



SDP

PVC-U DRAINPIPES,
PARTS AND
COMPONENTS

**Soundproof
System**



NUEVA TERRAIN S.L.





NUEVA TERRAIN

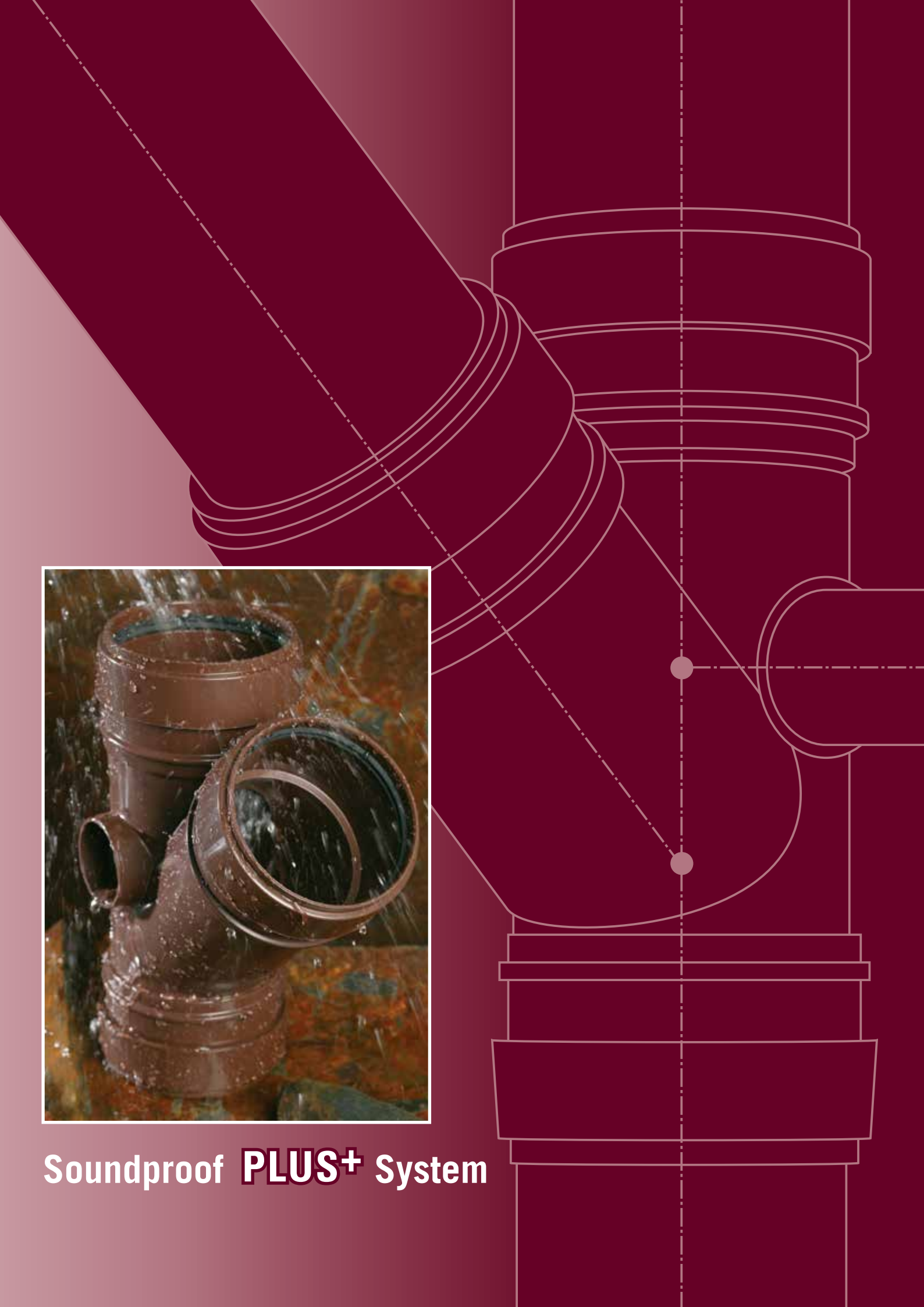
CONTENTS

- 3 Soundproof Plus System**
- 7 Soundproof Eco system**
- 12 Introduction**
- 13 Fireproofing**
- 15 Basic concepts regarding noise**
- 17 Acoustic performance tests performed on TERRAIN SDP soundproof drainage systems**
- 18 Description of the tests performed**
- 19 Manufacturing**
- 19 Flexible joint system and 135° joints**
- 20 Recommendations for Installation**
- 23 Firewall sleeve (intumescent)**
- 24 Positioning the Firewall Sleeve**
- 26 General Conditions**

After carrying out lengthy research and conducting detailed tests, **NUEVA TERRAIN** presents the new **SOUNDPROOF SDP** drainage system, in Ø 50, 110, 125 and 160 mm, comprising pipes, tees, couplers, sleeves, insert sleeves, isophonic pipe clamps, etc, specifically designed for use in hotels, hospitals, public venues, homes, etc. In comparison to traditional drainage piping, this system offers improved sound insulation, with considerable reductions in percentage and absolute values.

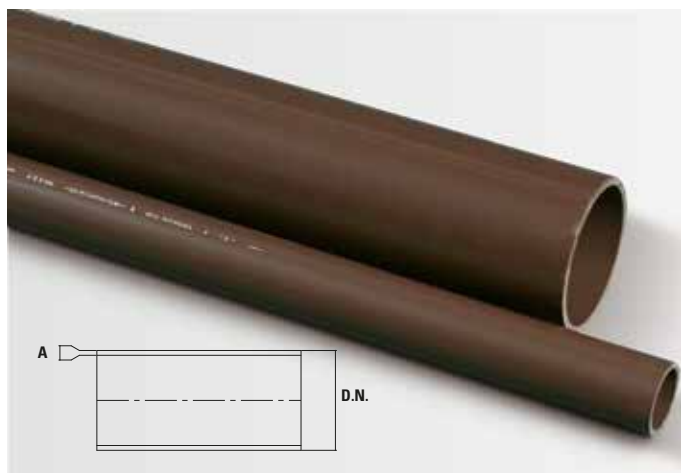


Soundproof **PLUS+** System



Piping

For application B pursuant to the UNE-EN 1329-1:2014 standard, capable of withstanding intermittent discharges of water at 95°C. C. Colour Andorra, RAL 8016.

