

# FTTx Microduct Connectors

## DATASHEET Series V4000 PLUS



5000062405	<b>FTTx Microduct Connectors</b> <b>DATASHEET Series V4000 PLUS</b>		
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Recepita come CEI EN 50411-2-8:2010-06

<p><b>EUROPEAN STANDARD</b></p> <p><b>NORME EUROPÉENNE</b></p> <p><b>EUROPÄISCHE NORM</b></p>	<p><b>EN 50411-2-8</b></p> <p>May 2009</p>
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ICS 33.180.20

English version

**Fibre organisers and closures to be used  
in optical fibre communication systems -  
Product specifications -  
Part 2-8: Microduct connectors, for air blown optical fibres, Type 1**

Organiseurs et boîtiers de fibres à utiliser  
dans les systèmes de communication  
par fibres optiques -  
Spécifications de produits -  
Partie 2-8: Connecteurs en microconduits  
de Type 1, destinés aux fibres optiques  
soufflées à l'air comprimé

LWL-Spleißkassetten und -Muffen  
für die Anwendung in LWL-  
Kommunikationssystemen -  
Produktnormen -  
Teil 2-8: ABF-Mikrorohrverbinder,  
Bauart 1

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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## CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

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Ref. No. EN 50411-2-8:2009 E

Copia concessa a CAMOZZI SPA in data 22/03/2011 da CEI-Comitato Elettrotecnico Italiano

Issued from <b>TECHNICAL OFFICE</b>	Date 07-06-2023	Designer <b>Paolo Simpsi</b>	Approved <b>Alberto Maffi</b>
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## 1 Scope

### 1.1 Product identification

This specification contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements of a fully installed blown fibre 'microduct' connector in order for it to be categorised as an EN standard product.

This product specification covers the following 'microduct connectors' to suit a wide range of blown fibre applications, for floating or fixed:

- joining the same size microduct, or different sizes of microduct;
- joining same size protected microduct, to same or different size of microduct or protected microduct;
- disconnection of the connector to gain access, for example, to insert blowing equipment;
- a means to seal the fibre inside the connector to prevent the flow of liquids;
- close off open-ended microducts.

This product specification covers blown fibre microduct connectors for use in 'sub-ducts or protected micro-duct cable closures' as specified in EN 50411-2-5 for use in outside environments, and for both sealed and non-sealed closures. The outside environment includes both subterranean (underground) and/or aerial applications.

This document includes reducer/enlarger products. It may not be possible to blow through these devices. Manual feeding may be required because of the pressure gradient step.

This product specification does not apply to microduct connectors for use in direct sunlight.

### 1.2 Operating environment

The tests selected, combined with the severity and duration, are representative of an outside plant environment for both subterranean and aerial environments defined by

- ETSI EN 300 019 series: class 8.1: underground locations,
- EN 61753-1: all categories.

Source: EN 50411-2-8

### SERVICE LIFE EXPECTANCY

#### 1.3 Reliability

Whilst the anticipated service life expectancy of the product in these environments is 20 years, compliance with this specification does not guarantee the reliability of the product. This should be predicted using a recognised reliability assessment programme.

Source: EN 50411-2-8

While the expected service life for the product can be set, complying EN 50411-2-8, to 20 years Camozzi, which is a recognized expert in Microduct connectors, has designed and tested its products to be fit for purpose for 25 years of normal service.

### AGEING TEST:

No.	Test	Requirement	Details	
12	Change of temperature (cycling)	Sealing performance (test 1) Visual appearance (test 3) (separate test samples are made for the optical test)	Method: Extreme temperatures:  Dwell time: Rate of change Number of cycles: Sample configuration: for sealing performance  Test pressure:	EN 61300-2-22 -40 °C ± 2 °C and +65 °C ± 2 °C 4 h 1 °C/min 20 Half of population is placed in a straight configuration, the other half shall make a 90° bend with minimum allowed bend radius as specified by the supplier of the microduct Internal overpressure regulated at 40 kPa ± 2 kPa during test

Source: EN 50411-2-8

Following EN 50411-2-8 norm conception, the 20 cycles represent 20 years expected lifetime of the product.

FTTx Camozzi V4000 PLUS Series of connectors have been tested and passed 40 (160 hours) to confirm our lifetime expectancy of 25 years.

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**QUALITY ASSURANCE**

**1.4 Quality assurance**

Compliance with this specification does not guarantee the manufacturing consistency of the product. This should be maintained using a recognised quality assurance programme.

Source: EN 50411-2-8

The manufacturing consistency of the product is maintained using TÜV SÜD dedicated quality assurance program.



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**FEATURES AND FUNCTIONAL SPECIFICATIONS:**

- For Standard and Direct Buried Applications
- Compact Size
- FULL PLASTIC DESIGN (METAL-FREE)
- Push-Fit
- No tools needed.
- Safety Clip assembled.
- Transparent body allows verification of the position of Microduct and population of the fiber.
- Maximum installation pressure: 20 bar
- Working temperature: -20° / +70°C
- Fluid: Compressed air with blowing system
- Microduct to connect: Polyethylene HDPE
- According to Standards: CEI EN 50411-2-8
- Protection class: IP68
- Estimated life: 25 years

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### 4 Description

#### 4.1 Microduct connector housing

It is essential that the connector should be compatible with input and output microduct internal diameters and that the connector with different microduct internal diameter tubes, should not impede blowing performance from the blowing direction.

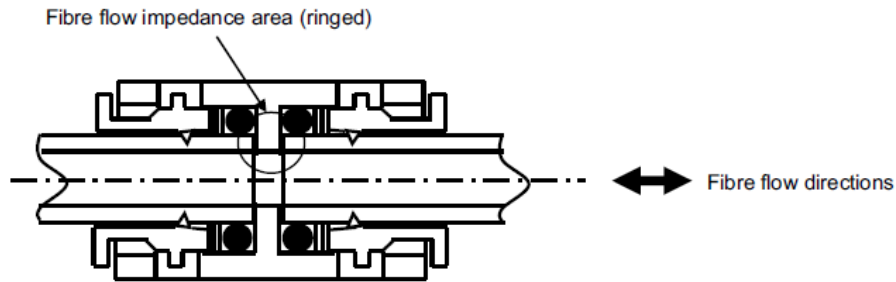


Figure 1 – Fibre flow impedance

Fibre flow impedance is typically caused by one of the following. Possible causes of impedance should be identified and effects on blowing considered prior to product selection.

- a) Internal diameter of the microduct stop lip face of the connector smaller than the internal diameter of the microduct, creating a step in both directions.



Figure 2 – Fibre flow impedance – Both direction step

- b) Internal diameters of the two microducts are different creating a step in one direction.



Figure 3 – Fibre flow impedance – One direction step

- c) Connector with different size microducts with an acute angled step on the lip stop face of the connector.

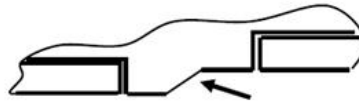
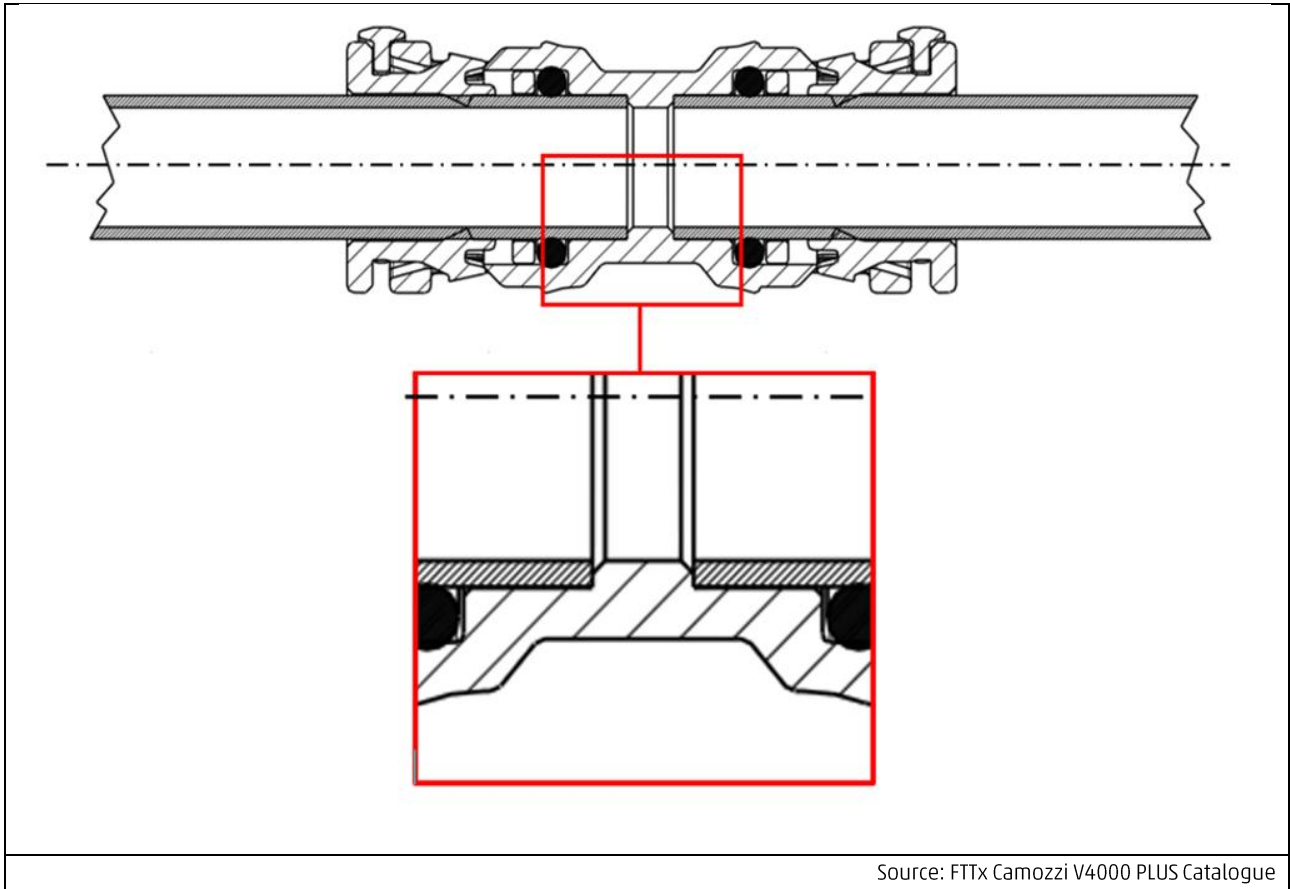


