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Test Certificates





ISO 9001 Certified
Company



Certificates

RiveStop®



LIST OF CERTIFICATES ENCLOSED:

1. Certified ISO 9001 JABE
2. Waterproofing Tests of different Sizes Rivestop
3. Waterproofing of the Rivestop at 3 bar (0.3MPa)
4. Waterproofing of the Rivestop with ageing at 3 bar (0,3MPa)
5. Waterproofing of the Rivestop with ageing at high temperature at 2.5bar
6. Waterproofing of the Rivestop with ageing at low temperature at 2.5bar
7. Waterproofing of the Rivestop with ageing in acid solution at 2 bar
8. Waterproofing of the Rivestop with ageing in saline solution at 2bar
9. Rubber Ozone Resistance
10. Relaxation after rubber ageing in water
11. Rubber ageing when immersed in water
12. Compressive strength of concrete
13. Concrete moisture expansion and shrinkage
14. Water absorption by capillary action in concrete
15. Isolation acoustic test

BUREAU VERITAS
Certification



Certificación Certification

Concedida a / Awarded to

CAUCHOS Y DERIVADOS JABE SL

POLIGONO KARRIKA 55 3A
20140 ANDOAIN
SPAIN

Bureau Veritas Certification certifica que el Sistema de Gestión ha sido auditado y encontrado conforme con los requisitos de la norma:

Bureau Veritas certify that the Management System has been audited and found to be in accordance with the requirements of standard:

NORMA / STANDARD

ISO 9001:2008

El Sistema de Gestión se aplica a:

Scope of certification:

FABRICACIÓN DE PIEZAS DE CAUCHO Y CAUCHO METAL. FABRICACIÓN DE PIEZAS DE CORCHO CAUCHO. ENSAMBLAJE DE FRENOS. MECANIZADO DE PIEZAS.

RUBBER PIECES AND RUBBER METAL PIECES MANUFACTURE. CORK RUBBER PIECES MANUFACTURE. BRAKES BONDING PROCESS. MACHINING OF PARTS.

Número del Certificado
Certificate Number

ES075220-1

Directora de Certificación / Certification
Manager

Aprobación original :
Original approval date :

11/12/2001

Certificado en vigor:
Effective date:

28/10/2016

Caducidad del certificado:
Certificate expiration date:

14/09/2018

Este certificado está sujeto a los términos y condiciones generales y particulares de los servicios de certificación
This certificate is valid, subject to the general and specific terms and conditions of certification services

Entidad de Certificación / Certification Body: Bureau Veritas Iberia S.L.
C/ Valportillo Primera 22-24, Edificio Caoba, Pol. Ind. La granja, 28108 Alcobendas - Madrid, Spain

ENAC
CERTIFICACIÓN
Nº 04/C-SC004

CERTIFICATE PRESSURE TEST

RIVESTOP D21X33 PZ

Waterproofing of the Rivestop
at 30 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D21x33 PZ
Hole Diameter:	22mm
Materials:	EPDM Plastic washer Rivet aluminum/ zinc coated steel
Test Date:	11-01-2017

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE
Test	Waterproofing at 30meters of water

Laboratory Test report:
2017-01-12

Testing Laboratory:



Review Date:
12-01-2017



RESULT:

OK, NO LEAKS

Date of testing:

Start Date: 11-01-2017
End Date: 12-01-2017

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concret device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) lthe duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D21X33 PS

Waterproofing of the Rivestop
at 30 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D21x33 PS
Hole Diameter:	22mm
Materials:	EPDM Plastic washer Rivet aluminum/ stainless steel
Test Date:	12-20-2016

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE
Test	Waterproofing at 30meters of water

Laboratory Test report:
2016-12-22

Testing Laboratory:



Date of testing:

Start Date: 12-20-2016
End Date: 12-22-2016

Review Date:
12-22-2016



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concret device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) lthe duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D21X48 PS

Waterproofing of the Rivestop
at 30 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D21x48PS
Hole Diameter:	24mm
Materials:	EPDM Batch 41105 Plastic washer Rivet aluminum/ stainless steel
Test Date:	06-02-2015

