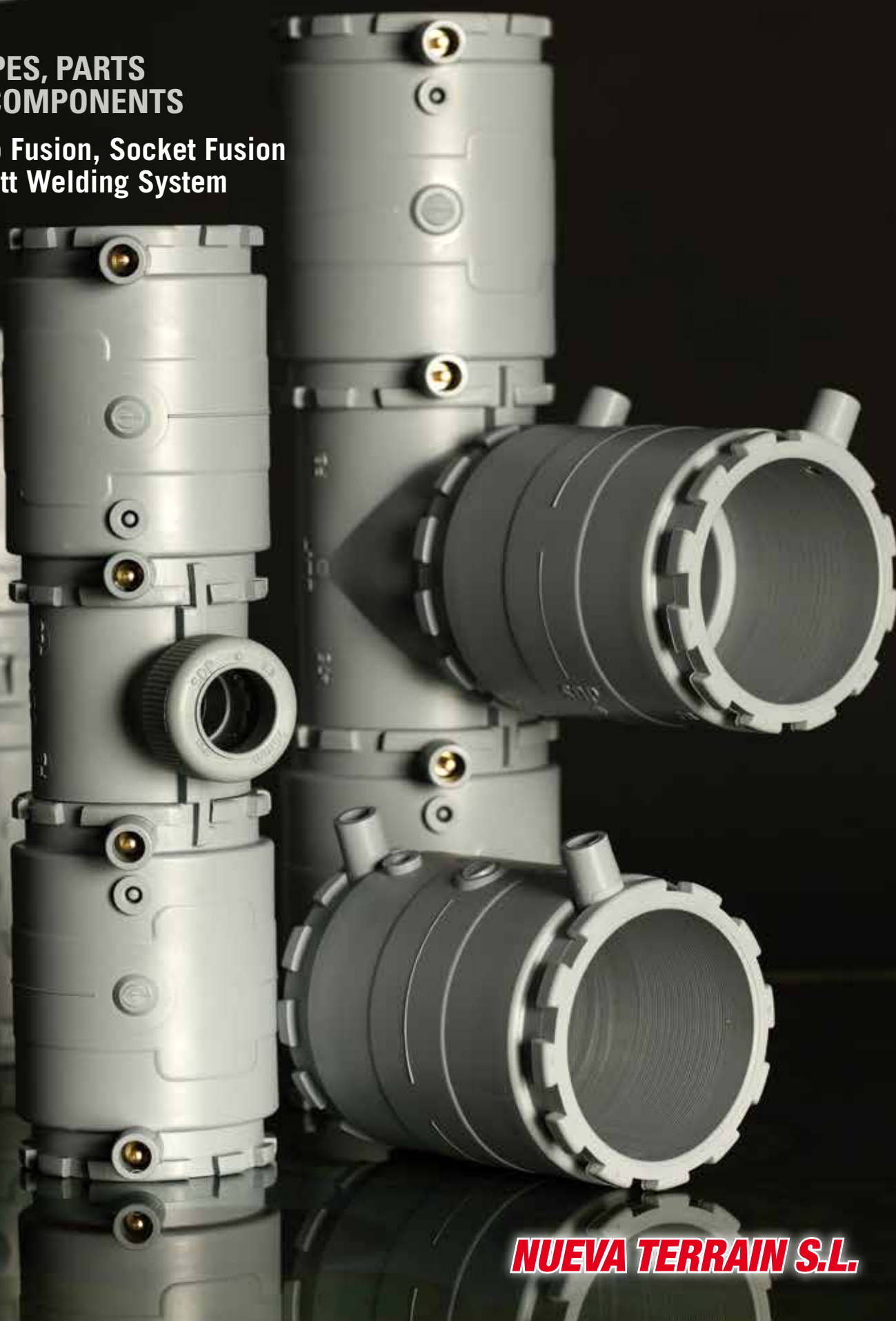




SDP

**PB PIPES, PARTS
AND COMPONENTS**

**Electro Fusion, Socket Fusion
and Butt Welding System**



NUEVA TERRAIN S.L.

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As part of its on-going research programme, **NUEVA TERRAIN**, the Spanish market leading manufacturer of PVC and Polybutylene (PB) parts and components with Push-Fit and Socket Fusion ranges, has developed the end part of the PB system- **PB BUTT WELDING AND ELECTROFUSION**.

This new line of products means that **NUEVA TERRAIN** can now offer a widest range of systems on the market, all manufactured to the highest quality standards.

The technical information, certification and other characteristics are set out in detail in this brochure.



NUEVA TERRAIN



Electro Fusion System





Pipes



STRAIGHT PIPES

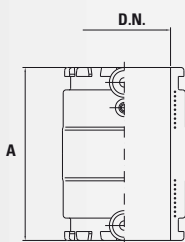
REFERENCE	DIAMETER	THICKNESS mm.	PIPE WEIGHT kg.	MATERIAL	TOTAL PIPE LENGTH m.
TFC.058.063	63	5,8	5,783	PB	5,80
TFC.058.075	75	6,8	8,033	PB	5,80
TFC.058.090	90	8,2	11,582	PB	5,80
TFC.058.110	110	10,0	17,690	PB	5,80
TFC.058.125	125	11,4	23,23	PB	5,80
TFC.058.160	160	14,6	37,90	PB	5,80

Classification according to classes : ISO 10508: Class 1/10 Bar – Class 2/10 Bar – Class 4/ 10 Bar – Class 5/8 Bar (Nominal pressure DIN 16969: PN 16).



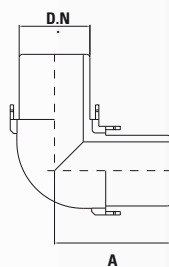


Polybutylene "PB" Parts



ELECTROFUSION SOCKET

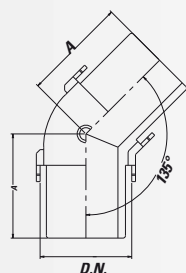
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC7.001.063	63	211,0	PB	116
FC7.001.075	75	282,0	PB	128
FC7.001.090	90	442,0	PB	144
FC7.001.110	110	680,0	PB	160
FC7.001.125	125	1.180,0	PB	180
FC7.001.160	160	-	PB	201



90° ELBOW

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.005.063.090	63	266,0	PB	103,5
FC6.005.075.090	75	380,0	PB	116,5
FC6.005.090.090	90	600,0	PB	133,5
FC6.005.110.090	110	960,0	PB	154,0
FC6.005.125.090	125	1.375,0	PB	167,0
FC6.005.160.090	160	-	PB	197,5

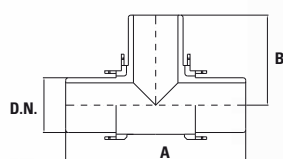
Electrofusion socket and butt welding fittings sold separately.



45° ELBOW

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.005.063.045	63	190,0	PB	83,0
FC6.005.075.045	75	282,6	PB	89,0
FC6.005.090.045	90	447,0	PB	102,0
FC6.005.110.045	110	765,0	PB	115,0
FC6.005.125.045	125	1.037,0	PB	125,0

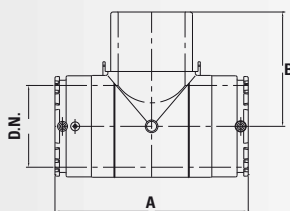
Electrofusion socket and butt welding fittings sold separately.



EQUAL TEE

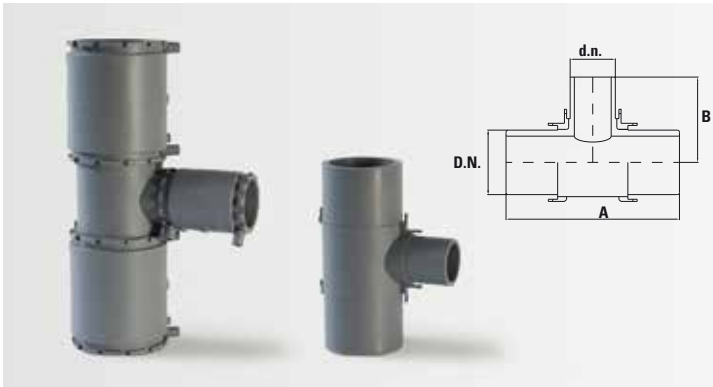
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A	B
FC6.010.063	63	290,0	PB	207	103,5
FC6.010.075	75	600,0	PB	233	116,5
FC6.010.090	90	803,0	PB	267	133,5
FC6.010.110	110	1.359,0	PB	307,5	154,0
FC6.010.125	125	1.833,0	PB	334	167,0
FC6.010.160	160	-	PB	395	197,5

Electrofusion socket and butt welding fittings sold separately.