Figure 4 – Fibre flow impedance – Acute angled step

Source: EN 50411-2-8

**PERFECT FIT**



Series V4000 PLUS are designed to have a different model for every single internal diameter of the microducts.

For example, CV4580 PLUS 12/10 and CV4581 PLUS 12/8, despite the common external diameter of coupling with the microduct, each have a different internal passage to align the walls of the duct with the walls of the connectors to ensure the absence of possible steps that could cause the fiber to block during the blowing process.



**MATERIALS SPECIFICATIONS:**

**4.4 Materials**

All materials that could come in contact with personnel shall meet appropriate health and safety regulations.

Connector housing and sealing materials shall be compatible with each other and with the materials of the cables. Material section of this document must conform to RoHS requirements.

All components of the microduct connector shall be resistant to solvents and degreasing agents typically used.

The effects of fungus shall be determined by measuring a suitable property both before and after exposure. The 28-day test from EN 60068-2-10 (micro-organisms) should be used.

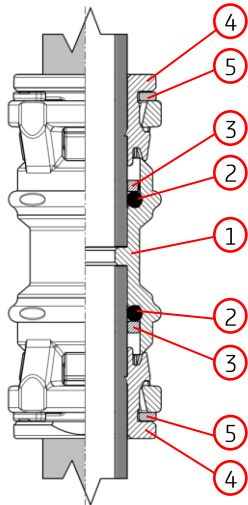
Metallic parts shall be resistant to corrosive influences they may encounter during the lifetime of the product.

Source: EN 50411-2-8

All straight connectors, endstop connectors and reducing straight connectors are made with plastic materials compatible with the substances present in the ground (substances and percentage values in accordance with the Standard CEI EN 50411-2-8).

Series V4000 PLUS are made with only plastic components (technopolymers and NBR) without using any metal part to avoid possible damages cause by corrosion influences.

All technopolymers used for production of Series V4000 PLUS comply with Directive 2002/95/EC RoHS (Restriction of Hazardous Substances).

	<p><b>FULL PLASTIC DESIGN:</b></p> <ol style="list-style-type: none"> <li>1. BODY: Polycarbonate UV Stabilized</li> <li>2. O-RING: NBR</li> <li>3. WASHER: Polyacetal</li> <li>4. COLLET: Homopolymer Polyacetal</li> <li>5. SAFETY CLIP: Polyacetal</li> </ol>
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**Doc. Reference:** 5000029975 VER 01

**Subject:** Supplier Declaration of Conformance to Directive 2011/65/EU on restriction of use of certain hazardous substances in electrical and electronic equipment, recasted after Commission Delegated Directive (EU) 2015/863, Commission Delegated Directive (EU) 2018/739, Commission Delegated Directive (EU) 2018/740, Commission Delegated Directive (EU) 2018/741

Camozzi Automation Spa declares that the "homogeneous materials" used in the products listed below are in compliance with requirements of directive **2011/65/EU**

Camozzi Product category	Description	Restricted substance contained	Exemption	Material containing restricted substances
C_FTTx	Series V4000 microduct connectors	None	None	None
	Series V4000 PLUS microduct connectors	None	None	None

Camozzi Automation hereby certifies that heavy metals such as lead, mercury, cadmium, hexavalent chromium and poly brominated biphenils and poly brominated diphenils ethers were not used as intentional ingredients in the production of the products listed above. In addition the composition of raw materials used in production of these products were reviewed for any known presence of residual heavy metals, PBBs and PBDEs and none above the current RoHS limits was found.

Restricted Phthalates contained in the following list: Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), Diisobutyl phthalate (DIBP), are not intentionally added by Camozzi Automation's suppliers, any presence of these substances is not foreseen in our products.

The Declaration of Conformity to the Directive and expiry date of exemptions is responsibility of the producer of the equipment which is part of the Categories mentioned in the scope of directive.

Brescia, 2023/06/15<sup>TH</sup>

**Camozzi Automation SPA**  
Product Certification Manager  
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Società soggetta all'attività di direzione e coordinamento di Camozzi Group S.p.A.



Impegnata per un ambiente migliore, Camozzi Automation utilizza carta riciclata.

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## INSTALLATION GUIDELINES

### 1. Preparing the microduct to be connected

Take the microduct to be connected, clean it, check its dimension and ovality.

The microduct should be clean and free from burrs, cuts, scratches or any other damage before it is inserted into the connector. In case of ovalization of the microduct shaping the round profile is mandatory.

Cut the microduct (recommended cut with Camozzi tube cutters Mod. PNZ-25 or Mod. PNZP-12) with a tilt angle of 90° (± 3°) and remove any burr due to the cut by trimming the edges of the microduct with a bevel tool.

### 2. Installing the connector

With the microduct properly prepared, install the push-fit connector (removal of safety clip is not required) reaching the internal register which indicates the correct position of the microduct in the connector.

### 3. Position of the connector in the infrastructure

Straight connectors CV4580 PLUS, CV4581 PLUS and Reducing Straight connectors CV4582 PLUS are designed to work parallel to the installation axis of the connected microducts, for this reason it is mandatory to respect at least 200 mm on each side of overlapped alignment of the axis of the connectors with respect to the axis of the microducts.

Endstop connectors CV4750 PLUS can be placed in any position of the infrastructure.

### 4. Releasing the connector

Make sure that the system is depressurised before you remove the microduct from the connector.

If present remove the safety clip and press the collet towards the inside of the connector.

The connector can be pulled following the installation axis.

Avoid twisting and rotating the connector around the microduct during the pulling operation as this could damage the design of the collets and render the connector unusable. If release of connector has been done by twisting and rotating don't use the same connector for new installation or reinstallation.

Using the correct procedure the connector can be released and installed up to 5 times.

For interventions on the infrastructure, after years of installation, during which maintenance and / or disconnection of the microduct from the connectors is required, we recommend the use of the Protection cap Mod. 4708.

### 5. Reinstalling the connector

To reinstall the connector on the infrastructure please refer to point 1 and point 4.

Cutting the used ends of the microduct may be necessary and is certainly advisable.

### 6. Direct Buried (DB) installation

Although the V4000 PLUS series can be direct buried we recommend a protective cap is placed on the connector before the microduct is inserted, especially on very challenging environmental conditions.

The protective cap prevents waste, soil, stones or sand entering the connector during disconnection.

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**ENVIRONMENTAL CONDITIONS:**

Transport and storage temperature	-10°C / +50°C
Installation temperature	-15°C / +50°C
Working temperature	-20°C / +70°C
Maximum installation pressure	20 bars
Recommended blowing temperature	-15°C / +35°

**DIRECT BURIED (DB) USE:**

ALL models can be used in direct buried installation. We don't recommend the burying of thin Microduct which can fail in DB conditions while the connector will perform correctly.

**WARNING:**

Not to be used in sealed closures without an over pressure safety system.

**CONFLICT OF SUBSTANCES:**

No liquids may be introduced into the infrastructure except for water-based lubricants specifically designed for optical fibers and compatible with polycarbonate.

**STORAGE CONDITIONS:**

Store in a dry environment, in the absence of dirt and dust, preferably away from direct sunlight and heat sources.

