

NORTH EASTERN RAILWAYCE'S P.WAY CIRCULAR NO.59 OF 1970.

Corrosion of rails not only reduces the life of rails but can also be dangerous if it remains un-noticed.

Importance of frequent inspection and anti-corrosive treatment of rails in locations where rails are prone to corrosion has therefore been stressed time and again. Trials with anti-corrosive paints have also been conducted and upto date instructions how anti-corrosive treatment should be applied have been issued under this office No.W/364/2/W-11/1137 dated 22.8.1968. To ensure that the anti-corrosive treatment is carried out properly and in locations where needed, the instructions previously issued have been embodied in the form of this circular which should be studied by all P.Way supervisors and strictly followed.

1. Anti-corrosive paints should be applied on the rail at water column & one rail on either side of this rail, on rails over ashpan or ashpits on running lines upto 40' from either end of the ashpit or ashpan, at the level crossings (for the length of the level crossings), at road-cum-rail bridges and at other such locations where rails are prone to corrosion due to contact with moist ashes, rubbish etc.

2. Paint should be applied at a time when there is no likelihood of rains as, if it were to rain within four hours of application, the emulsion coat may get washed away. The weather should also be not so hot as to cause difficulties in applying the paint uniformly.

3. Anti-corrosive paint should conform to following specifications:

(a) Priming Coat:

(i) On Rails in Track:

Bituminous solution type paint to IS:158 should be used as primer to seal off the pittings and to provide smooth base for subsequent coats.

(ii) On Rails not in Track:

Zinc chromate red oxide primer based on CNSL dispersion resins should be used. This is covered by Indian Patent No.60613 and is supplied in dual containers under main component A and component B. Component A & B are to be mixed before use in the ratio 5:1 by volume. It should be mixed only at the time of use as it has a storage life of about 120 hours only.

(b) Subsequent Coats:

For 1st. and 2nd. coat after priming coat, bituminous emulsion should be used. This is a colloidal clay type water emulsion based on hard bitumens, cashew- nut shell liquid-antioxidants and phosphoric acid-corrosion inhibitor. The emulsion paint is covered by Indian Patent No. 56192 and has been licensed on exclusive basis through Messrs Shalimar Tar Products (1935) Limited, 6 Lyons Range, Calcutta by the National Research Development Corporation. These emulsions have following characteristics:-

- (i) The emulsion can be applied in thick coats even to vertical surfaces without sagging and can be applied on wet surface.
- (ii) It does not flow at high temperature or lose its ductility at low temperature.

NOTE: Separate brushes should be used for the bituminous solution and bituminous emulsion.

(c) 3rd and final coat:

Bituminous emulsion as per Indian patent No.56192 containing 20% Mica is to be used for this coat.

4. Preparation of the surface:

(a) On old rails which have to be painted in the track:

Loose rust, dust, scales etc. should be removed as much as possible by hammering, scraping and wire brushing including that from bottom of the foot of the rail where it is not resting on the sleepers, if necessary by removing the ballast.

(b) On rails which are not in track or can be taken out from track for painting :

Grease and oil must be removed by means of white spirit or other suitable solvents and then as necessary all rust, loosely adherent scale and dust must be removed either by grit or sand blasting or manually by means of metal scrapes, suitable hammers and wire brushes.

All surfaces must be brushed down immediately prior to painting.

5. Method of application:

(a) On old rails which have to be painted in the track:

(i) Immediately after surface is made ready to receive the priming coat, apply one coat of bituminous solution type paint to IS: 158 to seal off the pitted surfaces and to provide a smooth base for subsequent coats.

(ii) After 24 hours drying apply three coats of bituminous emulsions to Indian Patent No.56192, the final coat containing 20% MICA in such a way that the total thickness is 14 mils minimum (0.014 in. or 0.35). A drying time of 6 hours should be allowed between two consecutive coats of emulsions applied.

(b) On rails not in track and rails which can be removed for painting:

(i) As soon as the surface is ready to take priming coat, apply one coat of zinc chromate red oxide primer to a thickness of minimum 2 mils (.002 in. or .05mm).

(ii) After the primer coat has dried apply 3 coats of bituminous emulsion, the final coat containing 20% MICA with drying period of minimum 6 hours between two consecutive coats. The total thickness of the finished point should be minimum 14 mils. (.014 in. or .35mm).

(iii) Before laying the painted rails in track any damaged coat of paint due to handling should be patch-painted. If the primer is also damaged the portion has to be touched up with the primer before applying emulsion. For laying the rails in position they should be dragged on the top table and before laying, a thick coat of emulsion should be applied on the sleepers directly in contact with the rail bottom. The fishplates, dog spikes, fish bolts and nuts should also be painted with a thick coat of bituminous emulsion. The thickness of dry film should be about 12 mils. (.012 in. or .30mm.).

6. Precautions:

(i) If the brush tends to harden or clog, it should be washed with water. If the bituminous emulsion has dried on the brush it should be washed with white spirit, then with soap and finally rinsed with water. No oil or paint contaminated brush should be used for applying bituminous emulsions.

(ii) In summer if the rails are very hot causing difficulties in uniform brushing it would be advisable to cool the primed rails with water. The excess water be removed before application of bituminous emulsions. It may be noted that bituminous emulsion adheres to damp surfaces but not in wet condition.

(iii) The emulsion should be used as supplied. It becomes thick in the container on exposure, this can be thinned down by portable water just to the original consistency. Do not use water from borrow pits, particularly in areas which are saline.

7. Inspection:

During routine inspections by supervisory staff and gangmen the condition of the paint should be examined and any damaged portion should be immediately patch-painted either by bituminous emulsions or with primer and bituminous emulsions, if the bare metal surface is also exposed. Before patch painting the surface should be washed with water to remove dust, soluble salts etc. Red lead should not be used for such patch painting.

8. Maintenance:

So long as the top emulsion coat is not damaged patch painting is not necessary except the maintenance painting at an interval of about a year.

During service condition the outer coat of bituminous emulsion becomes brown and dry whereas immediately beneath it will be soft and black. The brownish surface will be powdery and shall be removed by washing with jute soaked in water. If the total thickness of the film falls below 12 mils it should be repainted with one coat of emulsion containing 20% MICA. Some of the painted rails in the sections should be removed every year and the paint at the bottom of rails examined to decide the frequency of maintenance painting.

As it may not be possible to apply the coat of emulsion to the under side of the foot of the rails with the rails in the track carrying traffic, and as in course of screening of ballast the emulsion coat on the underside of the rails may come off, it is necessary that prompt action is taken by the gang-mate to repaint these. Record of such painting should be kept in the gang diary which should be inspected by the PWI of the section. The section of the track which is given through packing & screening should be specially inspected by the PWI to rectify any damage to the painted surface specially at the keys and the underside of the foot of the rails.