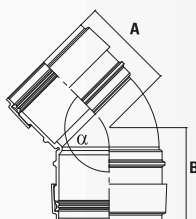


PVC-U SEWAGE PIPES

REFERENCE	NOMINAL DIAMETER D.M.	THICKNESS mm.	PIPE WEIGHT kg.	PVC-U COMPONENTS FOR DRAINS
INS 200.050.030	50	3,7	2,517	3,00
INS 100.110.030	110	5,3	8,106	3,00
INS 100.125.030	125	5,3	9,291	3,00
INS 100.160.030	160	5,3	12,018	3,00

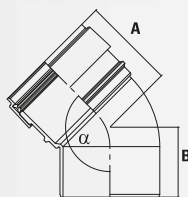
PVC-U - U COMPONENTS FOR DRAINS

For application B pursuant to the UNE-EN 1329-1:2014 standard, capable of withstanding intermittent discharges of water at 95° C. Color Andorra, RAL 8016.



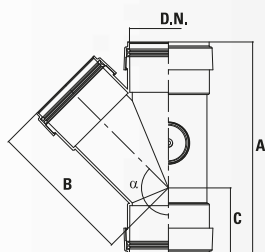
F-F ELBOW

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B
INS 201.050.135	50	138	F - F	135°	54,0	54,0
INS 101.110.135	110	565	F - F	135°	101,5	101,5
INS 1.101.125.135	125	586	F - F	135°	110	110
INS 101.160.135	160	1.195	F - F	135°	144	144



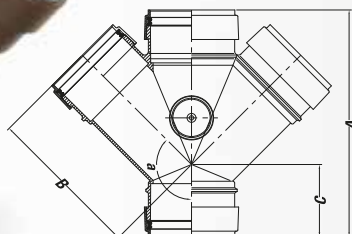
M-F ELBOW

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B
INS 107.110.135	110	480	M - H	135°	101,5	77



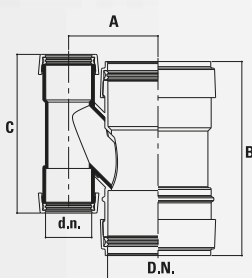
SINGLE BRANCH

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B	C
INS 104.110.135	110	1.150	F - F	135°	305	208	97
INS 1.104.125.135	125	1.215	F - F	135°	347	232	115
INS 104.160.135	160	2.309	F - F	135°	437	300	137



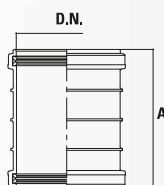
DOUBLE BRANCH

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B	C
INS 106.110.135	110	1.240	F - F	135°	305	208	97
INS 1.106.125.135	125	1.548	F - F	135°	305	208	97



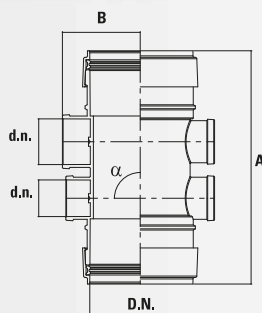
CROSS-VENTILATION CONNECTOR

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B	C
INS 108.110.050	110x50	710	F - F	135°	98,5	213	174,5



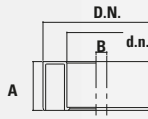
SLIP COUPLER

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
INS 1.111.110	110	368	F - F	-	155
INS 1.111.125	125	422	F - F	-	163
INS 111.160	160	899	F - F	-	210



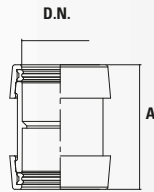
BOSS CONNECTOR COUPLER

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A	B
INS 116.110.050.040	110x50x40	670	F - F	90°	256,5	85



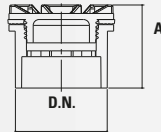
REDUCERS

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
INS 124.125.110	125 x 110	233	-	-	75,5
INS 124.160.110	160 x 110	290	-	-	76
INS 124.160.125	160 x 125	342	-	-	76



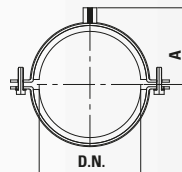
COUPLER

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
INS 210.050	50	107	F - F	-	47



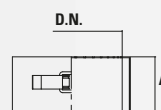
ACCESS CAP

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
INS 237.050	50	63	M	-	45,5



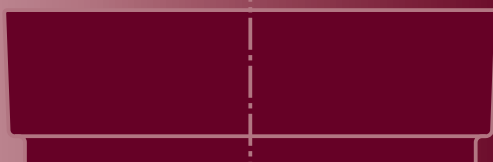
ISOPHONIC CLAMP USE WITH M-8 THREADED ROD

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
INS 643.050.008	50	104	For pipe	-	-
INS 643.110.008	110	138	For pipe	-	83
INS 643.115.008	110	565	For piece	-	-
INS 643.125.008	125	275	For pipe	-	93
INS 643.160.008	160	419	For pipe	-	-



FIREWALL COLLAR

REFERENCE	NOMINAL DIAMETER ND	WEIGHT COMPONENT grams	OPENING TYPE	ANGLE α°	A
670.055	50	-	F-F	-	47
670.063	63	-	F-F	-	47
670.110	110	385	F-F	-	47
670.125	125	620	F-F	-	47
670.160	160	775	F-F	-	47



Soundproof Eco System

Piping

For application B pursuant to the UNE EN 1329-1:2014 standard, capable of withstanding intermittent discharges of water at 95°C.



APPLICATION B - PVC-U SEWAGE PIPE

REFERENCE	NOMINAL DIAMETER ND	REFERENCE	NOMINAL DIAMETER ND
200.040.030	40	100.110.058	110
200.040.058	40	100.125.030	125
200.050.030	50	100.125.058	125
200.050.058	50	100.160.030	160
100.083.030	83	100.160.058	160
100.083.058	83	100.200.058	200
100.110.030	110	100.250.058	250

Fittings in PVC-U -U

For application B pursuant to the UNE-EN 1329-1:2014 standard, capable of withstanding intermittent discharges of water at 95°C.