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**EN 50411-2-8 VARIANT NUMBERS:**

#PART	VARIANT NUMBER (EN 50411-2-8)	DESCRIPTION (EN 50411-2-8)
CV4750 PLUS 3	EN50411-2-8 - 030 - EST - T	End stop
CV4580 PLUS 3/2.1	EN50411-2-8 - 030/021 - 030/021 - STR - T	Straight
CV4750 PLUS 4	EN50411-2-8 - 040 - EST - T	End stop
CV4580 PLUS 4/2.1	EN50411-2-8 - 040/021 - 040/021 - STR - T	Straight
CV4580 PLUS 4/2.5	EN50411-2-8 - 040/025 - 040/025 - STR - T	Straight
CV4750 PLUS 5	EN50411-2-8 - 050 - EST - T	End stop
CV4582 PLUS 5/3.5-3/2.1	EN50411-2-8 - 050/035 - 030/021 - BRE - T	ID and OD reducer/enlarger
CV4580 PLUS 5/3.5	EN50411-2-8 - 050/035 - 050/035 - STR - T	Straight
CV4750 PLUS 7	EN50411-2-8 - 070 - EST - T	End stop
CV4582 PLUS 7-5/3.5	EN50411-2-8 - 070/035 - 050/035 - ORE - T	OD reducer/enlarger
CV4581 PLUS 7/3.5	EN50411-2-8 - 070/035 - 070/035 - STR - T	Straight
CV4582 PLUS 7/4-4/2.1	EN50411-2-8 - 070/040 - 040/021 - ORE - T	OD reducer/enlarger
CV4582 PLUS 7/4-5/3.5	EN50411-2-8 - 070/040 - 050/035 - ORE - T	OD reducer/enlarger
CV4581 PLUS 7/4	EN50411-2-8 - 070/040 - 070/040 - STR - T	Straight
CV4580 PLUS 7/5.5	EN50411-2-8 - 070/055 - 070/055 - STR - T	Straight
CV4750 PLUS 8	EN50411-2-8 - 080 - EST - T	End stop
CV4581 PLUS 8/4	EN50411-2-8 - 080/040 - 080/040 - STR - T	Straight
CV4581 PLUS 8/4.5	EN50411-2-8 - 080/045 - 080/045 - STR - T	Straight
CV4581 PLUS 8/5	EN50411-2-8 - 080/050 - 080/050 - STR - T	Straight
CV4580 PLUS 8/6	EN50411-2-8 - 085/060 - 085/060 - STR - T	Straight
CV4750 PLUS 8.5	EN50411-2-8 - 085 - EST - T	End stop
CV4580 PLUS 8.5/6	EN50411-2-8 - 080/060 - 080/060 - STR - T	Straight
CV4750 PLUS 10	EN50411-2-8 - 100 - EST - T	End stop
CV4582 PLUS 10-7/5.5	EN50411-2-8 - 100/055 - 070/055 - ORE - T	OD reducer/enlarger
CV4582 PLUS 10/5.5-8/5	EN50411-2-8 - 100/055 - 080/050 - BRE - T	ID and OD reducer/enlarger
CV4581 PLUS 10/5,5	EN50411-2-8 - 100/055 - 100/055 - STR - T	Straight
CV4582 PLUS 10/6-7/4	EN50411-2-8 - 100/060 - 070/040 - BRE - T	ID and OD reducer/enlarger
CV4581 PLUS 10/6	EN50411-2-8 - 100/060 - 100/060 - STR - T	Straight
CV4581 PLUS 10/7	EN50411-2-8 - 100/070 - 100/070 - STR - T	Straight
CV4582 PLUS 10/8-7/4	EN50411-2-8 - 100/080 - 070/040 - BRE - T	ID and OD reducer/enlarger
CV4580 PLUS 10/8	EN50411-2-8 - 100/080 - 100/080 - STR - T	Straight
CV4750 PLUS 12	EN50411-2-8 - 120 - EST - T	End stop
CV4582 PLUS 12-10/8	EN50411-2-8 - 120/080 - 100/080 - ORE - T	OD reducer/enlarger
CV4581 PLUS 12/8	EN50411-2-8 - 120/080 - 120/080 - STR - T	Straight

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CV4580 PLUS 12/10	EN50411-2-8 - 120/100 - 127/100 - STR - T	Straight
CV4750 PLUS 12.7	EN50411-2-8 - 127 - EST - T	End stop
CV4580 PLUS 12.7/10	EN50411-2-8 - 127/100 - 127/100 - STR - T	Straight
CV4750 PLUS 14	EN50411-2-8 - 140 - EST - T	End stop
CV4582 PLUS 14-12/10	EN50411-2-8 - 140/100 - 120/100 - ORE - T	OD reducer/enlarger
CV4581 PLUS 14/10	EN50411-2-8 - 140/100 - 140/100 - STR - T	Straight
CV4580 PLUS 14/12	EN50411-2-8 - 140/120 - 140/120 - STR - T	Straight
CV4750 PLUS 16	EN50411-2-8 - 160 - EST - T	End stop
CV4581 PLUS 16/10	EN50411-2-8 - 160/100 - 160/100 - STR - T	Straight
CV4582 PLUS 16/12-14/10	EN50411-2-8 - 160/120 - 140/100 - BRE - T	ID and OD reducer/enlarger
CV4581 PLUS 16/12	EN50411-2-8 - 160/120 - 160/120 - STR - T	Straight
CV4580 PLUS 16/14	EN50411-2-8 - 160/140 - 160/140 - STR - T	Straight
CV4750 PLUS 18	EN50411-2-8 - 180 - EST - T	End stop
CV4581 PLUS 18/12	EN50411-2-8 - 180/120 - 180/120 - STR - T	Straight
CV4581 PLUS 18/14	EN50411-2-8 - 180/140 - 180/140 - STR - T	Straight
CV4580 PLUS 18/15	EN50411-2-8 - 180/150 - 180/150 - STR - T	Straight
CV4750 PLUS 20	EN50411-2-8 - 200 - EST - T	End stop
CV4581 PLUS 20/15	EN50411-2-8 - 200/150 - 200/150 - STR - T	Straight
CV4581 PLUS 20/16	EN50411-2-8 - 200/160 - 200/160 - STR - T	Straight

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**PACKAGING INFORMATION (CUSTOMIZATION ON REQUEST):**

CATALOGUE PART	RECYCLED PLASTIC BAG (Pieces)	RECYCLED CARTON 40x30 h.30 cm. N° of BAGS
OD < 15 mm	100	Ask for details
OD > 16 mm	50	Ask for details

**STANDARD PLASTIC BAG AND LABEL:**

	<p>Microperforated package in 75 % Recycled Polyethylene PE-LD material.</p> <p style="text-align: center;"></p>
	
	<p>Standard 80 % Recycled Carton Boxes dimensions: 40 cm. x 30 cm. h. 30 cm.</p>

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## 6 Dimensional requirements

### 6.1 Dimensions diagram

The overall dimensions of the sealed air blown fibre microduct connector are shown in Figure 15.

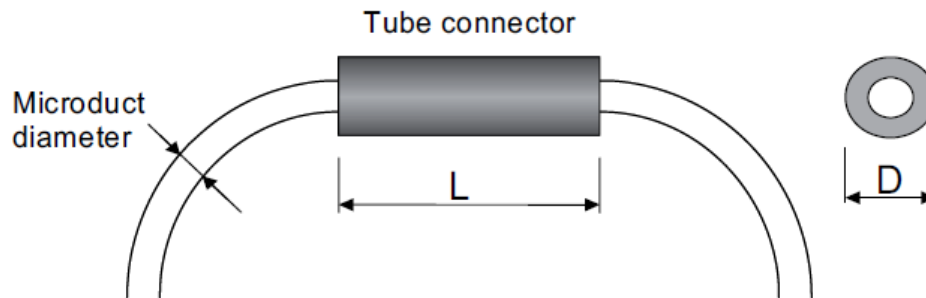


Figure 15 – Microduct connector overall dimensions

### 6.2 'Straight' connectors – Equal microduct

Table 2 – 'Straight' connector design – Maximum dimensions

Microduct	Diameter or across corners	Overall length
	D max. mm	L max. mm
3	9	23 *
4	14	32
5	15	40
6	15	38
7	18	42
8	20	46
10	24	50
12	25	54
14	29	62
15	38	70
16		
18	**	**
20	**	**

