1 Scope/Application

This OHL Technique covers the binding of conductors for the following types of line:

- LV (not ABC).
- LV services.
- HV light duty.

Refer to the appropriate OHL Instruction from the 500-series for the full sequence of steps required for conductor erection.

2 Safety Information

	**Work shall be carried out in accordance with General Requirements in Section 1. Approved mandatory PPE and work wear shall be in accordance with General Requirements in Section 1.**
	The task covered by this OHL Technique has significant hazards associated with it identified by the symbol and text **CAUTION:**  This OHL Technique details the risk control measures that must be applied when carrying out the task. If the risk control measures in this procedure are implemented the risks will be controlled. This OHL Technique also forms the method statement for the task.

3 Personnel

The minimum team number for this task is three Competent Persons.

4 Preliminary Operations

Refer to Section 1 of this manual.

5 Approved Equipment

Refer to Section 4 of this manual for approved tools and equipment. The following tools and equipment must be used for this task where appropriate:

- Come-along clamp.
- Pul-lift.
- Dynamomter.

6 Materials and Consumables

Refer to Tables and Drawings below and Section 5.

7 Before Making Off and Binding Conductors

Before making off and binding conductors, ensure that the following tasks have been completed:

1. Conductors have been marked.
2. Conductors have been made off at the tension end.
3. The line is at line tension and the poles are aligned and plumb.

8 Making Off and Binding Conductors – LV Lines (including Services)

8.1 LV Intermediate Poles

Refer to Drawing I-430P1-M548-001 and:

- Apply the mid-point of a continuous length of binding wire to the conductor at the centre line of the insulator and apply 'q' turns, as shown in the table below, in a clockwise or anticlockwise direction.
- Wrap the binder ends around the insulator and take one turn around the conductor as shown on drawing.
- Wrap the binder around the insulator and lock by applying 'r' turns, as shown in the table below, around the conductor as shown on drawing.
- Cut binder ends and close tightly on the conductor.

LV REEL INSULATOR BIND – INTERMEDIATE

CONDUCTOR TYPE & SIZE	ALIMINIUM						COPPER					
	100mm² BARE	100mm² PVC	50mm² BARE	50mm² PVC	25mm² BARE	25mm² PVC	70mm² BARE	70mm² PVC	32mm² BARE	32mm² PVC	16mm² BARE	16mm² PVC
Insulator	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel
Dimension A	125mm	125mm	125mm	125mm	125mm	125mm	100mm	100mm	100mm	100mm	100mm	100mm
Binding Wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC
Material req'd	2.9m	2.62m	2.24m	2.1m	1.8m	1.6	2.08m	1.92m	1.88m	1.7m	1.5m	1.5m
Turns:												
`p`	4	4	4	4	4	4	4	4	4	4	4	4
`q`	16	12	16	12	16	12	16	12	16	12	16	12
`r`	14	8	14	8	14	8	9	5	9	5	9	5

8.2 LV Section and Terminal Poles

Refer to Drawing I-430P1-M548-002 and:

- Wrap the end of the conductor around the insulator and 'neck' it parallel to itself as close to the insulator as possible.
- Lay one end of a continuous piece of binding wire parallel to the conductor for a distance of 'C', as shown in the table below.
- Bind the running end around the conductors and the binder tail commencing close to the insulator, continuing for a distance 'A1', as shown in the table below, in a clockwise or anticlockwise direction.

8.2.1 Copper Conductors

- Bend back the conductor tail to form a maximum angle of 45°.
- Bind both ends of the binding wire around the conductor for a distance 'B1', as shown in the table below.
- Cut binder ends and close tightly on the conductor.

8.2.2 Aluminium Conductors

- Bind the binding wire around the tensioned conductor for a distance 'B1', as shown in the table below, and then around both conductor and the binder tail for a distance 'A2', as shown in the table below.
- Bend back the conductor tail to form an angle of 45°.
- Bind both ends of the binding wire around the conductor for a distance 'B2', as shown in the table below.
- Cut binder ends and close tightly on the conductor.