F-F ELBOW

REFERENCE	NOMINAL DIAMETER ND
201.040.135 + (2)209.040	40
201.050.135 + (2)209.050	50
1.101.083.135 + (2)109.083	83
1.101.110.135	110
1.101.125.135	125
101.160.135 + (2)109.160	160
6.101.200.135	200
6.101.250.135	250



M-F ELBOW

REFERENCE	NOMINAL DIAMETER ND
207.040.135 + 209.040	40
207.050.135 + 209.050	50
1.107.110.135	110



SINGLE BRANCH

REFERENCE	NOMINAL DIAMETER ND
204.040.135 + (3)209.040	40
204.050.135 + (3)209.050	50
1.104.083.135 + (3)109.083	83
1.104.110.135	110
1.104.125.135	125
104.160.110.135 + (2)109.160+109.110	160x110
104.160.135 + (3)109.160	160
6.104.200.110.135 + 109.110	200x110
6.104.200.125.135	200x125
6.104.200.135	200



DOUBLE BRANCH

REFERENCE	NOMINAL DIAMETER ND
206.040.135 + (4)209.040	40
206.050.135 + (4)209.050	50
106.083.135 + (4)109.083	83
106.110.135 + (4)109.110	110
1.106.125.135	125
106.160.110.135 + (2)109.110+ (2)109.160	160x110



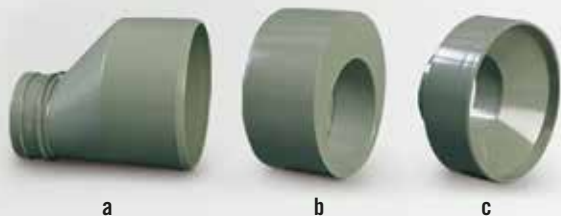
CROSS-VENTILATION CONNECTOR

REFERENCE	NOMINAL DIAMETER ND
108.110.050 + 109.110 + 209.050	110x50
108.110.063 + 109.110 + 209.063	110x63



BOSS CONNECTOR COUPLER

REFERENCE	NOMINAL DIAMETER ND
116.110.050.040+(2)109.110+209.050+(3)209.040	110x50x40



REDUCERS

REFERENCE	NOMINAL DIAMETER ND
124.110.050 (b)	110x50
124.083.050 (b)	83x50
124.125.110 (b)	125x110
124.160.110 (b)	160x110
124.160.125 (b)	160x125
124.200.110 + 109.110 (a)	200x110
1.124.200.125 (a)	200x125
124.200.160 + 109.160 (a)	200x160
123.200.110 (c)	200x110
123.200.160 (c)	200x160



STRAIGHT COUPLER

REFERENCE	NOMINAL DIAMETER ND
210.040 + (2)209.040	40
210.050 + (2)209.050	50
110.083 + (2)109.083	83
110.110 + (2)109.110	110
1.110.125	125
110.160 + (2)109.160	160
1.811.200	200
6.110.250	250



SLIP COUPLER

REFERENCE	NOMINAL DIAMETER ND
211.040	40
211.050	50
111.083	83
1.111.110	110
1.111.125	125
111.160	160
1.816.200	200



45° BOSS CONNECTOR

REFERENCE	NOMINAL DIAMETER ND
112.110.040.135	40
112.110.050.135	50



ADAPTING RINGS

REFERENCE	NOMINAL DIAMETER ND
209.040	40
209.050	50
109.083	83
109.110	110
109.160	160



ISOPHONIC CLAMP USE WITH M-8 THREADED ROD

REFERENCE	NOMINAL DIAMETER ND
INS 643.040.008	40
INS 643.050.008	50
INS 643.083.008	83
INS 643.110.008	110
INS 643.115.008	110
INS 643.125.008	125
INS 643.160.008	160
INS 643.200.008	200
INS 643.250.008	250



FIREWALL COLLAR

REFERENCE	NOMINAL DIAMETER ND
670.040	40
670.055	50
670.063	63
670.083	83
670.110	110
670.125	125
670.160	160
670.200	200



FIREWALL BAND

REFERENCIA	Ø NOMINAL D.N.
671.110	110
671.125	125

Nueva Terrain soundproof sewerage system

Introduction

During recent decades, the evolution of developed countries has led to a better quality of life for their citizens. However, it is not uncommon for the same elements that provide this quality of life (increased industrial activity, tourism, leisure, etc), have the opposite effect of reducing quality of life because of increased pollution, particularly noise pollution.

Noise pollution is a matter of great concern because of the serious discomfort it is capable of causing, as well as its detrimental effects on health, human behaviour and activities. A clear example of the growing sensitivity shown to this type of pollution is the fact that the Building Planning Law sets out some basic requirements with regard to safety and habitability. These include provisions governing "protection from noise, in such a manner that the noise perceived does not endanger the health of people and allows them to carry out their activities in a satisfactory way".

Likewise, building regulations from many countries specify the minimum requirements to assure basic protection against noise, specifying that "buildings shall be planned, built, used and maintained in such a manner that the built elements of which they comprise shall have acoustic characteristics suitable for the purpose of reducing the transmission of airborne noise, noise from impacts and vibrations from the facilities in the buildings themselves, and will limit the noise reverberating in the precinct".

Nueva Terrain, taking advantage of its more than 40 years experience in the sewer pipe market, and using the technology that have made it an exemplary firm in this field within the construction sector in Spain, has developed two excellent Soundproof Sewage Systems that provide a solution to potential noise problems in buildings.

These new systems are called SOUNDPROOF ECO and SOUNDPROOF PLUS. The former comes in a range of diameters ranging from 32 to 200 mm and the latter from 50 to 160 mm, with or without cross ventilation. The wide range of accessories, some of which are exclusive and patented, which make up the Terrain SDP systems, are: bends, connectors, joint sleeves, insert sleeves, etc, which allow the comprehensive, perfect installation of sewerage systems in hotels, hospitals, public venues, dwellings, etc.

