



European Organisation for  
Technical Approvals

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Autorisé et  
☆ notifié conformément à ☆  
l'article 10 de la directive  
89/106/EEC du Conseil, du  
21 décembre 1988, relative au  
☆ rapprochement des dispositions ☆  
législatives, réglementaires  
et administratives des Etats  
☆ membres concernant ☆  
les produits de  
construction.  
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**CSTB**

*le futur en construction*

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# EUROPEAN TECHNICAL APPROVAL

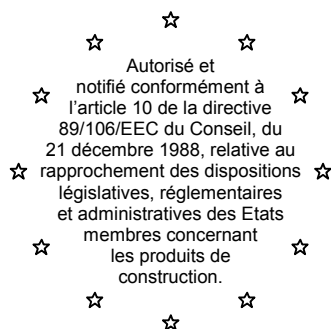
## ETA-09/0248

**FLEXIBLE COUPLINGS  
CANADA PLUS  
FOR ALL PIPE MATERIALS**



# Centre Scientifique et Technique du Bâtiment

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MEMBRE DE L'EOTA

## Agrément Technique Européen **ETA-09/0248**

(English language translation, the original version is in french language)

### Trade names:

Noms commerciaux :

- **FLEX-SEAL Plus (NORHAM Company)**
- **CANADA Plus (MÜCHER DICHTUNGEN GMBH & CO KG)**

### Holder of approval:

Titulaire :

**Société NORHAM**  
**ZA Les Druisieux**  
**F-26260 Saint-Donat-sur-l'Herbasse**

### Generic type and use of construction product:

Type générique et utilisation prévue du  
produit de construction :

**Elastomeric flexible couplings, with an eventually stainless  
steel shear band used to assembly sewer or drainage pipe.**  
Raccords flexibles en élastomère, éventuellement pourvus d'une bande  
de renfort en acier inoxydable, destinés à assembler différents types de  
canalisations d'assainissement.

### Validity from / to:

Validité du :  
au :

**15 December 2009**  
**15 December 2014**

### Manufacturing plant :

Usines de fabrication :

- Société NORHAM  
ZA Les Druisieux  
F-26260 Saint-Donat-sur-l'Herbasse  
- MÜCHER DICHTUNGEN GMBH & CO KG  
Saalestrasse  
D-58256 Ennepetal

Le présent Agrément technique européen  
contient :

**This European Technical Approval  
contains:**

14 pages including 4 annexes which form an integral part of the  
document.

**14 pages incluant 4 annexes faisant partie intégrante du  
document.**



Organisation pour l'Agrément Technique Européen  
European Organisation for Technical Approvals

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European Technical Approval is issued by Centre Scientifique et Technique du Bâtiment 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 products<sup>1</sup>, modified by Council Directive 93/68/EEC of 22 July 1993<sup>2</sup> ;
  - Décret n° 92-647 du 8 juillet 1992<sup>3</sup> concernant l'aptitude à l'usage des produits de construction;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European Technical Approvals set out in the Annex to Commission Decision 94/23/EC<sup>4</sup>;
- 2 The Centre Scientifique et Technique du Bâtiment is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant (for example concerning the fulfilment of assumptions made in this European Technical Approval with regard to manufacturing). Nevertheless, the responsibility for the conformity of the products with the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.
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- 4 This European Technical Approval may be withdrawn by the Centre Scientifique et Technique du Bâtiment pursuant to Article 5 (1) of the Council Directive 89/106/EEC.
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- 6 The European Technical Approval is issued by the approval body in its official language. This version corresponds to the version circulated within EOTA. Translations into other languages have to be designated as such.

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1 Official Journal of the European Communities L 40, 11.2.1989, p. 12

2 Official Journal of the European Communities L 220, 30.8.1993, p. 1

3 Journal officiel de la République française du 14 juillet 1992

4 Official Journal of the European Communities L 17, 20.1.1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product and intended use

#### 1.1. Definition of product

Flexible coupling and fitting FLEX-SEAL Plus or CANADA plus for drains are elastomeric connections (EPDM or 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 FLEX-SEAL Plus or CANADA Plus are the following ones:

- connections SC (FLEX-SEAL Plus) or MSC (CANADA plus) : with metal reinforcement, for weak adaptation of the outside diameters of the pipe to be connected.
- connections AC (FLEX-SEAL Plus) or MAC (CANADA plus) : without metal reinforcement, for adaptation important of the diameters external of the pipe to be connected.
- connections DC (FLEX-SEAL Plus) or MDC (CANADA plus) : without metal reinforcement, for weak adaptation of the outside diameters of the drains to be connected.

