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# **TECHNICAL SPECIFICATION FOR SET OF CABLE TIE & SET OF BASE FOR CABLE TIES FOR WAG-9 (Co-Co), WAP-5 (Bo-Bo) ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS**

**SPECIFICATION No. CLW/ES/3/0131 ALT-F**

## **ENCLOSURES:**

1. ANNEXURES:
2. DRG.NOS.CLW/ES/3/SK-1/0131
3. DRG.NOS. CLW/ES/3/SK-1/0120

## **ISSUED BY:**

**DY. CHIEF ELECTRICAL ENGINEER/D-III  
CHITTARANJAN LOCOMOTIVE WORKS  
P.O. CHITTARANJAN – 713331  
DIST. BURDWAN, WEST BENGAL (INDIA)**

PREPARED BY	CHECKED BY	APPROVED BY
<b>Achyut Kumar</b> <small>Digitally signed by Achyut Kumar Date: 2025.12.15 12:57:18 +05'30'</small> <b>SSE/DRG</b>	<b>BHARAT CHANDRA BAL</b> <small>Digitally signed by BHARAT CHANDRA BAL Date: 2025.12.15 13:00:17 +05'30'</small> <b>AEE/D/CONV.</b>	<b>AMIT AGGARWAL</b> <small>Digitally signed by AMIT AGGARWAL Date: 2025.12.15 13:07:24 +05'30'</small> <b>DY. CEE/D-III</b>

Signature No. Verified  
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Date: 2025.12.15 16:04:24 +05'30'  
Reason: IRIS-PS-CRIS  
Location: New Delhi

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### **ALTERATION RECORD SHEET**

Amend ment No.	ALT No.	DATE	REASON	AUTHORITY
01	A	16.12.1999	Add:- Cable Binder/ Cable Tie 203 x 7.6 PA at sheet No.3 CL.No.4 for WAP-5	
02	B	25.04.2003	Flammability test included in sheet no. 2 Test specified value included in sheet no. 4 Qty./Loco corrected as per category book.	
03	C	28.01.2014	Note added- Manufacture's name should be clearly embossed on the Cable tie.	
04	D	03.07.2015	1. Deletion of quantity per loco in clause.4 scope of supply 2. Note added in scope of supply as "Quantity per loco will be as per category book and the tender schedule".	
05	E	11.07.2024	The specification no. CLW/ES/3/0120 of 'Set of base for cable ties' is merged with specification no. CLW/ES/3/0131 Alt-E for 'Set of cable tie'.	
06	F	15.12.2025	Raw Material test in para 8.1 and Finished product test in para 8.2 have been revised.	

**Specification has been digitized and all alterations have been incorporated.**

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<b>Achyut Kumar</b> Digitally signed by Achyut Kumar Date: 2025.12.15 12:57:40 +05'30'	<b>BHARAT CHANDRA BAL</b> Digitally signed by BHARAT CHANDRA BAL Date: 2025.12.15 13:00:39 +05'30'	<b>AMIT AGGARWAL</b> Digitally signed by AMIT AGGARWAL Date: 2025.12.15 13:07:53 +05'30'
<b>SSE/DRG</b>	<b>AEE/D/CONV.</b>	<b>DY. CEE/D-III</b>

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**TECHNICAL SPECIFICATION FOR SET OF CABLE TIE AND SET OF BASE FOR CABLE TIES FOR WAG-9(Co-Co), WAP-5(Bo-Bo) ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS**

**1. SCOPE:**

This Specification covers the manufacture and supply of SET OF CABLE TIE & SET OF BASE FOR CABLE TIES for WAG-9 (Co-Co), WAP-5 (Bo-Bo), 3-phase, 25 kv, 50Hz, AC Locomotive.

