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SPECIFICATION FOR SEALING ADHESIVE FOR 3- PHASE ELECTRIC LOCOMOTIVES.

SPECIFICATION No.
CLW/MS/10/013 ALT.-4
ISSUE DATE: 15.09.1999

ENCLOSURES:

DRG. NOS. : NIL

ANNEXURE: A, B, C

ISSUED BY:

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**TECHNICAL SPECIFICATION OF SEALING ADHESIVE
(SEALING COMPOUND) FOR WAP-5 ELECTRIC LOCO**

1. SCOPE :-

This technical specification covers the minimum requirement of design, manufacturing, testing and supply conditions of ceiling adhesives (ceiling compound) to be used in WAP-5 Loco bogies.

2. SCOPE OF SUPPLY :-

Sealing adhesives shall be supplied as one part compound in sealed containers/tube. The quantity and grade of sealing adhesives required pre loco is indicated against each as shown in Annexure – 'A'.

3. GENERAL :-

3.1. The ceiling adhesives are capable of absorbing thermal movement between avarieties of materials and give even distribution of stresses and sound damping.

3.2. The ceiling compound shall remain serviceable for a period of at least 6 (six) months from the date of packaging in the original sealed containers. When stored at temperatures not exceeding 30°C. The supplier shall also provide the shelf life data for the storage at 40°C.

4. TECHNICAL REQUIREMENT :

4.1 The sealing adhesives shall be suitable for being delivered, stored, applied and put to use under tropical conditions of high temperature, high humidity, heavy rainfall and fungus conductive environment.

4.2 The sealing adhesives shall remain impervious to ultra-violet radiation, oil and water.

4.3 The sealing adhesives shall be suitable for being painted over and its properties shall not deteriorate due to the application of paint.

4.4 The required service life will be for a minimum of 10 (ten) years from the date of application.

4.5 No residual odors shall be apparent after 7 days from the date of application.

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- 4.6 Migration of oils, solvents, resins, dyes and other substances to surrounding areas is not acceptable.
4.7 The sealing adhesives shall maintain serviceability in the temperature range between – 10°C and 80°C.

5. TECHNICAL DATA :

The supplier shall provide the data sheet and the application instructions and details. The following details shall be included.

- 5.1 Tack free time and ambient temperature.
5.2 The rate of cure.
5.3 Shore hardness.
5.4 Elongation at break.
5.5 Shrinkage.

6. MANUFACTURE :

- 6.1 The chemical basis of sealant adhesive is polyurethane, which is cured by atmospheric moisture, considering the relative humidity and type of adhesive. However vibration damping compound is water based.
6.2 Working room temperature should not be below 15°C and relative humidity not less than 30%.
6.3 Procurement of polyurethane based elastomeric material shall be limited to reputed suppliers only.

7. INSPECTION & TESTING:

- 7.1 Nominated representative of the purchaser will carry out the inspection of the sample. All the necessary tests conducted during inspection shall be arranged and borne by the supplier.
7.2 Ignition retardant test to be done.
7.3 Fire rating test to be conducted.
7.4 Any defect in physical properties or non-conformance with a stipulation shall lead to the rejection of sealant.
7.5 Record low heat conductivity at 65°C and furnish the result.

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8. SUPPLY OF DOCUMENTS :

- 8.1 Material Certificate indicating the specification.
- 8.2 All the Certificates as mentioned in para 7.
- 8.3 Health and Safety Data Sheet to be submitted.
- 8.4 Data Sheet with application instructions and rate of cure.
- 8.5 Self-Life data for storage at 40 deg.C.
- 8.6 Test procedure to be supplied during offer.

9. LABELLING & MARKING:

With respect to the limited shelf life at the elevated temperature, each individual cartridge shall be labeled to provide an indication of the manufacturing or expire date. Each individual cartridge of sealant shall be marked with at least the following particulars pertaining to its content:

- 9.1 Item Identification or description.
- 9.2 Colour
- 9.3 Date, Month & Year of manufacture.
- 9.4 Quantity.
- 9.5 Manufacturer's Batch No. & code No.
- 9.6 Recommended storage temperature.
- 10. **QUALITY ASSURANCE:** As per ISO 9000

11. **GUARANTEE:**

- 11.1 All aspects of design, workmanship and material will be covered by the guarantee of satisfactory performance of the product from the date of application for at least 10 years.
- 11.2 Proper function of caulking gun with compound shall be guaranteed by the supplier.

12. **PACKING & DELIVERY:**

The protective packaging to be done which is suitable for transport and storage under the condition mentioned in clause 4.1 and will prevent any damage or deterioration of the material during handling, transit and storage. Storage period considered shall be at least 24 months.

