SPECIFICATION

FIBER OPTIC SPLICE CLOSURE

Model	**VSOF-BS403A**
Spec. No.	**VSS-0107-BS403A-04A/SD**
Distribution Depts.	□ **R & D Center** □ **Manufacturing Division** □ **Sales Division** □ **Management Division**
Revision	**10. 07 (Rev.4)**

Prepared by **QA Team** Engineer _____

Approved by **QA Team** Manager _____

1. INTRODUCTION

1.1. General

This specification covers the design requirements and characteristics required of fiber optic splice closures to be used on fiber optic cables for branch joint in various installation conditions such as aerial, manholes, ducts, wall and direct buried applications. It is specially designed for FTTH network and applicable to multi branching installation by using Mid-Plate which is for increasing core capacity and complying with the requirements in each point of network. The flat type gasket ensures reliable sealing performance by preventing air and water leak and the cone type sealing socket provides easy and reliable installation. This closure has high mechanical strength against any environmental conditions. With this splice closure, you can improve your network system to the higher level.

1.2. Description

Fiber Optic Splice closure for fiber optic cable may be exposed to severe environmental conditions. The splice closure for fiber optic cable shall provide excellent durability and long-term reliability in those severe conditions.

1.3. Reliability

The quality of a fiber optic splice closure is critical to reliable optical transmission performance. The product shall be produced with TL9000 certified production facilities and quality control system is applied the process from product design to packaging.

1.4. Classification

BS403A – M – SS – T2 – 48C

(1) (2) (3) (4)

No.	Title	Example	Descriptions	Remarks
(1)	Installation condition	A	Arial type	
		M	Manholes type	
		W	Wall type	
		P	Pole type	

(2)	Type of Splice Closure	SS	Splice closure without mid plate	
		SD	Splice closure with 1-mid plate	
		DD	Splice closure with 2-mid plate	
(3)	No. of Splice tray	T0	Splice closure without splice tray	
		T6	Splice closure with 6-splice tray	
(4)	Fiber Count	48C	Splice closure for 48 fiber optic cable	
		144C	Splice closure for 144 fiber optic cable	

1.5. Terms and Definitions

1.5.1. **SS-Type**: Standard type splice closure without Mid-Plate
1.5.2. **SD-Type**: Standard type splice closure with a total of 1 Mid-Plate
1.5.3. **DD-Type**: Standard type splice closure with a total of 2 Mid-Plate

1.6. Reference

Korea Telecom Generic Requirements KT-T24007-11-03
Korea industrial standard KS A 0101 Mathematical Symbols
Korea industrial standard KS A 0102 Quantity Symbols, Unit Symbols and chemical Symbols
Telcordia GR-771-core Generic Requirements for Fiber Optic Splice Closures

2. FIBER OPTIC SPLICE CLOSURE

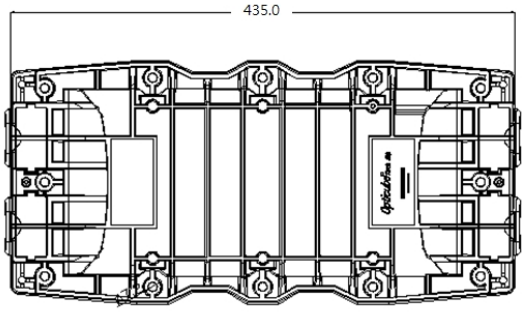
2.1. General

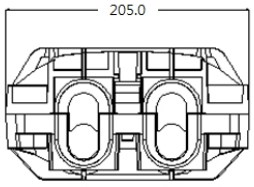
The closure consists of outer cases, gaskets, trays and inner kits. The closures have two main entry ports on each end. The outer cases consist of the upper and lower housing and constructed of highly chemical resistant material and attached a pressure valve on the upper housing. The trays are able to accommodate 24 individual fiber fusion splices

2.2. Configuration

2.2.1. The closure has an air valve on its cover for checking air pressure drop.
2.2.2. The ribbed body has high mechanical strength against impact and compression.
2.2.3. The closure has 2 inlet ports on each side and increase the number of port up to 12 ports by inserting Mid plate.

