File

FILE COPY

O T T A W A July 21, 1943.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1458

Examination of Brass Tubes.

(Copy No. b.)

Bureau of Mines
Division of Metallic
Minerals

Ore Dressing
and Metallurgical
Laboratories

CANADA
DEPARTMENT
OF
MINES AND RESOURCES
Mines and Geology Branch

O T T A W A July 21, 1943.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1458.

Examination of Brass Tubes.

= = = = = = = = =

Origin of Problem:

The Inspector General, Inspection Board of the United Kingdom and Canada, Ottawa, Ontario, requested in a Materials Division Analysis Requisition, No. O.T. 4031, dated July 9, 1943, the examination of 10 brass tubes according to U.S. Army Tentative Specification AXS-651.

Particularly requested were:

(a) Hardness tests.

(b) Crimping tests or tapered pin tests.

(c) Mercurous nitrate test.

Ten brass tubes, approximately 7¼ inches long and 0.54 inch outside diameter, were submitted.

Chemical Analysis:

		Examined tube	U.S. Army Spec. AXS-651
		- Per. cent -	
Copper	-	66.34	64-68
Zinc	-	32.70	Remainder
Lead	-	0.80	0.20-0.80
Iron	-	None detected	0.07 max.
Tin	-	None detected	-
Manganese	-	None detected	-
Nickel	-	None detected	-

Hardness Tests:

Hardness was determined by the Rockwell method, using the "B" scale.

The results: 80-82 Rockwell - "B" scale.

U.S. Army Spec. AXS-651 requires a minimum hardness of B-50, Rockwell.

Tapered Pin Tests:

One end of each of three brass tubes was subjected to a tapered-pin test, using a tapered pin having an included angle of 60 degrees. The specimens showed no signs of cracking when outside diameters of the tubes were expanded 35 per cent.

Mercurous Nitrate Test:

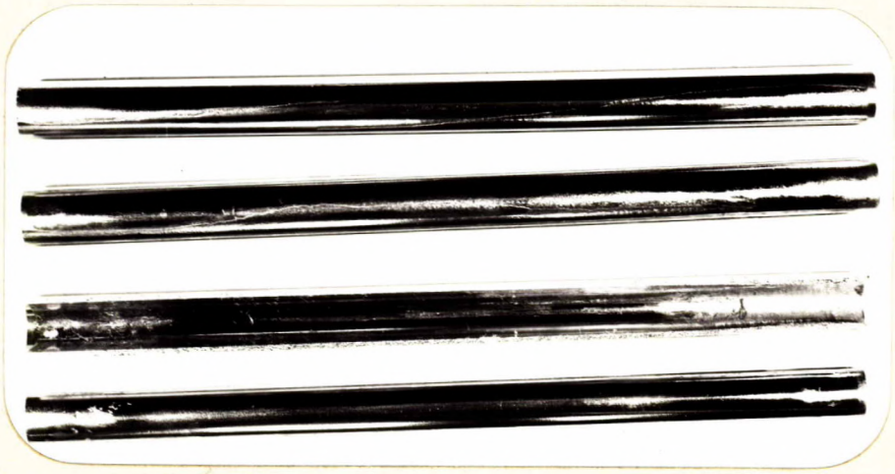
Three full-length brass tubes, approximately 7¼ inches in length, were cleaned with nitric acid and immersed in an aqueous solution containing 10% mercurous nitrate and 1.3% nitric acid. After 15 minutes of immersion the samples were removed and examined.

All samples showed considerable cracking along the full length of the tubes. Fig. 1 shows the character of the cracks. After light hammering, one tube split (Fig. 1, bottom).

(Continued on next page)

(Mercurous Nitrate Test, cont'd) -

FIGURE 1.



Samples after Mercurous Nitrate test.
(Approx. $\frac{1}{2}$ size.)

Conclusions:

The examination showed that the submitted tubes conform to the chemical composition and physical requirements but failed in the mercurous nitrate test.

This failure is due to lack of proper stress-relief heat treatment of the finished brass tubes.

oooooooooooo
oooooooo
ooo

JWM/RLC:FM.