

Engineering Standard

SAES-T-633

28 January, 2004

Communications Splice Closures

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Saudi Aramco DeskTop Standards

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1 Scope

This standard prescribes mandatory compliance governing Communication Cable Splice Closures, and it is recognized as the engineering criteria to be applied to Saudi Aramco Communication Cable Splice Closures.

2 Conflicts and Deviations

Any deviations, providing less than the mandatory requirements of this standard require written waiver approval as per Saudi Aramco Engineering Procedure [SAEP-302](#).

3 References

The selection and design of equipment and facilities covered by this standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedure

[SAEP-302](#)

*Instructions for Obtaining a Waiver of a
Mandatory Saudi Aramco Engineering
Requirement*

3.2 Industry Codes and Standards

General Telephone and Electronics

GTE 633 Series

Communication Splice Closures

4 Design

The General Telephone and Electronics (GTE) Series 633 on "Communication Splice Closures" is hereby recognized as Saudi Aramco Engineering Standard SAES-T-633. The following specifications refer to General Telephone and Electronics Practice GTE 633 Series, which is part of this standard.

4.1 General

- Lead sheath cable is no longer used by Saudi Aramco for new Construction.
- Thermo fit (heat shrinkable) wrap around sleeves are available for cable sheath repairs and as splice closures on new cable Construction.
- See the Specifications Section 633-404-201 below for information on installation of the Clear sight Splice Closure.

- For information on the use and installation of the K&B Cable Splice Vault and Building Closure, see the Specifications Section 633-451-206 below.
- All direct buried or underground cable splice closures shall be filled with a re-enterable encapsulating compound (see the Specifications Section 633-600-202 below). This same Section provides information on use of the Better Buried Splice Closure.

4.2 Cancelled GTE 633 Sections

The following GTE 633 sections are not adopted by Saudi Aramco, hence they are not part of this standard:

GTE 633-300-100

GTE 633-300-101

GTE 633-300-200

GTE 633-300-220

GTE 633-300-222

GTE 633-300-223

GTE 633-300-224

GTE 633-300-225

GTE 633-300-230

GTE 633-400-201

GTE 633-400-202

GTE 633-400-203

GTE 633-401-215

GTE 633-450-202

GTE 633-451-209

GTE 633-500-201

GTE 633-603-200

5 Specifications

The text in each paragraph below is an addition, exception, modification, or deletion to GTE 633 as noted. Paragraph numbers not appearing in GTE 633 are new paragraphs to be inserted in numerical order.

633-000-001 Issue 1, September 1984
Splice Case (PLP) For Enclosing Underground and Overhead Cable Splices

Exceptions:

- *Paragraph 2.01 - Since this Splice Case is not equipped to receive encapsulating compound, for Saudi Aramco purposes, it will be used on aerial and inside building cables only. Refer to Specifications 633-600-202 below.*
- *The Reddi Seal Cable Closure, is manufactured by Preformed Line Products (PLP) for use on filled cable in underground and buried plant splices. Whether used on filled or air core type cables, or whether splices are buried or underground, the closure must be filled with a reenterable encapsulating compound. It will not hold air pressure and the Reddi Seal end plates are not interchangeable with the pressurized Preformed Splice Case. Installation shall be in accordance with the manufacturer's instruction. This closure is available in three models. Refer to Table 1.*

**Table I - Reddi Seal Cable Closures
Maximum End Plate Cable Capacity ⁽¹⁾
Single or Double Sheath Cable Diameters**

| Reddi-Seal Closure Diameters | One Cable | Two Cables | Three Cables | Four Cables |
|------------------------------------|-----------|------------|--------------|-------------|
| 10.16 | 5.59 | 4.93 | 4.32 | 3.68 |
| 16.51 | 10.41 | 9.78 | 9.14 | 8.51 |
| 24.13 | 18.03 | 14.40 | 16.76 | 16.15 |

Note: (1) Always allow 0.64 cm clearance between cable holes.

633-400-200 Issue 4, May 1975
Closure Lead Sleeve - Wrapped Joint - Auxiliary Sleeve - Alpeth
and Stalpeth Sheath - Installation

Exception:

Delete references to Stalpeth cable, which is not used by Saudi Aramco.

633-400-300 Issue 1, January 1963
Closure Splice - Temporary Closing of Splice Openings -Using CR Tape

Exception:

None.

633-400-300 (Addendum) Issue 1, January 1963
Closure Splice - Temporary Closing of Splice Openings -Using CR Tape

Exception:

None.

