

Government of India
Ministry of Railways
Research, Designs & Standards Organisation

Manak Nagar,
Lucknow- 226011

No. EL/3.2.19

Dated 04.06.1993

MODIFICATION SHEET NO. RDSO/ WAM-4/175

1. TITLE:

Brake blocks with medium phosphorus contents
for Electric Locomotives.

2. APPLICATION:

All Electric Locomotives.

3. OBJECT:

Brake blocks used at present on Electric locomotives
grey cast iron casting as per RDSO Drawing No.D/BG 1753/
XII Alt. 6. The material for brake shoe conforms to
Grade FG220 as per IS:210. The average life of these
brake blocks is of the order of 40 days.

3.1 It is proposed to introduce brake blocks with
medium phosphorus content with a view to reduce the
rate of wear on these brake blocks without aff-
ecting brake force in any way. The ultimate
objective to get a life of 60 days or more.

3.2 Railways were requested vide RDSO's letter
No.EL/3.2.19 dated 21.9.92 to try brake blocks
with phosphorus content to 1 to 1.5%. Railways
have faced certain problems in procuring these
material and hardness obtained was very high.
These problems have been studied by RDSO and
necessary clarification/specifications are given
hereafter.

4. DETAILS OF BRAKE BLOCKS:

Railways are requested to procure the brake blocks
with phosphorus content of .9 to 1.1%. No
reference to IS:210 shall be mentioned while procuring
the material. However, the suggested chemical composition

and other parameters are given as under :-

Chemical Composition

C	2.9 - 3.3 %
Si	.6 - 0.8 %
P	0.9 - 1.1 %
MN	0.6 - 0.8 %
Fe	1.8 (In Sand Moulds)

Micro Structure:

Steadite (Minimum 10%) + Pearlite (Balance)

Hardness:

220 + 30 ~~30~~

Carbonic equivalent will be calculated

From $C + \frac{Si}{3} + \frac{P}{3}$

The following special precautions shall be taken by the Workshops/Suppliers to get quality products:

- a) Only sand mould shall be used.
- b) Ferro phosphorus to be charged along with metal at the rate of 30-35 kg per tonne of metal. Phosphorus shall not be charged in any case with flux.
- c) Phosphorus shall be in the form of lumps and not powder.
- d) Ferro phosphorus normally contains 22% phosphorus and hence adding 30-35 kg ferro phosphorus along with metal as mentioned in (a) above is expected to give desired phosphorus contents in final product.
- e) The presence of magnese is required to be more than 0.6% for stabilising pearlite in conventional as well as phosphorus brake blocks.

L-20 BHN

Railways will get the hardness of the order of 220 + 20 if above composition is ensured and precautions as detailed are taken. RDSO may be contacted for further clarifications, if any.

5. PERIODICITY OF IMPLEMENTATION:

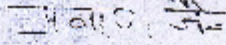
During schedule inspection of Loco.

6. AGENCY FOR IMPLEMENTATION:

All Electric Loco Sheds, Production Units and PCN Shops

7. DISTRIBUTION:

As per enclosed list.



(P.K.Jain)
for Director General/Elect.