

European Technical Approval ETA-12/0410

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung <i>Trade name</i>	"FLEXSEAL", "FERNCO", "EASYJOINT"
Zulassungsinhaber <i>Holder of approval</i>	Flex-Seal GmbH Hessenring 31 37269 Eschwege DEUTSCHLAND
Zulassungsgegenstand und Verwendungszweck <i>Generic type and use of construction product</i>	Elastomere Übergangsmanschetten mit oder ohne Scherband für erdverlegte Abwasserleitungen <i>Elastomeric flexible couplings, with or without stainless steel shear band used to assembly underground sewer or drainage pipes</i>
Geltungsdauer: <i>Validity:</i>	vom <i>from</i> bis <i>to</i> 15 November 2012 15 November 2017
Herstellwerke <i>Manufacturing plants</i>	Flex-Seal GmbH Hessenring 31 37269 Eschwege DEUTSCHLAND Flexseal Couplings Ltd. Endeavour Works. Valley Park Newlands Way Wombwell, Barnsley S73 0UW

Diese Zulassung umfasst
This Approval contains

20 Seiten einschließlich 10 Anhänge
20 pages including 10 annexes

I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
 - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products¹, modified by Council Directive 93/68/EEC² and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council³;
 - Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998⁴, as amended by Article 2 of the law of 8 November 2011⁵;
 - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC⁶.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
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- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

¹ Official Journal of the European Communities L 40, 11 February 1989, p. 12
² Official Journal of the European Communities L 220, 30 August 1993, p. 1
³ Official Journal of the European Union L 284, 31 October 2003, p. 25
⁴ *Bundesgesetzblatt Teil I* 1998, p. 812
⁵ *Bundesgesetzblatt Teil I* 2011, p. 2178
⁶ Official Journal of the European Communities L 17, 20 January 1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of the products and intended use

1.1 Definition of the construction product

Flexible couplings and fittings "FLEXSEAL", "FERNCO" or "EASYJOINT" for drains are elastomeric connections (EPDM/Nitrile), possibly equipped one metal band of reinforcement (stainless steel), intended to connect various types of pipe possibly made up of different materials.

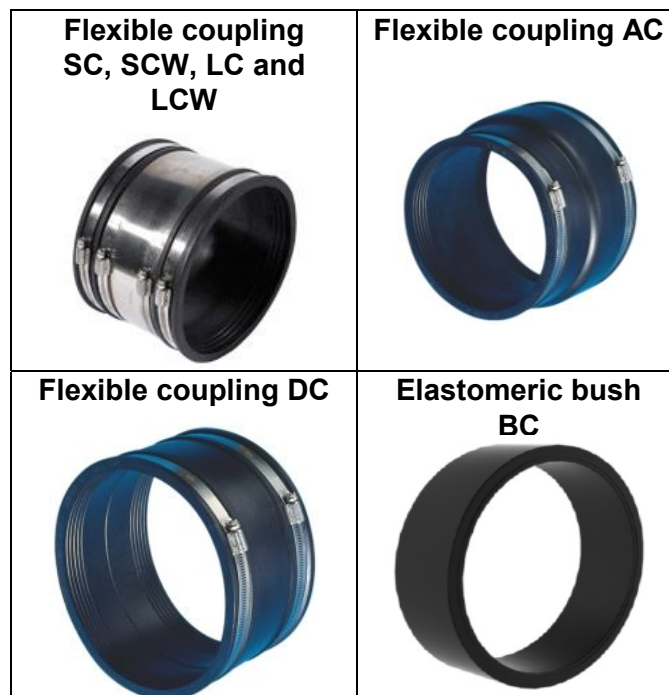
The tightening of elastomeric element on the drains is obtained by stainless steel tension band for which the tightening torque is recommended. The material constitutive of the pipe and their diameter can be different.

The various ranges characteristic of connections are the following ones:

- a) connections SC: with metal reinforcement, for weak adaptation of the pipes to be connected,
- b) connections LC: with metal reinforcement, for weak adaptation of the pipes to be connected,
- c) connections SCW and LCW: the same as a) and b) in a wide version,
- d) connections AC (PAC): without metal reinforcement, for adaptation important of the pipes to be connected,
- e) connections DC (PC): without metal reinforcement, for weak adaptation of the drains to be connected.