2.2.4. The 24F splice tray is applicable for both loose tube and ribbon fiber management.
2.2.5. The OSP cable clamping can be done by tension member gripper for clamping cables central strength member and sheath holder and adapter fitting each cable diameter for clamping cable sheath.
2.2.6. The LAP ground connector and ground wire are offered for grounding of the OSP cable.
2.2.7. One flat type gasket and the external screw bolts provide excellent tightness reliability.
2.2.8. Cone type sheath gasket is adjustable to fit any diameter cable.
2.2.9. The closure can be installed in aerial and manhole, pole with provide hangers





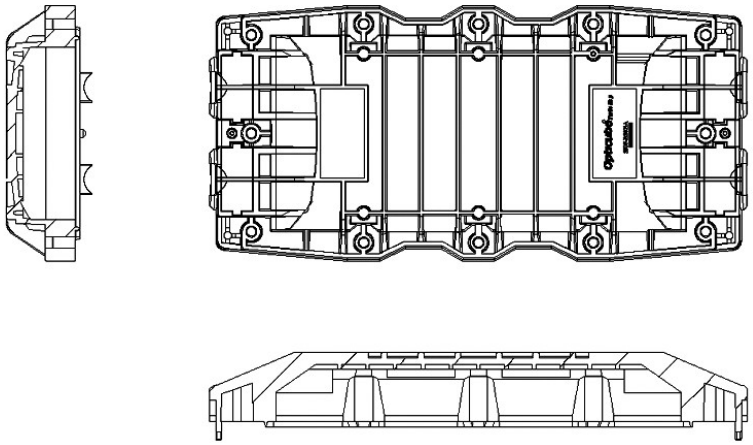
2.3. Specification

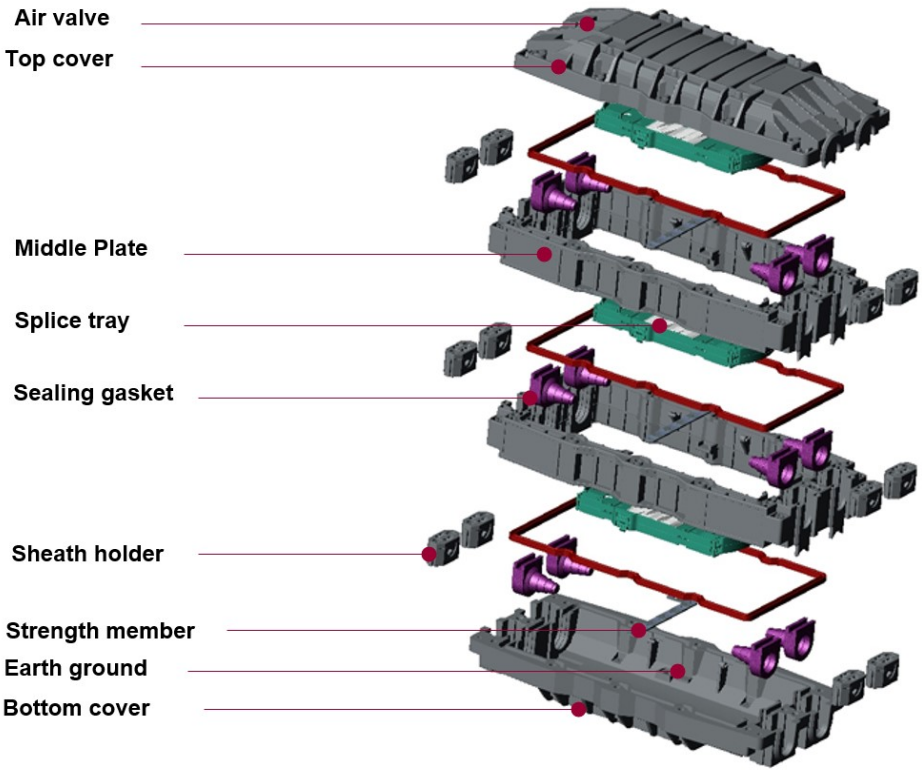
Item	BS403A-SS	BS403A-SD	BS403A-DD
Size (L*W*H)	435*205*113mm	435*205*167mm	435*205*221mm
Weight (kg)	2.8	3.8	4.8
Inlet ports(Max)	4 (32)	8 (64)	12 (96)
Cable Dia. (mm)	Φ3~ Φ20	Φ3~ Φ20	Φ3~ Φ20
No. of splice tray	4	6	8
Tray capacity	24F (Max. 48F)	24F (Max. 48F)	24F (Max. 48F)
Splice capacity	96F (Max. 192F)	144F (Max. 288F)	192F (Max. 384F)
Splice method	Fusion, Mechanical, Connector		
Splice protector	Heat shrinkable sleeve, Ribbon protection sleeve, Mechanical splice		
Tension member	Galvanized steel wire, FRP		

