




TD-201 Rev No. 00	Form No.  HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING HYDERABAD		GT 57117 Rev No. 08 Page 1 of 8							
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p style="text-align: center;"><u>TECHNICAL SPECIFICATION FOR</u> <u>LOW TENSION POWER CABLES (PVC INSULATED, COPPER CONDUCTOR)</u></p> <p>1.0 INTENT OF SPECIFICATION:</p> <p>1.1 This specification covers design manufacture, testing at Vendor's works and delivery to site of L.T. Power Cables.</p> <p>2.0 APPLICABLE STANDARDS: (Please refer Clause – 9 also)</p> <p>IS 1554 : Specification for PVC insulated (Heavy duty) Electric Cables.</p> <p>ASTM-D2863 : Standard for critical oxygen index and temperature index test.</p> <p>IEC-754-1 : Standard for Acid gas generation test.</p> <p>ASTM-D2843 : Standard for smoke generation test.</p> <p>IEC-332-1 : Standard for Flammability test.</p> <p>SS 424 1475 : Standard for Flammability test.</p> <p>Class F3</p> <p>IS 5831 : Standard for PVC Insulation & Sheath of electric cables.</p> <p>IS 3975 : Standard for Mild steel wires,strips & tapes for Armouring</p> <p>IS 3961(Pt-2) : Recommended current ratings for Cables</p> <p>IS 10418 : Drums for Electric cables</p> <p>3.0 CABLE CONSTRUCTION REQUIREMENTS:</p> <p>a) Voltage grade : 650/1100 V.</p> <p>b) Conductor : Stranded Copper conductor.</p> <p>c) Insulation : Heat resistant PVC(Type C).</p> <p>d) Core identification : As per IS 1554</p> <p>e) Inner sheath : Extruded PVC sheath of type ST-2</p> <p>f) Armour : Aluminum round wire for single core cables. Galvanised round wire where calculated dia below armouring is <13 mm Galvanised steel strips where calculated dia below armouring is >13 mm</p> <p>g) Outer sheath : Extruded FRLS PVC Sheath of Type ST-2</p>									
		Ref. Doc		Revisions : Refer to record of revisions :		Prepared : (M.V.Prebhash)		Approved : (G.V.Banakar)		Date : 14.11.2003	

Form No.		<div><div>बी एच ई एल</div><div></div><div>HYDERABAD</div></div>	<div>PRODUCT STANDARD</div> <div>PROJECT ENGINEERING</div> <div>HYDERABAD</div>	GT 57117
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<div><div><div>COPYRIGHT AND CONFIDENTIAL</div><div>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.</div></div><div><div><div>4.0 TESTS:</div><div>All acceptance and routine test shall be carried out on all cables at vendor’s work in the presence of purchaser’s representative. Wherever FRLS PVC sheaths are specified cables shall be tested to demonstrate FRLS Properties. Type test reports of similar cables wherever they are called for shall be furnished.</div></div><div><div><div>5.0 CABLES LENGTHS:</div><div>Cables shall be delivered in maximum possible lengths of not less than 500M neatly rolled on wooden drums, with both ends sealed with moisture proof sealing.</div></div><div><div><div>6.0 FRLS PVC PROPERTIES:</div><div>Wherever FRLS PVC sheathing is called for, it shall meet the following requirements.</div><div><div>a) The critical oxygen index value shall be greater than 29% at room temperature when tested as per ASTM-D2863.</div><div>b) Temperature index shall be greater than 250°C at a normal oxygen content of 21% in air when tested as per ASTM-D2863.</div><div>c) The acid gas generation shall be less than 20% by weight when tested as per IEC 754-1.</div><div>d) Smoke density rating shall be 60% maximum when tested as per ASTM-D2843.</div><div>e) The finished cable shall pass the flammability test as per IEC-332-1 and Swedish standard SS 424 1475, class F3.</div></div><div><div><div>7.0 DOCUMENTATION:</div><div><div>a) 2 Copies of filled-up Technical data sheets to be furnished along with the bid.</div><div>b) Quality Assurance Schedules.</div><div>c) 6 Copies of Test Certificates within one week after the inspection.</div><div>d) 18 Sets of final documents comprising of TDS, catalogues & certificates.</div></div><div><div><div>8.0 MATERIAL CODIFICATION:</div><div>The material codification in the attached sheets indicates Variant No, BHEL Material Code. No. of Cores and Cross Sectional Area (mm2) Voltage Grade, Material of Inner Sheath/Outer Sheath.</div></div><div><div><div>9.0</div><div>Cables offered by Non-Indian vendors shall comply with IEC 502 & other relevant IEC specifications.</div></div></div></div></div></div></div></div></div></div></div>				
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	S.No.	Description
	1.	Make
	2.	Type
	3.	Applicable Standard/s
	4.	Voltage Grade
	5.	Max. Conductor temperature:
		a) Continuous Deg. C. b) Short time Deg. C.
	6.	<u>CONDUCTOR:</u>
		a) Material b) Size (Sq. mm) c) No. of wires & diameter of each wire (No. / mm)
7.	<u>INSULATION:</u>	
	a) Material b) Size (sq. mm) c) Thickness (normal) mm.	
8.	<u>INNER SHEATH:</u>	
	a) Material b) Type c) Thickness (normal) mm. d) Extruded (Yes/No.) e) Approx. outside dia over inner sheath (mm). f) Thickness (normal) mm	
9.	<u>ARMOURING:</u>	
	a) Material b) Size (No. of wire x Dia. Of each wire) c) Dia over Armour.	
10.	<u>OVERALL SHEATH:</u>	
	a) Material b) Type c) Thickness (nominal) mm.	