Our painstakingly-designed accessories, all of which are high impact, their superior quality and the additives in our raw materials, the uniform thickness of our piping and components, and our manufacturing quality standards make the Terrain SDP Soundproof Drainage Systems some of the best noise reduction systems on the market, as has been shown by internationally prestigious laboratory tests.

The quality of the design and manufacturing of our piping and accessories, together with our excellent pre- and after-sales service, our technical department, documentation and in-house calculation programmes, make the Nueva Terrain SDP Soundproof Sewerage systems the best construction solution in today's market with its strict demands.



Reaction to fire

Nueva Terrain SDP Soundproof Sewerage systems have also been developed in compliance with the Spanish Building Code, on Basic Safety Requirements in the case of fire”, pursuant to the following premises:

1. That it is important to ascertain whether or not a material will contribute directly to the spread of a fire.
2. That the results of non-combustibility tests provide the information required, that they allow decision-makers to determine if the material in question is suitable for use in the building.
3. That consumers are entitled to be protected from risks that affect their safety.

CTE Royal Decree 312/2005

Classifies construction products and construction elements according to their reaction to fire and fire resistance, according to Royal Decree 312/2005, the adoption in Spain of the Construction Products Directive (CPD) 89/106/EEC, which is specified in the following standard:

- **UNE-EN 13501-1** Classification Of Construction Products And Building Elements

This standard defines “Reaction to fire” as the response of a product contributing with its own decomposition to a fire to which it is exposed, under specific conditions. It would be worth to remind that PVC-U is a self extinguished material. The potential contribution of a product to a fire depends not only on its intrinsic properties and those of the thermal attack, but also, to a great extent, on its final use application in the construction. Therefore, the product is tested in a manner that simulates its final use application.

Classes for reaction to fire	B Low speed of fire spread and heat emission	C Medium speed of fire spread and heat emission	D High speed of fire spread and heat emission	E Very high speed of fire spread and heat emission	F Without determined characteristic
SMOKE opacity classification (S)	S₁ Low quantity and speed of emission	S₂ Average quantity and speed of emission	S₃ High quantity or speed of emission		
Molten drip or flaming particle classification (d)	d₀ No flaming drips are produced	d₁ There are no molten drip particles with duration in excess of 10	d₂ High molten drip or particle classification		

Based on the above premises, the final results of the fire resistance tests performed on our sewage systems conducted at the AFITI-Licof laboratory in accordance with EN 13501-1:2002, are:

- **PVC-U - U Terrain Soundproof Eco system (grey-green colour): B-s1,d0**
- **PVC-U - U Terrain SDP Soundproof Plus system (brown colour): B-s1,d0**

The Euroclass obtained is the best that can be achieved by plastic systems, the classification of which is as follows:

- B:** Fire reaction rating. Our result: Low contribution to the spread of fire.
- S₁:** Smoke production rating. Our result: Low emission quantity or speed
- d₀:** Classification of flaming droplets. Our result: No flaming droplets are produced.

Informe de Clasificación nº 1417108-4
Hoja 1 de 5



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE CLASIFICACIÓN

Laboratorio de Reacción al Fuego

SOLICITANTE:
NUEVA TERRAIN S.L.

CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007

- Producto: Sistema de tubos y accesorio de PVC rígido
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP"

Informe de Clasificación nº 1521106-3
Hoja 1 de 5



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE CLASIFICACIÓN

Laboratorio de Reacción al Fuego

SOLICITANTE:
NUEVA TERRAIN S.L.

CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007

- Producto: Sistema de tubos y accesorio de PVC rígido.
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP INSOSORO PLUS"

Informe de Ensayo nº 1417108-2
Hoja 1 de 11



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE ENSAYO

Laboratorio de Reacción al Fuego

SOLICITANTE:
NUEVA TERRAIN S.L.

ENSAYO:
Ensayo de Resistencia al Fuego para productos de construcción excluyendo revestimientos de suelos expuestos al ataque térmico provocado por un único objeto ardiendo, según Norma UNE-EN 13823:2002.

- Material: Sistema de tubos y accesorio de PVC rígido.
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP"

Informe de Ensayo nº 1521108
Hoja 1 de 11



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE ENSAYO

Laboratorio de Reacción al Fuego

SOLICITANTE:
NUEVA TERRAIN S.L.

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- Material: Sistema de tubos y accesorio de PVC rígido.
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP INSOSORO PLUS"

Informe de Ensayo nº 1417108-3
Hoja 1 de 9



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE ENSAYO

Laboratorio de Reacción al Fuego

SOLICITANTE:
NUEVA TERRAIN S.L.

ENSAYO:
Ensayo de Resistencia al Fuego para productos de construcción. Determinación de la inflamabilidad cuando se somete a la acción directa de la llama según Norma UNE-EN ISO 11925-2:2002.

- Material: Sistema de tubos y accesorio de PVC rígido.
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP"

SEDE SOCIAL Y LABORATORIO:
 AFITI LICOF S.L. - LABORATORIO DE REACCIÓN AL FUEGO
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Informe de Ensayo nº 1521108-2
Hoja 1 de 9



AFITI LICOF Centro de Ensayos e Investigación del Fuego
Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios



ENAC ESPAÑA

INFORME DE ENSAYO

Laboratorio de Reacción al Fuego

SOLICITANTE:
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ENSAYO:
Ensayo de Resistencia al Fuego para productos de construcción. Determinación de la inflamabilidad cuando se somete a la acción directa de la llama según Norma UNE-EN ISO 11925-2:2002.

- Material: Sistema de tubos y accesorio de PVC rígido.
 - Fabricante: Nueva Terrain S.L.
 - Referencia: "TERRAIN SDP INSOSORO PLUS"

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Basic concepts regarding noise

Noise defined as “all unwanted sound” is a pollutant that can have a damaging effect on man. Some of these effects are merely physiological (loss of the ability to hear), interference with activities such as oral communication, distortion of sound and detrimental effects on performance at work.