**2. SERVICE CONDITION :**

**2.1 Climatic and environmental condition:**

Maximum atmospheric temperature	: +70 <sup>0</sup> C (in Sun) & +50 <sup>0</sup> C (in Shade)
Normal humidity	: 60%
Maximum Humidity	: 100% saturation during rainy season.
Altitude	: 160 m above mean sea level.
Rain fall	: Very heavy in certain areas. The equipment should be designed in such a way as to withstand its running at 10 Km/hr. in flood water Level of 102 mm above rail level.
Atmosphere during hot weather	: Extremely dusty and desert terrain in certain areas
Coastal Area	: Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.
Vibration	: The equipment, sub-system and their mounting arrangement will be designed to withstand vibration and shocks encountered in service as specified in correspondence unless otherwise prescribed.

- 3. STANDARD:** The standard IS 5762:2018 or equivalent, ASTM D792 or equivalent, ASTM D 638 or equivalent, ASTM D570 or equivalent, ASTM D2240 or equivalent shall apply to all materials used in the manufacture of CABLE TIE & SET OF BASE FOR CABLE TIES.

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<b>Achyut Kumar</b> Digitally signed by Achyut Kumar Date: 2025.12.15 12:57:59 +05'30'	<b>BHARAT CHANDRA BAL</b> Digitally signed by BHARAT CHANDRA BAL Date: 2025.12.15 13:01:00 +05'30'	<b>AMIT AGGARWAL</b> Digitally signed by AMIT AGGARWAL Date: 2025.12.15 13:08:19 +05'30'
<b>SSE/DRG</b>	<b>AEE/D/CONV.</b>	<b>DY. CEE/D-III</b>

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Flammability test as per IS: 11731(Part-1) class FH2-5 mm (Horizontal Specimen Method of test for solid insulating material) and class FVO as per IS: 11731 of (part-2) Vertical test method to be tested as a prototype test.

#### 4. SCOPE OF SUPPLY:

##### A) CABLE TIE

SL. No	Description	ABB Ref. Ident. No.	Fig.No.	Material
1.	CABLE TIE 140 x 3.6 PA	NBT 402938P0002	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
2.	CABLE TIE 186 x 4.8 PA	NBT 402938P0003	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
3.	CABLE TIE 338 x 7.6 PA	NBT 402938P0005	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
4.	CABLE TIE 360 x 4.8 PA	NBT 402938P0004	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
5.	CABLE TIE 368 x 7.6 PLT NF	HZN 450706P0011	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
6.	CABLE TIE 762 x 7.6 PA	NBT 402938P0006	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
7.	CABLE TIE 92 x 2.4 PA	NBT 402938P0001	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
8.	CABLE TIE 203 x 7.6 PA	NBT 402938P0008	CLW/ES/3/SK- 1/0131	POLYAMIDE 66
9.	CABLE TIE 140 x 3.6 (PA-HT)	NBT 402938P0502	CLW/ES/3/SK- 1/0131	POLYAMIDE 66

DRAWING NO. CLW/ES/3/SK-1/0131

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<b>SSE/DRG</b>	<b>AEE/D/CONV.</b>	<b>DY. CEE/D-III</b>

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## B) SET OF BASE FOR CABLE TIES

FIG. NO.	Description	Ident. No.	DRG. NO.	Material
1.	Base for cable Ties	NBT402938P0014	CLW/ES/3/SK-1/0120	Polyamide 66
1.	-DO-	NBT402938P0011	-DO-	-DO-
1.	-DO-	NBT402938P0012	-DO-	-DO-
1.	-DO-	NBT402938P0013	-DO-	-DO-
2.	Base Multiple Base 3 CA Ties	GMN937124P0023	-DO-	Polyamide 66 Non Coloured
2.	-DO-	GMN937124P0041	-DO-	-DO-
3.	Spacer for cable ties	NBT402938P0031	-DO-	Polyamide 66 Res. to high temp.
4.	Base for cable ties	NBT402938P0101	-DO-	Polyamide 66
4.	-DO-	NBT402938P0102	-DO-	-DO-
2.	Multiply Base for Cable ties	GMN937124P0025	-DO-	

DRAWING NO. CLW/ES/3/SK-1/0120

5. The following drawings are attached with the specification Drg. no-1. CLW/ES/3/SK-1/0131 and Drg. no-2. CLW/ES/3/SK-1/0120

5.1 Technical documents and drawings to be furnished by the supplier as part of contract.

## 6. TEST:

Type test and routine test shall be carried out according to the standard.