ELECTRIC SOCKET TEE

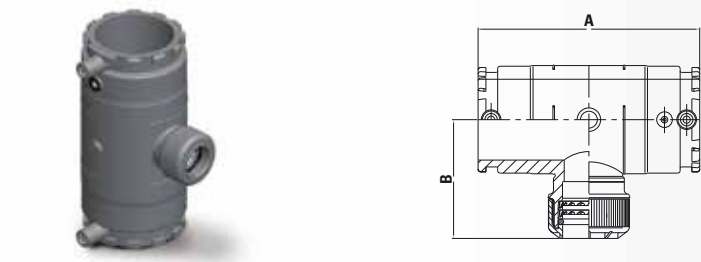
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC7.010.063.003	63	407,5	PB	103,60
FC7.010.075.003	75	658,0	PB	116,60
FC7.010.090.003	90	1033,0	PB	134,80
FC7.010.110.003	110	-	PB	153,80



REDUCED TEE

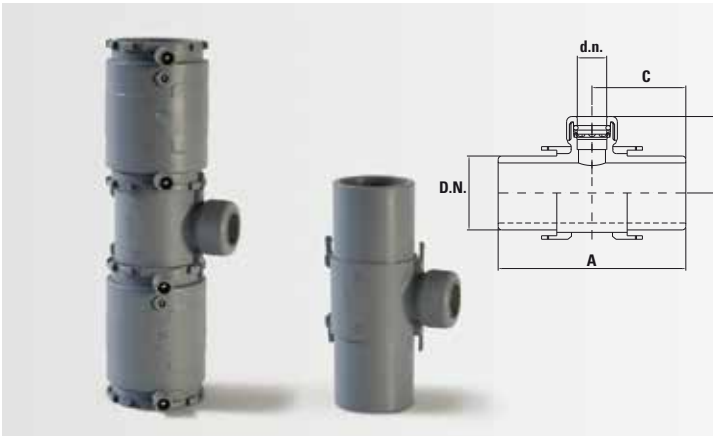
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A	B
FC6.013.090.063	90x63x90	600,0	PB	242	119
FC6.013.110.063	110x63x110	854,0	PB	258	132

Electrofusion socket and butt welding fittings sold separately.



E-FUSION REDUCED TEE TO PUSH FIT

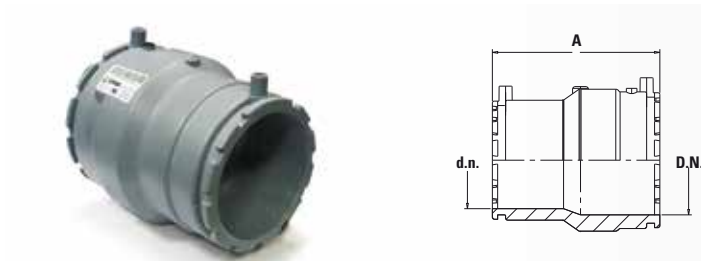
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A	B
FC7.013.063.025	63x25x63	354,0	PB	170	71
FC7.013.063.040	63x40x63	494,0	PB	170	91



REDUCED TEE TO PUSH FIT

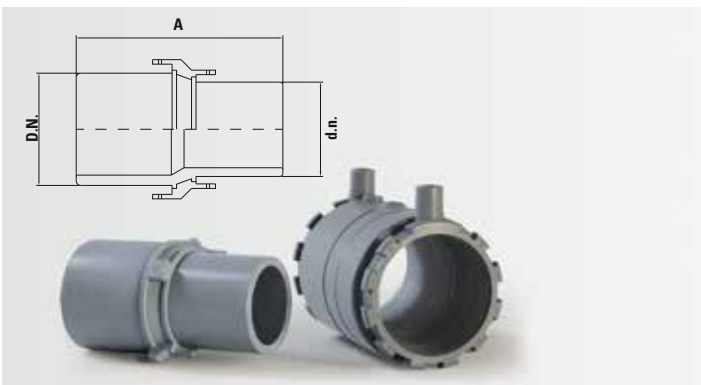
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A	B
FC6.013.063.025	63x25x63	183,0	PB	176	65

Electrofusion socket and butt welding fittings sold separately.



E-FUSION REDUCED SOCKET

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC7.002.125.110	125x110	1.055,0	PB	190

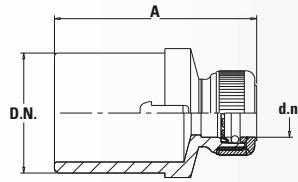


REDUCED SOCKET

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.002.075.063	75x63	386,0	PB	138
FC6.002.090.063	90x63	443,0	PB	146
FC6.002.090.075	90x75	558,0	PB	152
FC6.002.110.063	110x63	544,0	PB	154
FC6.002.110.075	110x75	661,0	PB	160
FC6.002.110.090	110x90	885,0	PB	168
FC6.002.160.125	160x125	-	PB	245

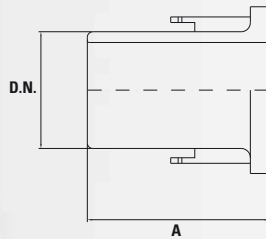
Electrofusion socket and butt welding fittings sold separately always for smaller diameter.

EN ISO 15876- 21,9 bar (in countries that are ruled by DIN 169691 – PN 16)



REDUCED SOCKET TO PUSH FIT

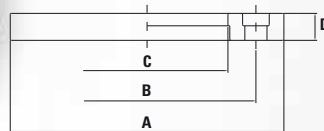
REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.002.063.025	63x25	117,0	PB	106,0
FC6.002.063.032	63x32	139,0	PB	112,0
FC6.002.063.040	63x40	253,0	PB	118,0
FC6.002.063.050	63x50	289,0	PB	113,8



FLANGE ADAPTER

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.032.063.001	63	139,0	PB	98
FC6.032.075.001	75	205,0	PB	104
FC6.032.090.001	90	309,0	PB	112
FC6.032.110.001	110	465,0	PB	120
FC6.032.125.001	125	702,0	PB	140
FC6.032.160.001	160	-	PB	180

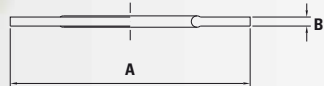
Every reference must be acquired by his corresponding socket.



BACKING FLANGE PN16

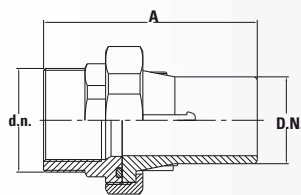
REFERENCE	DIAMETER	UNIT WEIGHT grams	TORNILLOS	A	B	C	D
FC6.032.063.002	63	940,0	M 16 x 90 (4)	171	125	78	20
FC6.032.075.002	75	1340,0	M 16 x 90 (4)	191	145	92	21
FC6.032.090.002	90	1.400,0	M 16 x 90 (8)	208	160	110	21
FC6.032.110.002	110 - 125*	1.560,0	M 16 x 90 (8)	226	180	133	22
FC6.032.160.002	160	-	M 20 x 140 (8)	296	240	188	27

*The flange ø110 is the same as for ø125



FLANGE RING

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A	B
FC6.032.063.003	63	41,0	EPDM	106	4
FC6.032.075.003	75	54,0	EPDM	125	5
FC6.032.090.003	90	60,0	EPDM	141	5
FC6.032.110.003	110	83,0	EPDM	161	5
FC6.032.125.003	125	158,0	EPDM	161	6
FC6.032.160.003	160	-	EPDM	218	6



MALE-MALE SOCKET ADAPTER

REFERENCE	DIAMETER	UNIT WEIGHT grams	MATERIAL	A
FC6.031.063	63 - 2"	1.372,7	PB - METAL	155,0
FC6.031.075	75 - 2 1/2" (F) - 3" (M)	2.086,0	PB - METAL	161,0
FC6.031.090	90 - 3" (F) - 3 1/2" (M)	2.620,0	PB - METAL	169,0

EN ISO 15876- 21,9 bar (in countries that are ruled by DIN 169691 – PN 16)



Socketfusion System



Pipes



STRAIGHT PIPES

REFERENCE	DIAMETER	WALL THICKNESS mm.	PIPE WEIGHT kg.	MATERIAL	TOTAL PIPE LENGTH m.
• TFC.058.016.025	16 (1)	2,2	551	PB	5,80
• TFC.058.020.020	20 (1)	2,3	737	PB	5,80
• TFC.058.025	25 (1)	2,3	928	PB	5,80
• TFC.058.032	32 (2)	2,9	1.508	PB	5,80
• TFC.058.040	40 (2)	3,7	2.378	PB	5,80
• TFC.058.050	50 (2)	4,6	3.654	PB	5,80
• TFC.058.063	63 (2)	5,8	5.783	PB	5,80