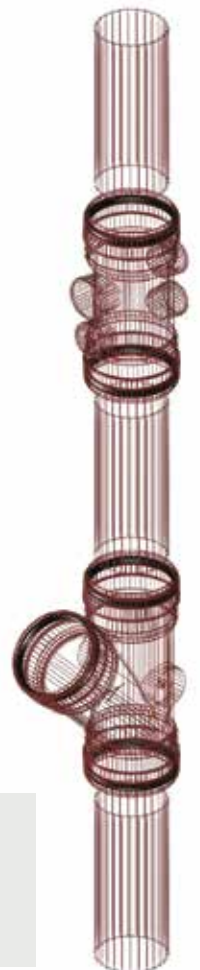
The entire population is exposed to some level of noise, but not everyone perceives the discomfort caused by noise in the same way. This depends on both the physical conditions of the noise itself as well as the subjective reaction of each individual. Generally speaking, it is accurate to say that below 20 dB of sound, nobody suffers any discomfort, but when noise levels exceed 80 dB, everyone suffers some discomfort.



DECIBELS	SUBJECTIVE PERCEPTION	BACKGROUND NOISE
0 20	Silence	Hearing threshold Level of sound study TV 
40 60	Not very noisy	Residential area at night Conversation 1 metre away 
80 100	Very noisy	Street with heavy traffic Inside a DC-6 plane 
120 140	Intolerable	Intolerable Car horn at 1 metre Aircraft taking off at 1 metre 

The human ear perceives the pressure generated by sound waves. Just as with all pressure, the unit of measurement is the Pascal (Pa), however, to measure the intensity of noise, the unit of measurement is the decibel (dB) which is calculated using the value of the pressure, and transforming it using logarithms.

It is interesting to note that a one decibel variation, for example, can cause a 12% variation in pressure and that a variation of three decibels doubles the intensity of the auditory sensation.



The noise emitted by sewage systems originates from the impact and constant striking of water and solid particles against the inside walls of the piping, especially the system's vertical pipes, couplers and joints. This impact causes vibrations to spread along the walls of the piping and the anchoring systems that transmit them to the structural elements to which they are attached. This noise is transmitted not only to the outside of the pipe, but also spreads along the inside, causing discomfort to the occupants of the homes above and below it.

Inside the building itself, noise has two basic components:

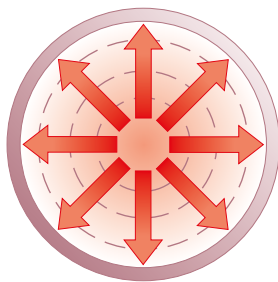
Airborne noise – this is merely the transmission of the sound wave from the source of the sound through the air to the person who perceives it.

Noise from impacts.- This is a sound wave caused by the vibratory excitation of structural elements as a consequence of an object striking it. The sound from the vibration must be reduced at the anchoring points using special clamps, fitted with a joint that guarantees sound insulation.

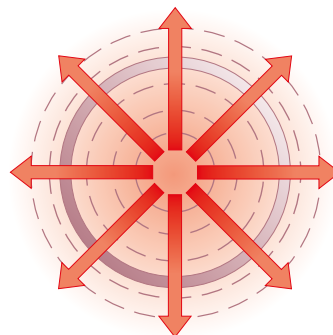
One of the possible sources of noise in a building are its plumbing installations, among which are the sewage systems. These systems are responsible for both airborne and impact noises. Water enters the system, descending and carrying air along with it, in a manner that both mix together, interfering with each other and hitting against the walls of the pipe. The oscillation induced in the pipe walls is transmitted along the sides as exterior noise, and it is also "re-routed" through the elements anchoring it to the structure of the building, propagating it as noise to the outside again. In this situation, the anchoring elements act as sound bridges.

In view of the phenomenon described, it is understandable that there are many variables capable of having an impact on the amount of noise reaching a room in a home: Descending drains, sewers (small sewerage), discharges from appliances, etc. Therefore, and as a general rule, the following aspects must be taken into account:

- The hydraulic characteristics of the discharge.
- The molecular structure, mass and thickness of the piping and components of the sewage system.
- The dimensions and configuration of the system
- The techniques used for installing and anchoring the system: Rigid or flexible joints, breakage of sound bridges, debarkation angles, etc.
- Construction elements: panel materials and their density, the location of descending pipes with respect to the most noise-sensitive rooms (descending zones), etc.



**SOUND PROOFED
TERRAIN SYSTEM**



CONVENTIONAL SYSTEM



Tests on the acoustic reaction of TERRAIN soundproofed evacuation systems

Terrain SDP ordered construction physics tests to be conducted at the Institute Fraunhofer in Stuttgart in compliance with norm EN 143655:2005, and achieved truly outstanding results in terms of noise reduction.

The tests performed at the Fraunhofer Institute are a reference in the soundproofed sewage system market, as is evident from the fact that practically all producers of these systems have had their tests conducted at the same laboratory.



Soundproof Plus System



Soundproof Eco System



Description of the test conducted

The Terrain SDP Soundproofed Sewerage Systems underwent tests in compliance with the requisites for the installation scheme and sewage volumes in EN 14366:2005.

The report issued by the Fraunhofer Institute states the following:

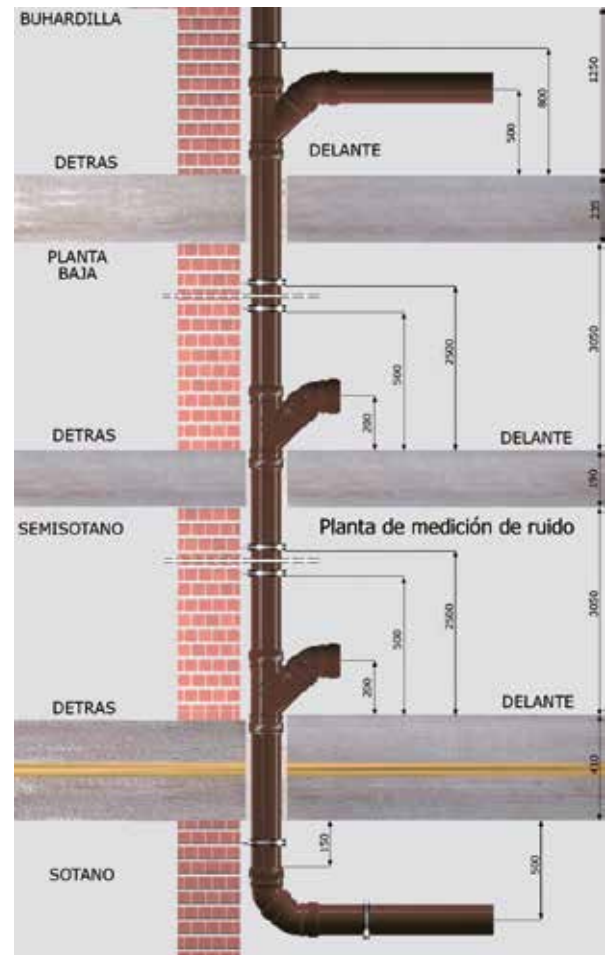
“Test centre: test centre for the P12 installation; mass per unit of wall area of the installation: 220 kg/m²; installation rooms: Basement, front semi-basement, front ground floor and attic; measurement room: Front semi-basement and rear semi-basement (details in annex P and in EN 14366:2005-2)”

The installation is carried out, according to the case, with 110 mm diameter piping, with a thickness of 5.3 mm for the Soundproof Plus System and with 110 mm diameter piping with a thickness of 3.2 mm for the Soundproof System. The accessories and the isophonic pipe clamps will be at 45° (as shown in the attached drawing). T

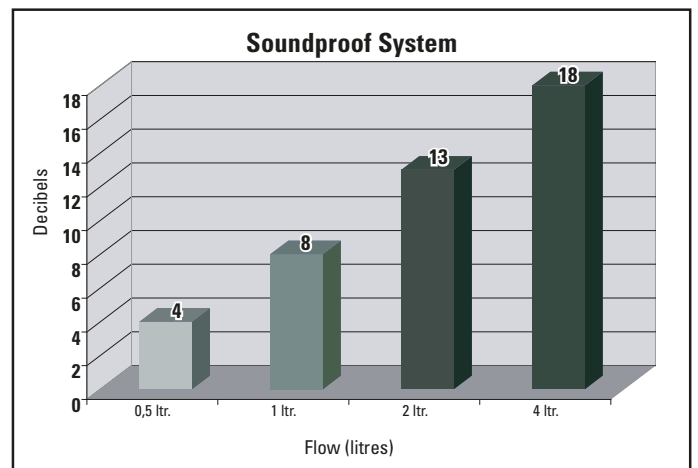
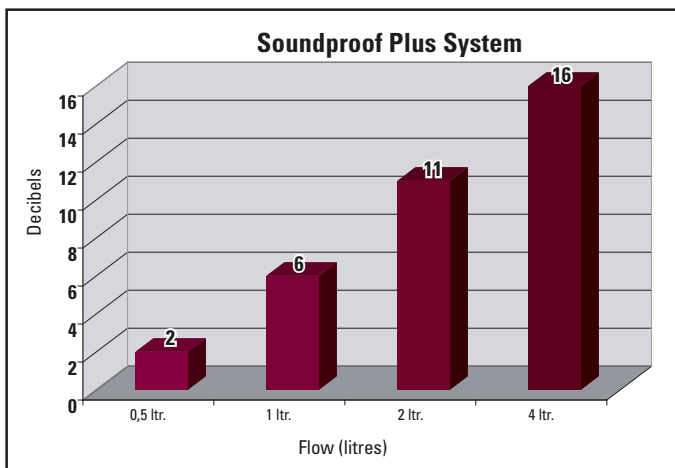
he stationary flow ratios used in the test are those set out below:

- Q = 0.5 l/s equivalent to Q = 30 l/min.
- Q = 1.0 l/s equivalent to Q = 60 l/min.
- Q = 2.0 l/s equivalent to Q = 120 l/min.
- Q = 4.0 l/s equivalent to Q = 240 l/min.

The noise measurement floor is the semi-basement (UG), frontal and rear zones, according to the requisites of EN 14366:2005-02.



Sound level in dB in the installation measured on the Semi-Basement Floor at the rear (UG rear) Indicated in the Fraunhofer reports





Manufacturing

Terrain SDP soundproof systems are based on the PVC-U technique, a material that has traditionally been recognised and used as the most suitable for sewerage installations, which contributes all its advantages to our products, making them: inert, insipid, rust proof, non-poisonous, hard-wearing, resistant to most chemical agents, with a low friction factor, scale free, low value elastic module, which nullify electrical conductivity.

Terrain SDP has modified this traditional PVC-U in the Soundproof Plus System by including a series of complex additives, meaning that the material maintains its regular characteristics but at the same time reacts better in terms of noise transmission, with a network of energy absorbing particles around the PVC-U that help absorb sound waves.

significantly lower levels of noise.

After several years of research and development and backed by Terrain SDP's extensive experience over the past 40 years as piping and PVC-U accessory manufacturers, and acknowledged on the market for their unequalled quality and design, these noise reduction systems give optimum performance.

Flexible joint system and 135° joints

Terrain SDP soundproof sewerage systems are assembled using flexible joints between the piping and accessories. Other materials must be used in this type of joint, because it is impossible to join them with glue. The Terrain SDP can be glued, because this is a PVC-U technique; however it is recommended flexible joints be used in order to break the transmission sound bridges, reduce the inherent "rigidity" of all installations, and ensure expansion and contractions, guarantee airtightness and facilitate installation.

All the components of the Terrain SDP soundproof system are manufactured with female openings, which include rubber seals. The small output joints from washbasins, bidets, bathtubs, etc, can be made using a small insert sleeve with a 40 or 50 mm diameter.



Terrain SDP Sewerage Systems reduce the use of insert sleeves to a minimum, as they are composed of male piping and female accessories.

The parts are made of the same material and thickness as the piping, and it is recommended the 135° components be used in order to reduce sound disturbances from flowing water.