Source: EN 50411-2-8

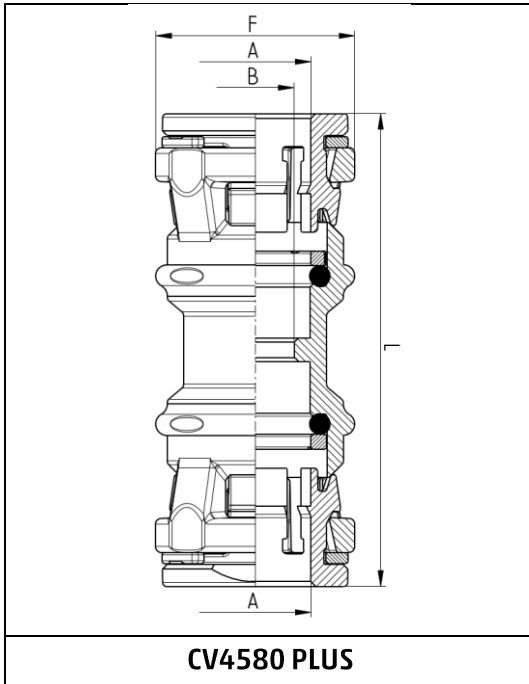
\* out of Norm EN 50411-2-8

\*\* diameter not mentioned in the Norm EN 50411-2-8

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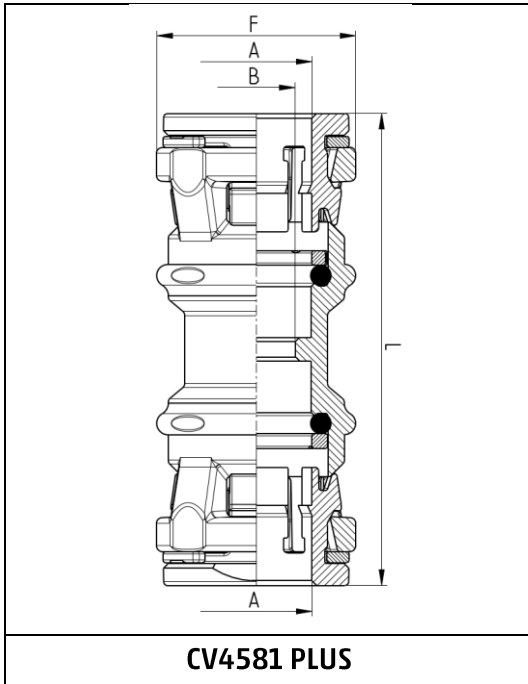
### DIMENSIONS and TOLLERANCES



MODEL	A (Duct OD)	B	F	L	Weight (g)
CV4580 PLUS 3/2.1	3	2.1±0.12	10±0.2	30.0±0.5	2
CV4580 PLUS 4/2.1	4	2.1±0.12	10±0.2	30.0±0.5	2
CV4580 PLUS 4/2.5	4	2.5±0.12	10±0.2	30.0±0.5	2
CV4580 PLUS 5/3.5	5	3.5±0.12	12.4±0.2	39.0±0.5	4
CV4580 PLUS 7/5.5	7	5.5±0.12	16.3±0.2	41.5±0.5	6.5
CV4580 PLUS 8/6	8	6.0±0.12	17.7±0.2	43.0±0.5	7
CV4580 PLUS 8.5/6	8.5	6.0±0.12	17.7±0.2	43.0±0.5	7
CV4580 PLUS 10/8	10	8.0±0.12	20.2±0.2	48.0±0.5	9
CV4580 PLUS 12/10	12	10.0±0.12	23.0±0.2	51.7±0.5	12
CV4580 PLUS 12.7/10	12.7	10.0±0.12	23.0±0.2	51.7±0.5	12
CV4580 PLUS 14/12	14	12.0±0.12	25.6±0.2	59.2±0.5	16
CV4580 PLUS 16/14	16	14.0±0.12	30.0±0.2	66.0±0.5	26
CV4580 PLUS 18/15	18	15.0±0.12	33.5±0.2	77.0±0.5	37

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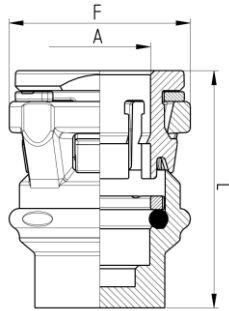
## FTTx Microduct Connectors DATASHEET Series V4000 PLUS



MODEL	A (Duct OD)	B	F	L	Weight (g)
CV4581 PLUS 7/3.5	7	3.5±0.12	16.3±0.2	41.2±0.5	6.5
CV4581 PLUS 7/4	7	4.0±0.12	16.3±0.2	41.2±0.5	6.5
CV4581 PLUS 8/4	8	4.0±0.12	17.7±0.2	43.0±0.5	7.5
CV4581 PLUS 8/4.5	8	4.5±0.12	17.7±0.2	43.0±0.5	7.5
CV4581 PLUS 8/5	8	5.0±0.12	17.7±0.2	43.0±0.5	7.5
CV4581 PLUS 10/5.5	10	5.5±0.12	20.2±0.2	48.0±0.5	10
CV4581 PLUS 10/6	10	6.0±0.12	20.2±0.2	48.0±0.5	10
CV4581 PLUS 10/7	10	7.0±0.12	20.2±0.2	48.0±0.5	10
CV4581 PLUS 12/8	12	8.0±0.12	23.0±0.2	51.7±0.5	12
CV4581 PLUS 14/10	14	10.0±0.12	25.6±0.2	59.2±0.5	16
CV4581 PLUS 16/10	16	10.0±0.12	30.0±0.2	66.0±0.5	26
CV4581 PLUS 16/12	16	12.0±0.12	30.0±0.2	66.0±0.5	26
CV4581 PLUS 18/12	18	12.0±0.12	33.5±0.2	77.0±0.5	37
CV4581 PLUS 18/14	18	14.0±0.12	33.5±0.2	77.0±0.5	37
CV4581 PLUS 20/15	20	15.0±0.12	37.5±0.2	81.5±0.5	45
CV4581 PLUS 20/16	20	16.0±0.12	37.5±0.2	81.5±0.5	45

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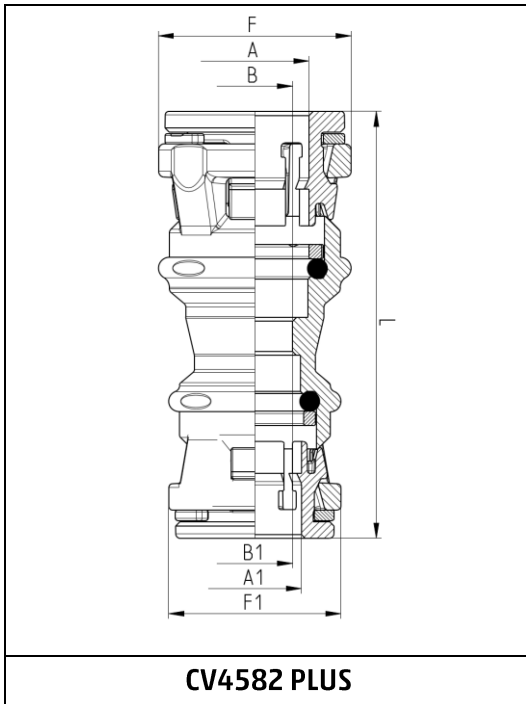
## FTTx Microduct Connectors DATASHEET Series V4000 PLUS



**CV4750 PLUS**

MODEL	A (Duct OD)	F	L		Weight (g)
CV4750 PLUS 3	3	10.0±0.2	16.5±0.3		1.5
CV4750 PLUS 4	4	10.0±0.2	16.5±0.3		1.5
CV4750 PLUS 5	5	12.4±0.2	21.5±0.3		2.5
CV4750 PLUS 7	7	16.3±0.2	22.6±0.3		3.5
CV4750 PLUS 8	8	17.7±0.2	23.6±0.3		3.5
CV4750 PLUS 8.5	8.5	17.7±0.2	23.6±0.3		3.5
CV4750 PLUS 10	10	20.2±0.2	26.0±0.3		5
CV4750 PLUS 12	12	23.0±0.2	27.8±0.3		7
CV4750 PLUS 12.7	12.7	23.0±0.2	27.8±0.3		7
CV4750 PLUS 14	14	25.6±0.2	32.6±0.3		9
CV4750 PLUS 15	15	27.2±0.2	32.9±0.3		10
CV4750 PLUS 16	16	30.0±0.2	36.0±0.3		13.5
CV4750 PLUS 18	18	33.5±0.2	42.0±0.3		19
CV4750 PLUS 20	20	37.5±0.2	45.5±0.3		25