LV REEL INSULATOR BIND – SECTION AND TERMINAL

CONDUCTOR TYPE & SIZE	ALIMINIUM						COPPER					
	100mm² BARE	100mm² PVC	50mm² BARE	50mm² PVC	25mm² BARE	25mm² PVC	70mm² BARE	70mm² PVC	32mm² BARE	32mm² PVC	16mm² BARE	16mm² PVC
Insulator	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel	Reel
Dimension:												
A1 & A2	50mm	50mm	50mm	50mm	50mm	50mm	100mm	100mm	100mm	100mm	100mm	100mm
B1 & B2	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm
C	400mm	400mm	350mm	340mm	330mm	330mm	325mm	320mm	280mm	280mm	270mm	270mm
Binding Wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC
Material req'd	4.2m	4m	3.3m	3m	2.8m	2.8m	3m	3.1m	2.5m	2.5m	2.4m	2.4m
Turns:												
`p`	20	15	20	15	20	15	40	29	40	29	40	29
`q`	10	8	10	8	10	8	10	8	10	8	10	8

8.3 LV Service Conductor Terminations

Refer to Drawing I-430P1-M548-003 and:

- Either wrap the end of the conductor around the reel insulator or thread through the corkscrew insulator and 'neck' it parallel to itself as close to the insulator as possible.
- Lay one end of a continuous piece of binding wire parallel to the conductor for a distance of 'C', as shown in the table below.
- Bind the running end around the conductors and the binder tail commencing close to the insulator, continuing for a distance 'A', as shown in the table below, in a clockwise or anticlockwise direction.
- Bend back the conductor tail to form a maximum angle of 45°.
- Bind both ends of the binding wire around the conductor for a distance 'B', as shown in the table below.
- Cut binder ends and close tightly on the conductor.

NOTE:
Concentric cables shall be terminated on reel insulators using a preformed grip.

SERVICE CONDUCTOR TERMINATION

CONDUCTOR TYPE & SIZE	SINGLE COPPER		SINGLE ALUMINIUM	
	16mm² BARE	16mm² PVC	22mm² BARE	22mm² PVC
Insulator	Reel or Coachscrew		Reel or Coachscrew	
Dimension: A B C	 100mm 25mm 230mm	 100mm 25mm 230mm	 100mm 25mm 230mm	 100mm 25mm 230mm
Binding Wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC
Material req'd	1.7m	2m	2m	2m

Turns:
`p`
`q`
	
	40
	10
		
		29
		8
			
			40
			10
				
				29
				8

8.4 HV Light Lines

Pin insulator binds shall comply with Drawing I-430P1-M548-004 for intermediate line positions and Drawing I-430P1-M548-005 for intermediate angle positions. Binds may be applied with hand tools using the method detailed on Drawing I-430P1-M548-006.

Proceed as follows:

- Tightly wrap aluminium tape (Shaffer tape) around bare aluminium based conductor in the same direction as the lay for a distance shown in the following tables. If the conductor is too heavy to lift by hand then approved lifting procedures shall be used.
- Tightly wrap semi-conductive tape around PVC covered conductors for a distance of 600mm either side of the centre line of the insulator with a 50% overlap, if necessary secure the ends with a suitable adhesive tape. Bare binding wire and stirrups shall be used with PVC covered conductors.
- Apply the centre of a continuous piece of binding wire, comprising two strands, under the neck of the insulator above the stirrup.
- Wrap the binding wires around both stirrup legs, or single stirrup for angle poles, to attach the stirrup leg(s) to the insulator.
- Tightly wrap the binding wires around the stirrup and conductor in a clockwise direction looking along the conductor towards the insulator.
- Wrap the binding wires for the distance shown in the following tables.
- Cut off the binding wire ends, the length of the ends shall not exceed 15mm, and point the ends downwards.

