

COPY

Invitation to Bid No. : N2.EB.(จข.)-22-2546 (รายการที่ 7-13)

Specification No. : R-506/2546

C Material, equipment, and specifications for CONNECTORS AND ELECTRICAL CONTACT COMPOUND**C1 General material and packing instructions**

Additional to the general instructions, the following shall be observed :

1a Scope

These specifications cover mechanical, compression and wedge type connectors to connect conductors, and electrical contact compound.

1b Standard

The connectors shall be manufactured and tested in accordance with the latest IEEE, ANSI, EEI-NEMA, ASTM, VDE Regulations and DIN, or equivalent; unless otherwise specified in these specifications.

The bodies of connectors shall be of aluminium-alloy according to manufacturer's standards, unless otherwise specified in these specifications.

1c Principal requirement**1c.1 General**

The connectors shall be suitable for connecting stranded and/or solid conductors according to DIN, TIS, or equivalent; unless otherwise specified in these specifications.

1c.2 Bolted type connector

For the purpose of against self loosening, each bolt shall be furnished with at least of one (1) locknut. The bolts shall be designed for single-wrench installation. Each U-bolt is counted as two (2) bolts. The bolts shall be tightened to torque levels according to these shown in the table below or according to manufacturer's recommendation; the technical details of tightening torque levels shall be submitted on request.

All ferrous materials shall be hot-dip galvanized after manufacturing; except bolts, lockwashers, washers, and nuts up to M6 shall be electro galvanized; according to the relevant standards or having the thickness or zinc coating shown in the table below.

Sizes of Bolts, lockwashers, Washers, and Nuts	Tightening Torque Level of Galvanized Steel Bolts kgf-m	Minimum Thickness of Zinc Coating mm
M 6 (1/4")	-	0.010
M 8 (5/16")	2.0	0.040
M 10 (3/8")	2.7	0.040
M 12 (1/2")	5.5	0.040
M 14 (9/16")	6.5	0.040
M 16 (5/8")	7.5	0.040
M 20 (3/4")	11.0	0.045

1c.3 Compression type connector

Full tension sleeves and partial tension sleeves shall withstand at least 90% and 40%, respectively, of the minimum breaking strength of the conductors for which they are designed. Each sleeve shall be prefilled with electrical contact compound and closed both ends by plastic caps.

Conductor barrel of each terminal lug shall be prefilled with electrical contact compound and closed by a plastic cap.

Tap connectors shall be prefilled with electrical contact compound and packed in suitable packages, one (1) or two (2) pieces per package.

1c.4 Compression deadend assembly set

The aluminium body and aluminium jumper terminal shall accommodate aluminium conductor which is according to TIS; and the conductor barrel shall be prefilled with electrical contact compound and closed by a plastic cap.

1c.5 Wedge type connector

The wedge type connector shall consist of C-shaped member and wedge, and made of aluminum alloys which shall be described.

The wedge type connector shall pass the current cycle tests Class A (500 cycles) in accordance with the latest IEEE-TD1-162/NEMA C3, ANSI C 119.4 or equivalent.

Bidders who have never submitted the test reports of current cycle tests shall submit either prior to receipt of bids or within fifteen (15) days of the bid closing date, for saving bid consideration time, the item without submitting the report shall be rejected.

1c.6 Marking

Each connector shall be marked, on the body, at least as follows :

- (1) Applicable conductor type and size.
- (2) Manufacturer's symbol.
- (3) Marks to press, for compression type only.
- (4) Words "FULL TENSION" and "PARTIAL TENSION", on full tension sleeves and partial tension sleeves, respectively.

Except for compression type tap connectors for main line size less than 10 mm² (not including size 10 mm²), if the applicable conductor type and size can not be marked on the bodies, the marks shall be marked on individual packages.

1c.7 Sample

Free samples shall be supplied on request. The samples will not be returned.

1d Packing

Each item shall be packed separately in suitable packages in sets or pieces of 1, 2, 100, 200, 250, or 300.

Except :

PEA Material No.	Preformed fittings	sets or pieces per package
02300103	Connector, parallel groove	75
02310001	Connector, dead-end type	100

Packages of same item may be packed together in suitable cases.