633-401-200
Sleeve - Raychem Thermo fit - Wrap around

Issue 3, March 1981

Exceptions:

- 1. Delete reference to asbestos pole guard. Do not use asbestos. Use fiberglass or some other fireproof material as a shield to protect adjacent cables etc., from heat used in placing heat-shrinkable sleeves.*
- 2. Due to the requirement for heat for the installation of the heat-shrinkable (thermo fit) sleeves (closures), discernment must be used in selecting locations in which it will be used, and all applicable safety precautions and Loss Prevention standards adhered to. Installations are to be made in accordance with manufacturer's instructions.*
- 3. Delete all references in this section to GTE AE material or stock numbers.*
- 4. The material covered in this section is generally available locally. Listed below are brief descriptions and uses of some locally available Heat-Shrinkable (Thermo fit) Sleeves (Closures). The list below is not comprehensive, but is typical of what is available in this type closure. (Additional heat-shrinkable (thermo fit) closures are listed in other GTE 633 series sections).*

- 102L:

Heat-shrinkable caps for sealing cable ends in non-pressurized or low performance pressurized applications. It is a medium-wall molded cap internally coated with an adhesive or mastic sealant. The end cap is available in sizes to fit cables that range from 4 mm to 115 mm diameter. For installation, the cap is centered over the ends of the cable and heat shrunk to form a seal of the cable ends.

- XAGA 200:

Consists of a heat-shrinkable wrap around sleeve with a stainless steel channel closure and a pre-formed non-hydroscopic laminate to insulate, compact, and shape the splice. To insure proper installation the wrap around sleeve is coated externally with a heat-sensitive paint that changes color when enough heat has been applied for proper installation. XAGA 200 has a splice capacity up to 200 pairs (.6 mm/22 AWG) in configurations up to three cables in and three cables out and is used for sealing and protection of unpressurized cable splices.

- XAGA 200R:

Is used for the sealing and protection of cable splices in the unpressurized telephone distribution network. A variable liner provides a laminated aluminum barrier against moisture vapor transmission as well as mechanical protection for the splice bundle. The shrinkable wrap around sleeve forms a watertight seal to the cable jacket. Up to three cables can enter each end of the sleeve. Each kit comes complete with filling compound for protection from water ingress. This sleeve comes in four sizes and can be used on a splice with a maximum of 120 mm diameter.

- XAGA 250:

Is used to seal telephone cable splices for filled or unpressurized air core cable. This wrap around, heat-shrinkable splice closure will accommodate in-line as well as branch splices on polyethylene or lead sheath cable. It may be used for direct buried, aerial, and underground installations. It provides a watertight seal that is also reenterable for cable repair and rearrangements. It is constructed of a material formulated to resist UV radiation and atmospheric contamination. A splice encapsulation kit does not come with the XAGA 250, but is available in a separate kit. The XAGA 250 comes in different sizes and can be used on splices with maximum diameters of 200 mm.

- **WRST:**

Wrap-around repair sleeves are split sleeves closed by a slide-on metal channel. WRST sleeves are suitable for all types of cables in direct buried, underground, or aerial applications. It is designed for use over transitions in a cable where a large shrink ratio is required. This sleeve is suited for repairing all types of sheath openings and sheath damage (trouble openings, fire and steam damage, cable bend repair and etc.). It comes in several sizes and can be used on cables from 10 mm to 190 mm diameter.

633-401-205

Issue 2, September 1984

Cable Repair Auto wrap for Lead and Polyethylene Sheath Cables

Exception:

All applicable safety precautions and Loss Prevention standards must be adhered to in the use and installation of the Cable Repair Auto wrap. Choose with care the locations in which this repair method will be used, due to the presence of heat and 120 volt electrical source.

633-401-210

Issue 2, September 1987

Cable Repair 3M Heat Reactive Tape-Description and Installation

Exception:

None.

633-403-200

Issue 1, March 1979

Sleeve Auxiliary Wrap - Type P

Exception:

None.

Commentary:

Follow all prescribed safety precautions for use of propane torch, raygun, etc.

633-404-200

Issue 3, January 1989

XAGA 1600 Series Cable Closure - Description and Installation

Exception:

None.

Commentary:

Select locations for use of this closure with great care due to the requirement for heat for its installation.

633-404-201 Issue 1, January 1984
Clear sight Splice Cable Closure - Description and Installations

Exception:

When placing or handling encapsulating compounds, observe manufacturer's warnings and safety precautions, warnings and safety precautions of this section (see GTE 633-404-201 Paragraphs 2.05, 3.01, 8.03) and all other applicable Saudi Aramco safety standards and instructions.

633-404-202 Issue 2, October 1991
CasChem Re-Enterable Encapsulating Compound use and Preparation

Exception:

None.

633-404-203 Issue 1, March 1990
C-A-T-M Arial Closure, Description, and Installation

Exception:

This section is retained as typical information for the installation.

633-405-200 Issue 3, May 1976
Kit Cable - Insulating Joint G7340-GC-Electrolytic Capacitor,
Alpeth, Stalpeth and Lead Sheath Cable - Installation

Exception:

This section is retained as typical information for the installation of a cable insulating joint and an electrolytic capacitor.