## FTTx Microduct Connectors DATASHEET Series V4000 PLUS



Mod.	A (Duct OD)	A1 (Duct OD)	B	B1	F	F1	L	Weight (g)
CV4582 PLUS 5/3.5-3/2.1	5	3	3.5±0.12	2.1±0.12	16.3±0.2	10.0±0.2	35.0±0.5	4
CV4582 PLUS 7/4-4/2.1	7	4	4.0±0.12	2.1±0.12	16.3±0.2	10.0±0.2	35.0±0.5	4
CV4582 PLUS 7-5/3.5	7	5	3.5±0.12	3.5±0.12	16.3±0.2	12.4±0.2	40.3±0.5	4.5
CV4582 PLUS 7/4-5/3.5	7	5	4.0±0.12	3.5±0.12	16.3±0.2	12.4±0.2	40.3±0.5	4.5
CV4582 PLUS 10/5.5-7/4	10	7	5.5±0.12	4.0±0.12	20.3±0.2	16.3±0.2	44.8±0.5	6
CV4582 PLUS 10-7/5.5	10	7	5.5±0.12	5.5±0.12	20.3±0.2	16.3±0.2	44.8±0.5	6
CV4582 PLUS 10/6-7/4	10	7	5.0±0.12	5.0±0.12	20.3±0.2	16.3±0.2	44.8±0.5	6
CV4582 PLUS 10/8-7/4	10	7	8.0±0.12	4.0±0.12	20.3±0.2	16.3±0.2	44.8±0.5	6
CV4582 PLUS 10/5.5-8/5	10	8	5.5±0.12	5.0±0.12	20.3±0.2	17.5±0.2	45.8±0.5	7.5
CV4582 PLUS 12-10/8	12	10	8.0±0.12	8.0±0.12	23.0±0.2	20.3±0.2	50.0±0.5	10
CV4582 PLUS 14-12/10	14	12	10.0±0.12	10.0±0.12	25.6±0.2	23.0±0.2	55.8±0.5	14
CV4582 PLUS 16/12-14/10	16	14	12.0±0.12	10.0±0.12	30.0±0.2	25.6±0.2	55.8±0.5	15
CV4582 PLUS 20/15-14/10	20	14	15.0±0.12	10.0±0.12	37.5±0.2	25.6±0.2	73.9±0.5	25
CV4582 PLUS 20/16-14/10	20	14	16.0±0.12	10.0±0.12	37.5±0.2	25.6±0.2	73.9±0.5	25

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## MICRODUCTS DIMENSIONS

All dimensions and tolerances, referred to microducts, are reported in Annex B of CEI EN 50411-2-8.

<b>Annex B</b> (informative)		
<b>Air blown fibre microduct – Mean outside diameter range</b>		
For the "O" ring seal to be effective these tolerances on the microducts outside diameter are recommended.		
<b>Table B.1 – Air blown fibre microduct – Mean outside diameter range</b>		
Nominal microduct outside diameter  mm	Outside diameter range	
	min. mm	max. mm
3	2,90	3,10
4	4,10	3,90
5	4,90	5,10
6	5,90	6,10
7	6,90	7,10
8	7,90	8,10
10	9,90	10,10
12	11,90	12,10
14	13,90	14,10
15	14,90	15,10
16	15,90	16,10
<p>NOTE 1 The microduct information refers to manufacturing process data; coiling, transport, handling and installation will affect the measured dimensions and tolerances.</p> <p>NOTE 2 Some connectors are tolerant of larger dimensional variants, because they allow reshaping of some microducts.</p> <p>NOTE 3 Other nominal outside diameters can be used as long as the following dimensional tolerances, apply:</p> <ul style="list-style-type: none"> <li>• 3 mm to 16 mm: nominal</li> <li>• (+0,10 to -0,10) mm: insert symbol ±.</li> </ul>		
Source: EN 50411-2-8		

For diameters **18** and **20**, not included in the Norm, the tolerances are  $\pm 0.2$ mm.

The data, indicated in the next pages, refer to tests performed with microducts in accordance with these tolerances and connectors Series V4000 PLUS Camozzi.

**EN 50411-2-8 - TESTS PERFORMED**

- n. 1 **Sealing performance after test:** EN 61300-2-38:2006, Method A
- n. 2 **Pressure lost during test:** EN 61300-2-38:2006, Method B
- n. 3 **Visual appearance:** EN 61300-3-1
- n. 5 **Vibration** (sinusoidal): EN 61300-2-1
- n. 6 **Microduct retention:** EN 61300-2-4
- n. 7 **Microduct bending:** EN 61300-2-37
- n. 8 **Torsion/twist:** EN 61300-2-5
- n. 9 **Crush resistance:** EN 61300-2-10
- n. 10 **Impact:** EN 60794-1-2:2003, Method E4
- n. 11 **Re-entries:** EN 61300-2-33
- n. 12 **Change of temperature** (cycling): EN 61300-2-22
- n. 14 **Water immersion:** EN 61300-2-23
- n. 15 **Salt mist:** EN 61300-2-26
- n. 16 **Resistance to solvent and contaminating fluids:** EN 61300-2-34
- n. 17 **Resistance to stress cracking solvents:** EN 61300-2-34
- n. 18 **High pressure resistance** (safety): CEI EN 50411-2-8, Annex C
- n. 19 **Installation test:** CEI EN 50411-2-8, Annex D
- n. 20 **Insertion force:** CEI EN 50411-2-8, Annex E

Test n°4 and n°13 are not applicable because they refer to connectors for fibre cable and NOT to connectors for microducts.

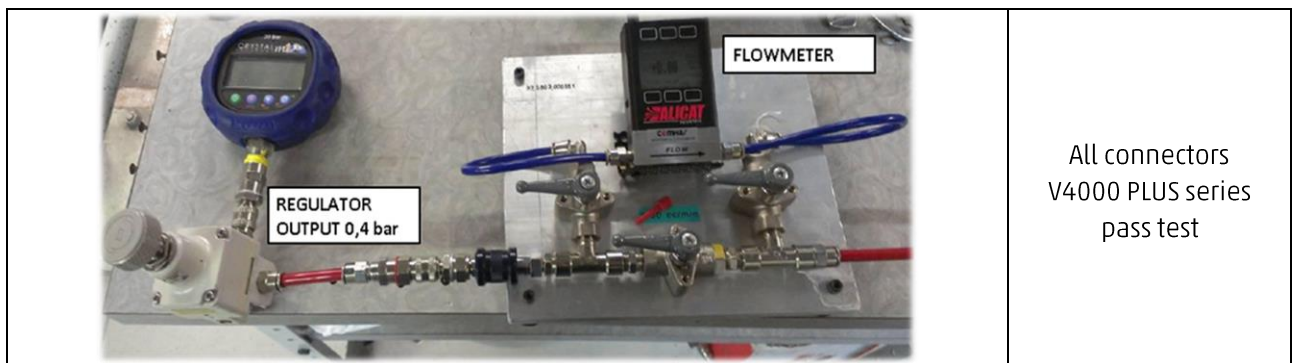
Φ (mm)	Control			Mechanical							Environmental							Ex	
	1	2	3	5	6	7	8	9	10	11	12	14	15	16	17	18	19	20	XX

EXTRA-TESTS added and performed by Camozzi Labs.

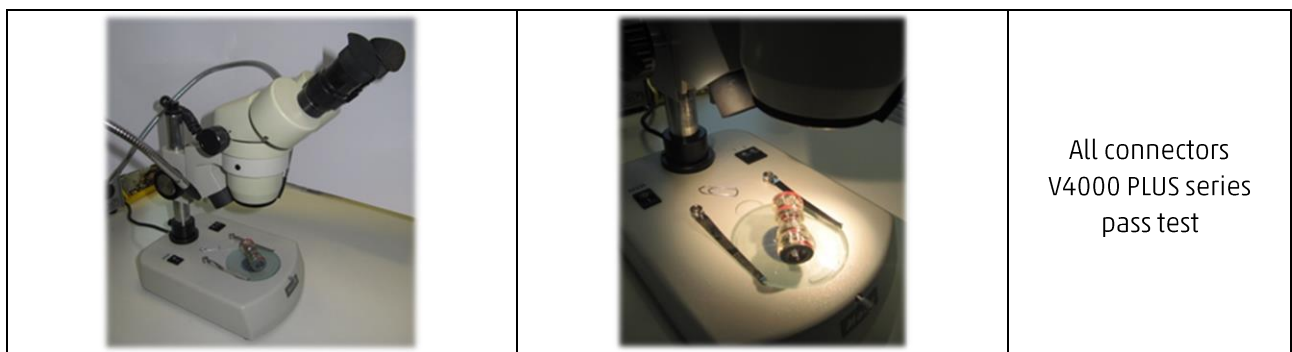
All FTTx V4000 PLUS connectors are compliant with the values requested by the Norm; more detailed TEST Result on request.