Recommendations for installation

The new SOUNDPROOF Nueva Terrain system is one of the most highly effective sound insulating systems of the market. However, for the soundproof sewerage system to perform to the best of its abilities, it must be installed in compliance with a strict series of conditions:



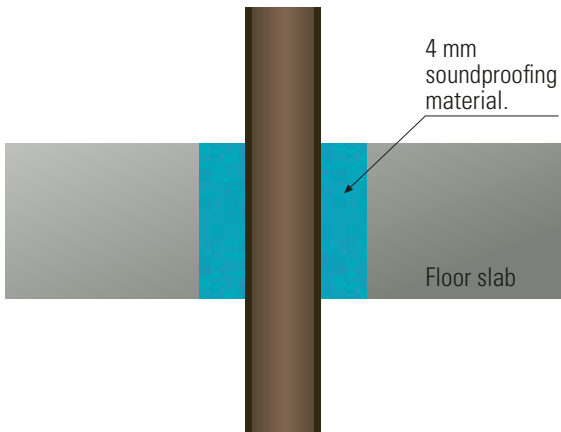
The descending joints must be made at 135° angles



Joints between the components and the pipes must be made with flexible seals.



The brackets or anchoring systems must be isophonic, containing rubber elements that break the sound bridges. Similar elements must be also be positioned where piping is anchored to outside or inside walls.



Where piping passes through floor or wall panels, these must be filled with insulation material at least 4 mm thick. The same is true for piping built into the wall. The surface weight of the wall that separates the piping from the area sensitive to noise must be at least 220 kg/cm².

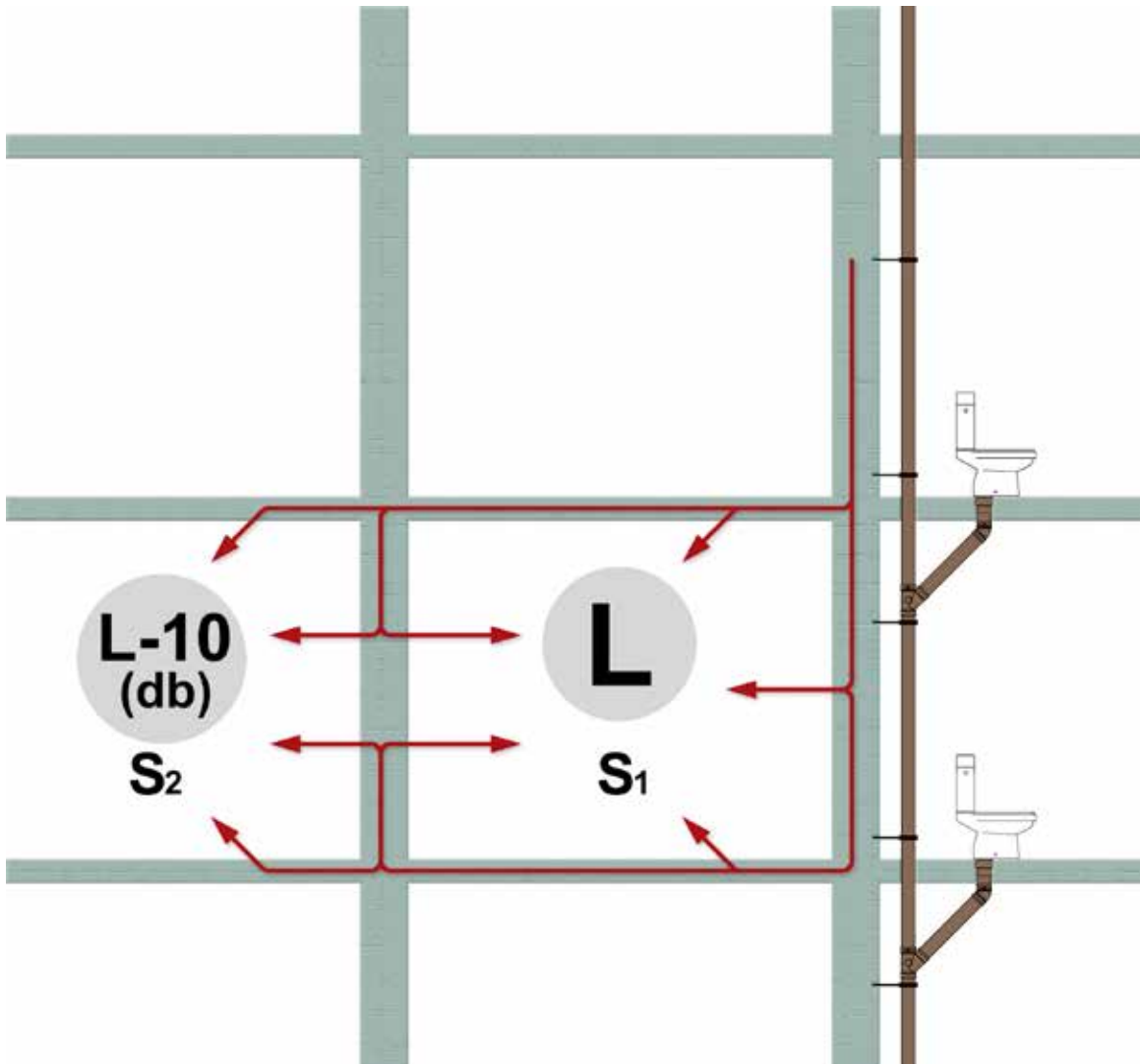
In transitions from vertical to horizontal, 92° couplers must not be used. The use of 135° couplers, joined together by a stretch of pipe approximately 20 cm long, that acts as a silencer is required.



When, for installation reasons, we need to install secondary ventilation, this will always be positioned over drains in both the kitchen and bathroom.



The noise-sensitive area and noise generating areas and installation panels must be located in a relatively advantageous position to each other. It is recommended that wet rooms be located on one side of the corridor, with the bedrooms on the other.



S_1 = No. 1 noise sensitive room

S_2 = No. 2 noise sensitive room

In noise-sensitive room one, there is a sound pressure level of L .

In noise-sensitive room two, there is a sound pressure level of $L-10$ (db).