## 7. TECHNICAL DOCUMENTS TO BE SUPPLIED BY THE SUPPLIER:

- i) Type test reports : 3 copies.
- ii) Routine test report along with each set : 3 copies.
- iii) Maintenance manual : 3 copies.
- iv) Detailed drawings : 3 copies.

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<b>Achyut Kumar</b> Digitally signed by Achyut Kumar Date: 2025.12.15 12:58:41 +05'30'	<b>BHARAT CHANDRA BAL</b> Digitally signed by BHARAT CHANDRA BAL Date: 2025.12.15 13:01:39 +05'30'	<b>AMIT AGGARWAL</b> Digitally signed by AMIT AGGARWAL Date: 2025.12.15 13:09:13 +05'30'
SSE/DRG	AEE/D/CONV.	DY. CEE/D-III

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## 8. Test Specified Values –

### 8.1 Raw Material Test

- a) Moisture Content : 0.00-0.20
- b) Melting Point : 255-265°C BS:2782 Pt – 1
- c) Specific Gravity : 1.13-1.15. BS:2782 Pt – 6
- d) Tensile Strength : 8 kgf/mm<sup>2</sup>(min) ASTM-D 638
- e) Elongation at Break : 40% ASTM-D 638
- f) Water absorption : 1.3 (min) ASTM-D 570
- g) Shore D Hardness : 75-90 ASTM D 2240

### 8.2 Finished Product Test

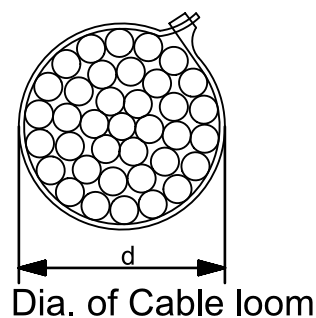
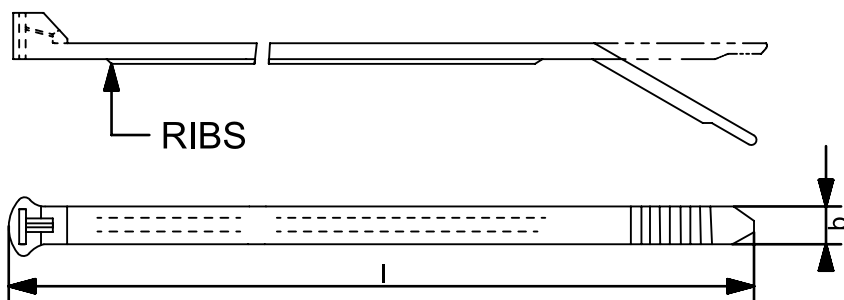
- a) Specific Gravity : 1.13-1.15. BS:2782 Pt – 6
- b) Melting Point : 255-265°C BS:2782 Pt – 1
- c) Test mentioned in drawing : As per drawing of cable tie and base for cable tie

## 9. **PACKING OF MATERIALS:** -Material to be packed in boxes of sufficient strength to prevent from damage and moisture in transport, handling and storage.

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<b>SSE/DRG</b>	<b>AEE/D/CONV.</b>	<b>DY. CEE/D-III</b>

Types:- Standard + High temperature  
STRIP LOCK, steel tongue(SST), antimagnetic