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE Rev 03-04-2015
Test	Waterproofing at 30 meters of water

Laboratory Test report:
2015-0602

Testing Laboratory:



Date of testing:

Start Date: 06-02-2015

End Date: 06-04-2015

Review Date:
06-04-2015



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concrete device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) the duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D21X48 PZ

Waterproofing of the Rivestop
at 30 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D21x48 PZ
Hole Diameter:	24mm
Materials:	EPDM Batch 41105 Plastic washer Rivet aluminum/zinc coated steel
Test Date:	06-02-2015

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE Rev 03-04-2015
Test	Waterproofing at 30 meters of water

Laboratory Test report:
2015-0602

Testing Laboratory:



Date of testing:

Start Date: 06-02-2015

End Date: 06-04-2015

Review Date:
06-04-2015



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concrete device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) the duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D24X50 PS

Waterproofing of the Rivestop
at 40 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D24x50 PS
Hole Diameter:	27mm
Materials:	EPDM Batch 41105 Plastic washer Rivet aluminum/ stainless steel
Test Date:	06-02-2015

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE Rev 03-04-2015
Test	Waterproofing at 40 meters of water

Laboratory Test report:
2015-0602

Testing Laboratory:



Date of testing:

Start Date: 06-02-2015

End Date: 06-05-2015

Review Date:
06-05-2015



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concrete device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) the duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D27X50 PS

Waterproofing of the Rivestop
at 40 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D27x50 PS
Hole Diameter:	30mm
Materials:	EPDM Batch 220628 Plastic washer Rivet aluminum/ stainless steel
Test Date:	04-04-2016

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE Rev 03-04-2015
Test	Waterproofing at 40 meters of water

Laboratory Test report:
2016-0404

Testing Laboratory:



Date of testing:

Start Date: 04-04-2016

End Date: 04-06-2016

Review Date:
06-04-2016



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concrete device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) the duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.



CERTIFICATE PRESSURE TEST

RIVESTOP D30X66 SS

Waterproofing of the Rivestop
at 40 meters of water column (mWc)

SAMPLE DETAILS	
Identification:	
Description/Size:	Rivestop D30x66 SS
Hole Diameter:	36mm
Materials:	EPDM Batch 220628 Plastic washer Rivet aluminum/ stainless steel
Test Date:	03-18-2016

REQUIRED TESTING	
Method	Waterproofing Testing Instruction JABE Rev 03-04-2015
Test	Waterproofing at 40 meters of water

Laboratory Test report:
2016-0318

Testing Laboratory:



Date of testing:

Start Date: 03-18-2016
End Date: 03-21-2016

Review Date:
03-21-2016



RESULT:

OK, NO LEAKS

METHODOLOGY:

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

The samples are applied inside of the hole of the concrete device (with tube inside) according to the rivet gun assembly instructions.

For this test, we make a previous hydrostatic assembly that allows you to test the 3 samples simultaneously.



The sample, by the side of the rubber cap, is subjected to a hydrostatic pressure of work through a closed water circuit (at the time of filling of water all the circuit check that air is eliminated) located in the rear of the concrete device, isolating the device test object.

The sample is subjected to a first pressure (Pi) of 0,5bar (5mWc) and will be increasing in steps of pressure time already defined.

From 0,5bares (5mWc) of pressure until 1 bar (10mWc) the duration of the test is 24 hours.

From 2 bar pressure (20mWc) of pressure the duration of the test is 2 hours.

The test finishes when it detects any failure/leak in any of the samples.





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Testing: Waterproofing of the Rivestop at 30 meters of water column (mWc)

Sample details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the samples

Required Testing

Testing	Waterproofing of the Rivestop at 30 mWc
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Testing Laboratory :



Lab Report No.

12-4677-396

Result :

OK, No leaks

Methodology

The samples are conditioned a minimum of 24 h at 23°C and 50% HR.

To perform this second trial of testing, prior hydraulic assembly is carried out which allows testing 6 test-tubes simultaneously.



The device for testing is programmed to perform the testing of leakage at a pressure of 3bar (0.30 MPa) for a period of 24 h at 10°C.