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

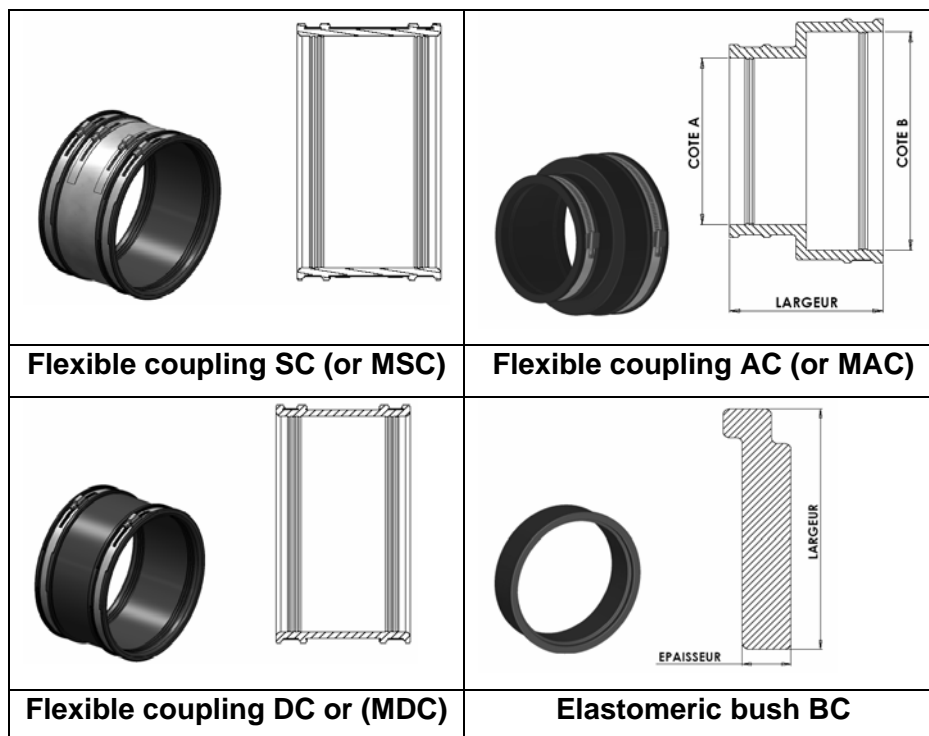


Figure 1 : Range of flexible coupling FLEX-SEAL Plus or CANADA Plus

## 1.2. Intended use

Flexible coupling FLEX-SEAL Plus or CANADA Plus make possible to connect various types of gravity or pressure 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 the following ones:

Type of coupling	Maximal pressure in the pipe (bars)	Outside diameter and pipes connected material	Shear resistance R(N)*
SC (or MSC)	1,0	Different	R(N) > 25 DN (mm)
AC (or MAC)	0,6	Different	Low
DC (or MDC)	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 the rebar connections 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 product and methods of verification

The assessment of fitness of a flexible coupling FLEX-SEAL plus or CANADA Plus 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 FLEX-SEAL Plus or CANADA Plus 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 3.

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

### 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 tool (screw driver or lever tool) is describe annex 1 to 3.

Tension band assembly shall withstand a minimum torque of 10 N.m when a screw-driver is recommended.

Tension band assembly shall withstand a minimum torque of 17N.m when a lever tool is recommended.

### 2.3. Tensile strength of welds or clinch

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 record.

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 FLEX-SEAL Plus or CANADA Plus 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 shall not leak with the recommended torque and the following hydrostatic pressure :

Type of flexible couplings	Pressure (bars)
AC (or MAC)	0,6
DC (or MDC)	0,6
SC (or MSC)	1,5

### 2.6. Reaction to fire

Reaction to fire of flexible couplings FLEX-SEAL Plus or CANADA Plus is tested according EN ISO 11925-2.

Flexible coupling FLEX-SEAL Plus or CANADA Plus are classified E according EN 13501-1.

### 2.7. Steel grade

Stainless steel components of flexible couplings FLEX-SEAL Plus or CANADA Plus 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 1.4401 or 1.4404).

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 (type WC) or Nitril (type WG) according to 681-1.