2.4. Feature

2.4.1. Body

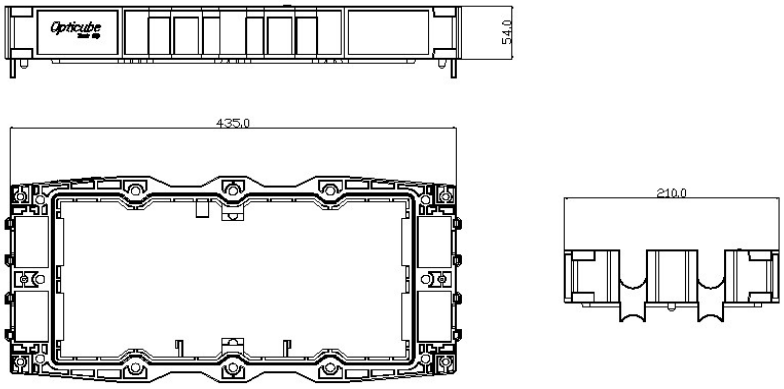
(1) Ribbed cover for greater impact and compressive strength
(2) Air valve for air tightness test.
(3) Hanger connecting part for easy installation.





2.4.2. Mid plate

(1) Multi-branching installation for FTTH network
(2) Separate maintenance on splicing and storage area on the Mid plate
(3) Increase the number of inlet ports up to 12 ports (6 on each end)