Form No. 12-02/7.02

Page 3 of 5

II

C2 Material and packing data to be given by bidder

- 2a For each item offered, the following details shall be submitted with the bid :
- Catalogue number.
 - Specifications of materials used for the component parts (body, bolts, nuts, screws, lockwashers, washers, etc.) .
 - Surface finishing of the component parts.
 - Nominal cross-sectional area in mm^2 of conductor for which the connector is designed.
 - Diameter in mm of conductor for which the connector is designed.
 - Material of conductors for which the connector can be used (Al, ACSR, Cu, etc.) .
 - Recommended tightening torques for bolts in kgf-m .
 - Weight in kg/100 sets or pieces.
- 2b It shall be advised whether the connectors should be protected by armour tape or preformed line guards, etc.
- 2c For each item offered, a drawing with dimensions in mm and marking details shall be submitted with the bid. For compression type connector, a drawing with the dimensions including inside and outside diameters and marking details shall be submitted.
- 2d Number of aluminium-alloy copper-alloy, and/or the chemical compositions of the bodies of connectors.

2e Packing details

Packing method.

Number of sets or pieces in each package (maximum 300 sets or pieces in one package)

Principal dimensions of each package in cm .

Volume of each package in m^3 .

Gross weight of each package in kg .

Net weight of each package in kg .

Number of packages.

If several packages are contained in one big case, further details are required :

Number of packages in each case.

Principal dimensions of each case in cm .

Volume of each case in m^3 .

Gross weight of each case in kg .

Number of cases.

Invitation to Bid No. : N2.EB.(จข.)-22-2546 (รายการที่ 7-13)

Specification No. : R-506/2546

COPY

C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
1	02400002		Compression splicing sleeve, full tension, for aluminium conductor according to TIS 85-2522 size 50 mm ² , length not less than 155 mm, see Drawing No. SA2-015/40002.
2	02400004		Ditto as Item 1, but size 95 mm ² , length not less than 165 mm.
3	02400005		Ditto as Item 1, but size 120 mm ² , length not less than 250 mm.
4	02400007		Ditto as Item 1, but size 185 mm ² , length not less than 330 mm.
5	02400008		Ditto as Item 1, but size 240 mm ² , length not less than 360 mm.
6	02400009		Ditto as Item 1, but size 400 mm ² , length not less than 380 mm.
7	02400102		Compression splicing sleeve, full tension, for ACSR conductor according to TIS 86-2522 size 50/8 mm ² , length not less than 440 mm, see Drawing No. SA2-015/40002.
8	02400104		Ditto as Item 7, but size 95/15 mm ² , length not less than 500 mm.
(11) 9	02410002 (1020410002)	2,000 ชิ้น	Compression splicing sleeve, partial tension, for aluminium conductor according to TIS 85-2522 size 50 mm ² , length not less than 85 mm, see Drawing No. SA2-015/40002.
10	02410004		Ditto as Item 9, but size 95 mm ² , length not less than 105 mm.
11	02410005		Ditto as Item 9, but size 120 mm ² , length not less than 105 mm.
12	02410007		Ditto as Item 9, but size 185 mm ² , length not less than 125 mm.
13	02410008		Ditto as Item 9, but size 240 mm ² , length not less than 145 mm.
14	02410009		Ditto as Item 9, but size 400 mm ² , length not less than 210 mm.
15	02410010		Ditto as Item 9, but size 625 mm ² , length not less than 250 mm.

Invitation to Bid No. : N2.EB.(จข.)-22-2546 (รายการที่ 7-13)

Specification No. : R-506/2546

C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
16	02410102		Compression splicing sleeve, partial tension, for ACSR conductor according to TIS 86-2522 size 50/8 mm ² , length not less than 85 mm, see Drawing No. SA2-015/40002.
17	02410104		Ditto as Item 16, but size 95/15 mm ² , length not less than 115 mm.
18	09080000		Compound, electrical contact aid and anti-oxidation for use in bolted connections of aluminium-to-aluminium and aluminium-to-copper. The compound shall be contained in handy squeeze packages.
(7) 19	02300102 (1020300102)	21,000 อัน	Connector, parallel groove, 2-bolt type, length not less than 55 mm, for electrical tap off connection of aluminium, aluminium-alloy, and ACSR conductors to aluminium, aluminium-alloy, and ACSR conductors, with : Main : diameter range of 6.42 mm to 13.60 mm (size 25 mm ² to 95 mm ²). Tap : diameter range of 6.42 mm to 13.60 mm (size 25 mm ² to 95 mm ²).
(8) 20	02300103 (1020300103)	2,500 อัน	Ditto as Item 19, but 3-bolt type length, not less than 90 mm. with : Main : diameter range of 10.75 mm to 17.64 mm (size 70 mm ² to 185 mm ²). Tap : diameter range of 10.75 mm to 17.64 mm (size 70 mm ² to 185 mm ²).
21	02300104		Ditto as Item 19, but 3-bolt type length, not less than 100 mm. with : Main : diameter range of 12.60 mm to 20.25 mm (size 95 mm ² to 240 mm ²). Tap : diameter range of 12.60 mm to 20.25 mm (size 95 mm ² to 240 mm ²).