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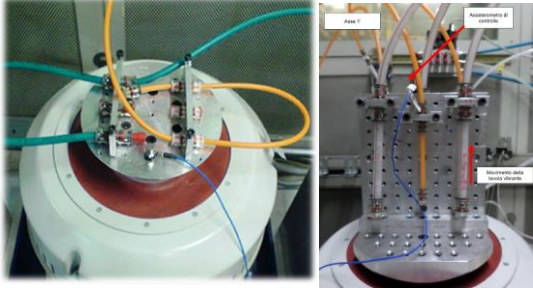
1	Sealing performance after test	No emission of water indicating a leak	Method: Test temperature: Test pressure: Duration: Pre-conditioning procedure:	EN 61300-2-38:2006, Method A 23 °C ± 3 °C Internal overpressure 40 kPa ± 2 kPa (0,4 bar) 15 min Sample should be conditioned to room temperature for at least 2 h.
2	Pressure loss during test	Difference in pressure before and after test shall be less than 2 kPa. Measurements taken at same atmospheric conditions	Method: Test temperature: Test pressure: Pressure detector: Pre-conditioning procedure:	EN 61300-2-38:2006, Method B As specified by individual test Internal overpressure 40 kPa ± 2 kPa at test temperature Minimum resolution 0,1 kPa Sample should be conditioned to specified temperature at test pressure for at least 4 h.
Source: EN 50411-2-8				



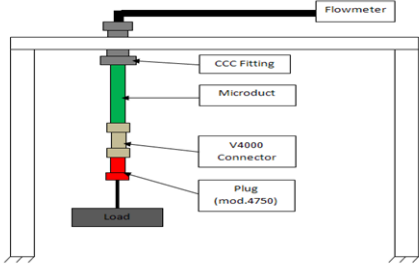
3	Visual appearance	No defects which would affect functionality of the connector	Method: Examination:	EN 61300-3-1 Product shall be checked with naked eye.
Source: EN 50411-2-8				



5	Vibration (sinusoidal)	Sealing performance (test 1) Visual appearance (test 3)	<b>Method:</b> <b>Frequency range:</b> <b>Amplitude / acceleration force:</b> <b>Cross-over frequency:</b> <b>Number of sweeps</b> <b>Number of axes:</b> <b>Test temperature:</b> <b>Test pressure:</b> <b>Pre-conditioning procedure:</b>	<b>EN 61300-2-1</b> 5 Hz – 500 Hz at 1 octave/min 3 mm or 1 g <sub>n</sub> max. 9 Hz 10 sweeps (5-500-5) 3 mutually perpendicular 23 °C ± 3 °C Internal overpressure 100 kPa ± 2 kPa Sample should be conditioned to room temperature for at least 2 h.
Source: EN 50411-2-8				

	All connectors V4000 PLUS series pass test
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6	Microduct retention	Sealing performance (test 1) Pressure loss (test 2) Visual appearance (test 3)	<b>Method:</b> <b>Test temperatures:</b> <b>Load:</b> <b>Duration:</b> <b>Test pressure:</b> <b>Pre-conditioning procedure:</b>	<b>EN 61300-2-4</b> -15 °C ± 2 °C and +45 °C ± 2 °C value N (as follows) 3 mm diameter: 25 N 5 mm diameter: 55 N 8 mm to 16 mm diameter: 125 N 1 h per tube Internal overpressure 40 kPa ± 2 kPa Sample should be conditioned to specified temperature for at least 4 h.
Source: EN 50411-2-8				

	All connectors V4000 PLUS series pass test
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**EXTRA TEST: TENSILE TEST - MAX VALUE (NOT REQUESTED BY NORM)**



**STRAIGHT CONNECTOR CV4580 PLUS \***

<b>Mod.</b>	<b>Temperature (°C)</b>	<b>Tensile Test (N)</b>
CV4580 PLUS 3/2,1	+23	≥ 65
CV4580 PLUS 4/2.1	+23	≥ 65
CV4580 PLUS 4/2.5	+23	≥ 65
CV4580 PLUS 5/3.5	+23	≥ 160
CV4580 PLUS 7/5.5	+23	≥ 200
CV4580 PLUS 8/6	+23	≥ 300
CV4580 PLUS 8.5/6	+23	≥ 420
CV4580 PLUS 10/8	+23	≥ 400
CV4580 PLUS 12/10	+23	≥ 450
CV4580 PLUS 12.7/10	+23	≥ 500
CV4580 PLUS 14/12	+23	≥ 500
CV4580 PLUS 16/14	+23	≥ 900
CV4580 PLUS 18/15	+23	≥ 1400

(\*) The value might be higher/lower if tested with microducts of different producers.

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**STRAIGHT CONNECTOR CV4581 PLUS\***

Mod.	Temperature (°C)	Tensile Test (N)
CV4581 PLUS 5/2.1	+23	≥ 200
CV4581 PLUS 7/3.5	+23	≥ 350
CV4581 PLUS 7/4	+23	≥ 300
CV4581 PLUS 8/4	+23	≥ 350
CV4581 PLUS 8/4.5	+23	≥ 350
CV4581 PLUS 8/5	+23	≥ 350
CV4581 PLUS 10/5.5	+23	≥ 600
CV4581 PLUS 10/6	+23	≥ 600
CV4581 PLUS 10/7	+23	≥ 600
CV4581 PLUS 12/8	+23	≥ 900
CV4581 PLUS 14/10	+23	≥ 900
CV4581 PLUS 16/10	+23	≥ 1000
CV4581 PLUS 16/12	+23	≥ 1000
CV4581 PLUS 18/12	+23	≥ 1400
CV4581 PLUS 18/14	+23	≥ 1400
CV4581 PLUS 20/15	+23	≥ 2000
CV4581 PLUS 20/16	+23	≥ 2000

(\*) The value might be higher/lower if tested with microducts of different producers.

**ENDSTOP CONNECTOR CV4750 PLUS\*\***

Mod.	Temperature (°C)	Tensile Test (N)
CV4750 PLUS 3	+23	≥ 65
CV4750 PLUS 4	+23	≥ 65
CV4750 PLUS 5	+23	≥ 160
CV4750 PLUS 7	+23	≥ 200
CV4750 PLUS 8	+23	≥ 300
CV4750 PLUS 8.5	+23	≥ 420
CV4750 PLUS 10	+23	≥ 400
CV4750 PLUS 12	+23	≥ 450
CV4750 PLUS 12.7	+23	≥ 700
CV4750 PLUS 14	+23	≥ 500
CV4750 PLUS 16	+23	≥ 1000
CV4750 PLUS 18	+23	≥ 1400
CV4750 PLUS 20	+23	≥ 2000

(\*\*) The value might be higher/lower if tested with microducts of different producers; Minimum value measured in the tests of CV4580 PLUS and CV4581 PLUS; under the same conditions of outside diameter microducts, the value might be higher if tested with different inside diameter microducts.

Values for CV4582 PLUS Reducing straight connectors can be obtained from the previous tables.

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## FTTx Microduct Connectors DATASHEET Series V4000 PLUS



7	Microduct bending	<p>Tightness</p> <p>Sealing performance (test 1)</p> <p>Pressure loss (test 2)</p> <p>Visual appearance (test 3)</p>	<p>Method:</p> <p>Test temperatures:</p> <p>Angle:</p> <p>Force application:</p> <p>Number of cycles:</p> <p>Test pressure:</p> <p>Pre-conditioning procedure:</p>	<p>EN 61300-2-37</p> <p>-15 °C ± 2 °C and +45 °C ± 2 °C</p> <p>30° at point of force application</p> <p>400 mm from end of connector</p> <p>5 cycles per tube</p> <p>Internal overpressure 40 kPa ± 2 kPa at test temperature</p> <p>Sample should be conditioned to specified temperature for at least 4 h.</p>
Source: EN 50411-2-8				

	<p>All connectors V4000 PLUS series pass test</p>
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No.	Test	Requirement	Details
8	Torsion/Twist	<p>Sealing performance (test 1)</p> <p>Pressure loss (test 2)</p> <p>Visual appearance (test 3)</p>	<p>Method:</p> <p>Test temperatures:</p> <p>Torque:</p> <p>Force application:</p> <p>Number of cycles:</p> <p>Test pressure:</p> <p>Pre-conditioning procedure:</p>
			<p>EN 61300-2-5</p> <p>-15 °C ± 2 °C and +45 °C ± 2 °C</p> <p>90° or max. 2 Nm</p> <p>100 mm from end of seal</p> <p>5 cycles per tube</p> <p>Internal overpressure 40 kPa ± 2 kPa</p> <p>Sample should be conditioned to specified temperature for at least 4 h.</p>
Source: EN 50411-2-8			

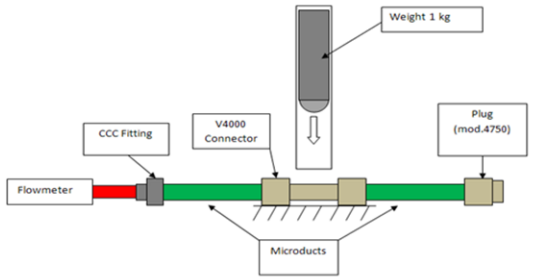

	<p>All connectors V4000 PLUS series pass test</p>
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9	Crush resistance	Sealing performance (test 1) Pressure loss (test 2) Visual appearance (test 3)	Method: Test temperatures: Load: Application area: Locations: Duration: Test pressure: Pre-conditioning procedure:	EN 61300-2-10 -15 °C ± 2 °C and +45 °C ± 2 °C 450 N 25 cm <sup>2</sup> Centre of connector at 0° and 90° around longitudinal axis of tube connector 10 min Internal overpressure 40 kPa ± 2 kPa Sample should be conditioned to specified temperature for at least 4 h.
				Source: EN 50411-2-8