11kV PIN INSULATOR BINDS FOR LIGHT LINES * – INTERMEDIATE

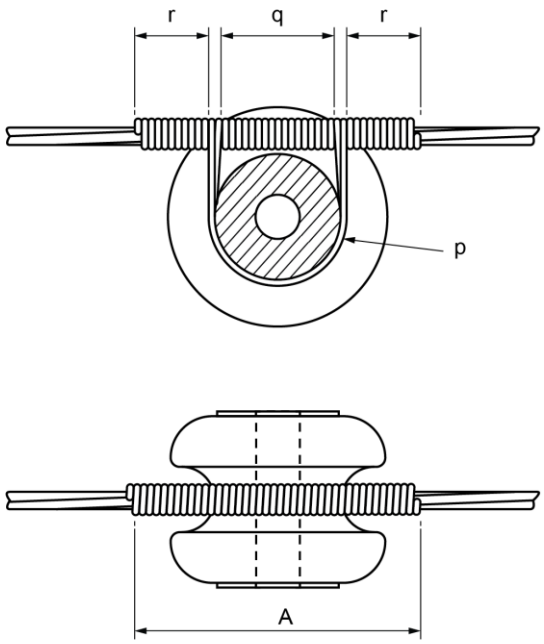
CONDUCTOR TYPE & SIZE	COPPER		ALUMINIUM ALLOY & ACSR	
	16mm²	32mm²	25mm²	50mm²
Insulator	11kV Pin Insulator		11kV Pin Insulator	
Tape	None	None	1mm x 6mm	1mm x 6mm
Material req'd	-	-	530mm	685mm
Stirrup	5mm dia	5mm dia	7mm dia	7mm dia
Material req'd	620mm per pr	620mm per pr	720mm per pr	720mm per pr
Dimensions:				
A (dia)	75mm	75mm	75mm	75mm
B (draw)	3mm	3mm	3mm	3mm
C (offset)	15mm	15mm	15mm	15mm
D (short leg)	40mm	40mm	50mm	50mm
E (long leg)	80mm	80mm	100mm	100mm
F (leg end)	15mm	15mm	15mm	15mm
Binding wire	2.5mm dia	2.5mm dia	2.5mm dia	2.5mm dia
Material req'd	3.5m (5)	4.1m (6)	4.8m (6)	5.9m (8)
Turns (double):				
p	3	3	3	3
q	6	6	9	9
r	5	5	8	8
S	5	5	5	5

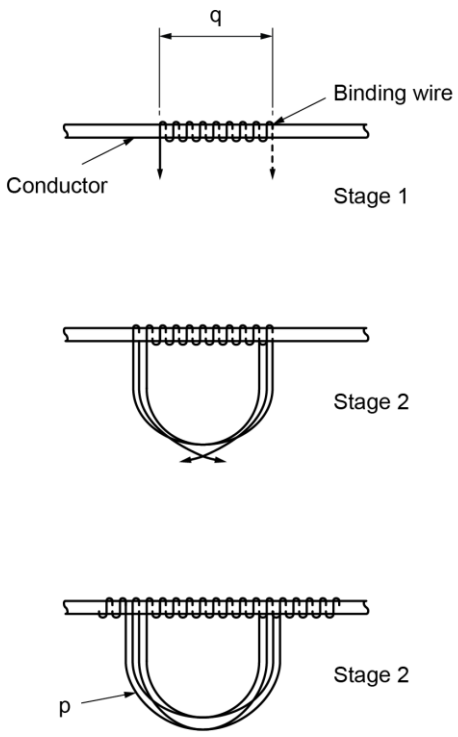
* Figures in brackets refer to PVC covered conductor.

11kV PIN INSULATOR BINDS FOR LIGHT LINES * – INTERMEDIATE ANGLE

CONDUCTOR TYPE & SIZE	COPPER		ALUMINIUM ALLOY & ACSR	
	16mm²	32mm²	25mm²	50mm²
Insulator	11kV Pin Insulator		11kV Pin Insulator	
Tape	None	None	1mm x 6mm	1mm x 6mm
Material req'd	-	-	530mm	685mm
Stirrup	5mm dia	5mm dia	7mm dia	7mm dia
Material req'd	380mm	380mm	435mm	435mm
Dimensions: A (dia) D (leg) F (leg end) Θ (bend to suit conductor deviation)	 75mm 80mm 15mm	 75mm 80mm 15mm	 75mm 100mm 15mm	 75mm 100mm 15mm
Binding wire	2.5mm dia	2.5mm dia	2.5mm dia	2.5mm dia
Marerial req'd	3.5m (5)	3.8m (6)	4.6m (6)	5.9m (8)
Turns (double): P Q S	 3 14 5	 3 14 5	 4 18 5	 4 18 5

* Figures in brackets refer to PVC covered conductor.

