WATERTOWN ARSENAL LABORATORY

MEMORANDUM REPORT

NO. WAL 640/96

BEND TESTS OF FILLET WELDS IN ARMOR

1/2" Rolled Homogeneous Plate

BY

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DATE 11 January 1944

WATERTOWN ARSENAL
WATERTOWN, MASS.

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OBJECT

These tests were made to determine whether the procedure prescribed for the Welding Operator Qualification Test of Figure 5, page 1020, AWS Welding Handbook, 1942 Edition, could be used on heat treated armor plate with the types of weld metal currently being used for armor weldments.

SUMMARY OF FINDINGS

Tests of specimens prepared in accordance with procedure prescribed by the AWS Handbook and welded with the following types of electrodes:

Mo Modified Austenitic Stainless (Armorise)
Mn-Mo Ferritic Alloy (AW-2C)
Plain Low Carbon Covered (Fillex)

using 1/2" Great Lakes Rolled Homogeneous Armor Plate indicated that:

1. The stiffness of the armor plate and the softness of the weld metal are such that failure in bending occurs through the weld metal away from the fusion zone between weld metal and armor.

2. The weld metal failure does not initiate at the root of the fillet weld.

3. The ferritic alloy and low carbon steel weld metals tend to fail approximately through the center of the weld deposit, whereas the austenitic stainless weld metal tends to fail between the midpoint of the weld deposit and the armor plate edge.

4. In view of the above, the test is not sensitive to fusion conditions at the root of the fillet weld when the base metal is heat treated armor plate.

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