The components made of elastomeric materials of flexible coupling FLEX-SEAL Plus or CANADA Plus are tested according the following table :

Characteristics	Test method	Requirement
Hardness (DIDC)	ISO 48	60±5
Tensile strength (MPa) Elongation at break. (%)	ISO 37	9 300
Compression set. (%) - 72 h at 23°C - 24 h at 70 °C - 72 h at -10°C	ISO 815	12 20 50
Ageing in air - Change hardness (%) - Change tensile strength (%) - Change elongation at break (%)	ISO 188	+8/-5 -20 +10/-30
Stress relaxation maxi. - 7days at 23°C (%) - 100 days at 23°C (%) - Stress relaxation (per logarithmic decad) (%)	ISO 3384	15 22 5,5
Volume change in water maxi. (%)	ISO 1817	+8/-1
Resistance of splice strength (%)	EN 681-1	100
Specification complementary (Type WG) : Volume change in oil (1 et 3) en %	ISO 1817	± 10 et + 50

## 2.9. Coupling performances

When tested according the following conditions and depending of type, flexible couplings FLEX-SEAL Plus or CANADA Plus do not leak :

Type of flexible couplings	Conditions		Assembly	Requirements
SC or MSC	Vacuum (air) : - 0,3 bar time test : 15 min	Shear load : 25 DN (N)	- Rigid/rigid	End value pressure ≤-0,27 bar
SC or MSC AC or MAC DC or MDC		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 or MSC	Pressure (water) : - SC or MSC : 1,5 bars - AC or MAC : 0,6 bar - DC or MDC : 0,6 bar time test : 15 min	Shear load : 25 DN (N)	- Rigid/rigide	No leakage
SC or MSC AC or MAC DC or MDC		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/rigide	
SC or MSC AC or MAC DC or MDC	Vacuum (air) : - 0,3 bar time test : 15 min	Diameter distortion	- Rigid/flexible - Flexible/flexible	End value pressure ≤-0,27 bar
SC or MSC AC or MAC DC or MDC	Pressure (water) : - SC or MSC : 1,5 bars - AC or MAC : 0,6 bar - DC or MDC : 0,6 bar time test : 15 min		- Rigid/flexible - Flexible/flexible	No leakage

## 2.10. Long term shear resistance and long term creep resistance

When tested according to EN 295-3 § 18.3, 18.5 and 18.6 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 FLEX-SEAL Plus SC or CANADA Plus MSC do not leak.

## 2.11. Content and/or release of dangerous substances

A written declaration is submit to the holder.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the product 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, if applicable, to be complied with.

## 3 Evaluation and attestation of conformity and CE marking

### 3.1. System of attestation of conformity

According to the decision 97/464.CE du 27/06/1997of the European Commission the system(s) of attestation of conformity for flexible couplings FLEXSEAL Plus or CANADA plus is 4 for :

- Mechanical resistance and stability (ER1)
- Hygiene, health and environnement (ER3)

In addition, according to the decision 2004/663/CE du 20/09/2004 of the European Commission the system of attestation of conformity is 3 with regard to reaction to fire.

The systems of attestation of conformity referred to above is defined as follows:

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

a) Tasks for the manufacturer :

1. Initial type-testing of the product,
2. Factory production control .

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

a) Tasks for the manufacturer : factory production control,

b) Tasks for the notified body : initial type-testing of the product,

### **3.2. Responsibilities**

#### **Task of the manufacturer :**

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Approval.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the prescribed test plan. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of incoming materials shall include control of the inspection documents presented by suppliers.

The frequency of controls and tests conducted during production is laid down in the prescribed test plan taking account of the automated manufacturing process of the product.

The results of factory production control are recorded and evaluated. 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;
- result of control and testing and, if appropriate, comparison with requirements;
- signature of person responsible for factory production control.

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

On request, they shall be presented to the Centre Scientifique et Technique du Bâtiment.

Details of the extent, nature and frequency of testing and controls to be performed within the factory production control shall correspond to the prescribed test plan which is part of the technical documentation of this European Technical Approval.

### **3.3. CE marking**

The CE marking shall be affixed on a label gummed 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 : FLEX-SEAL Plus or CANADA Plus,
- 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,
- reaction to fire class,

Following information shall be written on the direction for use :

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

## **4 Assumptions under which the fitness of the product 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 or MSC couplings) by point welding or clinch.

### **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 describe in annex 4.

It is the responsibility of the ETA-holder to guarantee that the information about design and installation of this panels 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 shells using one or several illustrations.