In addition with these connections, the elastomeric bush (BC) can be used according to the diameters to connect.

Figure 1: Range of flexible coupling



1.2 Intended use

The flexible couplings "FLEXSEAL", "FERNCO" or "EASYJOINT" make possible to connect various types of gravity pipes, intended to transport waste water or rainwater inside or outside of the building, in buried or not buried.

Subject to the respect of the tolerances on the outside diameter of the drains to which they are connected, limiting conditions of use of the connections are shown in Table 1.

Table 1: Types of flexible couplings

Type of coupling	Maximal pressure in the pipe (bars)	Outside diameter and pipes connected material	Shear resistance R(N)*
SC and SCW	1,0	Different	R(N) > 25 DN (mm)
LC and LCW	1,0	Different	R(N) > 25 DN (mm)
AC	0,6	Different	Low
DC	0,6	Same	Low
* according to EN 476. The value of DN is the maximum diameter possible to connect at the flexible coupling in mm.			

The provisions made in this European Technical Approval are based on an assumed intended working life of 50 years provided that the conditions as defined section 4.2 for the packaging, storage and installation are met. The indications given on the working life cannot be interpreted as a guarantee given by the ETA holder, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

2 Characteristics of the products and methods of verification

The assessment of fitness of a flexible coupling "FLEXSEAL", "FERNCO" or "EASYJOINT" in relation to the requirements for the mechanical resistance, stability, safety in case of fire, hygiene-health and environment and safety in use in the sense of the Essential Requirements 1, 2, 3 and 4 has been made in accordance with the following paragraphs.

2.1 Dimensions

2.1.1 Sleeves

Dimensions of the sleeves and bushes are tested according to ISO 3302-1.

Internal elastomeric sleeve diameter shall be checked with the clamps removed by measuring the external circumference around the tension band position and thickness.

The dimensional specifications of the sleeves constituting connections are indicated in Annex 1 to 3.

The minimum inside diameter of the sleeves are the minimum values of the range indicated.

The dimensional tolerances of the moulded components are in conformity with the class M3 of ISO 3302-1.

The dimensional tolerances of the extruded and vulcanized components are in conformity with the class E3 of ISO 3302-1.

2.1.2 Shear and tension bands

Dimensions of the shear and tension band shall be tested by using a calliper.

The dimensional specifications are indicated in Annex 1 to 8.

The reinforcements and bands of tension are free from sharp edges to prevent any damage of the elastomeric sleeve or wounds for installer.

2.2 Strength of tension band assembly

The tested band is tightened on a test tool include a cylindrical former which will not distort under the applied load and a calibrated torque wrench according ISO 6789.

Depending of the flexible coupling, the recommended locking torque is described annex 1 to 8.

Tension band assembly of connections AC shall withstand a minimum torque of 6 Nm on any kind of pipes.

2.3 Tensile strength of welds

The tensile test strength is realized on a sample prepared with a minimum of 100 mm length of unperforated tension band strip to a section of shear band strip cut with a minimum 100 mm length.

The test rate applied is 3 mm/min until failure. The maximum tensile force is recorded.

The assembly shall withstand a minimum force value of 6000 N.

2.4 Heat resistance

The test method for measurement of heat resistance of flexible coupling "FLEXSEAL", "FERNCO" or "EASYJOINT" is based on EN 1055.

When tested according to this method the assembly shall not leak.

2.5 Assembly torque

The assembly of couplings with the thickest bush supplied and the appropriate pipes shall not leak with the recommended torque and the following hydrostatic pressure according to the following table 2:

Table 2: Hydrostatic pressure per types of flexible couplings

Type of flexible couplings	Pressure (bars)
AC	0,6
DC	0,6
SC, SCW, LC and LCW	1,5

2.6 Reaction to fire

Reaction to fire of flexible couplings "FLEXSEAL", "FERNCO" or "EASYJOINT" is tested according EN ISO 11925-2.

Flexible couplings are classified class E of EN 13501-1.

2.7 Steel grade

Stainless steel components of flexible couplings "FLEXSEAL", "FERNCO" or "EASYJOINT" are tested and classified according EN 10088-2.