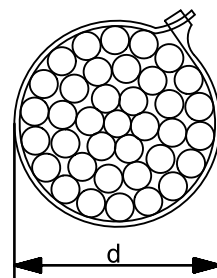
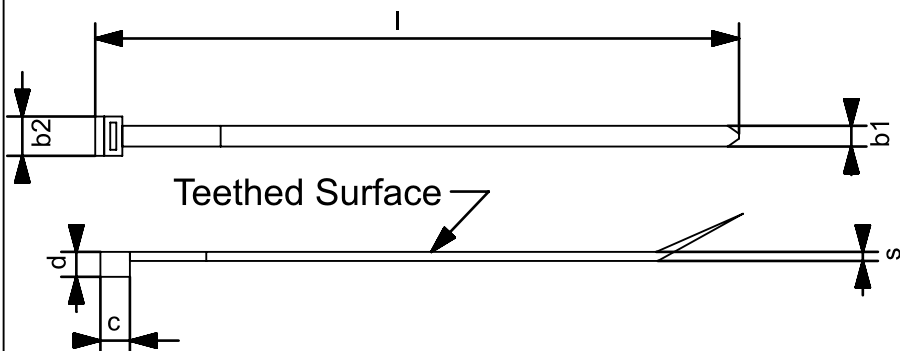
Example of application



Designation	Dimensions				Tensile strength (N)	Semiter designation
	b	l	d min	d max		
92 X 2.4	2.4	92	1.6	16	81	
140 X 3.6	3.6	140	1.6	29	180	130X3.6
186 X 4.8	4.8	186	1.6	45	225	175X4.8
360 X 4.8	4.8	360	1.6	102	225	300X4.8
338 X 7.6	7.6	338	4.8	90	544	325X7.6
762 X 7.6	7.6	762	4.8	229	544	552X7.6
203X 7.6	7.6	203	4.8	50	544	Alt-A
140 X 3.6	3.6	140	1.6	29	180	

Temperature: -40°C- - - - - +105°C

Example of application



Function:- Non-releaseable and therefore non-useable. Dia. of Cable loom

Text l x b1	Dimensions					Tensile strength(N)
	b2	a	c	s	dmax	
368 X 7.6	12.2	7.4	8.1	1.9	100	530

Note:- Manufacturer's Name should be clearly embossed on the cable tie.

अधिकृत DGN												जॉचा व.अ.अ. CHD SSE		MANGL ESHWA R GIRI		पदार्थ MATL		प्रति भार कि. ग्रा. WT. EACH IN KG																	
परिवर्तन संख्या ALT.NO.												प्राधिकार AUTHY		वर्णन DESCRIPTION				दिनांकित बाह्य DATED INITIAL		समीक्षित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE		विशिष्ट SPECN													
सतह - रक्षाता का मान मा. मा. 3073 / अ. मा. सं. 1302												अतिरिक्त सद्य - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768				TOL. CLS.		अनुमोदित स.मु.वि.अ. APPROVED DYCEE		SYAMA PRASA D PATRA		वर्णन DESCRIPTION													
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302												घातु-वेल्डन चिह्न मा. मा. : 813 / अ. मा. सं. : 2553				WELDING SYMBOLS TO IS:813 / ISO:2553		दिनांक DATE		30/06/97		SET OF CABLE TIES													
पदांक GRADE NO.												सं1 N1		सं2 N2		सं3 N3		सं4 N4		सं5 N5		सं6 N6		सं7 N7		सं8 N8		सं9 N9		सं10 N10		सं11 N11		सं12 N12	
Rz												0.16-0.3		0.5-0.7		0.9-1.1		1.5-2.0		2.5-3.8		5.0-6.3		9.0-12		16-25		30-40		50-63		75-100		160-250	
Ra μm												0.025		0.05		0.1		0.2		0.4		0.8		1.6		3.2		6.3		12.5		25		50	
चिह्न SYMBOL																																			
संदर्भ / REF.												ALT. -						रैखिक अनुपात SCALE		NTS		आरेखण संख्या DRAWING NO.		CLW/ES/3/SK-1/0131											
परिवर्तन संख्या ALTERATION. NO.																																			
परिचालन संख्या ALTERATION. NO.												पृष्ठ SHEET		1 OF 1		A4																			