The minimal data required are:

- outside diameters of pipes to connect,

- maximum pressure in use,
- torque and tool to assembly,
- capacity of the flexible coupling to resist at a shear load.
- information about installation, preferably with an illustration.

All data shall be presented in a clear and explicit form.

Annex 1, 2, 3 et 4 indicate flexible coupling to choose, function of outside diameters.

For flexible coupling SC (or MSC) the choice of the thickness bushes shall be according to the following table :

	A bush is necessary if the difference between the external diameters is greater than :
① for $D_{ext.} \leq 120$ mm	10 mm
② for $300 \geq D_{ext.} > 120$ mm	12 mm
③ for $D_{ext.} > 300$ mm	15 mm

The bush is pushed on the lower outside diameter.

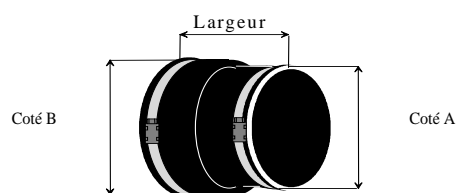
If the difference of external diameters is greater than these values it is necessary to install a bush on the lower outside diameter.

In case of flexible coupling AC (or MAC) the bush shall be choose to have the recommended range of use of the flexible coupling.

**Le Directeur Technique**  
**H. BERRIER**


**Table 1 : Flexible couplings "AC" or "MAC" (type 1)**

Outside diameter (mm)	Thickness under tension band (mm)	Width of tension band (mm)	Thickness of tension band (mm)
< 200	4,5	12	0,6
201 - 375	5,5		



Minimal values for dimensions of flexible couplings "AC" or "MAC"

Side A = Side little diameter      Side B = Side great diameter

References AC (or MAC)	Range of using side A (mm)	Range of using side B (mm)	Width (mm)	Torque assembly (N.m)
1221	80-95	110-125	120	 6 N.m Tool :
1361	80-95	121-136	120	
5144	100-115	110-125	120	
1362	100-115	121-136	120	
5654	100-115	130-145	102	
5664	100-115	155-170	150	
5164	100-115	165-182	153	
0264	100-115	180-200	150	
4000	110-125	121-136	120	
1452	110-125	130-145	120	
1602	110-125	144-160	120	
1702	110-125	155-170	120	
1922	110-125	170-193	120	
2102	110-125	185-210	150	
2352	110-125	210-235	150	
1603	121-136	144-160	120	
1923	121-136	170-193	120	
2353	121-136	210-235	150	
1703	130-145	155-170	120	
2000	130-145	180-200	150	
2104	130-145	185-210	150	
5685	130-145	210-235	166	
1924	144-160	170-193	120	
2105	144-160	185-210	152	
2354	144-160	210-235	150	
2654	144-160	240-265	150	
5686	150-170	197-222	150	
0286	153-168	232-257	153	
2001	155-170	180-200	150	
56106	155-175	255-280	165	
6000	160-180	180-200	150	
2355	170-193	210-235	150	
2655	170-193	240-265	150	
0698	180-200	275-300	152	
2356	190-215	210-235	150	
2656	190-215	240-265	150	
56108	197-222	250-275	165	
2657	210-235	240-265	150	
5612	250-275	300-325	165	
0212	300-325	350-375	153	

Range of flexible couplings "AC" or "MAC"

Nota : the reference of the couplings made of NBR rubber is added by the letter "N"

Flexible couplings FLEX-SEAL Plus or CANADA Plus


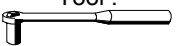
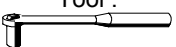
Dimensions

Annex 1  
of European Technical Approval  
ETA-09/0248

**Tableau 2 : Flexible couplings "SC " or "MSC" (type 2B)**

Outside diameter (mm)	Width (mm)	Thickness under tension band (mm)	Width of shear band (mm)	Thickness shear band (mm)	Width of tension band (mm)	Thickness of tension band (mm)
< 200	120	7,0	54	0,35	12	0,6
201 – 300	150	7,5	78	0,35	12	0,6
301 – 600	185	9,0	97	0,75	12	0,6