Invitation to Bid No. : N2.EB.(จข.)-22-2546 (รายการที่ 7-13)

Specification No. : R-506/2546

C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
22	02310000		Connector, dead-end type, for aluminium conductor diameter range of 6.42 mm to 7.56 mm (size 25 mm ² to 35 mm ²).
(9) 23	02310001 (1020310001)	40,100 อัน	Ditto as Item 22, but aluminium conductor diameter range of 9.06 mm to 10.75 mm (size 50 mm ² to 70 mm ²).
(10) 24	02310002 (1020310002)	900 อัน	Ditto as Item 22, but aluminium conductor diameter range of 12.60 mm to 14.25 mm (size 95 mm ² to 120 mm ²).
25	02420101		Connector (or lug), terminal, compression type made of aluminium-alloy, for connecting aluminium cable according to TIS 293 size 35 mm ² to terminal pad, length not less than 125 mm, see Drawing No. SA2-015/24029.
(12) 26	02420102 (1020420102)	33,500 อัน	Ditto as Item 25, but size 50 mm ² to terminal pad, length not less than 125 mm.
27	02420103		Ditto as Item 25, but size 70 mm ² to terminal pad, length not less than 130 mm.
(13) 28	02420104 (1020420104)	41,000 อัน	Ditto as Item 25, but size 95 mm ² to terminal pad, length not less than 140 mm.
29	02420106		Connector (or lug), terminal, compression type made of aluminium-alloy, for connecting aluminium cable according to TIS 85 size 185 mm ² to terminal pad, length not less than 155 mm, see Drawing No. SA2-015/24029.

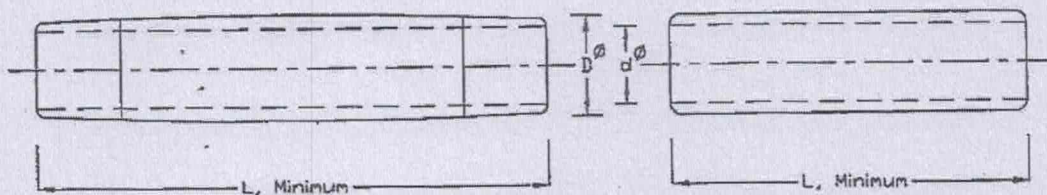
Invitation to Bid No. : N2.EB.(จข.)-22-2546 (รายการที่ 7-13)

Specification No. : R-506/2546

C3 Schedule of detailed requirement

Item	PEA Material No.	Quantity	Description
30	02340001		Connector, wedge type, for electrical tap off connection of aluminium conductor to aluminium conductor, with : Main : diameter of 15.80 mm - 17.64 mm. (size 185 mm ²) Tap : diameter of 12.80 mm - 14.25 mm. (size 120 mm ²)
31	02340000		Ditto as Item 30, but : Main- : diameter of 15.80 mm - 17.64 mm. (size 185 mm ²) Tap : diameter of 11.30 mm - 12.60 mm. (size 95 mm ²)
32	02340002		Ditto as Item 30, but : Main : diameter of 15.80 mm - 17.64 mm. (size 185 mm ²) Tap : diameter of 8.25 mm - 9.06 mm. (size 50 mm ²)
33	02340100		Power-actuated tool, for installation, and removing the wedge type connector in Item 30, Item 31 and Item 32, complete with tool for cleaning the power-actuated tool and tool for cleaning the conductor, and carrying bag.
34	02340101		Power-booster (cartridge), colour-coded to match the connector size, for driving wedge into C-shaped member, for use with wedge type connector in Item 30, Item 31 and Item 32.
35	02340102		Ditto as Item 34, but for removing the wedge from C-shaped member.
			<p>Note :</p> <ol style="list-style-type: none"> 1. Enclosed Drawing No. SA2-015/40002 and SA2-015/24029. 2. The bidder has to supply five(5) samples and approximately 0.5 kg of the COMPOUND, within fifteen (15) days, counted from the Committee's request. The samples will not be returned.