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11. **APPROX OVERALL DIAMETER (MM):**
12. **CONTINUOUS CURRENT RATING FOR STANDARD 'IS' CONDITION LAID DIRECT: (Amps)**
 - a) In ground
 - b) In duct
 - c) In all
13. **SHORT CIRCUIT CURRENT RATING OF CONDUCTOR FOR 1 Sec (KA)**
14. **ELECTRICAL PARAMETERS AT Max. OPERATING TEMP (Ohm/km)**
 - a) Resistance (DC/AC)
 - b) Reactance at 50 Hz.
 - c) Capacitance.
15. **TOTAL LOSSES (WATTS/METER):**

MATERIAL CODIFICATION

Var. No.	No. of cores & Sizes (Sq.mm.)	Armouring	Cond. & Insulation Outer sheath matl.	BHEL Material Code
01	3 ½ C x 300	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117013
02	3 ½ C x 95	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117021
03	3 ½ C x 35	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117030
04	4 C x 16	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117048
05	4 C x 10	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117056
06	1 C x 16	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117064
07	2 C x 6	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117072
08	1 C x 70	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117080
09	3 ½ C X 150	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117099
10	3 ½ C X120	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117102
11	3 ½ C X 70	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117110

12	3 ½ C X 25	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117129
13	4 C X 6	Armoured	Cu.Cond.PVC / FRLS Cable	GT9757117137
14	3 ½ C X 50	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117145
15	1C x 35	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117153
16	1C x 6	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117161
17	1C x 300	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117170
18	3C X 4	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117188
19	1C X 70	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117196
20	1C X 120	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117200
21	1C X 240	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117218
22	2C X 4	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117226
23	3C X 6	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117234
24	3C X 10	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117242
25	3C X 16	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117250
26	1C x 25	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117269
27	1C x 150	Un-Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117277
28	1C X 1000	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117285
29	3C X 25	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117293
30	1CX95	Unarmoured	Cu. Cond. PVC / FRLS Cable	GT9757117307
31	1CX120	Unarmoured	Cu. Cond. PVC / FRLS Cable	GT9757117315
32	1CX630	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117323
33	3.5CX185	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117331
34	3CX35	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117340
35	3CX50	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117358
36	3CX70	Armoured	Cu. Cond. PVC / FRLS Cable	GT9757117366

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