

TENDER SPECIFICATION

NO. CLW/ES/3/0175

ALT. 1 2 3 4 5 6

ENCLOSURES:

1. ANNEXURE: A, B
2. DRG. NOS. NIL

TOTAL NO. OF SHEETS.

ALT.:	1	2	3	4	5
SHEET	8	8	8	8	8

SPECIFICATION FORSET OF SIKAPLEX AND SEALING ADHESIVE  
FORWAG-9 (CO'CO) ELECTRIC LOCOMOTIVES

ISSUED BY  
DY. CHIEF ELECTRICAL ENGINEER/CON/TU  
CHITTARANJAN LOCOMOTIVE WORKS  
P.O. CHITTARANJAN, 713331  
DIST. BURDWAN, WEST BENGAL, (INDIA)

SPECIFICATION FOR  
SET OF SIKAPLEX  
AND SEALING  
ADHESIVES.

DRN. CHKD/REV

*Seechattan*  
COM 1/9/97 SEE/D&D

APPROVED BY

*hnd*  
DY. CEE/CON/TU

D & D CENTRE  
CHITTARANJAN LOCOMOTIVE  
WORKS.  
WEST BENGAL, INDIA

DATE. 1/9/97

NO. CLW/ES/3/0175

ALT 1 2 3 4 5

# CHITTARANJAN LOCOMOTIVE WORKS-CENTRE FOR DESIGN & DEVELOPMENT

DOCUMENT NO.-  
VERSION - 1.0  
DATE OF ISSUE-

SHEET-2

## AMENDMENT RECORD SHEET

AMEND- MENT No	DATE OF AMENDMENT	PAGE No	VERSION	AMENDMENT DESCRIPTION	REASON.	Authority
1	1-9-97	3 TO 14	1.0	Rewrite and clubbed with Mech Specn-N02-CLW/MS/ 3/023.	TO ease procurement in bulk qty instead of piece meal basis.	1/9/97
2.	14-7-99	8	2.0	Qty./Loco. has been changed to 15 Tubes instead of 9 Tubes in Sheet no. 8, Sl. no. 1.	Requirement revised as per Dy. CME/ELA's L.No:- DCME/ELA/43/ 3-Phase, dt. 06-7-1999	
3.	15.1.03	8	3.0	1) Separate quantity indicated for Separate type of SikaFlex. (u) Deleted Sl no. 2 & Sl no. 4 at Annex Part-2 at sheet 8	Due to shop requirement as per Dy CEE/D-13 Letter no ELDD/110/ HCM dt 7.12.02 and also joint note of JE-II/DLO & SE, Shop. 16 dt 13.12.02.	Sd/- 16/1/03
4	20.8.03	8	4.0	Qty./Loco 6 tubes each tubes of 310 ml capacity.	CDAM vide his letter under Reference has pointed out that material BSI is being used in various shops in between two halves of gear case. The matter was investigated in detail and found that certain BSI shop and not certain shop BSI RTV due to which material BSI available in store are being used by them for the application of gear case. Adtranz letter vide Ref. to to CDR 135 have recommended use of Silicon Sealant Anabond GSS RTV or Loctite 510 as Alternative of Cumil-T compound. As such Anabond GSS RTV as mentioned below may be included. vide letter no ELDD/375/ issued by AME/D-13/11/03	
	19-02-05	8	5.0	In sheet No-8 item SLNO-3, Qty/Loco of SikaFlex-221 has been changed to 50 (fifty) Tubes each tube contain- ing 310 ml (three hun- dred ten ml) inste- ad of 28000ml.	WM/ELA-II vide his letter No:-DCME/ELA/07/Design dt 05/10/2004 indicated that Qty/Loco requirement of SikaFlex-221 is 50 (fifty) Tubes each tube contain 310 ml.	
PREPARED	CHD	REVIEWED	APPROVED BY	TITLE :- SET OF SIKAFLEX AND SEALING ADHESIVES	NO: CLW/ES/3/075, ALT-4, 2, 3, 4, 5	
Mechatronics 1/9/97 Sd/-		Kraj 01/9/97 SEE(D&D)	dm 1/9/97 DY. CEE/CON/UTU			

