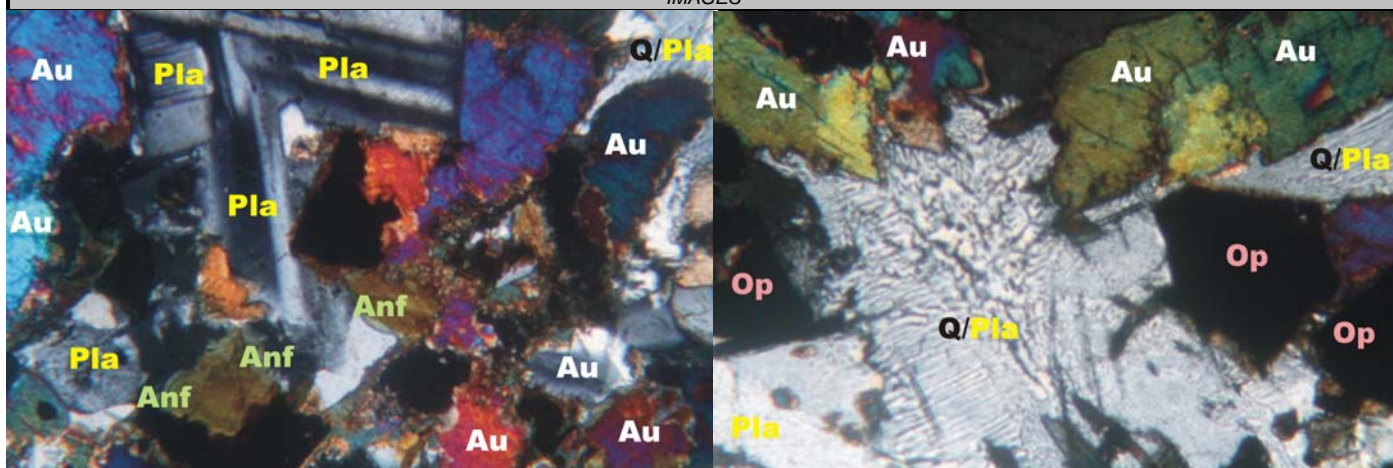
PETROGRAPHIC DESCRIPTION

Gabbro/Diabase (according to EN 12670:2001 paragraph 3.2.1.1).

COMMENTS

Igneous rock of basic subvolcanic or igneous composition. There are no field data to verify if it is a dyke or sill as it seems texturally.

IMAGES



Polarized light not analyzed. 25X

Polarized light not analyzed. 25X

Legend: Q: Quartz; Au: Augite; Pla: Plagioclase; Anf: Amphibole, Op: Opaque minerals

Imagen 1 tabular plagioclase cross-linked with polysynthetic twinnings together with subidiomorphic clinopyroxene (augite) partially altered to opaque greenish amphibole. **Imagen 2** Myrmekitic growth of vermicular quartz in plagioclase. Augite can also be seen with uralitization and opaque processes.

LPA: Polarised and Analysed Ligth. LPNA: Polarised and No Analysed Ligth. N°x: N° increases.

Note (1): The results of these test only relate with the samples tested. This report can not be partially reproduced without the permission of the laboratory.

Note (2): This essay has been carried out by petrographer Raúl Cueto Hirschberger in collaboration with the Centro Tecnológico del Granito.

O Porriño, a 07/07/2020

Approval: Laboratory Director

José Ángel Lorenzo Ramírez