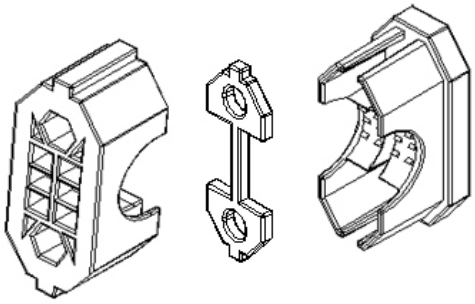


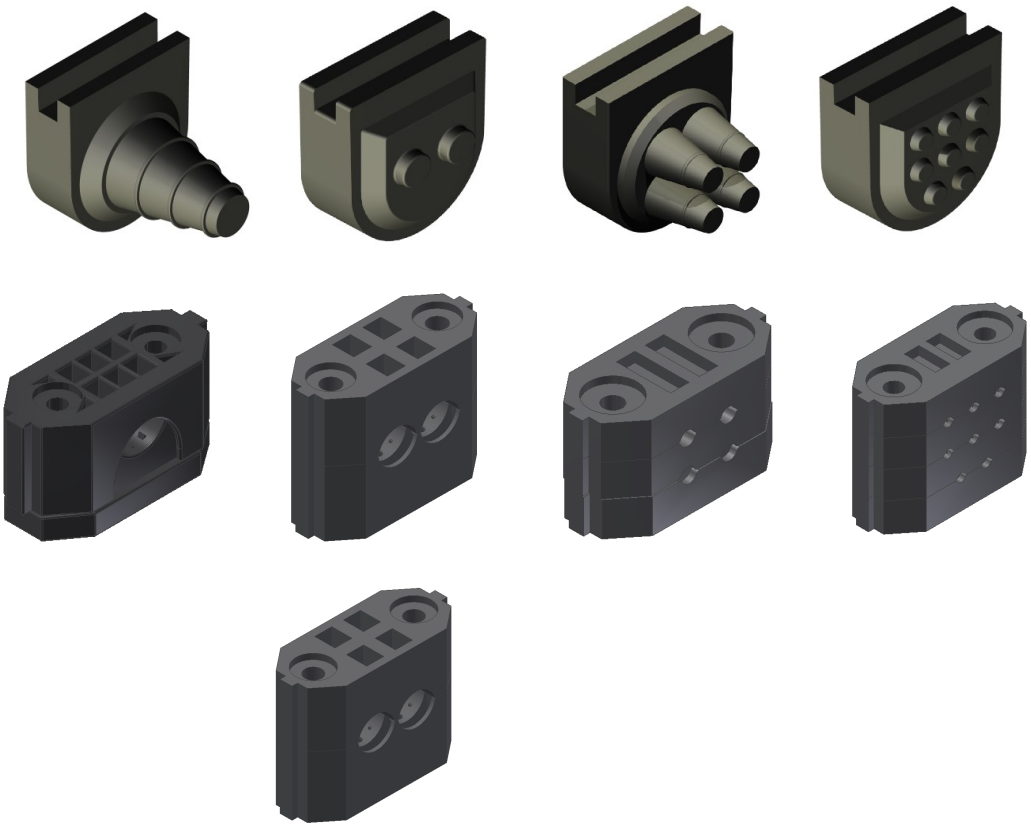
2.4.3. Multi-Branch Type Sheath Gasket

(1) Cone type sheath gasket made of silicon for proven water tightness, fitting any cable diameter
(2) Sheath gasket is also designed for mid span branching by simple cutting

2.4.4. Cable Clamping

(1) Mechanical cable clamping.
(2) Firm cable gripping by stacking the same size sheath holder adapter.
(3) Convenient installation and maintenance with the divided structure from the lower part.





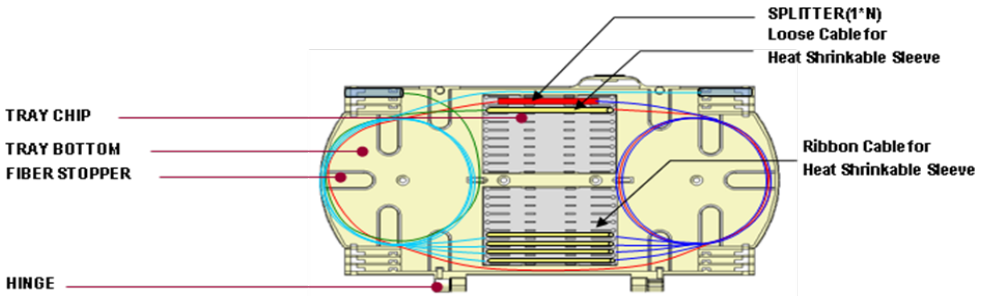
Item	Mono	Di	Tetra	Octa
Cable Dia. (mm)	6 ~ 20	11~12	6 ~ 12	3.5 or 5 ~ 6
Sheath holder	1port	2port	6 ~ 8 : 4port 9 ~ 12 : 2port	8port

2.4.5. Splicing Part

(1) 4 inlet parts in the tray, available to meet the requirements for FTTH network

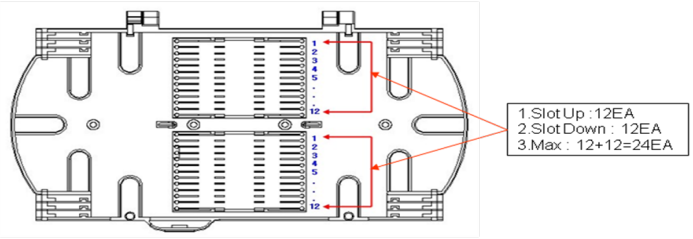
(2) Double layered storage (maximum 48 fibers by inserting two sleeves in one slit)

(3) Loose tube, ribbon fiber and mechanical splice are applicable.