Stainless steel used are austenitic with a minimum of Chrome of 17 % and Nickel of 8 % (or grade 1.4301 or 1.4401).

The different components of tensile band are made of stainless steel with the same requirements and a minimum hardness according to class +C850 according to EN 10088-2.

2.8 Characteristics of elastomeric elements

Sleeves and bushes are made of EPDM/Nitrile according to 681-1.

The components made of elastomeric materials of flexible coupling are tested according the following table 3:

Table 3: Characteristics of elastomeric elements

Characteristics	Test method	Requirement
Hardness (DIDC)	ISO 48	60±5
Tensile strength Elongation at break	ISO 37	≥ 9 MPa ≥ 300 %
Compression set 72 h at 23°C 24 h at 70°C 72 h at 23°C	ISO 815	≤ 12 % ≤ 20 % ≤ 50 %
Ageing in air - Change hardness - Change tensile strength - Change elongation at break	ISO 188	-5 % / +8 % -20 % -30 % / +10 %
Stress relaxation maxi. - 7days at 23°C - 100 days at 23°C -Stress relaxation (per logarithmic decad)	ISO 3384	15 % 22 % 5,9 %
Volume change in water maxi:	ISO 1817	-1 % / +8 %
Resistance of splice strength	EN 681-1	100 %

2.9 Coupling performances

When tested according the following conditions (table 4) and depending of type, flexible couplings "FLEXSEAL", "FERNCO" or "EASYJOINT" do not leak:

Table 4: Coupling performances

Type of flexible couplings	Conditions		Assembly	Requirements
SC, SCW, LC, LCW	Vacuum (air): - 0,3 bar time test: 15 min	Shear load: 25 DN (N)	Rigid/rigid	End value pressure $\leq -0,27$ bar
SC, SCW, LC, LCW AC DC		Angular deflection $D_{ext} \leq 200 : 3^\circ$ $201 \leq D_{ext} \leq 300 : 2^\circ$ $301 \leq D_{ext} \leq 600 : 1,75^\circ$	Rigid/rigid Rigid/flexible Flexible/flexible	
SC, SCW, LC, LCW	Pressure (water) : SC, SCW, LC, LCW: 1,5 bars AC or DC: 0,6 bar time test : 15 min	Shear load : 25 DN (N)	Rigid/rigid	
SC, SCW, LC, LCW AC DC	Vacuum (air) : - 0,3 bar time test : 15 min	Angular deflection $D_{ext} \leq 200 : 3^\circ$ $201 \leq D_{ext} \leq 300 : 2^\circ$ $301 \leq D_{ext} \leq 600 : 1,75^\circ$	Rigid/rigid	no leakage
SC, SCW, LC, LCW AC DC		Diameter distortion	Rigid/flexible Flexible/flexible	no leakage

2.10 Long term shear resistance and long term creep resistance

When tested according to EN 295-3 with two rigid pipes, a downward vertical force (in N) of 25 DN per mm of nominal size of pipe and during a period of 3 month, flexible couplings "FLEXSEAL", "FERNCO" or "EASYJOINT" do not leak.

2.11 Content and/or release of dangerous substances

A written declaration is submit to the holder.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to the decision 97/464/CE of 27th June 1997 of the European Commission the system of attestation of conformity for flexible couplings is **4** for

ER 1 (Mechanical resistance and stability) and

ER 3 (Hygiene, health and environment).

According to the decision 2004/663/CE of 20th September 2004 of the European Commission the system of attestation of conformity for flexible couplings is **3** for

ER 2 (Safety in case of fire).

The systems of attestation of conformity are defined as follows:

System **3**: Declaration of conformity of the product by the manufacturer on the basis of:

- (a) Tasks for the manufacturer:
 - (1) factory production control;
- (b) Tasks for the approved body:
 - (2) initial type-testing of the product.

System **4**: Declaration of conformity of the product by the manufacturer on the basis of:

- Tasks for the manufacturer:
- (1) initial type-testing of the product;
 - (2) factory production control.

Note: Approved bodies are also referred to as "notified bodies".

3.2 Responsibilities

3.2.1 Tasks for the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use raw materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the control plan which is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.⁷

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan. The records include at least the following information:

- designation of the product, basic material and components,
- type of control or testing,
- date of manufacture of the product and date of testing of the product or basic material and components,

⁷ The control plan is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

- result of control and testing and, if appropriate, comparison with requirements and
- signature of person responsible for factory production control.