**Minimal values for dimensions of flexible couplings type "SC" or "MSC"**

Reference	Diameter Mini (mm)	Diameter Maxi (mm)	Width (mm)	Torque assembly
SC or MSC115	100	115	120	<p>6N.m Tool :</p> 
SC or MSC 120	110	121	120	
SC or MSC 137	120	137	120	
SC or MSC 150	130	150	120	
SC or MSC 162	137	162	120	
SC or MSC 175	150	175	120	
SC or MSC 180	165	180	150	
SC or MSC 190	165	190	150	
SC or MSC 200	175	200	150	<p>10N.m Tool :</p> 
SC or MSC 212	187	212	150	
SC or MSC 225	200	225	150	
SC or MSC 250	225	250	150	
SC or MSC 275	250	275	150	
SC or MSC 290	265	290	150	
SC or MSC 310	285	310	190	
SC or MSC 320	290	320	190	
SC or MSC 335	310	335	190	
SC or MSC 350	325	350	190	
SC or MSC 360	335	360	190	<p>13 N.m Tool :</p> 
SC or MSC 365	340	365	190	
SC or MSC 385	355	385	190	
SC or MSC 410	385	410	190	
SC or MSC 430	400	430	190	
SC or MSC 445	415	445	190	
SC or MSC 465	435	465	190	
SC or MSC 490	460	490	190	
SC or MSC 510	480	510	190	
SC or MSC 525	495	525	190	
SC or MSC 545	515	545	190	
SC or MSC 550	525	550	190	
SC or MSC 560	530	560	190	
SC or MSC 570	545	570	190	
SC or MSC 585	550	585	190	
SC or MSC 600	570	600	190	

**Range of flexible couplings "SC" or "MSC"**

**Nota :** the reference of the couplings made of NBR rubber is added by the letter "N"

<b>Flexible couplings FLEX-SEAL Plus or CANADA Plus</b>	<b>Annex 2</b> of European Technical Approval <b>ETA-09/0248</b>
<b>Dimensions</b>	

**Table 3 : Flexible couplings "DC" or "MDC" (Type 1)**

Outside diameter (mm)	Width (mm)	Thickness under tension band (mm)	Width of tension band (mm)	Thickness of tension band (mm)
< 200	120	7,0	12	0,6
201 – 275	150	7,5	12	0,6

**Minimal values for dimensions of flexible couplings type "DC" or "MDC"**

Reference	Diameter Mini (mm)	Diameter Maxi (mm)	Width (mm)	Torque assembly
DC or MDC 115	100	115	102	6N.m Outillage : 
DC or MDC 120	110	120	120	
DC or MDC 137	120	137	120	
DC or MDC 150	125	150	120	
DC or MDC 162	137	162	120	
DC or MDC 175	150	175	120	
DC or MDC 180	160	180	150	
DC or MDC 190	165	190	150	
DC or MDC 200	175	200	150	
DC or MDC 212	187	212	150	
DC or MDC 225	200	225	150	
DC or MDC 250	225	250	150	
DC or MDC 275	250	275	150	

**Range of flexible couplings "DC" or "MDC"**

**Nota :** the reference of the couplings made of NBR rubber is added by the letter "N"

**Table 4 : dimensions for bushes « BC »**

Reference BC	08-80	16-80	08-100	16-100	24-100	32-100	40-100	48-100
Thickness (mm)	8	16	8	16	24	32	40	48
Width (mm)	80	80	100	100	100	100	100	100
Intended use	AC & SC or MAC & MSC width < 190 mm		SC or MSC width ≥ 190 mm					

**Nota :** the reference of the bushes made of NBR rubber is added by the letter "N"

**Flexible couplings FLEX-SEAL Plus or CANADA Plus**

**Dimensions**

**Annex 3**  
of European Technical Approval  
**ETA-09/0248**

## Tableau 7: Installation

### Flexible couplings « SC » - « DC » or « MSC » - « MDC »

In all the cases, the coupling shall be in contact with the pipe on 4 cm on each side. In case of shearing, the distance between the 2 pipes should not exceed 2 cm



① Trace on the larger external diameter pipe a reference mark corresponding to half of the width of the coupling.

② Loosen fixings and slip the coupling on the larger external diameter pipe.

③ Align the 2 pipes and approach them nearest possible one to the other.

④ Slip the coupling to the reference mark and tighten all fixings until blocking (The recommended tightening torque is indicated on the label of the coupling).

### Flexible couplings « SC » or « MSC » with « BC »

In all the cases, the coupling shall be in contact with the pipe on 4 cm on each side. In case of shearing, the distance between the 2 pipes should not exceed 2 cm.



① Loosen fixings and slip the coupling on the larger external diameter pipe.