PIPES IN COILS

REFERENCE	DIAMETER	WALL THICKNESS mm.	PIPE WEIGHT kg.	MATERIAL	TOTAL PIPE LENGTH m.
• TFC.100.016.025	16 (3)	2,2	9.800	PB	100,00
• TFC.050.016.025	16 (3)	2,2	4.900	PB	50,00
• TFC.050.020.020	20 (3)	2,3	6.355	PB	50,00
• TFC.036.025	25 (3)	2,3	5.760	PB	36,00

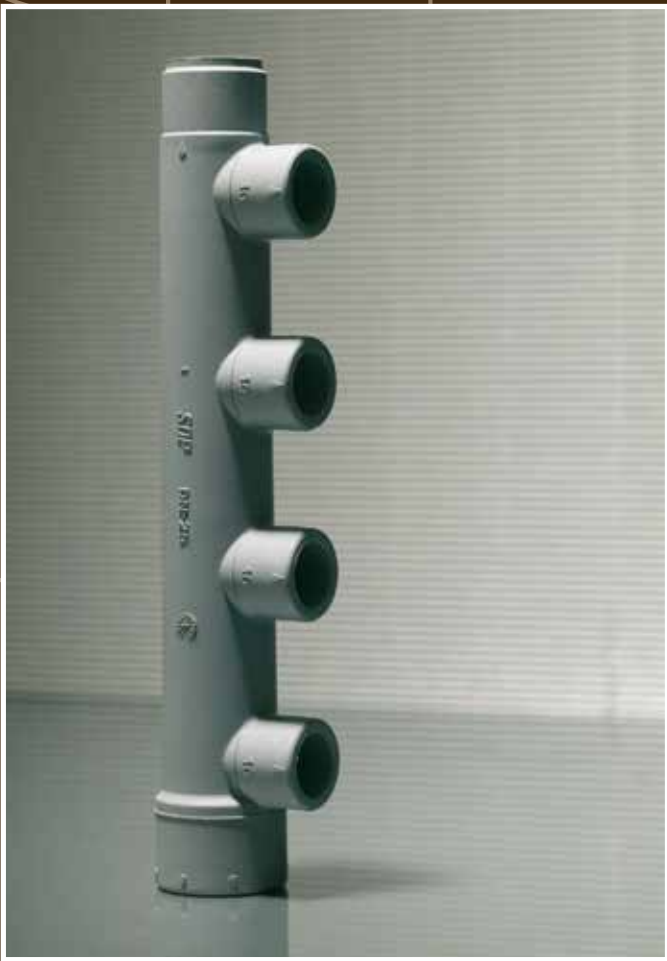
[1] For pipes on straight stretches curvatures of a radius no less than 10 times the exterior diameter of the tube are permissible.

[2] For lengths of pipes, it is permitted curves which radius is not less than 15 times the external diameter of the pipe.

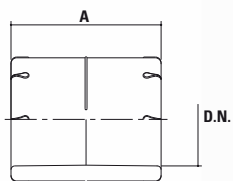
[3] Not less than 8 times of the external diameter of the pipe.

Classification according to classes: ISO 10508: Class 1/10 Bar - Class 2/10 Bar - Class 4/10 Bar - Class 5/8 Bar -
(Nominal pressure according DIN 16969: PN 16)

- AENOR certified pipes.

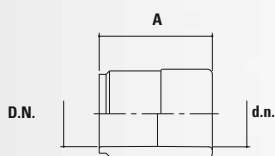


Polybutylene "PB" Parts



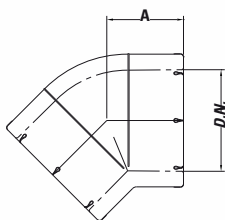
PIPE SOCKET

REFERENCE	DIAMETER D.N. x d.n.	UNIT WEIGHT grams	MATERIAL	A
FC4.001.016	16	6,0	PB	33,00
FC4.001.020	20	7,0	PB	33,00
FC4.001.025	25	12,5	PB	39,00
FC4.001.032	32	22,5	PB	43,00
FC4.001.040	40	38,5	PB	48,00
FC4.001.050	50	67,5	PB	54,00
FC4.001.063	63	125,0	PB	60,00



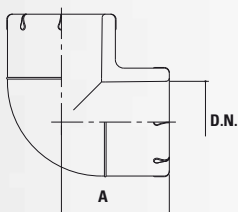
M-F REDUCER

REFERENCE	DIAMETER D.N. x d.n.	UNIT WEIGHT grams	MATERIAL	A
FC4.002.020.016	20x16	5,5	PB	30,00
FC4.002.025.016	25x16	6,5	PB	33,00
FC4.002.025.020	25x20	6,5	PB	33,00
FC4.002.032.025	32x25	12,5	PB	40,00
FC4.002.040.025	40x25	18,9	PB	46,00
FC4.002.040.032	40x32	20,0	PB	42,00
FC4.002.050.032	50x32	40,5	PB	52,50
FC4.002.050.040	50x40	40,5	PB	55,00
FC4.002.063.040	63x40	56,5	PB	59,00
FC4.002.063.050	63x50	68,0	PB	58,00



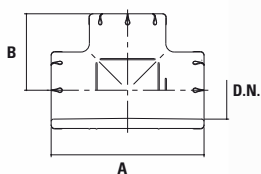
45° ELBOW

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.005.032.045	32	-	PB	29,0
FC4.005.040.045	40	-	PB	33,0
FC4.005.050.045	50	-	PB	37,0



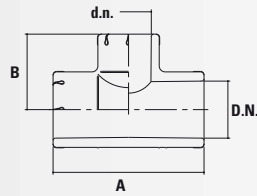
90° ELBOW

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.005.016.090	16	8,5	PB	25,0
FC4.005.020.090	20	12,0	PB	28,0
FC4.005.025.090	25	19,5	PB	32,0
FC4.005.032.090	32	36,0	PB	38,0
FC4.005.040.090	40	64,0	PB	44,0
FC4.005.050.090	50	114,5	PB	51,0
FC4.005.063.090	63	219,0	PB	62,0



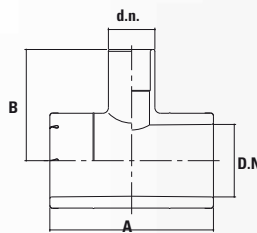
EQUAL TEE

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC4.010.016	16	11,5	PB	50,0	25,0
FC4.010.020	20	16,0	PB	56,0	28,0
FC4.010.025	25	25,0	PB	64,0	32,0
FC4.010.032	32	47,0	PB	76,0	38,0
FC4.010.040	40	83,0	PB	88,0	44,0
FC4.010.050	50	144,0	PB	102,0	51,0
FC4.010.063	63	280,0	PB	124,0	62,0



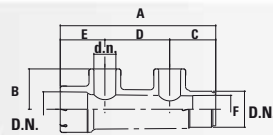
REDUCED TEE

REFERENCIA	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC4.013.020.016	20x16x20	18,0	PB	56,0	28,0
FC4.013.025.016	25x16x25	26,0	PB	64,0	32,0
FC4.013.025.020	25x20x25	24,0	PB	64,0	32,0
FC4.013.032.016	32x16x32	44,0	PB	76,0	38,0
FC4.013.032.020	32x20x32	42,0	PB	76,0	38,0
FC4.013.032.025	32x25x32	44,0	PB	76,0	38,0
FC4.013.040.025	40x25x40	77,0	PB	88,0	44,0
FC4.013.050.025	50x25x50	132,0	PB	102,0	51,0
FC4.013.063.025	63x25x63	255,0	PB	124,0	62,0



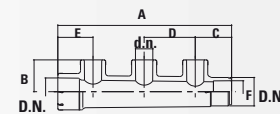
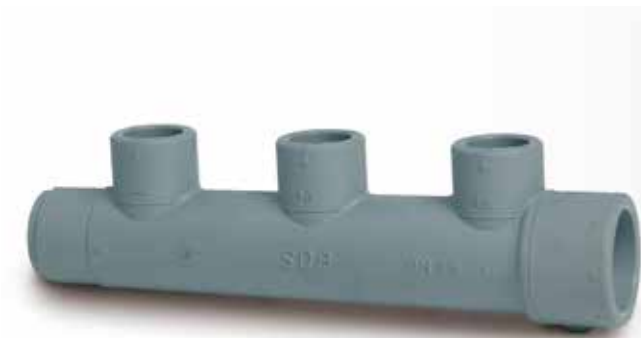
REDUCED TEE (FxmxF)