The following equipment is used for testing of waterproofing:
IPT Airless Basic Pressure Equipment
Climatic chamber Thermotron with certified calibration 10/34513341 of the 20-9-2010
Pattern measurement of pressure:
Telegan pressure transducer
XMLP010BC71V certified 12/34508029 of the 27-3-2012



Certificate Date: 12-20-2013



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Certificate

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Testing:

**Waterproofing of the Rivestop with ageing at
30 meters of water column (mWc)**

Sample Details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the samples

Required Testing

Testing	Waterproofing of the Rivestop with ageing at 30 mWc
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Testing Laboratory :



Lab Report No.

12-4677-396

Result :

OK, No leaks

Methodology:

First, the samples are subjected to a cycle of aging which comprises water immersion at +70°C +/-1°C for 7 days and then a process of drying at +70°C +/-1°C for 7 days.



Then, the samples are conditioned a minimum of 24 h at 23°C and 50% HR. To perform this second trial of testing, prior hydraulic assembly is carried out which allows testing 6 test-tubes simultaneously.

The device for testing is programmed to perform the testing of leakage at a pressure of 3bar (0.30 MPa) for a period of 24 h at 10°C.

The following equipment is used for testing of waterproofing:

IPT Airless
Basic Pressure
Equipment
Climatic chamber Thermotron with certified calibration 10/34513341 of the 20-9-2010
Pattern measurement of pressure:
Telegon pressure transducer
XMLP010BC71V certified 12/34508029 of the 27-3-2012



Certificate Date : 12-20-2013



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Testing:

Waterproofing of the Rivestop after Ageing in at High Temperaturas of 25 meters of water column (mWc)

Sample Details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the sample

Required Testing

Testing	Waterproofing after ageing at low temperatures
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Testing Laboratory :



Lab Report No.

12-5395-1293

Result :

OK, No leaks

Metodología

The samples are subjected to ageing at high temperatures which comprise maintaining the test-tubes in a climatic chamber at +80°C +/-1°C for 7 days. After this cycle of aging, the samples are conditioned a minimum of 24 h at 23 ° C and 50% RH before testing for leaks.



In order to perform this second trial of testing, prior hydraulic Assembly is carried out which allows testing 6 test-tubes simultaneously.

The testing device is programmed to perform the testing of leaks at 2.5 bar (0. 25MPa) for 24 hours at a temperature of 10°C.



The testing equipment for waterproofing used are the following:

Climatic Chamber
Thermotron with
certified calibration
10/34513341
of the 20-9-2010
Pattern Measure
of Pressure: Tele-
gan Pressure Transducer
XMLP010BC71V certified 12/34508029
of the 27-3-2012



Certificate Date: 12-20-2013





Empresa certificada
en ISO 9001 por
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Testing:

Waterproofing of the Rivestop after Ageing at Low Temperaturas of 25 meters of water column (mWc)

Sample Details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the sample

Required Testing

Testing	Waterproofing after ageing at low temperatures
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Testing Laboratory :



Lab Report No.

12-5395-1293

Result :

OK, No leaks

Methodology:

The samples are subjected to ageing at low temperatures which comprise maintaining the test-tubes in a climatic chamber at - 20 ° C +/- 1 ° C for 7 days.

After this cycle of aging, the samples are conditioned a minimum of 24 h at 23 ° C and 50% RH before testing for leaks.

In order to perform this second trial of testing, prior hydraulic Assembly is carried out which allows testing 6 test-tubes simultaneously. The testing device is programmed to perform the testing of leaks at 2.5 bar (0. 25MPa) for 24 hours at a temperature of 10°.



The testing equipment for waterproofing used are the following:

Pressure Equipment, IPT Airless Basic Climatic Chamber Thermotron with certified calibration 10/34513341 of the 20-9-2010

Pattern Measure of Pressure: Telegan Pressure Transducer XMLP010BC71V certified 12/34508029 of the 27-3-2012



Certificate Date: 12-20-2013





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Testing:

Waterproofing of the Rivestop after Ageing in Acid Solution at a pressure of 25 meters of water column (mWc)

Sample details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the sample

Required testing

Testing	Waterproofing after ageing at low temperatures
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Testing Laboratory :



Lab Report No.

