MAHAVIR TRANSMISSION LIMITED
An ISO 9001-15, 14001-15, 27001 : 13, 31000:18 & 45001-18, 50001:18 Certified Company
Corporate Office: C-58, Sector-4, Noida-201301 (U.P.) Ph.: 0120-4127944

Guaranteed Technical Particulars Of HTLS Conductor ACER 120/28

Sl.No.	Description	Unit	Values guaranteed by the Bidder
1	Name & address of Manufacturer		Mahavir Transmission Limited Works Unit 3 : KH. No. 647 & 648, Vill. Dautana, Th. Chhata, Dist. Mathura-281401
2.0	Type of HTLS conductor (HTLS Technology)		Carbon Composite Core Type
2.1	Construction of conductor/ Designation of conductor as per IEC:1089		ACER 120/28 Ann.Al. - 12/2.80 mm (TW) + Ann.Al. - 8/2.78 mm (TW) + Composite Core - 1/5.97 mm (R)
3	**PARTICULARS OF RAW MATERIALS**		
3.1	Outer Layers a) Applicable Standard (if any) b) Type of Aluminum/alloy c) Minimum purity of aluminum d) Maximum Copper content e) Zirconium content i) Maximum ii) Minimum e) Other elements----------	 % % %	 ASTM B233 & ASTM B609 1350 –O Temper 99.50% 0.04% NA **Element** **Max %** Silicon 0.10 Iron 0.40 Manganese 0.01 Chromium 0.01 Zinc 0.05 Boron 0.05 Gallium 0.03 Ti+Va 0.02% Other each 0.03% Other Total 0.10% (max)
3.2	Inner Core a) Applicable Standard (if any) b) Material of core c) Chemical composition of core	 % %	 a)ASTM B987 b) Carbon and glass fiber composite core c) Chemical composition of core i) N/A ii) N/A
3.3	Zinc used for galvanization of inner – Minimum purity of zinc	%	NA
4	**OUTER STRANDS AFTER STRANDING**		
4.1	Number of outer layers	Nos	2
4.2	Number of strands a) 1st Layer from core b) 2nd Layer from core c) 3rd Layer from core	Nos	 08 (Trapezoidal Shaped) 12 (Trapezoidal Shaped) -

4.3	Diameter of strands a) Nominal b) Maximum c) Minimum	MM	8 (Tw) 12 (Tw) 2.78 2.80 2.81 2.83 2.75 2.77
4.4	Minimum Breaking load of strand a) Before stranding b) After stranding	KN	8 (Tw) 12 (1w) 0.364 0.369 0.346 0.351
4.5	Resistance of strand at 20 deg. C	Ohm/km	8 (Tw) 12 (1w) 4.608 4.541
4.6	Final Modulus of elasticity	Kg/sq. mm	5911
4.7	Final Coefficient of linear expansion	Per °C	23 X 10^{-6}
5	**INNER CORE STRANDS/ INNER CORE AFTER STRANDING**		
5.1	Number of layers in inner core (excluding central wire)		1
5.2	Number of strands a) 1st Layer from center (excluding central wire) b) 2nd Layer from center c) 3rd Layer from center		- - -
5.3	Diameter a) Nominal b) Maximum c) Minimum	mm	5.97 6.02 5.92
5.4	Minimum Breaking load of strand/Core a) Before stranding b) After stranding	mm	 59.6 59.6
5.5	Resistance of strand at 20 deg. C	Ohm/km	NA
5.6	Final Modulus of elasticity	Kg/sq. mm	11452.6
5.7	Final coefficient of linear expansion	Per ^{0} C	1.61 X 10^{-6}
5.8	Minimum number of twist which a single strand shall withstand during torsion test for a gauge length equal to 100 times dia of wire a) Before stranding b) After stranding		NA
5.9	Minimum elongation of strand for a gauge length of 250mm(after break)		NA
5.10	**Composite Core**		
a)	Flexural Strength of the core	N/mm.sq	40 (min)
b)	Glass Transition Temperature of core (Tg)	Deg C	205 (Min)
c)	Galvanic protection barrier layer thickness	mm	0.38 (min)

6	**COMPLETE HTLS CONDUCTOR**			
6.1	Cross section area of complete conductor	Sq.mm	150.7	
6.2.a 6.2.b	Cross section area of Aluminium/ Alloy Cross section area of core	Sq.mm	122.7 28.0	
6.3	Diameter of conductor a) Nominal b) Maximum c) Minimum	mm	(Approx.) 14.35 14.49 14.21	
6.4	Diameter of core a) Nominal b) Maximum c) Minimum	mm	 5.97 6.02 5.92	
6.5.a 6.5.b	UTS (minimum) of Conductor UTS of Core	kN kN	60.4 59.6	
6.6	Lay ratio of conductor a) 1st layer from center (excluding central wire) b) 2nd Layer c) 3rd Layer		Maximum 16 13	Minimum 10 10
6.7	DC resistance of conductor at 20^0 C	Ohm/km	0.2286	
6.8	Final Modulus of elasticity			
a)	Up to transition temperature	Kg/sq. mm	6941	
b)	Above transition temperature	Kg/sq. mm	11500	
6.9	Coefficient of linear expansion			
a)	Up to transition temperature	Per deg C	16.5×10^{-6}	
b)	Above transition temperature	Per deg C	1.61×10^{-6}	
6.10	Maximum permissible conductor temperature for continuous operation	Deg C	180	
6.11	Maximum permissible conductor temperature for short term operation	Deg C	200	
6.12	Permissible duration of above short-term operation		10,000 hours over service life	
6.13	Steady state conductor temperature at conductor current of 600 A under Ambient conditions for Composite HTLS Conductor	Deg C	165.1	
6.14	AC resistance at maximum continuous operating temperature corresponding to specified maximum operating current 600 A under ambient condition of the Technical Specification	Ohm/Km	0.3624	
7.0	**Sag Tension Calculation**			
7.1	Sag Tension Calculation enclosed		Yes	
7.2	Ruling span	Mtr	215	
7.3	Tension at 32 deg. C & no wind	kg	1040.6	

7.4	Sag & tension at maximum continuous operating temperature corresponding to current of 600 A and Ambient conditions detailed in the Technical Specification	Meters & Kgs	2.46 meters & 921.4 Kgs
7.5	Tension at 32°C and full wind condition (124 kg/msq wind pressure)	Kg	1935.3
7.6	Direction of lay for outside layer		Right Hand
8	Linear mass of the Conductor a) Standard b) Minimum c) Maximum	 Kg/km Kg/km Kg/km	 392.3 384.5 394.0
9	Standard length of conductor	m	2400
10	Tolerance on standard length of conductor	%	±5
11	Drum is as per specification	Yes/No	Yes
12	Max. ampacity of the HTLS conductor (i.e Max. continuous operating temp.)	Amp	630

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