REFERENCIA	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC4.019.040.025	40x25x40	75,0	PB	88,0	57,0
FC4.019.050.025	50x25x50	128,0	PB	102,0	63,5



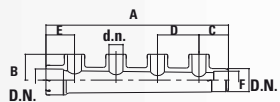
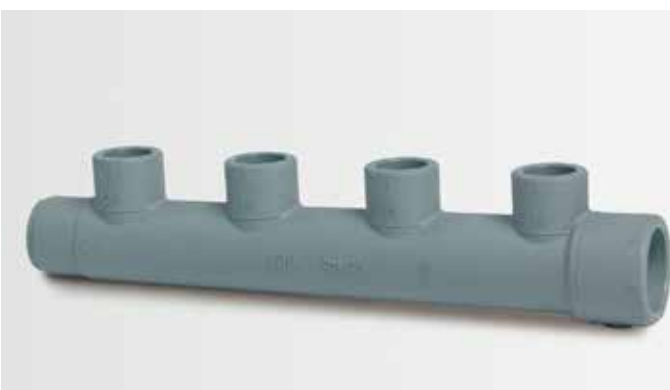
TWO OUTLET MANIFOLD

REFERENCIA	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B	C	D	E	F
FC4.015.025.016	25x16x16x25	34,5	PB	108,0	28,0	32,0	45,0	31,0	20,0



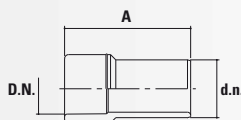
THREE OUTLET MANIFOLD

REFERENCIA	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B	C	D	E	F
FC4.017.025.016	25x16x16x16x25	50	PB	153,0	28,0	32,0	45,0	31,0	20,0



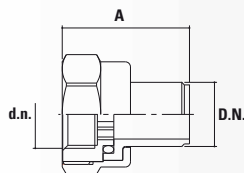
FOUR OUTLET MANIFOLD

REFERENCIA	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B	C	D	E	F
FC4.018.025.016	25x16x16x16x25	65,5	PB	198,0	28,0	32,0	45,0	31,0	20,0
FC4.018.032.016	32x16x16x16x32	93,0	PB	200,0	32,0	35,0	45,0	30,0	25,0



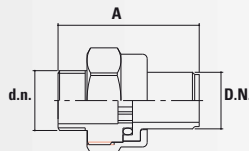
SOCKET FUSION REDUCED SOCKET

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.029.016.015	16x15	7,0	PB	47,5
FC4.029.020.022	20x22	10,0	PB	47,5



TRANSITION FROM SOCKET FUSION (M) TO THREADED (F)

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.030.016	16x1/2"	80,5	Brass-PB	41,0
FC4.030.020	20x1/2"	128,0	Brass-PB	41,0
FC4.030.025	25x3/4"	175,5	Brass-PB	49,5



TRANSITION FROM SOCKET FUSION (M) TO THREADED (M)

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.031.016	16x1/2"	110,0	Brass-PB	52,0
FC4.031.020	20x1/2"	155,0	Brass-PB	52,0
FC4.031.025	25x3/4"	226,5	Brass-PB	62,5



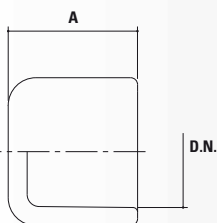
ADAPTOR UNION SOCKET- FEMALE THREAD

REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL
FC6.033.032	32x1"	-	Brass
FC6.033.040	40 x 1/4"	361,0	Brass
FC6.033.050	50 x 1/4"	498,0	Brass
FC6.033.063	63 x 1/2"	1.876,0	Brass



ADAPTOR UNION SOCKET - MALE THREAD

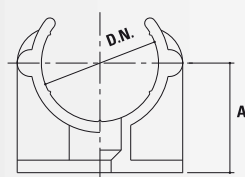
REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL
FC6.035.032	32x1"	-	Brass
FC6.035.040	40 x 1/4"	407,0	Brass
FC6.035.050	50 x 1/4"	569,0	Brass
FC6.035.063	63 x 1/2"	-	Brass



END CAP

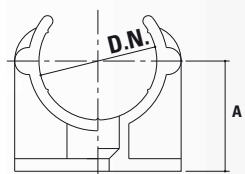
REFERENCE	DIAMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC4.041.016	16	4,0	PB	22,0
FC4.041.020	20	6,5	PB	24,0
FC4.041.025	25	9,0	PB	28,0
FC4.041.032	32	15,5	PB	32,0
FC4.041.040	40	33,0	PB	38,0
FC4.041.050	50	57,0	PB	44,0
FC4.041.063	63	107,0	PB	50,0

EN ISO 15876- 21,9 bar (in countries that are ruled by DIN 169691 – PN 16)



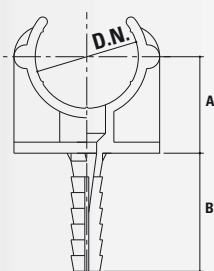
PIPE CLIP

REFERENCE	NOMINAL DIAMETER mm.	WEIGHT grs.	MATERIAL	A
FC.065.015.010	15	2,0	POLIPROP.	18,0
FC.065.020.010	20	3,0	POLIPROP.	20,5
FC.065.025.010	25	4,0	POLIPROP.	24,5
FC2.065.032.010	32	9,0	POLIPROP.	-
FC2.065.040.010	40	10,1	POLIPROP.	-
FC2.065.050.010	50	12,6	POLIPROP.	-



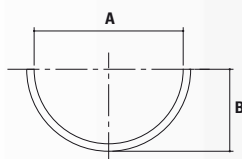
PIPE CLIP WITH LOCK

REFERENCE	DIÁMETER mm.	UNIT WEIGHT grams	MATERIAL	A
FC 065.015	16	5,3	POLIPROP.	19,00
FC 065.020	20	6,7	POLIPROP.	22,00
FC 065.025	25	7,3	POLIPROP.	24,50
FC 065.032	32	9,3	POLIPROP.	28,00
FC 065.040	40	13,0	POLIPROP.	32,00
FC 065.050	50	18,0	POLIPROP.	37,00



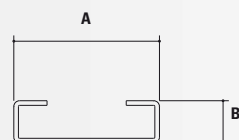
PIPE CLIP WITH BUILT-IN PLUG FOR PIPE

REFERENCE	DIÁMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC.065.015.000	15	3,0	POLIPROP.	18,0	30,0
FC.065.020.000	20	4,0	POLIPROP.	21,0	30,0
FC.065.025.000	25	5,0	POLIPROP.	25,0	30,0



CONTINUOUS PIPE SUPPORT

REFERENCE	DIÁMETER mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC.077.020	20x2000	520	I.G.	24,0	11,0
FC.077.025	25x2000	630	I.G.	29,0	18,0
FC.077.032	32x2000	720	I.G.	34,0	17,0
FC.077.040	40x2000	830	I.G.	42,0	21,0
FC.077.050	50x2000	1000	I.G.	52,0	26,0
FC.077.063	63x2000	1037	I.G.	65,0	33,5
FC.077.075	75x2000	1039	I.G.	77,0	38,5
FC.077.090	90x2000	1700	I.G.	95,0	26,0
FC.077.110	110x2000	2040	I.G.	107,0	34,0



PIPE CLIP RAIL

REFERENCE	mm.	UNIT WEIGHT grams	MATERIAL	A	B
FC.065.003	20x40x2000	620	I.G.	20,0	10,0



Tools



PIPE CUTTER

REFERENCE	DIAMETER	UNIT WEIGHT Kg.
FC.078.050.127	50 a 125	1,63



PIPE CUTTER (Ø TO 28 mm.)

REFERENCE	DIAMETER	WEIGHT grs.	MATERIAL
FC.073	0 a 28	110	PLASTIC



PIPE CUTTER (Ø TO 28 mm.)