633-450-201 Issue 2, July 1973
Closure Splice Case - Aluminum Types 20, 21 - Description and Installation

Exception:

This splice closure is for use on aerial cables only.

633-450-203 Issue 3, November 1977
Closure Splice Case - Cast Iron Types 20, 21, 30, 31 - Description and Installation

Exception:

Delete this entire section.

Commentary:

On underground and buried cable splices, Saudi Aramco uses splice cases in which the splice can be encapsulated.

633-450-204 Issue 4, December 1983
Closure Splice Case - Cast Iron Types 10A, 11A, 12A, 9A, 40/41E2- Description

Exception:

Delete this entire section.

Commentary:

On underground and buried cable splices, Saudi Aramco uses splice cases in which the splice can be encapsulated.

633-451-206 Issue 4, March 1984
Closure Splice - Vaults and Buildings - Description, Installation

Exception:

None.

633-451-207 Issue 1, May 1973
Closure Splice - Vaults - Channel Coml. Series PS-6000, 8000 - Description and Installation

Exception:

None.

633-451-208 Issue 1, May 1981
Closure Splice - Vaults - VSE Series - Description and Installation

Exception:

None.

633-475-204 Issue 3, July 1975
Closure Splice - Cable Stubs - Reliable 1126 and 1151, Type MD - Description and Installation

Exception:

None.

Commentary:

This section will be retained only until existing lead sheath cable is removed from plant.

633-475-205
Closure Splice - PIC Cable - Type B - Installation

Issue 3, April 1982

Exception:

None.

633-475-205 (Addendum)
Closure Splice - PIC Cable - Type B - Installation

Issue 1, July 1982

Exception:

None.

633-475-206
Closure Aerial "A" Series - Description and Installation

Issue 2, December 1983

Exception:

None.

633-500-200
Closure - Submarine Cable-Installation

Issue 1, September 1968

Exception:

None.

Commentary:

This Standard does not preclude the use of other manufacturer's submarine cable closures if they are of equal or better quality.

633-600-202
Closure Direct Buried (and Underground) Reenterable Splice

Issue 3, February 1984

Exceptions:

- The Preformed Stainless Steel Splice Closure (a non-filled type splice closure) or equivalent may be used on underground cables when the splice will be located inside a manhole. This type installation may require an annual preventive maintenance program (pressure test of splice closures etc.) for verification of splice integrity. Installation materials and procedures shall comply with the manufacturers recommendations.*
 - Addition: Paragraph 1.01 - All direct buried or underground cable splice closures shall be filled with a re-enterable encapsulating compound on air core as well as filled cables. The splice closure used shall be a type that is manufactured to hold encapsulating compound. The Pressure Wrap Kit, or a similar product utilizing a perforated web liner, shall be used in all encapsulated re-enterable splice closures.*
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- *The 3M Company's RJ Series Better Buried Closure system (Material is available from a local vendor) provides acceptable closures for this purpose. Although basically manufactured for buried splices, when used with the 3M Brand RJ Series support assembly, these closures can be used in manholes and cable vaults. This closure comes in different series and sizes that will accommodate cables with outside diameters ranging from 25 mm to 101 mm. A support assembly shall be used with 125 mm and larger diameter filled closures installed in manholes.*
- *The 3M Better Buried Closure body sleeve halves and end caps are made of material that withstands acids, detergents, chemicals and other harmful elements for assurance of direct buried splice integrity. The Better Buried Closures are available as complete closure kits, component kits or as individual parts to meet specific application requirements for direct buried straight and butt splices, cable repair and other direct buried applications such as tap splicing and sheath repairs. Some of this material is already on the SAMS stock list under the 18-021-xxx series of stock numbers.*

633-602-200

Issue 2, June 1984

Closure Terminal and Splice - Channel Coml. GHT - 308U
(Green Hornet) - Description and Installation

Exception:

None.

633-602-203

Issue 1, October 1994

Aarmor Cast Buried Closure

Exception:

None.

633-620-200

Issue 1, May 1991

Construction & Cable Splicing Stainless Steel Splice Closure,
Description and Installation

Exception:

None.

633-620-201

Issue 1, April 1989

Construction & Cable Splicing PST Pedestal Splice Closure

Exception:

None.

6 Installation

Cable splice closures shall be installed in accordance with the manufacturer's instruction unless directed otherwise in this Standard.

7 Testing and Inspection

All quality assurance (QA) Inspections shall be done by a qualified communications inspector. All splice closures shall be flash tested and inspected for proper seals. Buried and underground splices shall be inspected to assure proper fill (of encapsulating compound) in the closure and use of the recommended (by closure manufacturer) encapsulating compound.

Revision Summary

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| 28 January, 2004 | Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with minor changes. |
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