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ANNEXURE –‘A’ SHEET – 1 TO CLW TECHNICAL SPECN. NO. CLW/MS/10/013

SEALING ADHESIVES REQUIRED PER LOCO FOR WAP-5 BOGIES

SL. NO.	DESCRIPTION	EQUIVALENT SUGGESTED BY ABB	ABB DRG. REF.	REMARKS
1.	Loctite-270 (Tube or similar)	---	---	----
2.	Sealing Compound (HYLOMAR)	---	---	OEM's address Marston-Donsel GmbH, Bergheimer Strasse 15, 53909 Zulpich, Germany. Tel: 0049-2252- 2566 FAX: 0049-22520- 1744.
3.	Assly. Paste ALTEMP QNB 50 (70 gm tube or 600 gm Cartridge or 0.75 gm Can or 25 Kg drum).	---	182-00452	Technical requirement as per Annex-B (common with WAG-9 locos)
4.	Loctite-271 Heavy duty, medium Visc. 'Y' (Tube or similar).	Loctite 270	182-00311-008	Common with WAG-9 locos
5.	Loctite-242 Nut Lock med. Strength (tube or similar).	---	182-00311-002	----
6.	Pang bead Sealant (1 litre pack)	Loctite 767 Anti- seize paste	182-00519	Technical requirement as per Annex-'C' (common with WAG-9 locos)
7.	Sealing material (Curil-T) (Silastic 732 RTV)	Anabond silicon sealant 685 RTV	---	
8.	Thread sealing material Loctite- 542 (Tube or similar)	---	182-00311-011	-----

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ANNEXURE –‘A’ SHEET NO. 2 TO CLW TECHNICAL SPECN. NO. CLW/MS/10/013

SEALING ADHESIVES REQUIRED PER LOCO FOR WAP-5 PNEUMATIC & BODY

SL. NO.	DESCRIPTION	EQUIVALENT SUGGESTED BY ABB	ABB DRG. REF.	REMARKS
1.	Sikaflex –15 LM or similar (310 ml tube).	--	--	Common to WAG-9
2.	Silaflex-221 Grey or similar (320 ml tube)	--	--	-do-
3.	Loctite – 577	--	182-00311-007	
4.	Loctite – 262	--	182-00311-003	
5.	Contact Adhesive Dunlop superband S758 or equivalent.	--	182-00697	
6.	Loctite – 243	Loctite 241	For WAP-5 Bogie Shop No. 18	
7.	Loctite – 406	--		
8.	Loctite - 638	--		

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ANNEXURE 'B' TO TECHNICAL SPECN. NO. CLW/MS/10/013

ASSEMBLY PASTE ALTEMP QNB 50 OR SIMILAR

ALTEMP QNB 50 is a beige lubricating paste with a mineral base oil, barium complex soap and inorganic solid lubricants. The raw materials contain no lead, cadmium, nickel, sulphur or halogens.

ALTEMP QNB 50 is very resistant to water and other media i.e. coolants and cutting fluids. It prevents stick slip and protects against tribo-corrosion.

1. PRODUCT DATA :

- 1.1 Colour appearance – beige, cream
- 1.2 Service temperature range, °C – Approx. – 15 to 150
- 1.3 Drop point, DIN ISO 2176, °C - > 170
- 1.4 Worked penetration at 25 deg.C, - 250 to 270
DIN ISO:2137 (ASTM-D 217) . 0.1 mm
- 1.5 Four-ball test, welding force. - > 4000
DIN 51350 Pt. 4, N
- 1.6 Corrosion protection, SKF-Emcor - Corrosion rating 0/t
Test, DIN 51802, 1 Week,
Distilled water.

2. PHYSICAL DATA :

- 2.1 Boiling Point : N/A
- 2.2 Vapour pressure (mm Hg) : N/A
- 2.3 Vapour density (air = 1) : N/A
- 2.4 Solubility in water : Not soluble
- 2.5 Specific Gravity (H₂O = 1) : Approx. 1.4
- 2.6. Percent, Volatile by Volume (%) : 0
- 2.7 Evaporation rate (=1) : N/A
- 2.8 Appearance & odor : Beige, neutral.

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ANNEXURE 'C' TO T.S. NO. CLW/MS/10/013

PANGBEAD SEALANT (SUPER SEAL BEAD SEALANT) B 77 OR SIMILAR

Pang Bead Sealant B 77 is the product of TRUFLEX/PANG RUBBER PRODUCTS COMPANY, 1667 North main street, L O S Angeles, CA 90012, U.S.A or similar having following chemical composition and physical properties.