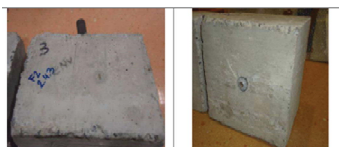
12-5395-1293

Result :

OK, No leaks

Methodology

Without expanding, samples undergo ageing in saline solution which comprises subjecting test-tubes to 50 cycles mingling moisture and dryness of 24-hour periods, each of which comprise: The ends of the surface of the test-tubes are soaked for 5 hours at room temperature with a solution that stimulates acid rain, preparing a mixture of 1



part of nitric acid with 2 parts of sulfuric acid in volume until it reaches a pH between 4.0 and 4.3. The acidic solution is poured onto the test-tubes for 10

hours at room temperature and afterwards drained. They left to dry for 2 hours at room temperature. After these cycles of ageing, the test-tubes are installed in the concrete substrates at room temperature. After installation, the test-tubes are stabilized for 24 hours at 23°C and 50% RH before testing for leaks. In order to perform this second trial of testing, prior hydraulic Assembly is carried out which allows testing 6 test-tubes simultaneously. The testing device is programmed to perform the testing of sealing pressure of 2bar (0. 20MPa) for 24 hours at a temperature of 10°.



The testing equipment for waterproofing used are the following:
Climatic Chamber
Thermotron with certified calibration 10/34513341 of the 20-9-2010
Pattern Measure of Pressure: Telegan
Pressure Transducer XMLP010BC71V certified 12/34508029 of the 27-3-2012



Certificate Date: 12-20-2013





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Testing:

**Waterproofing of the Rivestop after Ageing in Saline Solution
at a pressure of 20 meters of water column (mWc)**

Sample Details

Identification	Rivestop OF2012-191 Batch 11015
Description	Rivestop
Code	12-4677-395 Receiving the sample

Required Testing

Testing	Waterproofing after ageing at low tempera- tures
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Testing Laboratory :



Lab Report No.

12-5395-1293

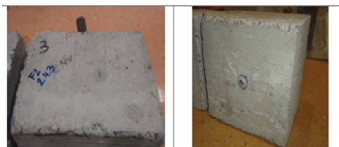
Result :

OK, No leaks

Methodology

Without expanding, samples undergo ageing in saline solution which comprises subjecting test-tubes to 50 cycles of salt corrosion whereby each period of 24 hours each comprises:

The ends of the surface of the test-tubes are soaked for 5 hours at room temperature with a saturated solution of sodium chloride. The pH of the saline solution adjusts to 13.2 or higher.



After that, the samples are placed in a climatic chamber at 20°C and 100% RH for 16 hours. At the end of the exposure to moisture for 16 hours, the test-tubes remain dry for 3 hours at room

temperature.

After these cycles of ageing in saline solution, the test-tubes are installed in the concrete substrates at room temperature. After installation, the test-tubes are stabilized for 24 hours at 23°C and 50% RH before testing for leaks.

In order to perform this second trial of testing, prior hydraulic Assembly is carried out which allows testing 6 test-tubes simultaneously. The testing device is programmed to perform the testing of sealing pressure of 2bar (0. 20MPa) for 24 hours at a temperature of 10°.



The testing equipment for waterproofing used are the following:

Pressure Equipment, IPT Airless Basic Climatic Chamber Thermotron with certified calibration 10/34513341 of the 20-9-2010
Pattern Measure of Pressure: Telegan Pressure Transducer XMLP010BC71V certified 12/34508029 of the 27-3-2012



Certificate Date: 12-20-2013





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Testing: Rubber Ozone Strength

Sample Details

Identification	M-11066 EPDM lote 11015
Description	Dark Rubber
Code	120326/11

Required Testing

Testing	Ozone Strength
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The testing was carried out on these
molded test-tubes.

Testing Laboratory :

C | T | R

Lab Report No.