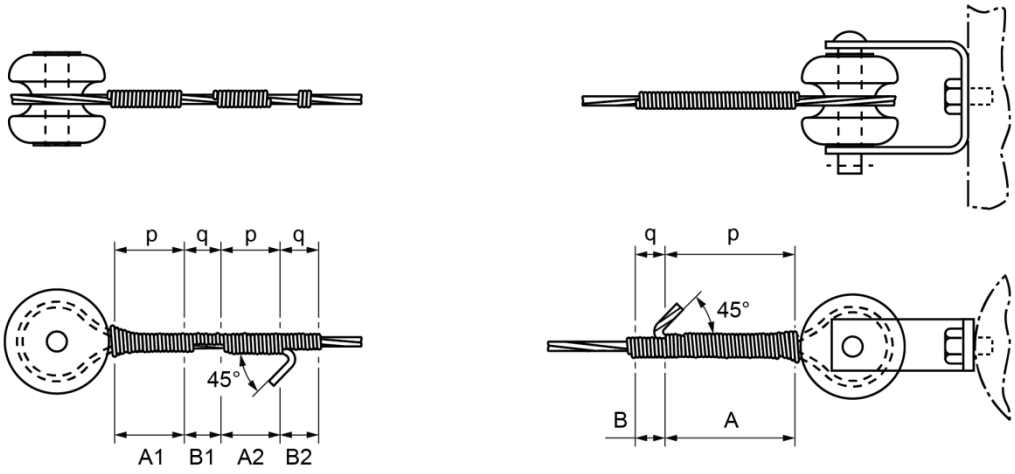




Method of binding

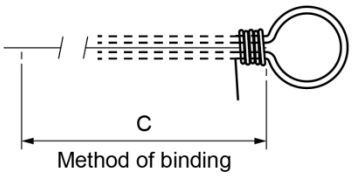
Conductor type and size	Aluminium						Copper					
	100mm² bare	100mm² PVC	50mm² bare	50mm² PVC	25mm² bare	25mm² PVC	70mm² bare	70mm² PVC	32mm² bare	32mm² PVC	16mm² bare	16mm² PVC
Insulator	← Reel →						← Reel →					
Dimension A	125mm	125mm	125mm	125mm	125mm	125mm	100mm	100mm	100mm	100mm	100mm	100mm
Binding wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC
Material required	2.9m	2.62m	2.24m	2.1m	1.8m	1.6m	2.08m	1.92m	1.88m	1.7m	1.5m	1.5m
Turns												
p	4	4	4	4	4	4	4	4	4	4	4	4
q	16	12	16	12	16	12	16	12	16	12	16	12
r	14	8	14	8	14	8	9	5	9	5	9	5

BINDING CONDUCTORS LV REEL INSULATOR BIND	Change information for this issue N/A	Appears in CP430 Pt 1	electricity north west I-430P1-M548-001 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 22/10/2019



