

TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED
STANDARDISED GUARANTEED TECHNICAL PARTICULARS FOR
HARDWARE FITTINGS FOR MOOSE, ZEBRA, PANTHER ACSR CONDUCTORS

Sl.	Description	Technical Parameters/Values				
1.	Quality of material & standard to which conform	BIS				
The Manufacturer shall produce the valid BIS certification at the time of acceptance tests.						
2	Size & designation of Ball and Socket with standard	Suspension – 16 mm		Tension – 20 mm		
3	Suitable for (Conductor size)	MOOSE, ZEBRA & PANTHER ACSR				
4	HARDWARE :					
i)	Components Description	Material with Chemical Composition	Minimum Breaking Strength			
			Suspension		Tension	
			Single	Double	Single	Double
a)	Socket Clevis	Forged Class IV Steel as per IS – 2004	70 KN	70 KN	120 KN	120KN
b)	Ball Clevis	- do -	70 KN	70 KN	120 KN	120 KN
c)	Anchor Shackle	- do -	70 KN	140 KN	120 KN	240 KN
d)	Clevis Eye	- do -	70 KN	70 KN	120 KN	120 KN
e)	Chain Link	- do -	-	-	-	240 KN
f)	Yoke Plate	Mild Steel Plate	-	140 KN	-	240 KN
g)	Arcing Horn	Mild Steel Tube	-	-	-	-
h)	Security Clip	Phosphur Bronze / Stainless Steel	-	-	-	-
i)	Horn Holder Ball Eye	Forged Steel Class IV as per IS – 2004	-	-	120 KN	-
j)	Split Pin	Brass / Stainless steel	-	-	-	-
k)	Clevis Clevis	Forged Class IV Steel as per IS – 2004	-	-	-	120 KN
l)	Ball Hook	- do -	70 KN	-	-	-
ii)	Whether parts are designed for interchangeability for different types of String	Parts are inter-changeable				
iii)	Standard specifications to which the materials conform	IS 2486 Part - I				
iv)	Whether reference detailed drawings with each component showing tolerances, weight, strength etc enclosed.	YES				
v)	Standard Specification to which galvanising conforms	IS 2633 & IS - 6745				

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Sl.	Description	Technical Parameters/Values					
5	SUSPENSION CLAMPS		Wt. in kg			Required	
	i)	Components	Material with Chemical Composition	MOOSE	ZEBRA	PANTHER	1 Set
	a)	Clamp Body (Cushion)	Neoprene	1.2	0.9	0.4	1 Set
	b)	Housing	Al. alloy	0.6	0.6	0.4	1 Set
	c)	Side Strap or Link	Al. alloy	0.25	0.25	0.25	1 Set
	d)	Insert of cushion	Al. alloy	0.3	0.2	0.1	1 Set
	e)	Armour Rod	Al. alloy	5.0	3.6	1.6	1 Set
	f)	Bolt, Nuts & washers	Forged Steel / Mild Steel	All bolts & nuts are 5.6 grade. Fully threaded bolts shall not be used.			
	ii)	Slip Strength	9% to 15% of UTS of Conductor				
	iii)	Breaking Strength	7000 Kg				
iv)	Electrical Resistance	Not applicable					
6	PREFORMED ARMOUR RODS:		MOOSE	ZEBRA	PANTHER		
	i)	Material	Heat treated Al. alloy HE-30 as per IS -733				
	ii)	Breaking Strength (Min.)	35 kg / mm ²	35 kg / mm ²	35 kg / mm ²		
	iii)	Weight (kg)	5.4	3.6	1.6		
	iv)	Conductivity	Min 40% of IACS	Min 40% of IACS	Min 40% of IACS		
	v)	No of Rods per Set	12	12	11		
	vi)	Diameter of Rod with tolerances (mm)	9.27 +0.0 or -0.1	7.87 +0.0 or -0.1	6.35 +0.0 or -0.1		
	vii)	Length of Rod with tolerances (mm)					
	viii)	Actual length of each Rod along with its helix (mm)	2235 +0.0 or -51	2080 +0.0 or -51	1520 +0.0 or -38		
	ix)	Difference of length between the longest and shortest rod in a set	As per IS - 2121 Part - I				
7.	Elastomer for AGS clamps:						
	a)	Type	Neoprene				
	b)	Moulded on insert	YES				
	c)	Shore hardness	65 to 80				
	d)	Temperature range for which designed (deg. C)	Up to 75 °C				

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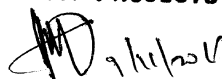


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8 TENSION CLAMPS:						
i)	Components	Material with chemical composition	Weight in kg			Required No.
			MOOSE	ZEBRA	PANTHER	
a)	Outer sleeve	Extruded Aluminium	2.4	2.0	1.2	1 No.
b)	Inner Sleeve	Forged Steel	2.4	1.2	1.0	1 No.
c)	Jumper	Forged Aluminium	1.2	0.8	0.6	1 No.
d)	Filler plug	Aluminium				1 No.
e)	Bolt, Nuts & washers	Forged Steel / Mild Steel				
		DIMENSIONS		LENGTH		
ii)	Dead End		Before Compression	After compression	Before Compression	After (Approx)
a)	For MOOSE ACSR					
	Aluminium		54.0	53.0 / 46.0	635	670
	Steel		21.0	20.2/17.5	335	355
b)	For ZEBRA ACSR					
	Aluminium		48.00 mm	46.0 / 40.0 mm	600 mm	630 mm
	Steel		21.00 mm	20.2 / 17.5	300 mm	340 mm
c)	For Panther ACSR					
	Aluminium		38.0 mm	37.0 / 32.0 mm	500mm	515 mm
	Steel		18.0 mm	17.4 / 15.1 mm	260 mm	305 mm
iii)	Whether Compression and non compression zones marked on the sleeves	YES				
iv)	Electrical resistance of tension clamp as a % of equivalent length of conductor	Max. 75 % of the measured resistance of equivalent length of conductor.				
v)	Details of dies and hydraulic compressor required for compressing sleeves of tension clamp.	MOOSE ACSR		ZEBRA ACSR	PANTHER ACSR	
		DA-12 & DS-12		DA - 11 & DS-11	DA - 9 & DS-9	