The records shall be presented to the inspection body during the continuous surveillance.

3.2.1.2 Other tasks for the manufacturer

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 in the field of ER 2 (Safety in case of fire) in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

In the case of ER 1 (Mechanical resistance and stability) and ER 3 (Hygiene, health and environment) the manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European technical approval ETA-12/0410 issued on 15 November 2012.

3.2.2 Tasks for the approved bodies

The approved body shall perform the initial type-testing of the product in accordance with the provisions laid down in the control plan.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

3.3 CE marking

The CE marking shall be affixed on a label attached on each flexible coupling.

The symbol « CE » shall be accompanied by the following information:

- number of the European Technical Approval,
- name or identifying mark of the producer: "FLEXSEAL", "FERNCO" or "EASYJOINT",
- the last two digits of the year in which the CE-marking was affixed,
- reference (added with the letter "N" in case of NBR rubber) and range of diameter,
- month and year of product,
- recommended assembly torque,
- maximum using pressure and
- reaction to fire class.

Following information shall be written on the direction for use:

- factory production unit,
- intended use: inside or outside building and
- statement on the presence or other wise of dangerous substances including concentration.

4 Assumptions under which the fitness of the products for the intended use was favourably assessed

4.1 Manufacturing

Depending of diameters and types, flexible couplings are moulded or manufactured by vulcanization welding of rubber extruded section.

Tension bands are fixed on shear bands (SC, SCW, LC or SCW) by point welding.
The European technical approval is issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval and if so whether further assessment or alterations to the approval shall be necessary.

4.2 Installation

Components are delivered ready to use in an appropriate packaging.
The fitness of the flexible coupling for the intended use is given only if installed as described in annex 10.
It is the responsibility of the ETA-holder to guarantee that the information about design and installation of this product are easily accessible to the concerned people.
These information can be given using reproductions of the European Technical Approval. Besides, all the data concerning the execution shall be clearly indicated on the packaging and/or the enclosed instruction sheet using one or several illustrations.

The minimal data required are:

- outside diameters of pipes to connect,
- maximum pressure in use and
- torque and tool to assembly.

All data shall be presented in a clear and explicit form.
For flexible coupling SC, SCW, LC or LCW the choice of the thickness bushes shall be according to the following table 5:

Table 5: Bushes according to external diameter

external diameter	A bush is necessary if the difference between the external diameters is greater than :
for $D_{ext.} \leq 120$ mm	10 mm
for $300 \geq D_{ext.} > 120$ mm	12 mm
for $D_{ext.} > 300$ mm	12 mm

The bush is pushed on the lower outside diameter.
If the difference of external diameters is greater than these values it is necessary to install a bush on the lower outside diameter.
In case of flexible coupling AC the bush shall be choose to have the recommended range of use of the flexible coupling.

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Head of department

beglaubigt:
Schmidt



type 2A		clay pipes (all manufacturers)			
reference	DN	tolerance range (mm)	width (mm)	internal pressure (bar)	torque assembly
TC 135	100	120 - 135	102	0,6	6 Nm
TC 165	125	150 - 165	102	0,6	6 Nm
TC 190	150	175 - 190	110	0,6	6 Nm
TC 250	200 N	235 - 250	110	0,6	6 Nm
TC 265	200 H	250 - 265	110	0,6	6 Nm
TC 305	250 N	290 - 305	165	0,6	10 Nm
TC 325	250 H	310 - 325	165	0,6	10 Nm
TC 360	300 N	345 - 360	165	0,6	10 Nm
TC 385	300 H	370 - 385	165	0,6	10 Nm
TC 425	350 N	410 - 425	160	0,6	13 Nm
TC 440	350 H	425 - 440	160	0,6	13 Nm
TC 500	400 N/H	485 - 500	160	0,6	13 Nm
TC 560	450 H	545 - 560	160	0,6	13 Nm
TC 590	500 N	575 - 590	160	0,6	13 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