REFERENCE	DIAMETER	WEIGHT grs.	MATERIAL
FC.074	0 a 28	294	METALLIC



ELECTROFUSION MACHINE (MANUAL, OPTIC READER)

REFERENCE	DIAMETER	UNIT WEIGHT Kg.	MEASUREMENTS
FC 7.090	UNIVERSAL DE 8 - 48V	20,0	116 x 220 x 119



PIPE PEELER

REFERENCE	DIAMETER	UNIT WEIGHT Kg.
FC7.092	50 a 160	4,20



Technical Manual





Nueva Terrain works continuously to offer its clients and the market integral solutions for the widest variety of facilities. The company has now developed its own, homologated, comprehensive, large diameter water supply system. After conducting lengthy research and performing thorough tests, NUEVA TERRAIN is now manufacturing and supplying its own polybutylene system, with diameters ranging between 63 and 160 mm. This represents a significant technological innovation.

This new system is compatible with standard tools found in other types of installations, such as gas and hot water supply. This enables it to contribute a unique solution in the sector, which is compatible with the equipment and joint tools already available in the market.



The SDP Terrain Polybutylene catalogue now includes diameters of up to 160 mm, and comes with a range of accessories compatible with the two standard joint systems: butt joints and 40 volt electro fusion joints. In line with the strategy on which our company has been founded, these are manufactured using the best material on the market. Polybutylene, with a standard, simple and reliable joint system ensures a product with unbeatable qualities for these applications. The system is therefore classified as Class 2 with a working pressure up to 10 bar according to ISO 10508, which is the highest possible for this type of installation. This means that the system is designed to withstand continuous operating temperatures of 70°C and a pressure of 10 bars, for a useful life of 50 years, with security coefficients defined by international standards. We have chosen an optimum system, to provide our customers with installations that meet increasingly demanding construction standards, particularly those governing resistance to treatments set out in the law for the prevention of Legionnaires disease. When you choose the Terrain SDP system, you can be sure you are installing a product that provides optimum performance according to the demands of the standards for different products used in cold and hot water, heating and cooling systems.



In addition to the above, the technical and commercial support of our staff and from a company with more than 40 years in the market, and the comprehensive nature of our research, development, design, manufacturing control process for all our products mean support and guarantees for Nueva Terrain customers. The safety and reliability of our system are guaranteed. Our customers' questions, enquiries or problems are immediately referred to our technical department, which has developed and manufactured the product, making them the right experts to provide you with the answers and solutions you need.

Our company's history, professionalism and approachability are essential elements of our desire to collaborate with the market we supply. This direct relationship enables us to continue to grow guided by our customers' demands and suggestions which will be more than happy to answer. It is in line with this philosophy that this new system is launched, as well as a multitude of other products and solutions that make up the largest product catalogue in our sector.

This large, 160 mm diameter system has been chosen to enable all types of installations to be supplied. No larger dimensions have been considered on the basis that these would cause the installation to become excessively dependent on a single supply point, so in these cases designs involving multiple rings of smaller diameters have been selected.

Application and characteristics

The characteristics of the pipes and fittings manufactured in Polybutylene (PB), a unique, homogeneous plastic material, make it suitable for piping an extremely wide range of liquids. Its inert nature makes it impervious to attacks from weak acids, alkalines and dissolvents, making it a suitable substitute for metal installations that become oxidised by such substances. For further information, see the table which sets out resistance to chemical agents or contact our technical department, which will be able to answer any questions you might have about piping fluids other than water.

The aforementioned inert quality of this materials also means that the useful life of PB installations is far lengthier than those of metal, especially in the case of hard water.

With regard to the above, PB is excellent in terms of hygiene, and holds certificates for carrying drinking water in many countries. The organoleptic and migration tests conducted satisfy international requirements, as well as the European Directive on Water Quality for human consumption, which was included in Spanish Law by the passing of Royal Decree Law 140/2003, of 7 February.



The system characteristics, according to the bivalence of the joint systems and the materials used for manufacturing the system are summarised below:

- **Versatile:** Adapts to different joint systems and solutions for different types of system existing on the market.
- **Standard:** The tools required for both types of joint are on the market and common to the other systems existing on the market.
- **Quality:** The whole system is designed, produced, tested and certified according EN ISO 15876.



- **Market leader in Resistance:** The Terrain SDP system is defined as Class 2 /10 bar pressure. This is 10 bar pressure designed for continuous temperature of 70°C and a useful life of 50 years. This classification is the highest included in the standards and makes it the market leader, thanks to the excellent characteristics of the material (polybutylene) and the specific design of the unions to withstand these conditions.
- **Complete, homogeneous range:** The large diameter Terrain SDP water supply system is manufactured entirely in polybutylene, the best performing material among those homologised. With a wide range of accessories and pipes for a large variety of construction solutions, our catalogue is constantly updated to meet the changing demands of the market.
- **Diverse, integrated applications:** The comprehensive Nueva Terrain system, which includes Push-Fit joint systems and socketfusion for smaller diameters, makes it the best available on the market, guarantees an installation from a sole provider and a single material. This makes it ideal for public buildings, hospitals, hotels, residential homes, schools, sports and religious installations... as well as industrial facilities and boats. The range and its characteristics make it ideal for cold and hot water, centralised air conditioning, heating and cooling systems.
- **Low elasticity module:** Polybutylene has a lower elastic module than the other materials for this application. This makes it the most flexible, and beyond the advantages this means for handling it on site, it has also excellent qualities: more resistance to impact, the generation of forces on dilatations are very low (in specific situations, even without the need to construct blows), resistant to freezing and reduction of water hammering effect.
- **Low thermal conductivity coefficient:** This means less heat loss and less likelihood of condensation on the outer surface of the pipes.
- **Hygienic:** Organoleptic and migration studies in several European institutes prove that it has no effects on water for human consumption. The absence of corrosion and lime scale deposits means water is piped in optimum conditions.
- **Low noise transmission:** The material's aforementioned elastic module makes these pipes excellent noise insulators, which leads to more comfortable installations.
- **Legionnaire's disease:** Polybutylene is the ideal material for fighting against Legionnaire's disease. Because of its resistance to chemical substances and high temperatures, the treatments demanded by Royal Decree Law 865/2003 for disinfection can be applied without any risk of damaging the installations. The absence of corrosion in plastic materials hinders the formation of a bio-layer.
- **Own development and manufacturing:** New Terrain designs and manufactures its systems entirely at its own production plants, and has a mechanical workshop for designing, manufacturing and maintaining the moulds and other production tools, which guarantees the close tolerances of our product throughout the whole process of its manufacture.



System Characteristics Table

Table of the characteristics of polybutylene (PB1)

PROPERTIES	STANDARD	VALUE	UNIT
External diameter	EN ISO 15876	See EN ISO 15876-2; Point 6.2.1	
Wall thickness	EN ISO 15876	See EN ISO 15876-2; Point 6.2.2	
Colour		Grey – RAL 7001	
Density	ISO 1183	0,939	g/cm ³
Fluid index (Melt Flow Index)	ISO 1133 – 190°C/2,16 Kg	0,35	dg/mg
Black carbon content	--	<0.1	%
ESCR (50°C/10 % solution Igpal C0603)	ASTM D1693	15000 h Without failure	H
Tensile Stegtht at yield	ISO R 527	20,4	MPa
Tensile Stegtht at break	ISO R 527	36,5	MPa
Tensile modulus	ISO 178	450	MPa
Enlongation at break	ISO R 527	300	%
Longitudinal Retraction	EN 743	< 2	%
Hardness	ISO 868	60	Shore D
Resistance to impact (Notched)	ISO 180	20	KJ/m ² a 20°C
		7	KJ/m ² a 0°C
Thermal expansion coefficient	ASTM D696	1,3 · 10 ⁻⁴	m/mK
Thermal conductivity (30 - 70°C)	ASTM C177	0,19	W/mK
Fusion temperature	DSC	130	°C
Vicat softening temperature	ISO 306	120	°C
Vitria transition temperature	DMTA	-16	°C
Hydrostatic resistance to rupture	EN 921	See EN ISO 15876-2 – Point 7	
Internal hydrostatic pressure	EN ISO 9080	See EN ISO 15876-2 – Point 4.2	
Speed of sound	-	620	m/s
Toxicity	Non-toxic – According to organoleptic and migration studies at several Independent Institutes		
Bacteriological Analysis	KIWA (Holland) and the German Association of water and Gas (GVGW), Technical Guide W270)	There is no growth of micro-organisms after 6 months of immersion. The material satisfies the requirements.	

Table of pipe characteristics for TERRAIN SDP fusion systems.