1. Chemical composition:

- | | |
|-----------------------------|------------|
| 1.1 Superseal special blend | : 85 – 90% |
| 1.2 Methylene chloride | : 45 - 60% |
| 1.3 Tetrachlorethylene | : 8 - 12 |
| 1.4 Petroleum naptha | : 8 - 12 |
| 1.5 Xylane | : Balance |

• Typical distribution :

- | | |
|-----------------------------------|-------------|
| a) Xylene (mixed isomers) | : 80 % |
| b) Ethyl Benzene | : 19 % |
| c) Toluene | : 1 % |
| 1.6 Natural Rubber - accelerators | : 15 – 10 % |

2. Physical Properties :

- | | |
|-------------------|--|
| 2.1 Boiling point | : 104° F |
| 2.2 VAP - PRESS | : 355 mm Hg @ 20°C (for methylene chloride) |
| 2.3 VAP – DENSITY | : 2.93 (for methylene chloride) |
| 2.4 SOL. IN WATER | : Negligible |
| 2.5 SP. GRAVITY | : 1.320 @ 25°C (for methylene chloride) |
| 2.6 APPEARANCE | : COLOURLESS LIQUID |
| 2.7 ODOR | : Penetrating ether-like odor. Irritating at high concentration. |

3. Fire and explosion Hazard data :

- | | |
|------------------------------|---|
| 3.1 Flash point | : None |
| 3.2 Flammable limits | : LFL : 14% @ 25°C
UFL : 22% @ 25°c (for methylene chloride) |
| 3.3 Extinguishing media | : Water fog |
| 3.4 Fire & explosion Hazards | : Form flammable Vapor-air mixtures |

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ALTERATION SHEET

ALT. NO.	DATE	DESCRIPTION	SIGNATURE	REMARKS
1.	16.12.1999	Qty. of Loctite 262 (Item Sl. No. 4, Sheet No.6) – 50ml. was – 1 Tube. QTY/LOCO FOR SL. NO. 6 OF SHEET NO. 5, SL. NO. 1 & 2 OF SHEET NO. 6 WERE 1 PAC, 15 TUBES & 86 TUBES RESPECTIVELY. ALTERATION SHEET (SHEET NO.9) ADDED.		
2.		<ul style="list-style-type: none"> Item no. 6,7, 8 of Sheet No. 6 added as per Dy.CME/ELB letter no.M/ELB – 004 & 010 dt. 25.02.2010 & 01.04.2010. Qty./Loco. Column deleted due to frequent change of Qty./Loco. 		
3.	06.03.2013	AT SL. NO. 7 OF SHEET NO. 5 “LOCTITE – 510” & “COMMON TO WAG-9” DELETED.		TO PREVENT LEAKAGE FROM THE GEAR CASE OF WAP-5 LOCOS.
4.	04.04.2017	PAGE NO. 10 ADDED WITH ITEM LOCTITE – 518, 7649 & NOTE FOR INSPECTION. TITLE CORRECTED AS “FOR 3-PHASE ELECTRIC LOCOMOTIVES”.		FOR SMOOTH PROCUREMENT PROCESS OF SEALANTS.

Specification have been digitized and all alterations have been incorporated

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Item – Loctite-518 or Equivalent

- | | | |
|--|---|----------------------------|
| 1. Application | - | Flange Sealant |
| 2. Features | - | Gasketing Paste, Anaerobic |
| 3. Colour | - | Red |
| 4. Handling cure time at 25°C,
M10 Black Bolt & Nut | - | 5-30 minutes |
| 5. Ultimate Strength | - | 12-24 hours. |
| 6. Tensile Shear Strength | - | 4-14 N/mm ² |
| 7. Break Away Torque | - | Shear 5-13 Nm |
| 8. Av Viscosity Centipoises | - | 800,000 (thixo) mPa.S |
| 9. Maximum Gap Fill | - | 0.5 mm |
| 10. Temperature Range °C | - | -55 to +150 |

Item – Loctite-7649 or Equivalent

- | | | |
|--|---|--------------------------------|
| 1. Application | - | Activator |
| 2. Features | - | Liquid, cleaning of oily parts |
| 3. Colour | - | Green |
| 4. Handling cure time at 25°C,
M10 Black Bolt & Nut | - | 30-70 seconds |
| 5. Av Viscosity Centipoises | - | 2 (thixo) mPa.S |

Note:- This specification covers a wide range of sealants. Hence, all the tests as appeared in Para 7 not applicable for each sealant.

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