PRELIMINARY



COMPRESSION SPLICING SLEEVE FOR CONDUCTORS ACCORDING TO TIS

CONDUCTOR		DIMENSIONS					
		FULL TENSION SLEEVE			PARTIAL TENSION SLEEVE		
NOMINAL CROSS-SECTION AREA mm ²	OVERALL DIAMETER mm	ϕ D mm	ϕ d mm	L mm, Min.	ϕ D mm	ϕ d mm	L mm, Min.
ALUMINIUM STRANDED CONDUCTORS ACCORDING TO TIS 85-2522							
50	9.06	16.0(±0.5)	10.0(±0.5)	155	16.0(±0.5)	10.0(±0.5)	85
95	12.60	23.0(±0.5)	13.5(±0.5)	165	23.0(±0.5)	13.5(±0.5)	105
120	14.25	25.5(±0.5)	16.0(±0.5)	250	23.0(±0.5)	15.0(±0.5)	105
185	17.64	28.5(±0.5)	18.5(±0.5)	330	28.5(±0.5)	18.3(±0.5)	125
240	20.25	34.5(±0.5)	21.5(±0.5)	360	32.5(±0.5)	21.5(±0.5)	145
400	25.65	43.0(±0.5)	27.0(±0.5)	380	43.0(±0.5)	27.0(±0.5)	210
625	32.56	—	—	—	53.5(±0.5)	35.5(±0.5)	250
ALUMINIUM CONDUCTORS STEEL REINFORCED ACCORDING TO TIS 86-2522							
50/8	9.60	20.5(±0.5)	10.5(±0.5)	440	16.0(±0.5)	10.7(±0.5)	85
95/15	13.60	30.0(±0.5)	14.5(±0.5)	500	22.5(±0.5)	14.7(±0.5)	115

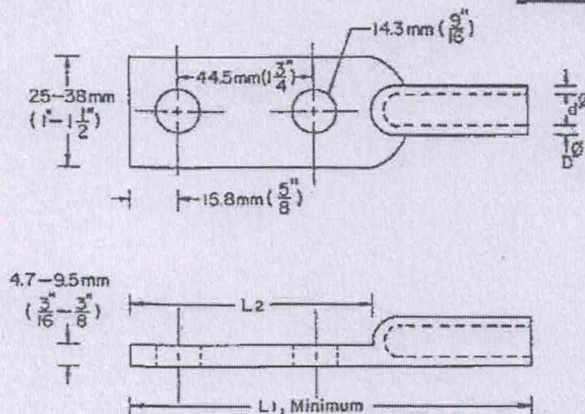
NOTE :

1. FULL TENSION SLEEVES AND PARTIAL TENSION SLEEVES SHALL WITHSTAND LEAST 90% AND 40% RESPECTIVELY OF THE MINIMUM BREAKING STRENGTH OF THE CONDUCTORS FOR WHICH THEY ARE DESIGNED.
2. THE SLEEVE SHALL BE PRE-FILLED WITH ANTI-CORROSION COMPOUND AND CLOSED BOTH ENDS BY PLASTIC CAPS.
3. EACH SLEEVE SHALL BE MARKED WITH APPLICABLE CONDUCTOR SIZE, MARKS TO PRESS, AND MANUFACTURER'S SYMBOL.
4. FIGURES IN PARENTHESES ARE TOLERANCE.
5. THIS DRAWING IS ATTACHED TO SPECIFICATIONS OF COMPRESSION TOOLS AND OF COMPRESSION SPLICING SLEEVES.

กองมาตรฐานระบบไฟฟ้า ฝ่ายมาตรฐานและความปลอดภัย การไฟฟ้าส่วนภูมิภาค

มีมติเป็น —	TABLE OF COMPRESSION SPLICING	แบบเลขที่ SA2-015/40002
วันที่ 10 ตุลาคม 2545	SLEEVES ONE PIECE TYPE	แผ่นที่ 1 ของจำนวน 1 แผ่น

การประกอบเลขที่
ASSEMBLY NO.



