O T T A W A May 10, 1945.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1864.

Corrosion Resistance of Galv-Weld Alloy Coating Applied to Steel Pipe.

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Background:

A request was received on April 29, 1945, from Lieut. L.E. Sibley, R.C.N., of the Directorate of Naval Construction, Department of National Defence (Naval Service), Ottawa, Ontario, to test the corrosion resistance of a coating of Galv-Weld alloy which had been applied to a piece of steel pipe (2-3/8" O.D). A similar piece of pipe coated with zinc by hot dip galvanizing was to be included in the test for purposes of comparison.

(Continued on next page)

Tests Performed:

The following tests were performed on the two pieces of coated pipe:

1. Both pieces of pipe were subjected to the spray from 20 per cent salt (sodium chloride) solution at 95° F. for 96 hours.

2. The thickness of the coatings on both pieces of pipe was measured, using the Aminco-Brenner Magne-Gage.

1. Salt Spray Corrosion Test.

After 48 hours: Rust spots appeared on the pipe coated with Galv-Weld alloy.

After 72 hours: General breakdown occurred on that part of the Galv-Weld alloy surface which was directly exposed to the spray. One small rust spot visible on the galvanized pipe.

After 96 hours: Several other small rust spots visible on the galvanized pipe. Test discontinued.

The condition of the two pipes at the end of the test is shown in Figure 1.

(a) (b)

Figure 1.

STEEL PIPES COATED WITH (a) GALV-WELD ALLOY, (b) ZINC, AFTER 96 HOURS IN THE SALT SPRAY CORROSION TEST.

Most of the dark material on sample (a) is iron rust. The light material on sample (b) is zinc corrosion product.

Magnification: X 0.5.

(Tests Performed, cont'd) -

2. Thickness Measurements.

The following thickness measurements were obtained:

Galv-Weld Alloy Coating (inches)	Galvanized Coating (inches)
0.0014	0.0022
0.0016	0.0017 - (thinnest)
0.0037	0.0023
0.0040	0.0020
0.0037	0.0022
0.0011 - (thinnest)	0.0035 - (thickest)
0.0013	0.0019
0.0061 - (thickest)	
Av. = 0.0022 inch.	0.0022 inch.

It will be noted that the average thickness of the two coatings was about the same. However, the variation in thickness was much greater in the case of the Galv-Weld (0.0011 to 0.0061 inch) than in the case of the galvanized coating (0.0017 to 0.0035 inch).

Conclusion:

In the Salt Spray Corrosion Test, the galvanized coating offers much better protection to steel than the Galv-Weld coating.

RRR/GDF.