Aluminium conductors

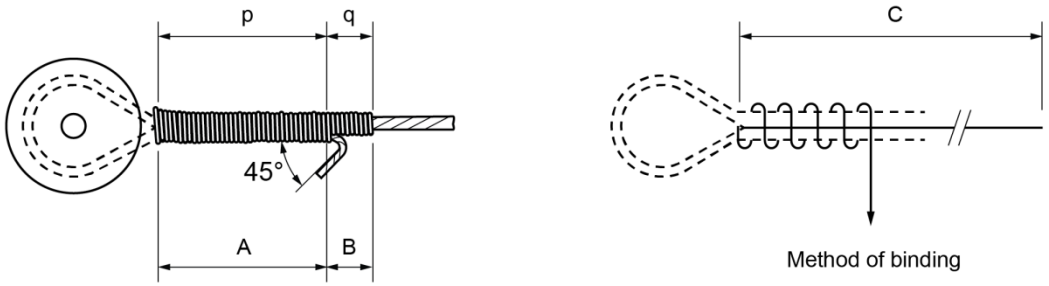
Copper conductors



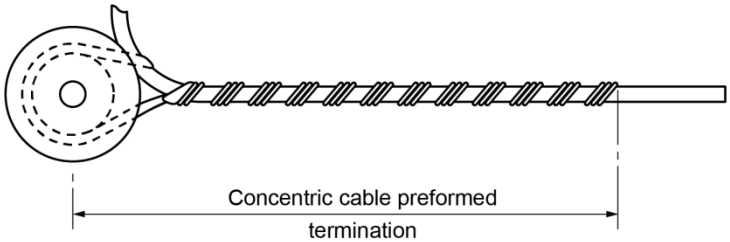
Method of binding

Conductor type and size	Aluminium						Copper					
	100mm² bare	100mm² PVC	50mm² bare	50mm² PVC	25mm² bare	25mm² PVC	70mm² bare	70mm² PVC	32mm² bare	32mm² PVC	16mm² bare	16mm² PVC
Insulator	← Reel →						← Reel →					
Dimension												
A1 & A2	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm	50mm
B1 & B2	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm	25mm
C	400mm	400mm	350mm	350mm	330mm	330mm	325mm	320mm	280mm	280mm	270mm	270mm
Binding wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC
Material required	4.2m	5.0m	3.3m	3.0m	2.8m	2.8m	3.0m	3.1m	2.5m	2.5m	2.4m	2.4m
Turns												
p	20	15	20	15	20	15	40	29	40	29	40	29
q	10	8	10	8	10	8	10	8	10	9	10	8

BINDING CONDUCTORS LV REEL INSULATOR BIND (SECTION AND TERMINAL)	Change information for this issue N/A	Appears in CP430 Pt 1	electricity north west I-430P1-M548-002 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 22/10/2019

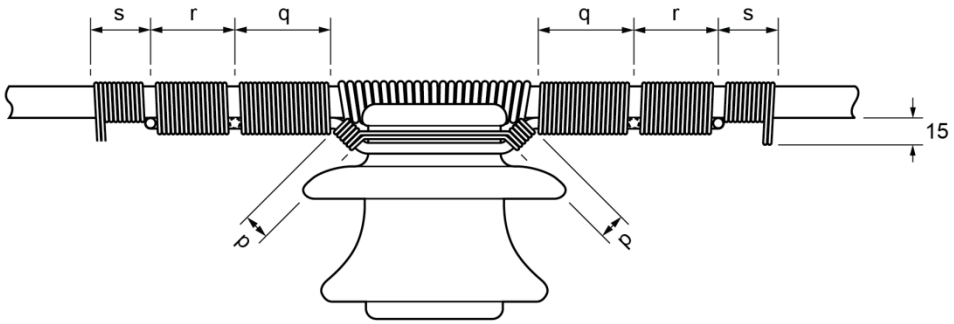


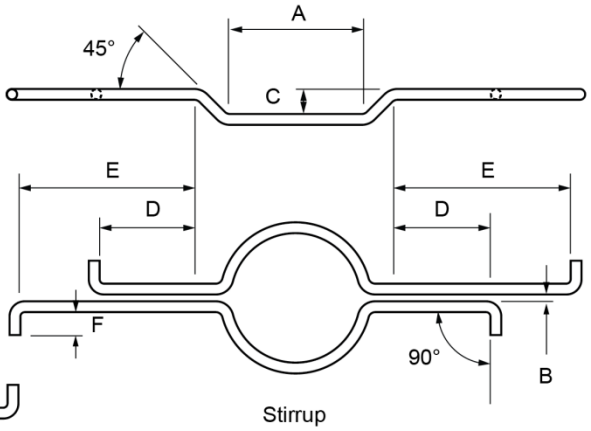
Binding of reel or coachscrew insulator



Conductor type and size	Single Copper		Single Aluminium		Concentric Copper	
	16mm² bare	16mm² PVC	22mm² bare	22mm² PVC	16mm²	25mm²
Insulator	← Reel or coachscrew →				← Reel →	
Dimension						
A	500mm	500mm	500mm	500mm	Preformed termination	
B	25mm	25mm	25mm	25mm		
C	230mm	230mm	230mm	230mm		
Binding wire	2.5mm	2.5mm 0.5mm PVC	2.5mm	2.5mm 0.5mm PVC		
Material required	1.7m	2.0m	2.0m	2.0m		
Turns						
p	40	29	40	29		
q	10	8	10	8		