COMPRESSION TYPE TERMINAL LUG, FOR ALUMINIUM CABLE

COMPRESSION TYPE, TERMINAL LUG	FOR ALUMINIUM CABLE		DIMENSIONS OF COMPRESSION TYPE TERMINAL LUG			
	SIZE	OVERALL DIAMETER OF CONDUCTOR	ϕ	ϕ	L1	L2
PEA MAT. NO.	mm ²	mm	mm	mm	mm, Min	mm
02420101	35	6.95	14.0 (±0.4)	7.65 (±0.15)	125	75 (+5/-0)
02420102	50	8.33	16.0 (±0.5)	9.75 (±0.25)	125	75 (+5/-0)
02420103	70	9.73	18.5 (±0.5)	11.25 (±0.25)	130	75 (+5/-0)
02420104	95	11.45	23.0 (±0.5)	13.25 (±0.25)	140	75 (+5/-0)
02420105	120	12.95	23.0 (±0.5)	14.75 (±0.25)	145	75 (+5/-0)
02420106	185	17.64	28.5 (±0.5)	18.3 (±0.5)	155	75 (+5/-0)

- NOTES:
- FIGURES IN PARENTHESES IN THE TABLE, ARE TOLERANCE.
 - THE LUG SHALL BE PREFILLED WITH ELECTRICAL CONTACT COMPOUND AND CAPPED BY PLASTIC CAPS.
 - EACH LUG SHALL BE MARKED WITH APPLICABLE CONDUCTOR SIZE, MARKS TO PRESS, AND MANUFACTURER'S SYMBOL

กองวิศวกรรมไฟฟ้าและเครื่องกล ฝ่ายวิศวกรรม	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ
ผู้รับ ผู้พิจารณา วิศวกร หัวหน้าแผนก หัวหน้ากอง ผู้อำนวยการฝ่าย	ผู้ทำการ	ถูกแทนด้วยแบบ เดือนปีที่จัดทำ 20.10.24 แก้ไขครั้งที่ 20.ก.ค.2530 ผู้แก้ไข มาตรฐาน
รองผู้อำนวยการฝ่ายเทคนิค	CONNECTOR (OR LUG), TERMINAL, COMPRESSION TYPE	แบบเลขที่ SA2-Q15/24029 แผ่นที่ 1 ของจำนวน 1 แผ่น

Invitation to Bid No. : N2.EB.(จข.)-22-2564 รายการที่ 14

Specification No. : RHDW-011/2556

C Material, equipment, and specifications for OVERHEAD LINE HARDWARE

C1 General material and packing instructions

Additional to the general instructions, the following shall be observed :

1a Scope

These specifications cover line hardware for overhead line construction.

1b Standard

The overhead line hardware shall be in accordance with the latest TIS, VDE Regulations, DIN, and PEA Drawings attached to these specifications, or equivalent.

1c Principal requirement

The overhead line hardware shall be marked with manufacturer's name or trademark, except full thread double arming bolts, full thread stubbing bolts, and washers.

All ferrous materials shall be galvanized after manufacturing. Method of galvanizing and thickness of coating shall be according to the attached Table "THICKNESS OF ZINC COATING". Free samples shall be supplied on request. The samples will not be returned.

1d Packing

Each item should be packed in suitable packages in sets or pieces of 10, 50, 100, or that specified in Table "Packing Details for Overhead Line Hardware" (see page 3 of 3).

The gross weight of each package should not exceed 40 kg.

If there are several packages, the number of package shall be stamped on each package or each tag, as follows :

package number / total number of packages.

C2 Material and packing data to be given by bidder

- 2a** For each item offered, the following details shall be submitted with the bid :

Catalogue number.

Description of materials used for the component parts.

Surface finishing of the component parts.

Zinc coating in g/m^2 or μm ($1 \mu\text{m} = 0.001 \text{ mm}$).

Minimum breaking strength in kgf.

Weight in kg/set or piece.

- 2b** For each item offered, a detail drawing with dimensions in mm shall be submitted with the bid.

2c Packing details

Packing method.

Number of sets or pieces in each package.

Dimensions of each package in cm.

Gross weight of each package in kg (should not exceed 40 kg).

Net weight of each package in kg.

Number of packages.

If several packages are contained in one big case, further details are required :

Number of packages in each case.

Dimensions of each case in cm.

Gross weight of each case in kg.

Number of cases.

-3-

Table
Packing Details for Overhead Line Hardware

PEA Material No.	Quantity Per Package	Packing Method
00120004, 01000103	18	Bundle
01200001, 01200002	20	Bundle
01010100, 01200004, 01200005	50	Bundle
01200007	150 (15 per layer)	Bundle
01110200, 01110201, 01140000, 01170001, 01180001	150	Sack
01110202, 01110203	100	Sack
01110204, 01110205, 01140001, 01140002	75	Sack
01110206, 01110207, 01110208, 01110401, 01120000, 01120001, 01120002, 01130000, 01130001, 01130002, 01140003	50	Sack
01180100, 01180201	500	Sack
01180301	5,000	Sack
02440102	30	Sack
02440103	60	Sack