EXTERIOR DIAMETER MM	mm	16	20	25	32	40	50	63	75	90	110	125	160
Wall Thickness	mm	2,2	2,3	2,3	2,9	3,7	4,6	5,8	6,8	8,2	10,0	11,4	14,6
Interior tube diameter	mm	11,6	15,4	20,4	26,2	32,6	40,8	51,4	61,4	73,6	90,0	102,2	130,8
SDR		7,4	9	11	11	11	11	11	11	11	11	11	11
Pipe Serie		3,2	4	5	5	5	5	5	5	5	5	5	5
PN (bar)		34,5	27,2	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8	21,8
Length in straight stretches	m	3	3	3	---	---	---	---	---	---	---	---	---
	m	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8	5,8
Length in Coils	m	50	50	36	---	---	---	---	---	---	---	---	---
	m	100											

**TYPE OF APPLICATION
IN ISO 15876**

**Class 2
(70°C, 10 bars, 50 years, C 1,5)**

Definition of C: Overall Service Coefficient (Safety Factor).

Definition of PN: Nominal pressure at 20oC bcC for 50 years with a safety factor of 1.25. (This definition is not used anymore in the EN ISO 15876)

Definition of SDR: Standard dimensional ratio (OD /SDR=> approx. thickness).

SDR 11: includes values of diameters from 25 to 160.



The material used for manufacturing the pipes and accessories is homogeneous, because polybutylene is injectable, and therefore the parts are made of the same material as the pipes. Polybutylene is a thermoplastic suitable for heat fusion of pipe and part, and can therefore be welded using thermo fusion, electro fusion and butt joint welding techniques. These two latter have been chosen for constructing the Terrain SDP large dimension system. They are simple, standard techniques that provide excellent, safe joints.

Connections to external networks are created by flange joints (PN16). This system ensures compatibility and enables easy, quick joining.

For installations with joints that can be made on the ground on in accessible positions, butt joint welding is very reliable and economic. To the contrary, when the joint must be located in an inaccessible or complex spot for typical butt welding joint tools to be used, the electro fusion technique should be chosen, as this allows cold assembly and subsequent joining by the application of an electrical current.

The characteristics of electro fusion joints are as follows:

- **Fusion on the external walls of the pipe and electro fusion fitting**, with electrical resistance on the inner surface, to ensure heat transmission among the parts to join the embedded resistance more efficiently.
- **Standard fusion at 40 V by machine transformer**, which avoids the hazards of electrical contact when handling joints, as well as ensuring stable tension regardless of the electrical source on the site.
- **Simple, reliable joint** which needs no more than a scrape or a cleaning of the joint to fuse and ensure the penetration length of the tubular part of the electro fused opening.
- **Joint presented cold on site**, and then created remotely using the electro fusion machine, which forms a simple, secure joint in even the most inaccessible of conditions.
- **Automatic compensation of the energy contributed to the fusion** according to the actual environmental temperature at the time of the joint, which ensures stable, even fusion regardless of environmental conditions.

With regard to the butt weld joint, the following aspects are significant:

- **Parts joined must be of equal wall thickness**, which results in a final installation equivalent to a prolonged pipe, with the consequential absence of reductions in diameter and additional stress on the joint.
- **Simple, reliable joint, as there is no dependence on external factors.**
- **Economical, suitable joint** for welding in workshops or in accessible situations.
- **Safe and secure;** The Butt Welding assembly technology is one of the most experienced type of unions in plastic piping systems so far. This type of unions has been done since more than 40 years and many of them are still working. The best proof is the fact that this type of unions is chosen for gas pipelines and chemical - industrial applications too. Laboratory tests shows that the pipe burts always first, before the Butt Welding union get damaged. The main difference to Socket Fusion is that Butt Welding unions must be made by machine.



Electro fusion jointing

Electro fusion jointing

- **Qualified staff for jointing**

The joints must be made by staff training in electro fusion welding techniques with practical knowledge of the use of the available welding machinery.

- **Welding equipment**

It is essential that homologated machines be used, capable of delivering the voltage and output required. It is recommended that machines used meet the requirements set out in standard DVS 2208.

- **Steps-by-step instructions:**

- 1 Cut the tube perpendicularly to its axis, to create a section which is as even as possible.



- 2 Ream and clean the tube and the lower part of the coupler.





- Using the marks on the tube, mark off the penetration length of the tube.



- Insert the tube as far as the mark.



- Connect the electric terminals of the electro fusion machine to the coupler.



- Using the optical reader, read the bar codes on the coupler.



- Accept the settings read and start the fusion process.



- During the fusion process, stay at least one metre away from the fusion zone and do not handle the installation.
- Once the fusion is complete, wait for the cooling time indicated in the parameters table, before continuing to handle the installation.
- The fusion gauge will enable you to check the installation is ready quickly.
- After 24 hours has past since creating the last joint, you can proceed with the hydraulic test on the installation.**

Recommendation

- It is very important to ensure that all the joint surfaces are clean. The presence of drops of water, grease or any other element on the joint surface can cause a faulty joint.
- It is recommended you check that the gap between the tube and the coupler is acceptable. Very large gaps leave spaces in the joint that are detrimental to the joining process. This gap can be controlled during the reaming process and when aligning the coupler and the tube.
- It is recommended that correct alignment be achieved between the tube and part with the coupler. Angular misalignment may cause a faulty joint. According to DVS standards at 300 mm from the join, the misalignment of the tube must be no more than 1mm. The gap between the tube and the coupler must be even throughout its circumference.
- When the joint is finished, it is very important to comply with the cooling time stated. Handling the installation before the joint has cooled may damage the internal welding performed.

Electro fusion jointing parameters

DIAMETER mm	PENETRATION LENGTH mm	ELECTRICAL RESISTANCE Ohms	FUSION TIME SECONDS Seg	COOLING TIME min
63	58	2.9	110	15
75	64	1.4	110	15
90	72	2.2	160	15
110	80	1.0	220	15
125 - 110*	90 - 80	1.2	310	15
125	90	1.3	345	15
160	100	2.0	780	15

* All the active elements of the NUEVA TERRAIN electro fusion system have a bar code label where all the information needed to create the joint is stored.

- E-Fusion reduced socket





Butt Welding Joints

Butt Welding Joints

- **Qualified staff for joining**

The joints must be made by staff training in butt joint welding techniques with practical knowledge of the use of the available welding machinery.

- **Welding equipment**

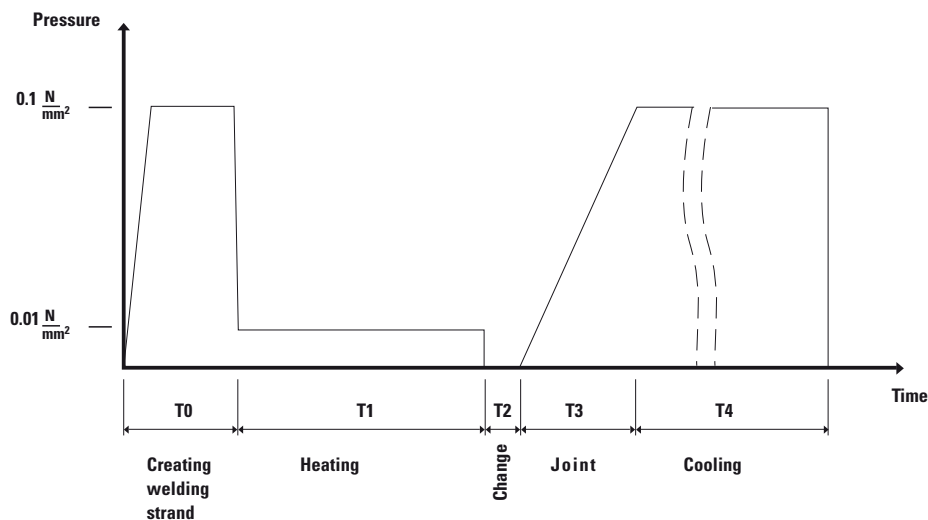
It is essential that homologated machines be used, capable of reaching and maintaining the temperature required for butt welding the SDR II tubes to 160 mm.

It is recommended that machines meeting the requirements set out in standard DVS 2208 be used.

- **Diagram of butt welding jointing process**

The pressure value indicated in the previous diagram corresponds to the pressure that must be reached on the faces of the welded joint (part against part).

According to the machine used to make the joint and the dimensions of the fittings to be joined, it will be necessary to calculate the force or pressure settings required by each machine, to achieve the pressure indicated in the diagram in the part contact zone.



The attached data tables set out the force values to be applied in the case of manual pressure joints (mechanical). In the case of hydraulic machines, the pressure to apply in the cylinder will depend on the diameter.