TC couplings type 2A designed for clay pipes

Annex 1



type 2B

for any kind of sewage pipes

reference	outside diameter pipe (mm)	width (mm)	internal pressure (bar)	torque assembly
LC 6xx	620 - 685	190	1,0	20 Nm
LC 7xx	686 - 785	190	1,0	20 Nm
LC 8xx	786 - 880	190	1,0	20 Nm
LC 9xx	881 - 980	190	1,0	20 Nm
LC 10xx	981 - 1030	190	1,0	25 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

LC couplings type 2B designed for any kind of sewage pipes

Annex 2



type 2B for any kind of sewage pipes

reference	outside diameter pipe (mm)	width (mm)	internal pressure (bar)	torque assembly
LC 6xx W	620 - 685	300	1,0	20 Nm
LC 7xx W	686 - 785	300	1,0	20 Nm
LC 8xx W	786 - 880	300	1,0	20 Nm
LC 9xx W	881 - 980	300	1,0	20 Nm
LC 10xx W	981 - 1030	300	1,0	25 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

LCW couplings type 2B designed for any kind of sewage pipes

Annex 3



type 2B

for any kind of sewage pipes

reference	DN	tolerance range (mm)	width (mm)	internal pressure (bar)	torque assembly
SC 65	*	50 - 65	90	2,5	6 Nm
SC 75	*	60 - 75	90	2,5	6 Nm
SC 85	*	70 - 85	90	2,5	6 Nm
SC 95	*	80 - 95	110	2,5	6 Nm
SC 100	*	90 - 100	80	2,5	6 Nm
SC 115	*	100 - 115	120	2,5	6 Nm
SC 120	*	110 - 121	120	2,5	6 Nm
SC 125	*	110 - 125	120	2,5	6 Nm
SC 137	100	120 - 137	120	2,5	6 Nm
SC 150	*	125 - 150	136	2,5	6 Nm
SC 165	125	140 - 165	136	2,5	6 Nm
SC 175	*	150 - 175	136	2,5	6 Nm
SC 180	*	160 - 182	136	2,5	6 Nm
SC 200	150	175 - 200	150	2,5	6 Nm
SC 215	*	190 - 215	150	2,5	10 Nm
SC 225	*	200 - 225	150	2,5	10 Nm
SC 250	200 N	225 - 250	150	2,5	10 Nm
SC 265	200 H	240 - 265	150	2,5	10 Nm
SC 275	*	250 - 275	150	2,5	10 Nm
SC 290	*	265 - 290	150	2,5	10 Nm
SC 310	250 N	285 - 310	190	2,5	10 Nm
SC 320	*	295 - 320	190	2,5	10 Nm
SC 335	250 H	305 - 335	190	2,5	10 Nm
SC 345	*	315 - 345	190	2,5	10 Nm
SC 360	300 N	340 - 360	190	2,5	10 Nm
SC 385	300 H	355 - 385	190	2,5	10 Nm
SC 410	*	385 - 410	190	2,5	13 Nm
SC 425	350 N	400 - 425	190	2,5	13 Nm
SC 430	*	405 - 430	190	2,5	13 Nm
SC 445	350 H	420 - 445	190	2,5	13 Nm
SC 450	*	425 - 450	190	2,5	13 Nm
SC 465	*	435 - 465	190	2,5	13 Nm
SC 470	*	440 - 470	190	2,5	13 Nm
SC 490	400 N	465 - 490	190	2,5	13 Nm
SC 510	400 H	480 - 510	190	2,5	13 Nm
SC 525	*	495 - 525	190	2,5	13 Nm
SC 540	*	510 - 540	190	2,5	13 Nm
SC 550	*	520 - 550	190	2,5	13 Nm
SC 560	450 H	530 - 560	190	2,5	13 Nm
SC 570	*	540 - 570	190	2,5	13 Nm
SC 580	*	555 - 580	190	2,5	13 Nm
SC 600	500 N	570 - 600	190	2,5	13 Nm
SC 620	500 H	590 - 620	190	2,5	13 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