DOCUMENT NO. -  
VERSION - 1.0  
DATE OF ISSUE -

SHEET-2 / A

[illegible]

1. **Scope:-** This specification covers the manufacture and supply of Sikaflex and sealing adhesives/sealing compound for used as a gap sealant, for applying on finished welded joints in WAG-9,3 Phase 50 HZ A.C. Electric locomotive of Indian Railways.
2. **Service conditions :-** As the materials are used in locomotive, they are subjected to the following environmental conditions.
- 2.1 **Temperature range:-** 50°C in shade,  
70°C in Sun.
- 2.2 **Humidity:-** Normal :- 60%  
Maximum :- 100% in rainy season.
- 2.3 **Atmosphere:-** Generally oily, dusty and in coastal region salty also.
- 2.4 **Vibrations :-** Subjected to maximum vibrational and buffing shocks upto 50m/s<sup>2</sup> while the locomotive is in operation.
3. **Technical Requirements :-**
- 3.1. Sealing adhesive shall have low modulus and paintable polyurethane construction Cement, except vibration damping compound which is water based.
- 3.2. The sealing adhesives should be capable of absorbing thermal movement between a variety of materials and should produce even distribution of stresses. It should have a very good ageing and weathering resistance.
- 3.3. The material should be non-toxic. This apply to all forms of the compound and in all stages of curing process.
- 3.4. The sealing compound shall remain serviceable for a period of at least 24 months from the date of packing in original sealed container. The supplier shall have to provide the self-life data for storage at 40°C.
- 3.5. The sealant shall be suitable for application by travel both on horizontal and vertical surfaces either by thixotropic or fast drying formula.
- 3.6. The compound shall be suitable for being painted over and its properties should not deteriorate due to application of paints.
- 3.7. The compound shall remain impervious to water, oil etc and shall be water proof when cured.

SPECIFICATION FOR:-  
SET OF SIKA-FLEX  
AND SEALING  
ADHESIVES

DRN. CHKD/REV  
CDM 1/9/97 SEE/D&D  
APPROVED BY  
DY. CEE/CON/TU

D & D CENTRE  
CHITTARANJAN LOCOMOTIVE  
WORKS.  
WEST BENGAL, INDIA

DATE. 11/9/97

NO. CLW/ES/3/0175

ALT 14 12 31 15

- 3.8. The compound should have a good adhesion to cementitious construction materials when cured on steel, nonferrous metals, wood, numerous synthetic materials ceramic etc.
- 3.9. Sikaflex is a polyurethane sealant, permanently elastic, but cures to durables. It has got a good excellent adhesion without priming to clean ceramic, Aluminium, stainless steel joints for maximum performance where condition of joint, bonding surface may be of suspect.

- 3.10. The physical properties required for all types of sealants and compounds are given in "Annexure A, C, D, E, F & G." Perloco requirement of each types of sealants and compounds has been tabulated in Annexure B

4. Manufacture :-

- 4.1. The Chemical basis of sealant adhesive is polyurethane, which is cured by atmosphere moisture, considering the relative humidity and type of adhesive. However Vibration Damping Compound is Water Based.
- 4.2. Working room temperature should not be below  $15^{\circ}\text{C}$  and relative humidity not less than 30%.
- 4.3. Procurement of Polyurethane based elastomeric material shall be limited to reputed suppliers only.

5. INSPECTION & TESTING

- 5.1. 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.
- 5.2. Ignition retardant test to be done.
- 5.3. Fire rating test of be conducted.
- 5.4. Any defect in physical properties or non-conformance with any stipulation shall lead to the rejection of sealant. Record low-heat conductivity at  $65^{\circ}\text{C}$  & furnish the result.