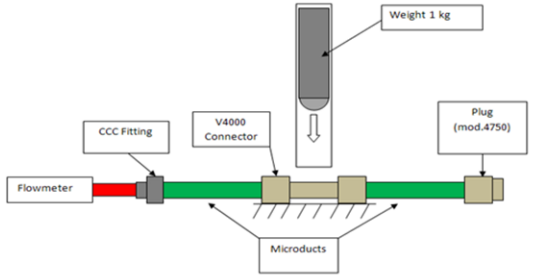

		All connectors V4000 PLUS series pass test
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10	Impact	Sealing performance (test 1) Visual Appearance (test 3)	Method: Test temperatures: Impact tool: Impact locations: Impact energy: Number of impacts: Pre-conditioning procedure:	EN 60794-1-2:2003, Method E4 -15 °C ± 2 °C and +45°C ± 2 °C Steel ball with radius of striking surface: 12,5 mm. 1 hit at the mid-section 1,0 joule 1 Sample should be conditioned to specified temperature for at least 4 h.
				Source: EN 50411-2-8

		All connectors V4000 PLUS series pass test
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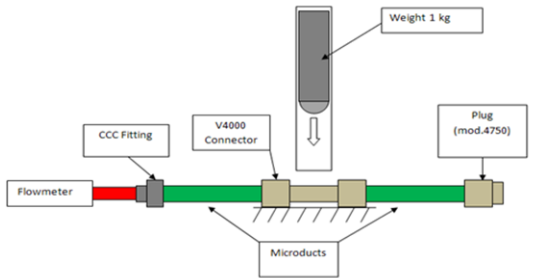

**EXTRA TEST: IMPACT TEST 10 JOULES** (EXTRA TEST NO REQUEST BY NORM)

CONDITIONS	TEMPERATURE
The test is performed acc.to n° 10 Impact Test of CEI EN 50411-2-8 by changing the impact force (10J).	+23°C

		<p>All connectors V4000 PLUS series pass test</p>
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**EXTRA TEST: IMPACT TEST 15 JOULES** (EXTRA TEST NO REQUEST BY NORM)

CONDITIONS	TEMPERATURE
The test is performed acc.to IEC 60794-1-21 and impact force (15J); in the next two pages the extract of the Norm.	-15°/+45°C

		<p>All connectors V4581 PLUS series pass test</p>
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## FTTx Microduct Connectors DATASHEET Series V4000 PLUS



21

86A/1418/CD

### 609 **6 Method E4: Impact**

#### 610 **6.1 Object**

611 The purpose of this test is to determine the ability of an optical fibre cable to withstand  
612 impact.

#### 613 **6.2 Sample**

##### 614 **6.2.1 Sample length**

615 The sample length shall be sufficient to carry out the specified test. When only physical  
616 damage is to be evaluated, the length may range from 1 m (for example for small diameter  
617 jumper cords or duplex cables) to 5 m (for larger diameter cables). Longer lengths may be  
618 necessary to permit optical measurements.

##### 619 **6.2.2 Termination**

620 The sample shall be terminated at each end in a connector, or in a manner such that the  
621 fibres, sheathings and any strain members are clamped together in a representative manner.  
622 Clamps on the impact apparatus may be used, or the sample may be long enough so that no  
623 restraint is needed.

#### 624 **6.3 Apparatus**

625 The apparatus shall allow an impact to be imparted to the cable sample which is fixed to a flat  
626 substantial steel base. When a single or only a few impacts are required, a suitable  
627 apparatus, as shown in Figure 6a, is used. This allows a weight to drop vertically onto a piece  
628 of steel which transmits the impact to the cable sample. When repeated impacts are required  
629 (say, more than five), a more practical apparatus, as shown in Figure 6b, is used, which  
630 allows multiple impacts by a drop hammer. The apparatus shall be arranged to impart minimal  
631 friction to the moving weight/hammer.

632 NOTE: This issue of friction has been found to be a particular problem when the apparatus is used at temperature  
633 extremes.

634 In both cases, other equivalent apparatus may also be used.

635 The diameter of the hammer shall be 20 mm  $\pm$  1 mm, and the surface shall be either flat or  
636 have a radius of no less than 300 mm. If using a 300 mm radius impact head, then the  
637 surface may also be a hemisphere, as shown in Figure 6c, A, since for such a large radius  
638 this gives an equivalent test method to that when using a rounded cylinder.  
639 [Ed. Note: July agreement was for all of WG3 to consider the change to either flat or  
640 large radius hammer and present positions in Melbourne.]

641 The apparatus shall include any optical test equipment needed to measure the changes in  
642 optical performance as required in the detail specification, and specified in method A  
643 (Transmitted power) of IEC 60793-1-46.

#### 644 **6.4 Procedure**

645 Unless otherwise specified, the conditions for testing shall be in accordance with standard  
646 atmospheric conditions.

647 The mass of the weight or drop hammer and the height from which it falls shall be adjusted to  
648 give the value of impact energy shown in the detail specification. The number and rate of  
649 impacts, and their location on the sample shall be as specified in the detail specification.

#### 650 **6.5 Requirements**

651 The acceptance criteria for the test shall be as stated in the detail specification. Typical  
652 failure modes include loss of optical continuity, degradation of optical transmittance or  
653 physical damage to the cable.

#### 654 **6.6 Details to be specified**

655 The detail specification shall include the following, if other than the values herein:

- 656 a) number of impacts;
- 657 b) impact energy;
- 658 c) test temperature;
- 659 d) radius of the striking surface if other than specified herein;
- 660 e) frequency of multiple impacts (if any);
- 661 f) location of impacts on the sample;
- 662 g) if optical continuity or change in transmittance is to be measured.

Source: IEC 60794-1-21

Issued from  
**TECHNICAL OFFICE**

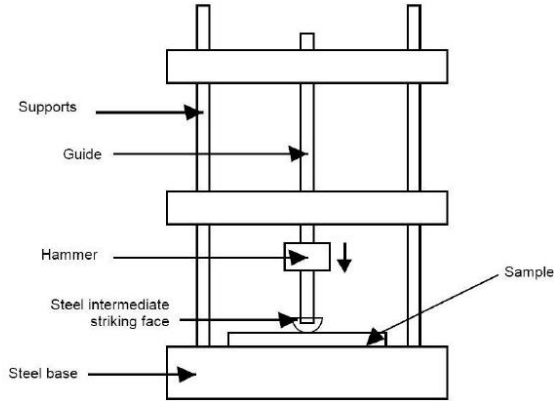
Date  
07-06-2023

Designer  
**Paolo Simpsi**

Approved  
**Alberto Maffi**

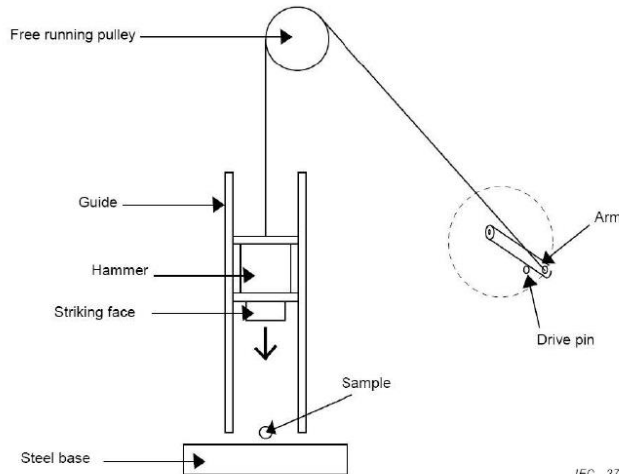
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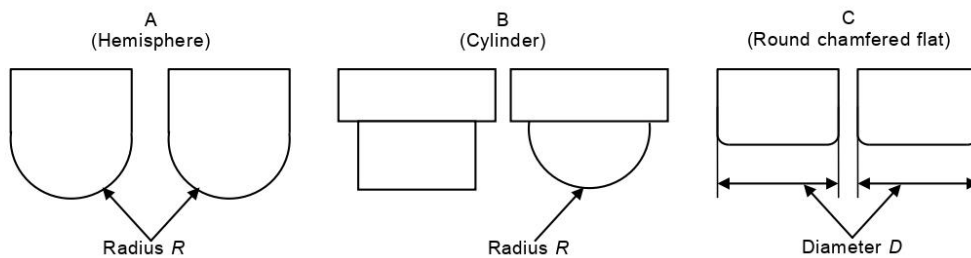
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**Figure 6 a – Impact Test, Apparatus for a few impacts**



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**Figure 6 b – Impact test, Apparatus for multiple impacts**



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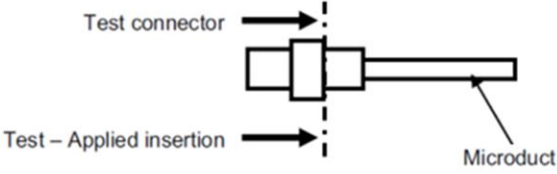
**Figure 6c – Impact test, Details of striking surface**