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MOOSE, ZEBRA AND PANTHER ACSR CONDUCTORS**

9	COMPLETE STRING	220 kV				132 kV			
		Suspension		Tension		Suspension		Tension	
		Single	Double	Single	Double	Single	Double	Single	Double
	i) Mechanical failing load (kgf)	7000	14000	11500	23000	7000	14000	11500	23000
	ii) No deformation load (kgf)	4690	9380	7705	15410	4690	9380	7705	15410
10	Total weight of hardware tested :-	Single Suspension		Double Suspension		Single Tension		Double Tension	
	a) MOOSE ACSR	13 Kg		23 Kg		11 Kg		22 Kg	
	b) ZEBRA ACSR	11 Kg		23 Kg		9 Kg		20 Kg	
	c) PANTHER ACSR	8 Kg		18 Kg		8 Kg		19 Kg	
11	Whether hardware fittings are suitable for hot line maintenance.	YES							
12	Whether ball and socket meets the 'GO' and 'NO GO' gauge test as per IS-2486 (Part-II)	YES							
13	Whether the materials covered by this bid have been fully type tested and if so whether the copies of the type test certificates enclosed to the offer.	YES							
14	Packing details of each fitting per package and gross weight.	Shall be suitably packed tin order to avoid damage in transit. Approx. Gross Wt. of each package – 50 Kg Approx.							
15	Certification mark (BIS/BS/ Any national institution)	BIS							
The Manufacturer shall produce the valid BIS certification at the time of acceptance tests.									
16	Type Tests	The type tests should have been conducted not earlier than 5 years in the Standard third party laboratory. The Manufacturer shall produce the type test reports at the time of acceptance tests.							
17	Bolt & Nuts	All bolts & nuts are 5.6 grade. Fully threaded bolts shall not be used.							
18	Washers	Spring washers are to be made of spring steel.							
19	Galvanisation	All ferrous parts except spring washers are to be hot dip galvanised. Spring washers are to be electro galvanised.							
20	Forged components.	All forged componenets shall be made out of class IV steel as per IS-2004.							

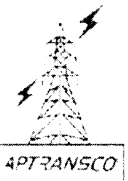
	Standardised Guaranteed Technical Particulars for Suspension and tension Hardware for Moose, Zebra and Panther ACSR Conductors
	STD/GTP-DWG/Approval No. <u>11 - 1</u> / Revision No. <u>0</u>
	Prepared & Approved during November - 2011

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M. Dattil 2011

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TRANSMISSION CORPORATION OF ANDHRA PRADESH LIMITED
GUARANTEED TECHNICAL PARTICULARS FOR SUSPENSION AND TENSION
CLAMPS FOR GALVANISED STEEL EARTH WIRE

Sl. No	Description	Suspension Clamp	Tension Clamp
(1)	(2)	(3)	(4)
1	Materials	SUSPENSION AND TENSION CLAMPS FOR GALVANISED STEEL EARTH WIRE	
2	Type	Envelope Type	Compression Type
3	Manufactured as per ISS	IS – 2486 Part - I	IS – 2486 Part - I
4	Material used	Forged Steel & MCI	Forged Steel
5	Quality of material used	As per Requirement of relevant ISS for each type of materials	
6	Make of bolt, nut & washers used	BI/ASP or equivalent	
7	Ultimate strength of material used	Min.35 Kg/mm ²	
8	Method of manufacture adopted e.g. forging or casting	Susp. Clamp – Casting Eye Hook - Forging	Forging
9	Standard specification to which galvanising conforms	IS – 2633	
10	Minimum slip strength (kg)	15 kN to 17 kN	95% of Earthwire UTS
11	Minimum ultimate strength (kg)	70 kN	- do -
12	Tested to standard specification	IS – 2486 Part - I	
13	Total weight of each clamp	Approx. 2.5 Kg	Approx 2.2 Kg
14	Packing details	Shall be suitably packed tin order to avoid damage in transit. Gross Wt. of each package 50 Kg Approx.	
15	Certification mark (BIS/BS/ Any national institute)	BIS. The Manufacturer shall produce the valid BIS certification at the time of acceptance tests.	
16	Whether the materials covered by this bid have been fully type tested.	The type tests should have been conducted not earlier than 5 years in the Standard third party laboratory. The Manufacturer shall produce the type test reports at the time of acceptance tests.	
17	Bolt & Nuts	All bolts & nuts are 5.6 grade. Fully threaded bolts shall not be used.	
18	Washers	Spring washers are to be made of spring steel.	
19	Galvanisation	All ferrous parts except spring washers are to be hot dip galvanised. Spring washers are to be electro galvanised.	
20	Forged components.	All forged componenets shall be made out of class IV steel as per IS-2004.	
		Standardised Guaranteed Technical Particulars for Suspension and tension Hardware for HTGS wire	
		STD/GTP-DWG/Approval No. 11 - 2 / Revision No. 0	
		Prepared & Approved during November - 2011	

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