6. SUPPLY OF DOCUMENT

- 6.1. Material certificate indicating the specn.
- 6.2. All the certificates as mentioned in clause 5.
- 6.3. Health and safety data sheet to be submitted.
- 6.4. Data sheet with application instructions and rate of cure.

PREPD.	CHKD.	REVIEW ED	APPROVED BY	SPECIFICATION FOR	CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN (W.B)
<i>Prachar</i> 1/9/97	<i>K. S. J.</i> 1/9/97	<i>dh</i> 1/9/97		SBT OF SIKAFLEX AND SEALING ADHESIVES.	
CDM	SEE/D&D	dy.CEE/CON/TU			

No. CLW/ES/3/0175

DATE: 1/9/97

ALT - XX BA, 5

SUPPLY OF DOCUMENT

- 6.5 Self-life data for the storage at 40°C  
 6.6. Test procedure to be supplied during offer.

7. LABELING/MARKING

With respect of the ~~limited~~ self-life of the sealing compound at the elevated temperature each individual castridge shall be labelled to provide indication with following particulars.-

- i) Description of the item.
- ii) Colour
- iii) Date, month and year of manufacture
- iv) Date of expiry
- v) Quantity
- vi) Name of manufacturer with trade mark, code No & batch number.
- vii) Recommended storage temperature.
- viii) Indicate the known hazardous ingredients clearly

8. QUALITY ASSURANCE- As per ISO-9000.9. GUARANTEE

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

10. PACKAGING & DELIVERY

- 10.1. The protective packaging to be done which is suitable for transport and storage under the climatic and environmental/condition mentioned in ~~clause 2~~ and will prevent any damage or deterioration of the material during handling, transit and storage. Storage period considered shall be at least 24 months.

PREPD. <i>Insulation</i> 11/9/97	CHKD	REVIEW ED <i>[Signature]</i> 11/9/97	APPROVED BY <i>[Signature]</i> 11/9/97	SPECIFICATION FOR CHITTARANJAN LOCOMOTIVE SET OF SIKAPLEX WORKS, CHITTARANJAN (W.B.) AND SEALING ADHESIVES.
CDM	SUPDT	SEE D&D	DYCEE/CON/TU	No. CLW/ES/3/0175 DATE: 11/9/97

ALT. 4.8.34, 5

11. PROBABLE SOURCES OF SUPPLY :-

(a) Sika Australia Pty LTD.

Unit 2, 42 Garden Boulevard

Dingley 3172Telephone :- 0061-3-9558 - 1388.FAX :- 0061-3-9558 - 1678

(b) M/s. Spenta Polysynth Pvt Ltd.

9, Yugprabhat

Off Sitaldevi Temple Road,

Mahim, Mumbai 400016.

FAX No :- 022 - 464888.

(c) M/s. Sika Quacrete Ltd.,

24 -B Park Street

Calcutta - 700016 (Contact person:- Mr. Bhaskar Sen )

FAX NO:- 033- 24985551/ 2966958

Telephone No:- 033-294670 / 3622/0329/0330.

(d). Adtranz

ABB Daimler Benz Transportation  
Austria GmbH.

Brown Boveri strasse 1.

A-2351 Wlener Neudorf, Austria.

FAX:-0043-2236 - 404510

PREPD.	CHKD	REVIEW ED	APPROVED BY	SPECIFICATION FOR SET OF SIKAFLEX AND SEALING ADHESIVES.	CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN (W.B)
<i>Subhash</i> 1/7/97	<i>[Signature]</i> 1/7/97	<i>[Signature]</i> 1/7/97	<i>[Signature]</i> 1/7/97		
CDM	SUPD	SBE/D&D	DYCEE/CON/TU		No. CLW/ES/3/0175 dated:- 4/9/97