- **Butt welding jointing settings**

Tube PB SDR 11	Sec. mm ²	0.1 N/mm ² F1 N	T0 seg	Welding strand mm	0.01 N/mm ² F2 N	T1 sec	T2 sec	T3 sec	0.1 N/mm ² F3 N	T4 min	Temp °C
Ø63 x5.8	1042	104	HC*	0.5	11	55	6	10	104	8	260
Ø75 x6.8	1457	146	HC*	0.5	15	60	6	10	146	9	260
Ø90 x8.2	2107	211	HC*	1	21	70	7	11	211	10	260
Ø110 x10	3142	314	HC*	1	32	80	7	11	314	12	260
Ø125 x11.4	4069	407	HC*	1	41	85	8	12	407	14	260
Ø160x14.6	6669	667	HC*	2	67	100	10	16	667	16	260

*HC : Until welding strand is made.

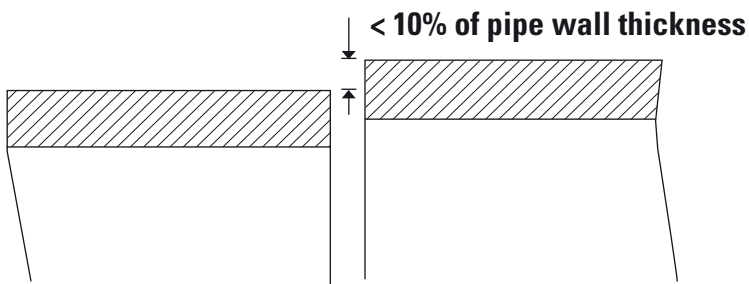


- **Step-by-step instructions**

- 1 Place the tubes or parts to join in the vices of the welding machine.



- 2 Check that the wall thickness of both parts is equal.
Close the clamps and check that the tubes/parts are aligned, putting their faces together with the pressure device.
 - The maximum permitted misalignment is 10% of the thickness of the wall.



- 3 Clean any dirt from the faces and nearby areas. Place the buffing tool between the faces and start the machining process.



- 4 Remove the buffing tool and clean away any remaining shavings.

- 5 Check that when you join the faces with the pressure device there are no excessive gaps in the joint. The maximum gap must not exceed 0.5 mm.



- 6 Check that the heating element is at the right temperature. (for PB $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

- 7 Put the heating element between the two parts.



- 8 Bring the faces to the heating element by applying a pressure of 0.1 N/mm^2

- In mechanical machines the force identified as F1 in the attached table will be applied.
- In hydraulic machines it will be necessary to calculate the pressure to apply to the cylinder.



- 9 Continue to apply the pressure until the welding strand formed is of a sufficient height.
- Recommended dimensions for welding strand according to the table attached.

Lower the pressure applied to 0.01 N/mm^2

- In mechanical machines, the force identified as F2 in the attached table is applicable.
- In hydraulic machines, it will be necessary to calculate the pressure to be applied to the cylinder.

Maintain this pressure for the time indicated in the table attached as T1.





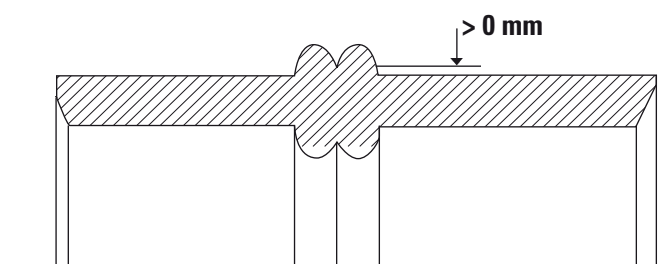
- 10 Separate the faces of the heating element and withdraw.
 - It is recommended this operation be carried out as quickly as possible, in accordance with the time recommended (T2 in the attached table).
 - Before removing the heating element, check that it is not adhered to the faces of the pieces to avoid damaging the welding strand.
- 11 Put the faces together to start joining
- 12 Increase the pressure during the time T3 to reach 0.1 N/mm^2
 - In mechanical machines the force called F3 in the table attached is applied
 - In hydraulic machines it will be necessary to calculate the pressure to apply to the cylinder.
- 13 Maintain this pressure for the time indicated in the table attached as T4.



- 14 Release the pipe clamps and remove the parts from the machine.
- 15 Although the joint is now finished, it is recommended you wait for approximately one hour for the weld to cool down before starting to handle the pieces welded.
- 16 **Before carrying out a pressure test on the installation, you must wait 24 hours.**

• Aspects to take into consideration

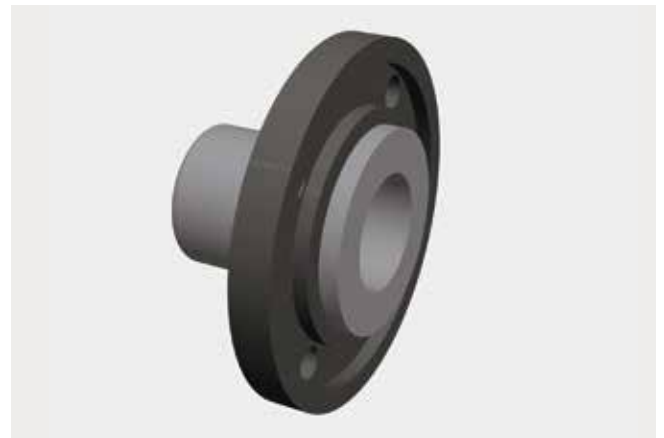
- After welding, the joint zone should appear as a double welded rectangular-shaped strand along the circumference, whose intermediate zone (valley) is always higher than the outside face of the parts. (see figure)
- In the case of carrying out welding outdoors, it is recommended the joint be protected from adverse climate conditions (rain, snow, wind...) which may cause inadmissible variations in the welding temperature reached.



Joints with Flange

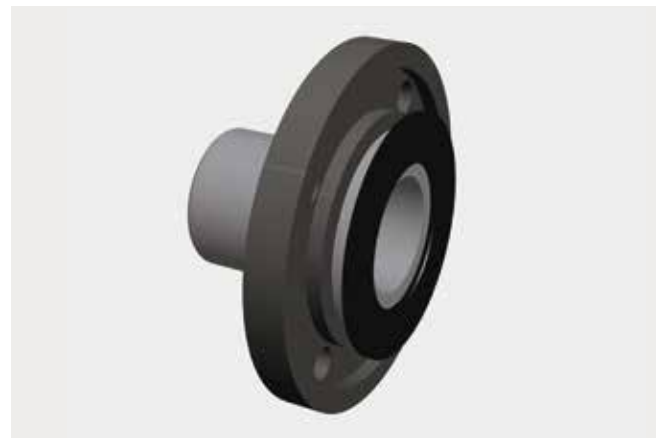
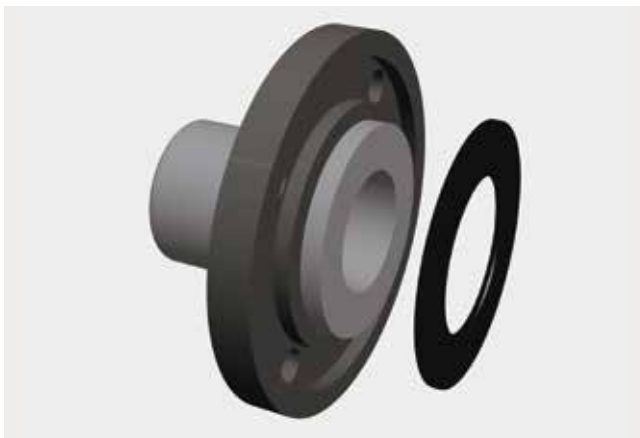
• Step-by-Step Instructions

- 1 Make sure you have all the parts you need to assemble the joint.



Important: The face of the flange face outwards to allow the bolt nuts to be installed.

- 2 Insert the flange into the flange holder with the flat part facing towards the outside of the joint.





- 3 Place the joint on the flat part of the flange holder.



- 4 Assemble the parts with the joint against the joint to be created. Position the bolts with their corresponding nuts and tighten evenly.



Important: Do not place the coupler before the flange, as it will then be impossible to insert it and it will be rendered useless.

- 5 If the installation is to be continued with electro fusion joints, insert the coupler in the flange holder. The coupler must be fitted at the end of the process, because it will not allow the flange holder to pass through.

Recommendations:

- It is very important to comply with the tightening torque of the bolts. Excessive tightening could damage the joint.
- Never apply grease or lubricant to the joint.
- The Nueva Terrain flange joint system is designed to be installed with its original components: flange holder, flange and flange joint. The use of other components may lead to unsatisfactory joints.