SC couplings type 2B designed for any kind of sewage pipes

Annex 4



type 2B for any kind of sewage pipes

reference	DN	outside diameter pipe (mm)	width (mm)	internal pressure (bar)	torque assembly
SC 225 W	*	200 - 225	300	2,5	10 Nm
SC 290 W	*	265 - 290	300	2,5	10 Nm
SC 310 W	250 N	285 - 310	300	2,5	10 Nm
SC 320 W	*	295 - 320	300	2,5	10 Nm
SC 335 W	250 H	305 - 335	300	2,5	10 Nm
SC 345 W	*	315 - 345	300	2,5	10 Nm
SC 360 W	300 N	340 - 360	300	2,5	10 Nm
SC 385 W	300 H	355 - 385	300	2,5	10 Nm
SC 410 W	*	385 - 410	300	2,5	13 Nm
SC 425 W	350 N	400 - 425	300	2,5	13 Nm
SC 430 W	*	405 - 430	300	2,5	13 Nm
SC 445 W	350 H	420 - 445	300	2,5	13 Nm
SC 450 W	*	425 - 450	300	2,5	13 Nm
SC 465 W	*	435 - 465	300	2,5	13 Nm
SC 470 W	*	440 - 470	300	2,5	13 Nm
SC 490 W	400 N	465 - 490	300	2,5	13 Nm
SC 510 W	400 H	480 - 510	300	2,5	13 Nm
SC 525 W	*	495 - 525	300	2,5	13 Nm
SC 540 W	*	510 - 540	300	2,5	13 Nm
SC 550 W	*	520 - 550	300	2,5	13 Nm
SC 560 W	450 H	530 - 560	300	2,5	13 Nm
SC 570 W	*	540 - 570	300	2,5	13 Nm
SC 580 W	*	555 - 580	300	2,5	13 Nm
SC 600 W	500 N	570 - 600	300	2,5	13 Nm
SC 620 W	500 H	590 - 620	300	2,5	13 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

SCW couplings type 2B designed for any kind of sewage pipes

Annex 5



reference	OD - range 1 (mm)	OD - range 2 (mm)	width (mm)	internal pressure (bar)	torque assembly
PAC 0301	30 - 34	24 - 28	80	0,6	6 Nm
PAC 0431	38 - 43	30 - 35	80	0,6	6 Nm
PAC 0562	48 - 56	38 - 43	80	0,6	6 Nm
PAC 0682	60 - 68	38 - 43	80	0,6	6 Nm
PAC 0923	82 - 92	48 - 56	80	0,6	6 Nm
PAC 0924	82 - 92	60 - 68	80	0,6	6 Nm
AC 0633	53 - 63	40 - 50	90	0,6	6 Nm
AC 0894	75 - 89	53 - 63	90	0,6	6 Nm
AC 1155	100 - 115	75 - 90	90	0,6	6 Nm
AC 1201	105 - 120	35 - 45	100	0,6	6 Nm
AC 1221	110 - 122	80 - 95	100	0,6	6 Nm
AC 1225	110 - 122	48 - 56	100	0,6	6 Nm
AC 1226	110 - 122	60 - 68	100	0,6	6 Nm
AC 5144	110 - 125	100 - 115	100	0,6	6 Nm
AC 1361	121 - 136	80 - 95	100	0,6	6 Nm
AC 1362	121 - 136	100 - 115	100	0,6	6 Nm
AC 4000	121 - 136	110 - 121	100	0,6	6 Nm
AC 1452	130 - 145	110 - 125	120	0,6	6 Nm
AC 1552	140 - 155	90 - 105	120	0,6	6 Nm
AC 1602	144 - 160	110 - 122	120	0,6	6 Nm
AC 1603	144 - 160	121 - 136	120	0,6	6 Nm
AC 1603	144 - 160	117 - 132	120	0,6	6 Nm
AC 1702	155 - 170	110 - 125	120	0,6	6 Nm
AC 1703	155 - 170	130 - 145	120	0,6	6 Nm
AR 1500	170 - 191	160 - 170	100	0,6	6 Nm
AC 1922	170 - 192	110 - 122	120	0,6	6 Nm
AC 1923	170 - 192	121 - 136	120	0,6	6 Nm
AC 1924	170 - 192	144 - 160	120	0,6	6 Nm
AC 2000	180 - 200	130 - 145	150	0,6	6 Nm
AC 2001	180 - 200	155 - 170	150	0,6	6 Nm
AC 6000	180 - 200	160 - 180	150	0,6	6 Nm
AC 2100	185 - 210	100 - 115	150	0,6	6 Nm
AC 2101	185 - 210	160 - 180	150	0,6	6 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