BINDING CONDUCTORS SERVICE CONDUCTOR TERMINATIONS	Change information for this issue: N/A	Appears in: CP430 Pt 1	electricity north west I-430P1-M548-003 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 22/10/2019





Stirrup

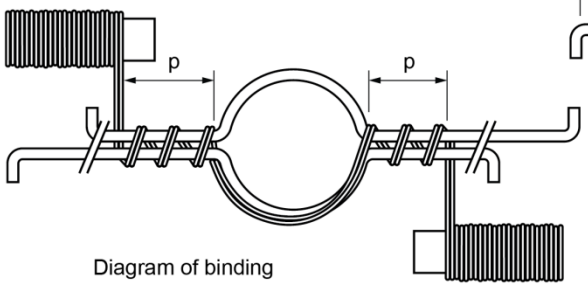


Diagram of binding

	Copper		Aluminium alloy & C.S.R.	
Conductor size	16mm²	32mm²	25mm²	50mm²
Insulator	11kV pin insulator		11kv pin insulator	
Tape	None	None	1mm x 6mm	1mm x 6mm
Matrial required	–	–	530mm	685mm
Stirrup	5mm dia	5mm dia	7mm dia	7mm dia
Matrial required	620mm per pr	620mm per pr	720mm per pr	720mm per pr
Dimensions				
A (dia)	75mm	75mm	75mm	75mm
B (draw)	3mm	3mm	3mm	3mm
C (offset)	1.5mm	1.5mm	1.5mm	1.5mm
D (short leg)	40mm	40mm	50mm	50mm
E (long end)	80mm	80mm	100mm	100mm
F (leg end)	15mm	15mm	15mm	15mm
Binding wire	2.5mm dia	2.5mm dia	2.5mm dia	2.5mm dia
Matrial required	3.5m (5)	4.1m (6)	4.8m (6)	5.9m (8)
Turns (double)				
p	3	3	3	3
q	6	6	9	9
r	5	5	8	8
s	5	5	5	5

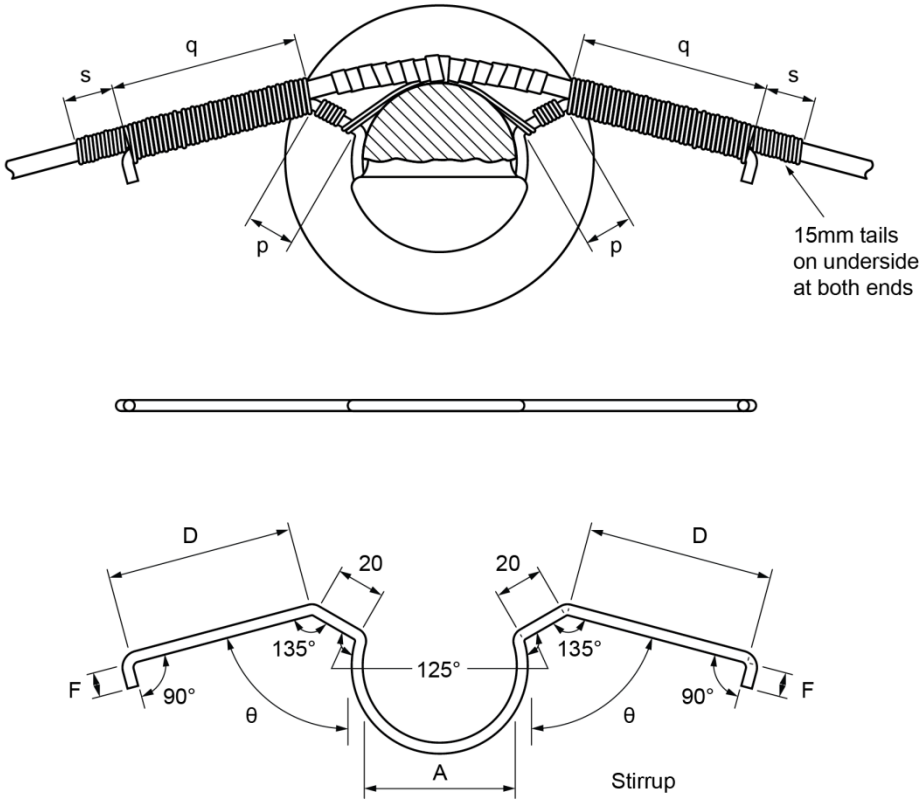
BINDING CONDUCTORS
11kV PIN INSULATOR BINDS
FOR LIGHT LINES
(INTERMEDIATE)