Likewise, the rooms in the neighbouring homes should not have walls adjoining these wet rooms. Thus, for example, norm DIN 4109-2 requires positioning an area that is not sensitive to noise between the local noise generator and the area sensitive to noise, it is possible to achieve a reduction in sound pressure of around 10 dB, which is applicable to both airborne and structural noise.



Firewall sleeve (intumescent)

Why is this needed?

Given the fact that the majority of drainage and sanitary systems for sewage are made of plastic, we find ourselves faced with the need to supply this type of materials, with a product that prevents the spread of fire through a piping circuit. Spanish regulations, and the increasing awareness among developers, builders and installers of the need to comply with these (particularly with regard to commercial buildings, schools, hotels, etc) require structures that prevent the spread of fire. The network of PVC-U piping can be an element that spreads fire and smoke, therefore a type of firewall sleeve has been created which contributes to the possibility of sealing the building into airtight compartments.

What is an intumescent sleeve?

This consists of a specially designed metal band, lined inside with intumescent material. When the fire reaches a temperature of approximately 200°C, the intumescent material expands, strangling the PVC-U tube, sealing the gap effectively, and therefore preventing flames and smoke from passing through. Once the firewall sleeve has closed the gap, the area through which this pipe runs is protected from the spread of the fire during the time indicated by the manufacturer.



Due to the potential risks of fire in the buildings, protecting these against fire in the sanitary installations depends essentially on the height of the building, which exists between the ground surface and the top floor. In low rise buildings ≤ 7 metres, no specific requirements need to be complied with.

The exception to this is, when such buildings have a boiler room with a capacity of $> 50\text{Kw}$ or have a petrol tank with a capacity of $> 5,000$ litres. Measures must be taken in these buildings.

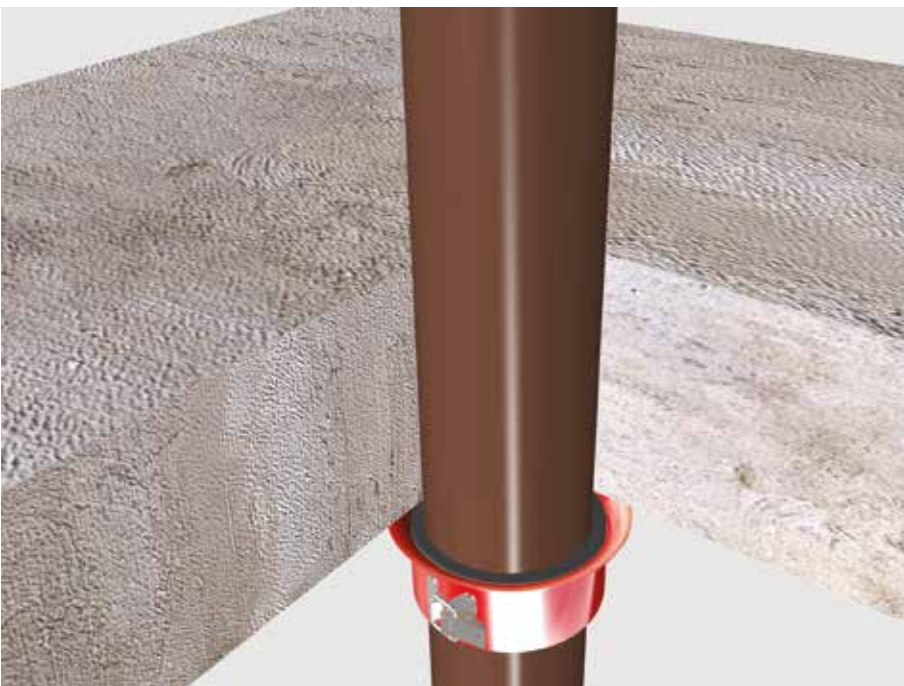
It must be remembered that in independent premises, firewall sleeves are positioned between their respective collectors.

Firewall Sleeve Installation

Before installing the coupler you have to take into account:



1. When these are installed in walls, a sleeve must be positioned on each side of the wall.



2. When these are installed in floors, only one sleeve need be positioned on the lower side of the floor.



To mount the firewall sleeve, follow these steps:

1. Remove the sleeve from the box and carefully place it around the PVC-U tube to protect it. Slide the collar over the tube until it touches the wall or ceiling where it is to be mounted (wall or floor slab).
2. Close the sleeve using the central closing flange.
3. Choose an appropriate position for the mobile fixtures, taking the characteristics of the location into account. Mark off and drill $\varnothing 6$ mm holes. Steel plugs are provided to fix them in place.
4. Apply pressure to the fittings and manually test the reliability of the installation.

Official Approval

Nueva Terrain intumescent sleeves are homologated to conform to the pioneering British standard BS 476. "Fire tests on building materials and structures". This law regulates the methods used to determine fire resistance in different construction elements. Nueva Terrain firewall sleeves have been tested according to this law by the Warrington FIRE Research Investigation Centre, certifying their integrity to resist fire for 240 minutes (180 minutes for the $\varnothing 200$ mm.)

Heat conditions

Terrain firewall sleeves can be used for environmental temperatures from -25 °C to $+80$ °C.

Available range

Terrain supplies firewall sleeves from $\varnothing 83$, 110, 125, 160 and 200 mm.

In the case of a fire, the PVC-U tube will soften and warp. Also, the inside of the sleeve will expand by 12 times its volume when it reaches 130° , causing the tube to restrict in a few seconds and preventing the release of smoke or flames from inside the tube to another location.



General Conditions

GUARANTEE

Our guarantee solely and exclusively covers the replacement of the defective material or part once the client has carried out the tests required by the conditions and the defect has been reviewed and accepted by our technical department. Any incorrect handling or use other than that for the purpose for which it was designed automatically voids the guarantee.

DISCLAIMER

We reserve the right to make any type of modification to the design and dimensions in our products without prior notice.

JURISDICTION

To resolve disputes which may arise from the application of these standards, NUEVA TERRAIN, S.L. and the customer agree to be bound to the courts and tribunals of Vitoria – Álava – España, renouncing all other applicable codes of law.

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