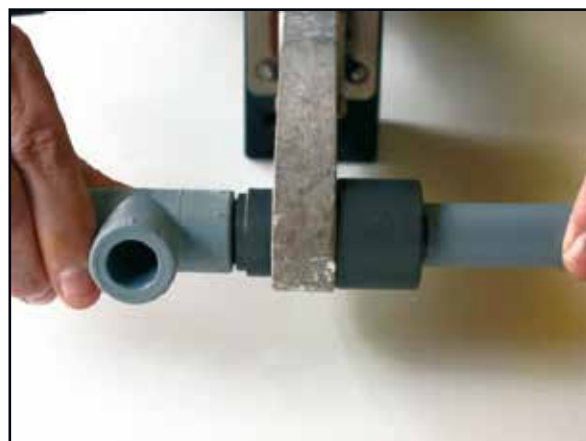
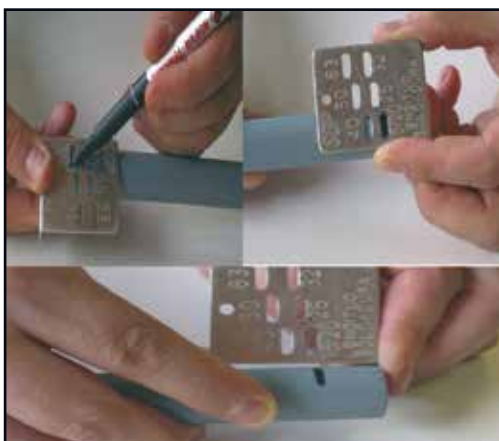
NOMINAL DIAMETER (ext)	TIGHTENING TORQUE (Nm)	BOLT	No. BOLTS PER FLANGE
63	30	M 16 x 80	4
75	35	M 16 x 80	4
90	40	M 16 x 90	8
110	45	M 16 x 90	8
125	50	M 16 x 100	8
160	60	M 20 x 140	8

Socket Fusion Assembling

The assembly

Joints must be created according to the instructions in our “Instruction Manual for assembling the PB Thermo fusion system”. Here is a summary of the steps to be followed:

- 1 The tube and the part to be thermo-welded must be of the same diameter and material.
- 2 To ensure that the tubular part penetrates the mouth of the piece to the correct depth, a mark is made on the tube using a marker pen or wax pencil with the help of template Reference FC 4070. The tube is then positioned on the mark that corresponds to the diameter of the tube being used. This template has marks (windows or perforations) for the entire range of measurements manufactured. This mark will be visible when next to the burr produced by the harrow of the weld.
- 3 To correctly carry out the weld, start by making a perpendicular cut in the tube. Then put the end of the tube and the mouth of the piece simultaneously into the oven (male and female) corresponding to their diameter, ensuring the machine is at the right temperature at that moment (for PB $260^{\circ}\text{C} \pm 10^{\circ}\text{C}$)



- 4 The tube and the part must remain in the oven for the time stipulated for each diameter, indicated as the **heating time** in table 1. This time period starts once the tube and the part are entirely inside the ovens.

TABLE 1 PARAMETERS FOR WELDING BY SOCKET FUSION IN PB.

TUBE DIAMETER (mm.) ND	THICKNESS OF TUBE WALL E (mm.)	LENGTH WELD L (mm.)	HEATING TIME (Seconds)	MAINTENANCE TIME (Seconds)	COOLING TIME (Minutes)
16	2,2	15	5	15	2
20	2,3	15	6	15	2
25	2,3	18	6	15	2
32	2,9	20	10	20	4
40	3,7	22	14	20	4
50	4,6	25	18	30	4
63	5,8	28	22	30	6



Immediately after removing the tube and the part from the ovens these must simultaneously be joined. **Do not twist the parts at all while making the join.** The pieces must be inserted axially and flexion is only permitted to achieve better alignment.

- 5 Once the tube is inserted in the piece, the time period set out in table 1 as the **maintenance time** must be observed. This time is considered to start when the tube has been totally inserted until the weld has been established. This is done by exerting slight axial pressure, similar to that used to insert the part, during the time indicated in table 1, to avoid the tendency for the part to come out.



- 6 **The cooling time** is considered the space of time between the end of the thermo welding of the joint (without including the maintenance time) until the beginning of the next weld on the same part or tube being worked on, indicated in table 1.

The utmost care must be taken in this thermo fusion process, to ensure the tube is correctly aligned when inserted in the part to which it is to be joined. The tubes must be cut perpendicular to their axis and these must be free of any waste material or residue caused by cutting.

be cleaned. This should be done using absorbent paper, without dust threads and slightly moistened in an ethyl alcohol based detergent (for example technical alcohol 94%), which is free of greases and oils.

Tubes of 16 and 20 mm diameter do not need champhering or bevelling.

Bevelling is recommended for tubes of 25, 32 and 40 mm in diameter.

For tubes with a diameter of 50 and 63 mm bevelling is obligatory.

One hour after the final weld, the installation is ready for hydraulic testing, in accordance with the applicable standards and regulations.

Very important note: Never mix materials of different classes or composition, as they are not compatible (example: PB-PP, etc).

Standards and tests

The TERRAIN SDP Polybutylene system for carrying cold and hot water and heating in large diameters complies with European and International Standard UNE EN ISO 15876, and is classified as 10 Bar Service Pressure at 70°C/50 years.

This means that the tube, the accessory and its joint have all satisfied the following functional tests according to requirements of the UNE EN 15876 application standard:

- Internal pressure tests at 20°C, 31 bars and 1 hour duration as a validation test throughout the production series.
- Internal pressure tests at 95°C, 12.8 bars and 22 hours duration as a validation test throughout the production series.
- Internal pressure tests at 95°C, 12.3 bars and 165 hours duration as system-type tests.
- Internal pressure tests at 95°C, 11.9 bars and 1000 hours duration as system-type tests.
- Internal pressure tests at 110°C, 5 bars and 8760 hours (1 year) duration as system-type tests.
- Thermal cycle test consistent in 5000 alternating cycles of temperature every 15 minutes between 20 and 90°C at 10 bars of pressure. The test sample consists of a tube circuit with nine accessories (18 joints) and around nine metres of tube.



The aforementioned tests are allowed to continue or to rupture the test sample due to increased pressure, to check the resistance of the sample tested, producing failure at values much higher than those defined by the test pressure, and never in the joint between the tube and the accessory.

With regard to the standards for the joint method, the specifications of the standards of the German Institute DVS have been followed, for consultation purposes, representing the standardisation of this type of joint at international level. The following standards that have served as the basis of the design and development of the system are of note:

- DVS 2207-1 Welding of thermoplastics
- DVS 2207-11 Welding of themoplastics
- DVS 2202-1 Imperfections in thermoplastic joints
- DVS 2208 Machines for welding thermoplastics



For further information see:

<http://www.die-verbindungs-spezialisten.de/>



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 regulations 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, renouncing all other applicable codes of law.



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La Asociación Española de Normalización y Certificación (AENOR) certifica que el producto "ACCESORIOS PARA TUBOS DE POLIBUTILENO (PB) PARA INSTALACIONES DE AGUA CALIENTE Y FRÍA" (FITTINGS FOR POLYBUTYLENE (PB) PIPES FOR HOT AND COLD WATER INSTALLATIONS) detallado en la(s) página(s) siguiente(s), (detailed in the following page(s)), suministrado por **NUEVA TERRAIN, S.L.** (supplied by) y elaborado en **CL. PADULETA, 2 01195 VITORIA (Álava - ESPAÑA)** (and manufactured in) es conforme con **UNE-EN ISO 15876-1:2004** (complies with).

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BRANCA COMERCIAL: TERRAIN SDP
TRADING

TIPO	DIÁMETRO (mm)	CLASE DE BAJACIÓN (PUNCIÓN DE BARRIL)	APLICACIÓN CLASE / RESIST. PRESIÓN	GRANDEZAS	TIPO DE UNIDAD	MATERIAL
Accesorio	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160	1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 8	Distribución	PN16, PN25, PN40, PN63, PN100, PN160	Individual	Polibutileno (PB)
Accesorio	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160	1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 8	Distribución	PN16, PN25, PN40, PN63, PN100, PN160	Individual	Polibutileno (PB)
Accesorio	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160	1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 8	Distribución	PN16, PN25, PN40, PN63, PN100, PN160	Individual	Polibutileno (PB)
Accesorio	16, 20, 25, 32, 40, 50, 63, 80, 100, 125, 160	1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 8	Distribución	PN16, PN25, PN40, PN63, PN100, PN160	Individual	Polibutileno (PB)

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