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SUBJECT Standard Makes of Babbitt Metals Used in the USSR

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1. In the Merchant and River Fleet of the USSR uses are found for all makes of babbitt metal. In Diesel operating practice during the last few years a method of lining the bearings with two grades of babbitt metal was introduced. In practice this method consists of lining the sides of the Diesel bearings with a cheaper grade of babbitt because the sides of the bearings play almost no part in operation.

2. In practice, this method was not successful compared with the ordinary methods of lining bearings. The lining of bearings with babbitt of two grades did not become possible until the ordinary lining was replaced by a fused surface of babbitt by means of an autogenous or some other welding torch. The basic method for the autogenous lining of bearings with two makes of babbitt is as follows: First of all, the old babbitt is melted off the bearing, after which it is helpful to plate the bushing with tin in the same place to prevent the oxidation of its surface. Then the bushing is put on a welding bench and is heated through from the inside by the intense flame of an autogenous welding torch to a temperature 200 - 250° C (pre-heating may be done in a hearth). The section, to be fused, of the inner surface of the bushing is put in a horizontal position and steel blocks covered with a layer of sheet asbestos are pressed up against both ends of the bushing to prevent the babbitt metal from running off. The autogenous torch again heats up the place for the fusion and fuses onto it babbitt from rods of babbitt, about 10 x 10 mm in cross section.

3. Usually the babbitt is fused on in rows (beads) and if there is a simple arrangement for turning the bushing, it is possible to manage without help.

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4. In order to determine the thickness of the layer, an iron template cut out of sheet iron is used. By this means it is possible in one shift to babbitt up to 10 bushings for a shaft of 250 mm diameter.

5. While fusing the babbitt metal, the torch flame need not be intense. It is helpful to run the same rod of babbitt metal along the surface of the bushing at the places where for some reason or another the babbitt is not adhering, and sometimes it is necessary to use hydrochloric acid.

6. It should be born in mind that the use of too thick rods of babbitt, the fusing of which requires the torch flame to be intensified, results in the burning out and ruining of the babbitt. This can easily be noticed from the appearance of blackness.

7. It is quite immaterial with what grade of babbitt metal the fusing is begun; the only important thing is to keep the different grades of rods strictly separated.

8. This method of lining bearings can also be used for larger parts, for example, crosshead shoes or crankpin bearings. In these cases thorough heating of the parts is not required; only the surface which is to be fused with the babbitt metal is heated.

9. Repair of bearings with cracked linings cannot be carried out by this method. In this case the babbitt metal is poorly bound to the body of the bearing. Usually in such instances the crack in the bearing will reappear in the old place.

10. The method of lining bearings with two grades of babbitt metal has become widespread in the USSR as an economically profitable method, in view of the fact that babbitt metals fall in the category of materials in critically short supply.

11. The following standard makes of babbitt metals are used in the USSR:

(A) Tin babbitt - B 83

Chemical composition:

antimony	10 - 12 %
copper	5.6 - 6.5 %
tin	82 - 84 %

Melting point 240 - 350° C

Pouring temperature 480° C

Specific gravity 9.3

(B) Tin-lead babbitt - B 16

Chemical composition:

antimony	15 - 17 %
copper	2.75 - 3.25 %
lead	64 - 66 %
tin	15 - 17 %

Melting point 240 - 435° C

Pouring temperature 480° C

Specific gravity 9.3

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(C) Tin-lead babbitt - B 10

Chemical composition:

anitimony	14 - 16 %
copper	2.75 - 3.25 %
lead	71 - 73 %
tin	9.5 - 10.5 %

Melting point 240 - 435° C

Pouring temperature 485° C

Specific gravity 9.7

(D) Lead babbitt - B S

Chemical composition:

antimony	16 - 18 %
copper	1.25 - 1.75 %
lead	80.5 - 82.5 %

Melting point 240 - 415° C

Pouring temperature 465° C

Specific gravity 10.1

(E) Calcium babbitt BK 1

Chemical composition:

lead	97.9 - 98.4 %
calcium	0.8 - 1.1 %
sodium	0.75 - 1.0 %

Melting point 320 - 450° C

Pouring temperature 500° C

Specific gravity 10.5

(F) Arsenic cadmium babbitt BMK

Chemical composition:

antimony	11 - 11.5 %
copper	1.5 - 2.0 %
tin	11 - 12 %

Melting point 250 - 350° C

Pouring temperature 400° C

Specific gravity 9.6

The alloys from (A) through (D) (OST/NKTP [People's Commissariat of Heavy Industry] 2721) have been standardized. Alloy (E) replaces alloy (D) and alloy (F) replaces alloy (A).

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