ALT - 48, 3A, 5

1. Sikaflex 15-LM - Grade A
2. Sikaflex 221 - Grade B
3. Sikaflex 251S - Grade C

Sikaflex 15-LM  
Grade ASikaflex 221  
Grade BSikaflex 251S  
Grade C

Density	1.3 Kg/litter	1.17± 0.03 Kg/l	1.18
Stability	Excellant	Very Good	
Cure System	Moisture Curing	Moisture Curing	Moisture curing.
Tack-free time	2 to 4 hours	50 minutes	30 Min
Rate of cure	2mm per 24 hours	3 mm approx per 24 hours.	
Shore of hardness (DIN 53505)	15 to 20	45 approx	40
Elongation at break (DIN 53501)	800%	7450%	400%
Colours	White, black Gray, brown	Black, white, Gray	Grey
Tensile strength (DIN 53504)	0.1 N/mm <sup>2</sup> at 60%(20°C)	1.8N/mm <sup>2</sup> approx	
Lap shear strength	.5 N/mm <sup>2</sup>	1.5 N/mm <sup>2</sup>	1.5 N/mm <sup>2</sup>
Tear propagation strength (DIN 52515)	7 N/mm <sup>2</sup> approx	7 N/mm	
Shrinkage (DIN 52451)	6%	6% approx	15%
Application temperature	+5°C to +40°C	+5°C to 35°C	
Service temperature	-40°C to +80°C	-40°C to +80°C upto +150°C for brief period	-40°C to 12°C
Life	Min 9 months or more at 5°C to 25°C		

PREP. BY	CHKD BY	REVIEWED BY	APPROVED BY	SPECIFICATION FOR Set of Sika flex and sealing Adhesives	CENTRE for D & D CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN-713331
					NO. CLW/16/3/0175
					ALT NO. 1 2 3 4 5



Annexure -B Part-I

Sl.No.	Description	Qty./Loco	Remarks
1	Sealing Adhesive (Grade A, Annexure A) Sikaflex 15 LM or similar / 851 Ana bond	<del>10 Tubes</del> <del>(4650 ml)</del> 3000 ml	ALT- Each Tube of 310ml capacity. <b>ALT 6</b>
2.	Sealing Adhesive (Grade B, Annexure A) Sikaflex 221 Black or Similar	48 Tubes (15360 ml)	ALT- Each Tube of 320ml capacity
3.	Sealing Adhesive (Grade B, Annexure A) Sikaflex 221 Grey or similar	27 Tubes (8640 ml) 28000 ml	ALT- Each Tube of 320ml capacity. Contain 310ml → ALT-5
4.	Sealing Adhesive (Grade C Annexure A Sika flex 251S	50 (fifty) Tubes (320 ml)	ALT- Each Tube of 320ml capacity.

Annexure B Part-II

Sl.No.	Description	Qty./Loco	Remarks
1.	<u>3L NO. 5.</u>		Each can of 50ml. capacity.
	<u>DESCRIPTION</u>	<u>Qty./Loco</u>	<u>Remarks</u>
2.	Thermal Sealant (Annexure I)	6 cans	Each can of 1 Kg.
3.	Anabond 685 RTV	Qty/LOCO 6 tube each	AS Per letter NO. ELDD/3751 issued by SME/DA dt. 8.8.13
4.	Seal (Annexure F)	6 Tubes	

[Note: As per WM/ELA-II, Letter No. DCME/ELA/07/Design dt 05/10/2004]

Indicated that Quantity per Loco requirement of Sikaflex-221 is 50 (fifty) Tubes Each tube Containing 310ml (three hundred ten ml.) **ALT-5**

PREPD. BY	CHKD BY	REVIEWED BY	APPROVED BY	SPECIFICATION FOR SET OF SIKAFLEX AND SEALING ADHESIVES	CENTRE for D & D CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN-713331
					NO. CLW/ES/3/0175
					ALT NO. 1 2 3 4 5