AC adaptor couplings page 1 designed for any kind of pipes

Annex 6



reference	OD - range 1 (mm)	OD - range 2 (mm)	width (mm)	internal pressure (bar)	torque assembly
AC 2152	195 - 215	100 - 115	150	0,6	6 Nm
AC 2154	190 - 215	150 - 165	150	0,6	6 Nm
AC 2254	200 - 225	160 - 175	150	0,6	6 Nm
AC 2352	210 - 235	110 - 122	150	0,6	6 Nm
AC 2353	210 - 235	121 - 136	150	0,6	6 Nm
AC 2354	210 - 235	144 - 160	150	0,6	6 Nm
AC 2355	210 - 235	170 - 192	150	0,6	6 Nm
AC 2356	210 - 235	190 - 215	150	0,6	6 Nm
AC 2654	240 - 265	144 - 160	150	0,6	6 Nm
AC 2655	240 - 265	170 - 192	150	0,6	6 Nm
AC 2656	240 - 265	190 - 215	150	0,6	6 Nm
AC 2657	240 - 265	210 - 235	150	0,6	6 Nm
AC 2754	250 - 275	160 - 175	150	0,6	6 Nm
AC 2756	250 - 275	200 - 225	150	0,6	6 Nm
AC 9001	260 - 285	180 - 205	150	0,6	6 Nm
AR 2250	260 - 285	240 - 250	130	0,6	6 Nm
AC 2904	265 - 290	144 - 160	150	0,6	10 Nm
AC 2907	265 - 290	210 - 235	150	0,6	10 Nm
AC 2908	265 - 290	235 - 260	150	0,6	10 Nm
AC 2956	270 - 295	185 - 210	150	0,6	10 Nm
AC 3204	295 - 320	144 - 160	150	0,6	10 Nm
AC 3205	295 - 320	170 - 192	150	0,6	10 Nm
AC 3207	295 - 320	210 - 235	150	0,6	10 Nm
AC 3208	295 - 320	240 - 265	150	0,6	10 Nm
AC 3209	295 - 320	265 - 290	150	0,6	10 Nm
AC 3351	310 - 335	180 - 205	150	0,6	10 Nm
AC 3608	335 - 360	240 - 265	165	0,6	10 Nm
AC 3609	335 - 360	265 - 290	165	0,6	10 Nm
AC 3600	335 - 360	295 - 320	165	0,6	10 Nm
AC 3858	360 - 385	240 - 265	165	0,6	10 Nm
AC 3859	360 - 385	265 - 290	165	0,6	10 Nm
AR 3000	360 - 385	325 - 335	160	0,6	10 Nm
AC 3850	360 - 385	300 - 325	165	0,6	10 Nm
AC 4208	395 - 420	240 - 265	165	0,6	10 Nm
AC 4209	395 - 420	265 - 290	165	0,6	10 Nm

"FLEXSEAL", "FERNCO", "EASYJOINT"

AC adaptor couplings page 2 designed for any kind of pipes

Annex 7



reference	OD - range (mm)	width (mm)	internal pressure (bar)	torque assembly
PC 35	30 - 35	80	0,6	6 Nm
PC 43	38 - 43	80	0,6	6 Nm
DC 50	40 - 50	90	0,6	6 Nm
DC 65	50 - 65	90	0,6	6 Nm
PC 68	60 - 68	80	0,6	6 Nm
PC 76	70 - 76	80	0,6	6 Nm
PC 85	78 - 85	80	0,6	6 Nm
DC 95	80 - 95	100	0,6	6 Nm
PC 100	92 - 100	80	0,6	6 Nm
DC 115	100 - 115	100	0,6	6 Nm
DC 125	110 - 125	100	0,6	6 Nm
DC 135	120 - 135	120	0,6	6 Nm
DC 150	135 - 150	120	0,6	6 Nm
DC 165	150 - 165	120	0,6	6 Nm
DC 175	160 - 175	120	0,6	6 Nm
DC 185	170 - 185	120	0,6	6 Nm
DC 195	180 - 195	120	0,6	6 Nm
DC 215	200 - 215	150	0,6	6 Nm
DC 225	210 - 225	150	0,6	6 Nm
DC 250	235 - 250	150	0,6	6 Nm
DC 265	250 - 265	150	0,6	6 Nm
DC 275	260 - 275	150	0,6	10 Nm

