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Raylinks Technical specification

Q/BKBT1-1997

Non-pressurized Joint Splice Closure RSBJ550

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Shanghai Raylinks Heat Shrinkable Materials Company Limited

1. Scope

This Chapter details the technical requirements for heat shrinkable wraparound splice closure, for use in the main and distribution non pressurized cable networks.

2. Applied standards and abbreviations

The following unattached China national &international standard shall be applied &deemed to be an integral part of this specification.

YD/T590.1-92 Splice closure 1 part-General technology

YD/T590.1-92 Splice closure 2 part-Heat shrinkable sleeve

3. Type and size

3.1 RSBJ type shall be used in non pressurized network.

3.2 All closures shall be capable of in-line and branched applications up to three cables on each side.

3.3 Size

3.3.1 D/d-L

D: Maximum splice bundle diameter

d: Minimum cable diameter

L: Nominal sheath opening

3.3.2 Non-pressurized closures size shall be as shown

Cable Pairs	Pairs Diameter	Size for B-type	Size for UR	Size for Module 4000DWP
10	0.4-0.6	43/8-200	43/8-200	
30	0.4-0.6	43/8-300	43/8-300	
50	0.4-0.6	43/8-350	43/8-350	43/8-350
100	0.4-0.6	43/8-500	43/8-500	43/8-500
200	0.4-0.6	75/15-500	75/15-500	75/15-500
300	0.4-0.6	75/15-500	75/15-500	92/25-500
400	0.4-0.6	92/25-500	122/30-500	122/30-500
500	0.4-0.6	92/25-500	122/30-500	122/30-500
600	0.4-0.6	122/30-500	122/30-500	122/30-500
800	0.4-0.6	122/38-500	122/30-650	122/30-650
1000	0.4-0.6	122/30-650	160/42-500	160/42-500
1200	0.4-0.6	160/42-500	160/42-500	160/42-500
1400	0.4-0.6	160/42-500	160/42-500	160/42-500
1600	0.4-0.5	160/42-500	160/42-650	160/42-650
1800	0.4-0.5	200/50-500	200/50-500	200/50-720

3.3.3 For example “RSBJ550 43/8-300”, please see product installation sheet.

3.3.4 Accept special size ordered by customers

4. Design requirements

4.1 General description

4.1.1Closure shall retain the electrical & mechanical properties in the working temperature range -30°Cto 60°C and atmosphere pressure range 86kPa to 106kPa.

4.1.2 Closure shall be installed at temperatures between –10°Cto 45°C.

4.1.3 Dimension of main parts shall meet YD/T590.2-4.1requirements, please see documents (Q/Raylinks-09-01-1999

process control).

4.2 Heat shrinkable sleeve

4.2.1 The sleeve shall be homogenous and free of flaws, defects, pinholes, bubbles, cracks or inclusions visible with the unaided eye.

4.2.2 The sleeve shall be made of a fibre reinforced high strength composite material with integrated layer of aluminium serving as a moisture barrier.

4.2.3 The sleeve shall be internally coated with a flexible heat activated adhesive which will melt and adhere to the cable to form an air and water tight seal

4.2.4 The sleeve shall be coated externally with a heat sensitive thermo chromic indicator which changes colour when adequate heat has been applied.

4.2.5 A flexible channel to be used to wrap the sleeve shall be manufactured from corrosion resistant stainless steel.

4.3 Closure components

4.3.1 Following items shall be provided for straight and branch joints.

4.3.1.1 Wrap-around fibre re-inforced heat shrinkable sleeve as specified (with or without valve)

4.3.1.2 A flexible stainless steel closure channel

4.3.1.3 A wrap-around metal support canister/variable liner

4.3.1.4 Branch-off clips (in Branch kits only)

4.3.1.5 Shield continuity hardware.

4.3.1.6 Silica gel dessicant in adequate quantity

4.3.1.7 Cleaning tissure

4.3.1.8 Abrasive strip(s)

4.3.1.9 Aluminium foil strips

4.3.1.10 Aluminium strip for closing canister

4.3.1.11 PVC tape

4.3.1.12 Installation gauge

4.3.1.13 Installation in English language

4.3.2 In addition to items, the following accessories shall also be provided.

4.3.2.1 For single branch (one each of following)

4.3.2.2 For double branch (two each of following)

4.3.2.3 Branch off clip small for: 10-100 pairs

4.3.2.4 Branch off clip medium for:200-300 pairs

4.3.2.5 Branch off clip large for: 600-800 pairs

4.3.2.6 Branch continuity wire

4.3.2.7 Continuity wire connecting clip

4.3.2.8 Tie wrap

4.3.2.9 Cleaning tissue

4.3.2.10 Aluminium foil

4.3.2.11 Abrasive strip

5. Performance requirements of completed joint closures

5.1 Materials

	Test Condition and method	Requirement
5.1.1 Bursting Strength	Test Temp:23±5°C	Min 2500N
5.1.2 Thermal Ageing Bursting Strength	168Hrs at 150±2°C (After free shrinkage)	Min 2700N
5.1.4 Dielectric strength	Electrode Surface Dia: 6mm Wight: 50±2gms Voltage steps:2KV/20sec	Min 12 KV/mm
5.1.5 Split Resistance	Temp: 200±2°C Test time 23±3°C	No split Propagation
5.1.6 Carbon Content UV Res of Out/layer	Heating rate:20°C/min Gas flow rate:300cc/min	Min 2.5%
5.1.8 Cold Crack Resistance	Test temp≤-40°C	No crack
5.1.9 Resistance to aggressive media Bursting Strength	Test media: Fuel oil, petroleum jelly Test temp: 70±2°C	Min 2000N
5.1.10 Environmental Stress cracking	10% Igepal Co 630 solution immersion Time 30 days Test Temp: 50±3°C	No cracking
5.1.11 Temp. indicating paint conversion	Scraped off paint from sleeve	230-250°C