120716/4

Industrial Standard

ISO 1431-1

Result : No Cracks

Specified : no cracks

Methology

The testing of Ozone Resistance has been carried on three test-tube straight lines, according to the industrial standard ISO 1431-1 "Rubber, vulcanized or thermoplastic -- Resistance to ozone cracking --

Part 1: Static and dynamic strain testing".

Rubbers containing double bonds can be damaged by ozone. This damage causes cracks to appear in the parts which are subject to deformation in compression or traction, cracks appearing perpendicular to which deformation is applied. Ozone resistance testing is performed in special chambers as which can be seen as follows:

The chamber incorporates a discharge lamp that generates ozone, as well as resistance that allows testing at moderately high temperatures (up to 50°C). In this case the parameters of the test were the following:



In this case the parameters of the testing were the following:
Ozone concentration: 50 ppb (parts per billion)
Temperature: 40°C
Elongation: 20% in traction
Duration: 96 hours

The test-tubes were distorted in aluminum tooling and were left to rest 72 hours at room temperature and protected f

rom light and ozone, and then entered into the chamber for 96 hours. At the end of the exhibition, the presence of cracks with a 10 times more lens was examined.



Certificate Date: 12-20-2013





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Testing: Relaxation after rubber ageing in water

Sample Details

Identification	M-11066 EPDM Batch 11015
Description	Dark Rubber
Code	120326/11

Required Testing

Testing	Relaxation after rubber ageing in water
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The testing was carried out on these
molded test-tubes.

Testing Laboratory :

C | T | R

Lab Report No.

120716/3

Industrial Standard

ISO 3384

Result : +14 %

Specified : 30% maximum

Methodology:

Relaxation after rubber ageing in
water

Relaxation of compressive strength
at constant strain has been deter-
mined, after 7 days at 23°C, ac-
cording to the industrial standard
ISO 3384 "Rubber, vulcanized or
thermoplastic --

Determination of stress relaxation
in compression -- Part 1: Testing
at constant
temperature", method B.

The testing was carried out at a
temperature of 23°C, with 25%
deformation. The deformation of
compressive strengths at constant
strain is determined
by compressing cylindrical test-
tubes of 6.3 mm thickness and 13
mm diameter, up to a fixed 25%

deformation, and given that it va-
ries the elastic force over a certain
period of time, at a given tempe-
rature, in this case 7 days at 23 °
C.

The test-tubes are compressed
between two parallel metal plates
like the following figure:



The assembly is placed in a device
capable of measuring the force
exercised by the test-tube. That is,
a testing "Instron" machine, model
"4411", was used in this case. The

result is takes thirty minutes after
installing the plates on the machi-
ne as a start, recording from the
indication of the equipment there
at the time. The relaxation of for-
ces is calculated according to the
following equation:

$$RE = \frac{F_{30 \text{ min utos}} - F_{7 \text{ dias}}}{F_{30 \text{ min utos}}} * 100$$

Certificate Date: 12-20-2013





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Testing: Rubber ageing when immersed in water

Sample Details

Identification **M-11066 EPDM
batch 11015**

Description **Dark Rubber**

Code **120326/11**

Required Testing

Result **Ageing
in water**

The testing has been carried on cast
test-tubes.

Testing Laboratory :

C | T | R

Lab Report No.

120716/1

Industrial Standard

ISO 1817:2011

Result : +2.5 %

Specified : between -3% and +5%

Methodology:

Variation of the sample volume following immersion in water for 7 days at 70° C has been determined, according to the industrial standard ISO 1817:2011 "Rubber, vulcanized or thermoplastic --Determination of the effect of liquids" The industrial standard ISO 1817:2011 describes a method for assessing the resistance of the vulcanized rubber upon action of liquids, by measuring any property of the them before and after suitable liquid immersion under certain conditions. At this time, the variation of volume after immersion in distilled water for 7 days at 70°C has been measured.

The effect of liquids on vulcanized rubber may differ depending on the nature of both of them. Thus, polar liquids will tend to be absorbed by

rubbers characterized with similar polarity, resulting a considerable increase in volume, followed by consequent decrease in mechanical properties.