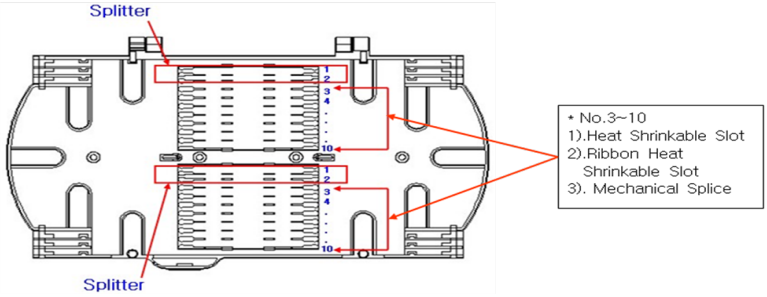


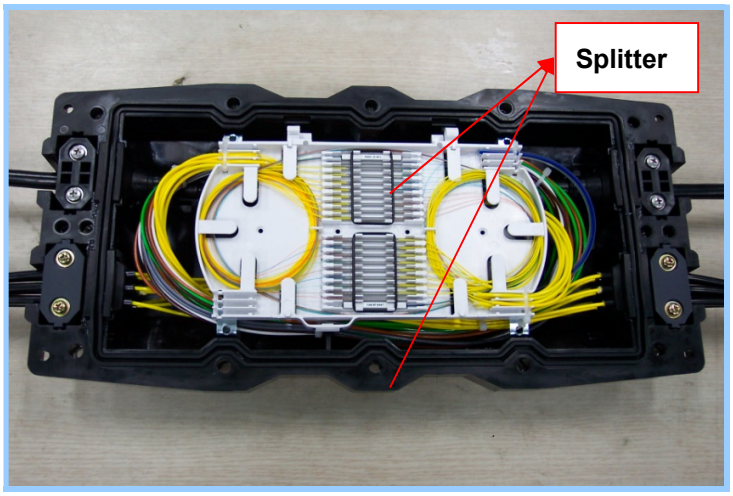
Applications

STI 24-6 TRAY



STI 18-6 TRAY



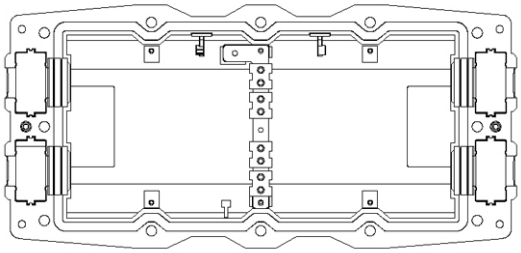


2.4.6. Tension member gripping

(1) Tension member gripping supporter connected by grounding bolt.

(2) No interference with splice tray and cable routing and storage

(3) Separate T/M gripper is provided in case of using more Mid plate



3. TEST PROCEDURE

3.1. General

3.1.1. This section specifies the Fiber Optic Splice Closure and its material physical, chemical environmental and mechanical requirements and the tests to be applied for the determination of compliance to these requirements.

3.1.2. Sample means all completed assembling closure that finished bonding, grounding and connecting equipments.

3.1.3. For all measures of optical attenuation need to splice and for the measures of just a mechanical performance test(no need for optical attenuation test), insert the cable into the splice closure.

3.1.4. Optical fiber shall be fusion spliced to minimize effect from test environment and shall be protected by heat shrinkable protection sleeve at the splice point

3.1.5. The samples of cable for a performance test shall be prepared with middle size of diameter which is available

3.1.6. The wavelength for measurement of optical attenuation shall be 1550±30nm or 1310±20nm and stability shall be under ±0.01dB

3.1.7. Test will be completed with temperature 20±5℃ if there is no and special regulation

3.2. Mechanical characteristics.

Item	Test Conditions	Requirements
Cable clamping	• Measure the loss after 3 fiber splicing. • Assemble the closure • Measure and compare the loss variation	No greater than ± 0.05dB
Sheath Retention	• Mount the closure in a fixture and measure the initial loss • Apply an axial load of D/45*100kg • After 8hours compare the loss.	No mechanical damage
Cable Flexing	• Inner pressure: 6PSI • Attach a 10kg weight to the cable 1m from the closure • Lower the cable 90˚for 15min. • Repeat the procedure while rotating the closure 90˚→ 720˚	No mechanical damage No greater than 1PSI