**Figure 6– Impact test**

Source: IEC 60794-1-21

Issued from <b>TECHNICAL OFFICE</b>	Date 07-06-2023	Designer <b>Paolo Simpsi</b>	Approved <b>Alberto Maffi</b>
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11	Re-entries (only to be performed when tube connector can be disconnected and reconnected again)	Sealing performance (test 1) Visual appearance (test 3)	Method: Test temperature: Conditioning between each re-entry: Number of re-entries:	EN 61300-2-33 -15 °C ± 2 °C and +45 °C ± 2 °C Ageing of minimum 1 temperature cycle as specified in test 12 5
Source: EN 50411-2-8				

	<p>All connectors V4000 PLUS series pass test</p>
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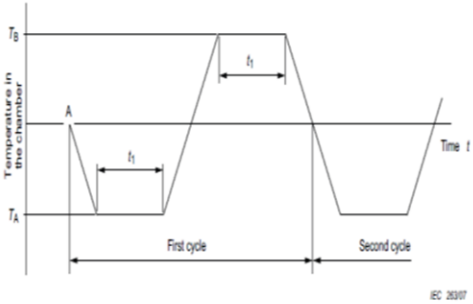

**EXTRA TEST: RELEASE / UNRELEASE TEST (TEST NOT REQUESTED BY NORM)**

CONDITIONS	TEMPERATURE
It's performed a repeated operation of inserting and disconnecting the Microduct in the connector, verifying at the end the correct maintenance of the crimping and pneumatic seal.	+23°C

Up to 20 times	All connectors V4000 PLUS series pass test
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12	Change of temperature (cycling)	Sealing performance (test 1) Visual appearance (test 3) (separate test samples are made for the optical test)	Method: Extreme temperatures:  Dwell time: Rate of change Number of cycles:  Sample configuration: for sealing performance  Test pressure:	EN 61300-2-22 $-40\text{ °C} \pm 2\text{ °C}$ and $+65\text{ °C} \pm 2\text{ °C}$  4 h 1 °C/min 20  Half of population is placed in a straight configuration, the other half shall make a 90° bend with minimum allowed bend radius as specified by the supplier of the microduct  Internal overpressure regulated at $40\text{ kPa} \pm 2\text{ kPa}$ during test
Source: EN 50411-2-8				

 <p style="text-align: center;">Temperature in the chamber vs Time t</p> <p style="text-align: center;">TA = +65°C TB = -40°C t1 = 4 h</p>		All connectors V4000 PLUS series pass test
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**EXTRA TEST: AGEING 25 YEARS (NO REQUEST BY NORM)**

CONDITIONS	TEMPERATURE
The test is performed acc.to n° 12 Change of temperature (cycling) of CEI EN 50411-2-8 by changing the number of cycles (n°40)	EN 61300-2-22 $-40\text{ °C} \pm 2\text{ °C}$ and $+65\text{ °C} \pm 2\text{ °C}$ 4 h 1 °C/min

 <p style="text-align: center;">Temperature in the chamber vs Time t</p>		All connectors V4000 PLUS series pass test
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5000062405		<b>FTTx Microduct Connectors</b> <b>DATASHEET Series V4000 PLUS</b>	
Rev. --	Ver. 02		
Page 34 of 37			

14	Water immersion	No water ingress Visual appearance (test 3)	Method: Test temperatures: Water column height: Wetting agent: Duration: Test pressure:	EN 61300-2-23:1997, Method 2 +23 °C ± 3 °C 5 m or an equivalent external water pressure of 50 kPa None 7 days 0 kPa overpressure in tube
Source: EN 50411-2-8				

		All connectors V4000 PLUS series pass test
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**EXTRA TEST: IP68 (NO REQUEST BY NORM)**

CONDITIONS	TEMPERATURE
The test is in acc. to CEI EN 60529:1991 + A1:2000 + A2:2013, Par. 13.4 & 13.6 IP 6 = totally protected against dust (dust-tight) 8 = continuous immersion	+23°C

	All connectors V4000 PLUS series pass test
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15	Salt mist	Sealing performance (test 1) Visual appearance (test 3)	Method:	EN 61300-2-26
			Test temperatures:	+35 °C ± 2 °C
			Salt solution:	5 % NaCl (pH 6,5-7,2)
			Duration:	5 days
			Test pressure:	0 kPa overpressure
Source: EN 50411-2-8				

				All connectors V4000 PLUS series pass test
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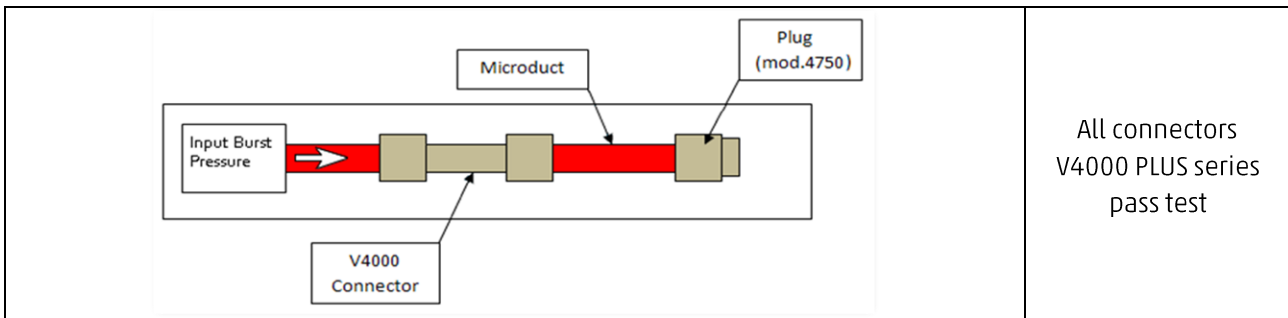
16	Resistance to solvents and contaminating fluids	Sealing performance (test 1) Visual appearance (test 3)	Method:	EN 61300-2-34
			Test temperatures:	+23 °C ± 3 °C
			Submersion in:	HCl at pH 2 NaOH at pH 12 Kerosene (lamp oil) ISO 1998-1 1,005 Petroleum jelly Diesel fuel for cars EN 590 5 % NaCl (pH 6,5-7,2) White spirit and IPA
			Drying time at 70 °C:	None
			Duration:	5 days
			Test pressure:	0 kPa overpressure
Source: EN 50411-2-8				

				All connectors V4000 PLUS series pass test
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17	Resistance to stress cracking solvents	Sealing performance (test 1) Visual appearance (test 3) No visible cracking allowed	Method: Test temperatures: Submersion in:  Drying time at 70 °C: Duration: Test pressure:	EN 61300-2-34 +50 °C ± 2 °C 10 % detergent solution (Nonylphenol ethoxylate, non ionic surfactant e.g. CAFLON NP9, IGEPAL) None 5 days 0 kPa overpressure
Source: EN 50411-2-8				

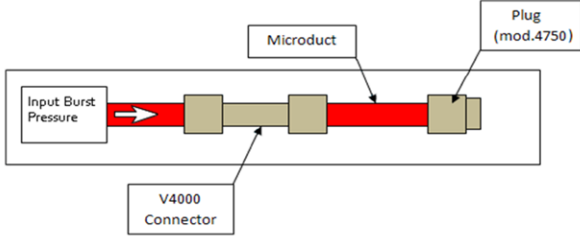
	All connectors V4000 PLUS series pass test
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18	High pressure resistance (safety)	Visual appearance (test 3) No damage or disconnection	Method: Test temperatures: Duration: Test pressure:	Annex C +23°C ± 2°C 30 min 2 500 kPa overpressure
Source: EN 50411-2-8				



**EXTRA-TEST: BURST PRESSURE TEST - MAX BREAK VALUE +23°C (TEST NO REQUIRED BY NORM)**

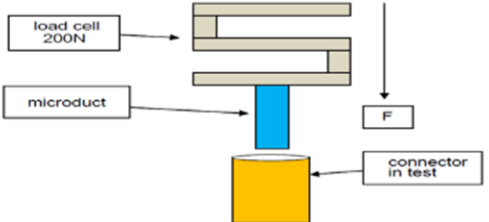
CONDITIONS	TEMPERATURE
Burst test up to the breaking of the fitting or the Microduct	+23°C

	<p>All connectors V4000 PLUS have values measured over 50 bar</p>
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19	Installation test	Sealing performance (test 1) Visual appearance (test 3) Must allow, microduct fibre cable, or a fibre unit, to pass through the connector	Method: Test temperatures: Duration: Test pressure:	Annex D +23 °C ± 2 °C (both at -10 °C and +40 °C) 1 h 1 000 kPa overpressure
Source: EN 50411-2-8				

				<p>All connectors V4000 PLUS series pass test</p>
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20	Insertion force	Sealing performance (test 1)	Method Inserting force in fitting the connector to the microduct	Annex E 50 N max. (12 mm microducts and below) 120 N max. (above 14 mm microducts)
Source: EN 50411-2-8				

	<p>All connectors V4000 PLUS series pass test</p>
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