On the contrary, when elastomer comes in contact with a liquid polarity different from yours, the interaction between the two is very weak, resulting in a very limited absorption and, therefore, a variation of low properties. The testing was carried out using three test-tubes, with 4cm² side and 2mm in thickness. The initial and final volume has been determined by using a hydrometer scale, "Mettler Toledo" brand and "204 AG" model . The image of the equipment may be viewed



below. The calculation of the volume of the test-tubes is done based on the Archimedean principle, by weighing the test-tube in air and then in a suitable liquid and thereby making the relevant calculations.

After determining the volume of the test-tubes in original condition, they were submerged in distilled water for 7 days at 70°C. After this time period, they were removed from the water and were left to rest, again determining the volume. Volume variation was calculated according to the following

formula:

$$\Delta V = \frac{V_{final} - V_{initial}}{V_{initial}} \times 100$$

Certificate Date : 12-20-2013





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Certificate

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Concrete Identification Testing

Compression strength of concrete

Sample Details

Identification	Concrete
Description	Concrete Test-Tube
Code	12-4677-395 <small>Acta Recepcion Muestras</small>

Required Testing

Method	UNE-EN 12390-3
Testing	Compression strength of Concrete

Testing Laboratory :



Lab Report No.

12-4677-396

Industrial Standard

UNE-EN 12390-3

Result:

Average = 56.5 MPa

Methodology



Certificate Date: 12-20-2013





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Testing of Concrete Identification

Concrete moisture expansion and shrinkage

Sample Details

Identification	Concrete
Description	Concrete Test-Tube
Code	12-4677-395 <small>Receiving the sample</small>

Required Testing

Method	EN 772-14:2002
Testing	Concrete moisture expansion and shrinkage

Testing Laboratory :



Lab Report No.

12-4677-396

Industrial Standard

EN 772-14:2002

Result :

Average coefficient of dryness shrinkage = 0.2.....

Average coefficient of moisture expansion = 0.31mm/m

Coefficient of total movement= 0.54mm/m

Methodology:

The testing comprises of determining the variation due to moisture of the pieces of concrete masonry of dryness and artificial stone according to the industrial standard UNE-EN 772-14:2002.

The coefficient of total movement of each sample of concrete is calculated from the sum of the dryness coefficient and from the moisture expansion of each sample.



Certificate Date: 12-20-2013





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Certificate

RiveStop®



Testing for Identification of Concrete Water absorption by capillary action in concrete

Sample Details

Identification	Concrete
Description	Concrete Test-Tube
Code	12-4677-395 Receiving the samples

Required Testing

Method	EN 772-11:2001
Testing	water absorption by capillary ac- tion in concrete

Testing Laboratory :



Lab Report No.

12-4677-396

Industrial Standard

EN 772-11:2001

Result :

Average = 1,8 g/(m²·s)

Methodology

The testing is based on on a water immersion in concrete for a time of 10 minutes on the edges of concrete specimens
un tiempo de 10 minutos de los cantos de las probetas de hormigón



Certificate Date: 12-20-2013





Testing:

Acoustic isolation to air noise according to EN ISO 10140-2:2010

Required testing

Test : **Acoustic isolation to air noise according to standard EN ISO 10140-2:2010**

Test Date: **April 6, 2017**

Test Laboratory:

DEPARTAMENT OF ENVIRONMENT, SPATIAL PLANNING AND HOUSING
Housing Direction
Laboratory of Building Quality Control



No. Report Laboratory

B2017-LACUS-IN-23

Test Standard

EN ISO 10140-2:2010

Sample details

Identification Sample	D21x33PZ
Description sample	Rivestop
Samples Code	Samples description
B2017-23-M404	Enclosure without perforations according to 7-8 photos
B2017-23-M405	Enclosure with perforations according to 9-10 photos
B2017-23-M406	Enclosure with holes sealed with Rivestop D21x33PZ 1-face (photos 11-12)
B2017-23-M407	Enclosure with holes sealed with Rivestop D21x33PZ 2-faces (photos 13-14)

Methodology

This test includes the results of the trial of acoustic isolation to air noise made according to standard EN ISO 10140-2 of 4 vertical enclosures, 2 of them applied with mechanical system Rivestop D21x33PZ.