② Slip the ring on the smaller external diameter pipe. The ring levels the edge of the pipe.

③ Align the 2 pipes and approach them nearest possible one to the other.

④ Slip the coupling on the bush until the coupling level the shoulder of the bush. Tighten fixings until blocking (the tightening torque recommended is indicated on the label of the coupling).

### Flexible couplings « AC » or « MAC »

In all the cases, the coupling must be in contact with the pipe on 4 cm on each side.



① Loosen fixings.

② Slip the coupling on the smaller external diameter pipe.

③ Push the smaller external diameter pipe towards largest and push the larger diameter external pipe nearest possible of the internal shoulder to the coupling.

④ Tighten the fixations of the coupling until blocking. (The tightening torque recommended is indicated on the label of the coupling).

#### Complementary remarks :

-1 : In case of assembly "coupling+bush", according to the direction of the flow, it can be useful to block the bush in order to limit the risks of dismantling.

-2 : For any connection on concrete pipe, check before the surface quality of the pipe; if necessary make the surface clean, smooth and clear.

-3 : For any connection on corrugated pipe, place the clamp at the top of corrugation.

**Flexible couplings FLEX-SEAL Plus or CANADA Plus**

**Installation**

**Annex 4**

**of European Technical Approval  
ETA-09/0248**

All national testing boards listed below are member of the **EOTA** and have accepted and validated the **European Technical Approval ETA-09/0248**.

EOTA MITGLIEDER		EOTA MITGLIEDER	
 Austria :	ÖSTERREICHISCHES INSTITUT FÜR BAUTECHNIK (OIB)	 Latvia	ETA-Latvia Building Department of the Ministry of Economics
 Belgium	UNION BELGE POUR 'L AGREMENT TECHNIQUE DANS LA CONSTRUCTION (UBAtc) asbl - BELGISCHE UNIE VOOR DE TECHNISCHE GOEDKEURING IN DE BOUW (BUtgb) vzw	 Lithuania	Statybos Produkcijos Sertifikavimo Centras (SPSC) SE Certification Centre of Building Products
 Cyprus	CENTRAL LABORATORY - PUBLIC WORKS DEPARTMENT	 Luxemburg	LABORATOIRE DES PONTS ET CHAUSSÉES
 Czech Republic	Technicky a zkusebni ustav stavebni Praha, s.p. (TZUS) Technical and Test Institute for Construction	 Netherlands	STICHTING BOUWKWALITEIT (SBK)
 Denmark	ETA-DANMARK A/S	 Norway	SINTEF Building and Infrastructure (SINTEF)
 Estonia	Tallinna Tehnikaülikool Tallinn University of Technology (TUT)	 Poland	Instytut Techniki Budowlanej (ITB)
 Finland	VTT Expert Services Oy	 Portugal	LABORATORIO NACIONAL DE ENGENHARIA CIVIL (LNEC)
 France	CENTRE SCIENTIFIQUE ET TECHNIQUE DU BATIMENT (CSTB)	 Slovak Republic	Technicky a Skúšobný Ústav Stavebný (TSUS) Building Testing & Research Institute
 Germany	DEUTSCHES INSTITUT FÜR BAUTECHNIK (DIBt)	 Slovenia	ZAVOD ZA GRADBENIŠTVO SLOVENIJE (ZAG)
 Greece	HELLENIC ORGANIZATION FOR STANDARDISATION (ELOT)	 Spain	INSTITUTO DE CIENCIAS DE LA CONSTRUCCIÓN EDUARDO TORROJA (IETcc)
 Hungary	ÉPÍTÉSÜGYI MINOSÉGELLENORZO INNOVÁCIÓS KHT (ÉMI Kht) Non-profit Company for Quality Control and Innovation in Building	 Sweden	SWEDISH INSTITUTE FOR TECHNICAL APPROVAL IN CONSTRUCTION (SITAC)
 Iceland	INNOVATION CENTRE ICELAND (NMI)	 Switzerland	SWISS FEDERAL LABORATORIES FOR MATERIALS TESTING AND RESEARCH (EMPA)
 Ireland	IRISH AGRÉMENT BOARD (IAB) NATIONAL STANDARDS AUTHORITY OF IRELAND	 United Kingdom.	BRITISH BOARD OF AGRÉMENT (BBA)
 Italy	ISTITUTO PER LE TECNOLOGIE DELLA COSTRUZIONE (ITC)		