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DC couplings type 1 designed for any kind of sewage pipes

Annex 8



reference	thickness (mm)	width (mm)	designed for use with
04 / 70	4	70	AC, SC, LC, SCW, LCW < 290 mm
08 / 70	8	70	AC, SC, LC, SCW, LCW < 290 mm
12 / 85	12	85	SC, LC, SCW, LCW > 310 mm
16 / 70	16	70	AC, SC, LC, SCW, LCW < 290 mm
08 / 85	8	85	SC, LC, SCW, LCW > 310 mm
16 / 85	16	85	SC, LC, SCW, LCW > 310 mm
24 / 85	24	85	SC, LC, SCW, LCW > 310 mm
32 / 85	32	85	SC, LC, SCW, LCW > 310 mm



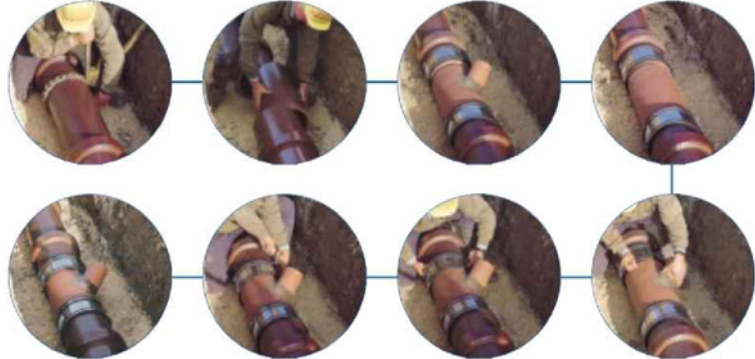
"FLEXSEAL", "FERNCO", "EASYJOINT"

BC elastomeric bushes

Annex 9

Standard Couplings (SC & SCW) & Large Couplings (LC & LCW)

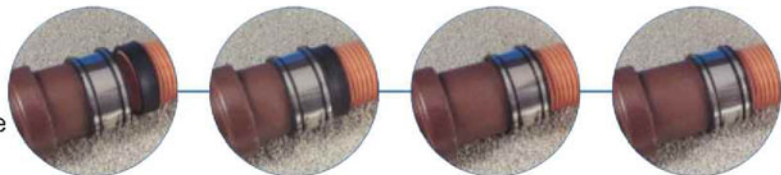
1. Cut Section from pipeline using cutter or disc saw and then remove.
2. The cut should be about 20mm longer than the junction or new section of pipeline to be inserted.
3. Loosen the coupling's stainless steel clamps and slide onto each end of the existing pipeline. No lubricant is required. Position new junction into pipeline.
4. OR position the new section into the pipe.



5. Place pencil mark half a coupling width from each joint and using these pencil marks, centre a coupling over one joint at a time.
6. Tighten the worm drive units in sequence across the width of the coupling to the recommended torque. (Alternatively tighten the central shear band and then the clamps).
7. Once assembled, carefully tamp the bedding under the pipeline.
8. Prior to backfill, re-tighten all worm drives to the recommended torque

Standard Coupling with Bush

1. Position the bush onto the end of the smaller pipe. Loosen the stainless steel clamps on the coupling and place on the large pipe end.
2. Putt the pipes together and slide the coupling over the bush until the edges are level. No lubricant is required.
3. Tighten central shear band and then the clamps to the recommended torque. (Alternatively tighten the worm drive units in sequence across the width of the coupling).
4. After assembly carefully tamp the bedding under the pipeline.
5. Prior to backfill, re-tighten all worm drives to the recommended torque.



Adaptor Couplings

1. Slide the coupling fully on to the large pipe.
2. Place a pencil mark half a coupling width from on the smaller pipe.
3. Insert smaller pipe into the coupling up to the pencil mark and ensure it does not enter too
4. Tighten clamps to the recommended torque and carefully tamp bedding under pipeline.
5. Prior to backfill, re-tighten all worm drives to the recommended torque.



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Installation instruction for flexible couplings

Annex 10