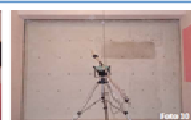
This test is made an enclosure (through concrete wall) with holes of diameter dimensions 2, 8m high D22mm 3, 6m long (the sample surface 10, 08 m²). This enclosure has been constructed in a prefabricated concrete of 40cm thick frame.



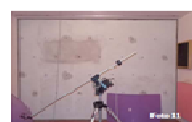
Fotos 5-6: Detalle de instalación de sistema mecánico



The tests have been performed by TECNALIA laboratory (Area Construction-Division services technology) in the halls of horizontal transmission of the Area of acoustics of the laboratory of Control of Quality of the building of the Basque Country Government.



Fotos 9-10: Vistas de muestra B2017-23-M405 en cámaras de ensayo



Fotos 11-12: Vistas de muestra B2017-23-M406 en cámaras de ensayo



Fotos 13-14: Vistas de muestra B2017-23-M407 en cámaras de ensayo



Fotos 15-16: Vistas de muestra B2017-23-M404 en cámaras de ensayo

Date: 04-06-2017



Certificate

Testing:

Acoustic isolation to air noise according to EN ISO 10140-2:2010

Results:

The following results for each test sample:

*The index of sound reduction, R, in bands of frequencies of third octave between 100 and 5000 Hz, in table and graph.

*The index weighted sound reduction, R_w , calculated according to the standard EN ISO 717-1, starting at the index of sound reduction, R.

*The terms of adaptation to the spectrum between 100 and 3150 Hz, C and Ctr, calculated according to the standard EN ISO 717-1, which are the values, in decibels, that must be added to the value of the global scale (R_w for example) to take into account the characteristics of a particular noise spectrum, such as noise pink (C) and noise of traffic (Ctr).

The following global indices, calculated according to the basic document "DB-HR protection against noise", of the technical building code (CTE), starting at the index of sound reduction, R:

**Global sound reduction index weighted A, R_A , between 100 and 5000 Hz, expressed with a digit decimal.

* * Global index weighted sound reduction A, for exterior noise key cars, $R_{A,tr}$, between 100 and 5000 Hz and expressed with a number decimal.

	B2017-23-M404	B2017-23-M405	B2017-23-M406	B2017-23-M407
f (Hz)	R (dB)	R (dB)	R (dB)	R (dB)
100	40,4	35,4	41,6	41,1
125	31,3	29,8	33,1	33,2
160	36,1	34,9	36,1	35,8
200	34,0	33,9	34,6	34,3
250	35,0	35,0	35,9	35,3
315	39,4	39,1	38,3	38,4
400	41,4	40,4	41,2	41,5
500	44,4	41,7	44,5	44,3
630	46,4	39,7	47,7	47,6
800	48,2	30,8	49,9	49,3
1000	51,8	33,1	52,5	52,5
1250	55,2	34,6	55,7	55,5
1600	57,5	29,4	56,8	56,9
2000	58,3	31,1	56,7	57,4
2500	54,6	28,5	52,9	53,7
3150	53,7	29,9	52,6	53,5
4000	55,6	30,3	53,7	54,2
5000	56,3	32,2	54,5	55,1
R_w (dB)	48	32	48	48
(C; Ctr) (dB)	(-1; -5)	(-1; 0)	(-1; -4)	(-1; -5)
R_A (dBA)	47,5	31,3	47,7	47,6
$R_{A,tr}$ (dBA)	43,1	32,2	43,7	43,5

Test Laboratory:

DEPARTAMENT OF ENVIRONMENT, SPATIAL PLANNING AND HOUSING

Housing Direction

Laboratory of Building

Quality Control



No. Report Laboratory

B2017-LACUS-IN-23

Test Standard

EN ISO 10140-2:2010

Conclusion:

The enclosure (concrete wall) with the holes sealed by mechanical system Rivestop D21x33PZ give a value of acoustic insulation $R_w = 48$ dB, as well as the enclosure (concrete wall) original without perforating holes.

Date: 04-06-2017