5.2 Hot melt adhesive

	Test method and conditions	Requirements
5.2.1 Peel Strength	-PE at 23±2°C -PE at 23±2°C -Pb at 23±2°C	Min 100N/25mm
5.2.2 Shear Strength	At 23±2°C	Min200N
5.2.4 Corrosive Effect	Copper Mirror test Test time:16hrs Test temp:60±2°C	No effect

5.3 Completed Closure

5.3.1 Test environment conditions

temperature:15-35°C

relatively humidity:45-75%

atmosphere pressure:80-106kPa

	Test methods and conditions	Requirement
5.3.2Appearance	According to YD/T590-1 requirements The sleeve shall be homogenous and free of flaws, defects, pinholes, bubbles, cracks or inclusions visible with the unaided eye.	No defects which will affect the product performance
5.3.3 Tightness test	According to YD/T590-1 requirements Immerse in water bath at Temp: 23±3°C Time:15 min Internal Regulated Pressure: 35±2Kpa	No leakage
5.3.4 Temperature cycling test	According to YD/T590-1 requirements Highest Temp: 60±2°C Lowest temp: -30°C±2°C Dwell time: 4hours Transition time: 2 hours Cycle duration; 12 hours Internal regulated Pressure; 35±2Kpa Number of cycles: 10	Tightness as per 5.3.3
5.3.5 High temperature tightness test	According to YD/T590-1-5.5 requirements Temp: 60±2°C Pressure; 35±2Kpa Time: 168h	Tightness as per 5.3.3
5.3.6 Axial tension test	According to YD/T590-1-5.6 requirements Time: 8 hours each cable Load: D/45×1000N (700N±10N max) Internal Regulated Pressure: 35±2Kpa	Tightness as per 5.3.3
5.3.7 Bending test	According to YD/T590-1-5.7 requirements Clamping distance: 10×D from closure edge(min 250 mm) Force: max 500N or 45 deg Bend. Internal regulated Pressure: 35±2Kpa Bending cycle: 2 cable cycle: bend cable & hold for 5 minutes, bring to normal & bend in opposite direction, hold 5 minutes & bring to normal position	Tightness as per 5.3.3

5.3.8 Tension test	According to YD/T590-1-5.7 requirements Torque: 50 Nm. Or 90 deg rotation Clamping distance: 10×D from closure edge (D=outer dia Of cable) 2 complete torsion cycles per cable. Internal regulated Pressure: 35±2Kpa cycle: Twist cable and hold for 5 minutes; bring cable back to starting position	Tightness as per 5.3.3
5.3.10 Static Load test	According to YD/T590-1-5.7 requirements Load: 1000N/5sq cm Load application: 90° from seam, Int, regulated pressure: 35±2Kpa Time: 5 min remove load, turn sample through 180°, reapply load for 5 min	Tightness as per 5.3.3
5.3.11Impact test Steel ball test	According to YD/T590-1-5.7 requirements steel ball Weight: 1Kg Drop height 1m Impact: 90Deg. From seam (sleeve middle) Internal regulated Pressure: 35±2Kpa Temp: -15°C Internal regulated Pressure: 35±2Kpa (Channel closing)	Tightness as per 5.3.3 Tightness as per 5.3.3
5.3.12 Vibration test	According to YD/T590-1-5.7 requirements Vibration: 10Hz Amplitude: 3mm (6mm peak to peak) Time: 6days Clamping distance:10×D from closure edge. (D=the cable outer dia) Internal regulated Pressure: 35±2Kpa	Tightness as per 5.3.3
5.3.13 Resistance to stress cracking	According to YD/T590-1-5.7 requirements Test temp: 50±2°C Internal regulated pressure: 35±2Kpa Test medium: 10% igepal Solution test time: 7 days	Tightness as per 5.3.3

6. Inspection, please see documents (Q/Raylinks-12-01-1999 Inspection and Test Status)

7. Marking package transportation and storage

7.1 Printed marking shall be distinct even after shrinking.

7.1.1 On the outer surface of the sleeve, following shall be printed

i) Product size

ii) Manufacture logo or name

iii) Manufacturing batch

iv) Or Purchase order No& date

7.1.2 The closure shall be supplied in a kit form, marking and documentation within and outside the packages shall comply strictly with following requirements or shall be expressly provided for in the contract

v) Manufacturer

vi) Product name

vii) Size

viii) Manufacturing date or batch

ix) Manufacturing batch

x) Suitable cable's diameter

xi) Checker stamp

7.2 Package

7.2.1 The packing unit is paper case which shall be sufficient to with stand during transit and upon storage.

7.2.2 Packing case size and weight shall take into consideration, where appropriate, the remoteness of the goods final destination aid the absence of heavy handling faculties at all point in transit.

7.2.3 The packing list and operation instruction shall be inside.

7.2.4 The closure offered shall be proven one unit, marking and documentation within and outside the packages shall comply strictly with following requirements or shall be expressly provided for in the contract

xii) Manufacturer

xiii) Product name

xiv) Size

xv) Manufacturing date or batch

xvi) Marking for keeping from dry and hot

7.3 Transportation and storage

7.3.1 Package shall be prevent from exposure to extreme environment, and precipitation during transit and upon storage.

7.3.2 Products shall be storage in house.