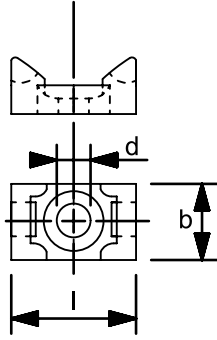


FIG.-1

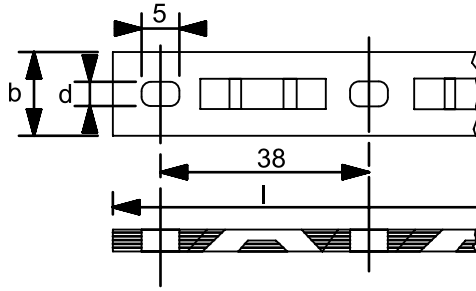


FIG.-2

FIG.	b	l	d	IDENT.NO.
1.	15.9	22.2	5.1	NBT402938P14
	8.3	12.8	3.8	NBT402938P11
	9.5	14.9	4.6	NBT402938P12
	15.9	22.2	6.6	NBT402938P13

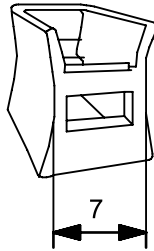


FIG.-3

FIG.	b	l	d	IDENT. NO.
3	-	-	-	NBT402938P31

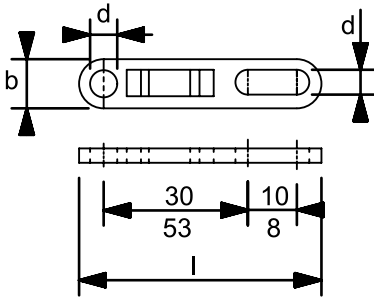


FIG.-4

FIG.	b	l	d	IDENT. NO.
4.	13	50	4.8	NBT402938P101
	16	78	7	NBT402938P102

परिवर्तन संख्या ALT.NO.		प्राधिकार AUTHY	वर्णन DESCRIPTION		दिनांकित बाधक DATED INITIAL	अभिलेखित स.वि.अ. / व.वि.अ. REVIEWED AEE / SEE	अनुमोदित स.पु.वि.अ. APPROVED DYCEE	दिनांक DATE	रैखिक अनुपात SCALE	संदर्भ / REF.	परिवर्तन संख्या ALTERATION. NO.	पृष्ठ SHEET	1 OF 1	A4
सतह - रूखाता का मान मा. मा. 3073 / अ. मा. सं. 1302		अनिर्दिष्ट सद्य - सीमा मा. मा. : 2102 / अ. मा. सं. : 2768		TOL. CLS.		अनुमोदित स.पु.वि.अ. APPROVED DYCEE		SYAMA PRASAD PATRA		CHITRANJAN LOCOMOTIVE WORKS, INDIA		BASE FOR CABLE TIES		
SURFACE ROUGHNESS VALUE TO IS:3073 / ISO:1302		धातु-वैल्लन चिह्न मा. मा. : 813 / अ. मा. सं. : 2553		WELDING SYMBOLS TO IS:813 / ISO:2553		अनुमोदित स.पु.वि.अ. APPROVED DYCEE		SYAMA PRASAD PATRA		CHITRANJAN LOCOMOTIVE WORKS, INDIA		CLW/ES/3/SK-1/0120		
पदार्थ MATERIAL	प्रति भार कि. ग्रा. WT. EACH IN KG		वर्णन DESCRIPTION		आरेखण संख्या DRAWING NO.		परिवर्तन संख्या ALTERATION. NO.		पृष्ठ SHEET		1 OF 1		A4	
पदार्थ MATERIAL	प्रति भार कि. ग्रा. WT. EACH IN KG		वर्णन DESCRIPTION		आरेखण संख्या DRAWING NO.		परिवर्तन संख्या ALTERATION. NO.		पृष्ठ SHEET		1 OF 1		A4	
पदार्थ MATERIAL	प्रति भार कि. ग्रा. WT. EACH IN KG		वर्णन DESCRIPTION		आरेखण संख्या DRAWING NO.		परिवर्तन संख्या ALTERATION. NO.		पृष्ठ SHEET		1 OF 1		A4	