Cable Torsion	• Mount the closure and condition the assembly at -20±2℃ for 2 hours. • Inner pressure: 6PSI • Twist the cable at D*10mm point • Cycle; CW90˚-> CCW180˚->CW90˚ • Repeat 10cycles. • Repeat the above procedure at 40±2℃.	No mechanical damage No greater than 1PSI
Vertical Drop	• Condition the closure at -20±2℃ for 2 hrs. • Drop the closure onto a 1/2inch thick concrete floor from 75cm height.	No mechanical damage No greater than 1PSI
Compression	• Condition the closure at -20±2℃ for 2 hr. • Measure the diameter or vertical dimension. • Apply a weight of 90kg on 5cm2 area for 15minutes. • Unload a weight and measure the dim. • Repeat the above procedure at 40±2℃.	No mechanical damage No greater than 1PSI
Impact	• Condition the closure at -20±2℃ for 2 hr. • Impact a closure using a drop-tube from 1m • Impact level: 2.4kg, &2.54cm	No mechanical damage No greater than 1PSI
Vibration	• Inner pressure: 6PSI • Measure the loss after 2 fiber splicing. • Amplitude : 1.0mm(peak to peak) • Frequency : 10~55Hz • Direction : X,Y(2 hours at each direction)	No greater than ±1.0dB(on test) No greater than ±0.1dB (after test) No mechanical damage No greater than 1PSI

3.3. Environmental characteristics

Item	Test Conditions	Requirements
Temperature and Humidity	• Measure the loss after 3 fiber splicing. • Assemble the closure • Temp. cycle -30~60℃ • 20Cycle (1cycle is 7hours)	No greater than ± 0.1dB No air bubble in the water after test
Water resistance	• Put the closure into a1.5m depth- water tank for 20days.	No evidence of water intrusion. IP 67
Chemical resistance	• Inner pressure: 6PSI • solution: pH2 HCL, NaOH, 10% IGEPAL • Submerge for 120hours into the solution. • Impact/compression Test	No mechanical damage No greater than 1PSI Shall be no change in mechanical integrity or sealing ability.

4. DELIVERY

4.1. Packing

The Closure shall be packed as a complete kit containing all components necessary for installation. Each item is to be covered with a protective material to prevent scratching or damage during shipping or storage.

Complete assembly and installation instructions in English shall be provided with each packaged unit.

4.2. Marking

The details given below shall be distinctively marked in English with a weatherproof material on at least two sides of the shipping carton.

- The company to be delivered
- The product item
- Country of origin
- Manufacturer's name and/or trademark
- Date of manufacture
- Caution mark

Each Closure shall be marked with the company, the month and year of manufacture and the trademark and/or name of manufacturer in legible color.

5. ALL OF COMPONENTS

No.	Item	Unit	403SS	403SD	403DD	Remark
1	Upper main body	ea	1	1	1	
2	Lower main body	ea	1	1	1	
3	Mid plate	ea	-	1	2	
4	Main body screws	ea	12	12	12	
5	Air valve	ea	1	1	1	
6	Main body gasket	ea	1	2	3	
7	Sheath holder	ea	4	6	8	Note 1
8	Ground bolt	ea	1	1	1	
9	Sheath gasket	ea	4	6	8	Note 2
10	T/M Ass'y	ea	1	2	3	
11	Splice tray	ea	1	2	3	
12	Unit protection tube	ea	2	4	6	
13	Cable tie	ea	4	8	12	
14	Splice protection Sleeve	ea	-	-	-	Note 3
15	Sheath holder adapter	ea	12	18	24	Note 4
16	Silica gel	ea	1	2	3	
17	High vacuum grease	ea	1	2	3	
18	User manual	ea	1	1	1	
19	Individual carton	ea	1	1	1	
20	Aerial hanger set	ea	2	2	2	Option
21	Manhole hanger set	ea	2	2	2	Option
20	Wall hanger set	ea	4	4	4	Option

Note 1 : The type of sheath holder shall be accordance with type of sheath gasket.
(Mono, Di, Tetra, Octa-branch type)

Note 2 : The type of sheath gasket shall be accordance with customer's requirements.

Note 3 : The number of splice protection sleeve shall be accordance with the fiber count to be installed

Note 4 : Do **NOT** provide for Di, Tetra, Octa-branch type sheath gasket.