Change information for this issue
N/A

Appears in
CP430 Pt 1

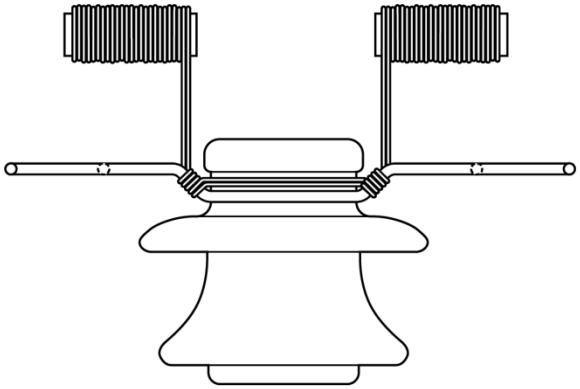
I-430P1-M548-004 Iss 1 sht 1 of 1

Scale: nts Auth: DMT Date: 22/10/2019

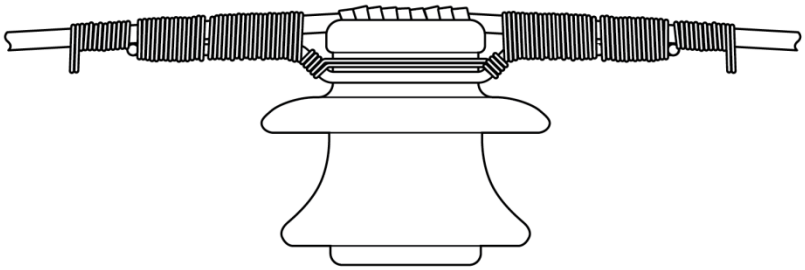


	Copper		Aluminium alloy & C.S.R.	
Conductor size	16mm²	32mm²	25mm²	50mm²
Insulator	11kV pin insulator		11kv pin insulator	
Tape	None	None	1mm x 6mm	1mm x 6mm
Matrial required	–	–	530mm	685mm
Stirrup	5mm dia	5mm dia	7mm dia	7mm dia
Matrial required	380mm	380mm	435mm	435mm
Dimensions				
A (dia)	75mm	75mm	75mm	75mm
D (leg)	80mm	80mm	100mm	100mm
F (leg end)	15mm	15mm	15mm	15mm
θ (bend to suit conductor deviation)				
Binding wire	2.5mm dia	2.5mm dia	2.5mm dia	2.5mm dia
Matrial required	3.5m (5)	3.8m (6)	4.6m (6)	5.9m (8)
Turns (double)				
p	3	3	4	4
q	14	14	18	18
s	5	5	5	5

BINDING CONDUCTORS 11kV BINDS FOR LIGHT LINES (INTERMEDIATE ANGLE)	Change information for this issue N/A	Appears in CP430 Pt 1	electricity north west I-430P1-M548-005 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 22/10/2019



Insulator fitted with stirrup
(assembled by hand)



Insulator with complete binding

BINDING CONDUCTORS 11kV PIN INSULATOR BIND APPLICATION	Change information for this issue N/A	Appears in CP430 Pt 1	I-430P1-M548-006 Iss 1 sht 1 of 1 Scale: nts Auth: DMT Date: 22/10/2019