

NATIONAL BUREAU OF STANDARDS REPORT

9800

EXAMINATION OF GALVANIZED (ZINC COATED) STEEL SHEET SAMPLES

To

Department of State

Agency for International Development



U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

THE NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards¹ provides measurement and technical information services essential to the efficiency and effectiveness of the work of the Nation's scientists and engineers. The Bureau serves also as a focal point in the Federal Government for assuring maximum application of the physical and engineering sciences to the advancement of technology in industry and commerce. To accomplish this mission, the Bureau is organized into three institutes covering broad program areas of research and services:

THE INSTITUTE FOR BASIC STANDARDS . . . provides the central basis within the United States for a complete and consistent system of physical measurements, coordinates that system with the measurement systems of other nations, and furnishes essential services leading to accurate and uniform physical measurements throughout the Nation's scientific community, industry, and commerce. This Institute comprises a series of divisions, each serving a classical subject matter area:

—Applied Mathematics—Electricity—Metrology—Mechanics—Heat—Atomic Physics—Physical Chemistry—Radiation Physics—Laboratory Astrophysics²—Radio Standards Laboratory,² which includes Radio Standards Physics and Radio Standards Engineering—Office of Standard Reference Data.

THE INSTITUTE FOR MATERIALS RESEARCH . . . conducts materials research and provides associated materials services including mainly reference materials and data on the properties of materials. Beyond its direct interest to the Nation's scientists and engineers, this Institute yields services which are essential to the advancement of technology in industry and commerce. This Institute is organized primarily by technical fields:

—Analytical Chemistry—Metallurgy—Reactor Radiations—Polymers—Inorganic Materials—Cryogenics²—Office of Standard Reference Materials.

THE INSTITUTE FOR APPLIED TECHNOLOGY . . . provides technical services to promote the use of available technology and to facilitate technological innovation in industry and government. The principal elements of this Institute are:

—Building Research—Electronic Instrumentation—Technical Analysis—Center for Computer Sciences and Technology—Textile and Apparel Technology Center—Office of Weights and Measures—Office of Engineering Standards Services—Office of Invention and Innovation—Office of Vehicle Systems Research—Clearinghouse for Federal Scientific and Technical Information³—Materials Evaluation Laboratory—NBS/GSA Testing Laboratory.

¹ Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D. C., 20234.

² Located at Boulder, Colorado, 80302.

³ Located at 5285 Port Royal Road, Springfield, Virginia 22151.

NATIONAL BUREAU OF STANDARDS REPORT

NBS PROJECT
3120625 (G-39190)

MAR 26 1968

NBS REPORT
9800

EXAMINATION OF GALVANIZED (ZINC COATED) STEEL SHEET SAMPLES

By

W. F. Gerhold
Engineering Metallurgy Section

Sponsor

Department of State

Agency for International Development

IMPORTANT NOTICE

NATIONAL BUREAU OF STANDARDS
for use within the Government.
and review. For this reason, this
whole or in part, is not authentic
Bureau of Standards, Washington, D.C.
the Report has been specifically

Approved for public release by the
Director of the National Institute of
Standards and Technology (NIST)
on October 9, 2015

These accounting documents intended
to be subjected to additional evaluation
and a listing of this Report, either in
the Office of the Director, National
by the Government agency for which
copies for its own use.



U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Examination of
GALVANIZED (ZINC COATED)
STEEL SHEET SAMPLES

Submitted by

Department of State
Agency for International Development

Reference: (a) Department of State, Agency for International Development letter, dated February 8, 1968.

Introduction: Two galvanized (zinc coated) steel sheet samples were submitted under Reference (a). It was requested that these samples be examined to determine if the weight of the zinc coating was in conformance with that specified in ASTM Specification A446-67⁽¹⁾ for 1.25 commercial coating class. The minimum weight of coating specified for this coating class in the single spot test is 0.80 oz/ft².

Procedure: There were visible indications of corrosion and abrasive damage on one surface of each of the samples submitted. The other surface of each sample had been painted but there were indications of paint failure and subsequent corrosion on these surfaces also. A specimen of suitable size was obtained from an area on each sample where corrosion and abrasion were minimal. The paint coatings were stripped from these specimens and the specimens were then cleaned and weighed.

The zinc coating was stripped from the specimens by immersion in a 1:1 hydrochloric acid solution. The specimens were then rinsed in water, dried and reweighed.

The weight of coating was then determined by use of the following formula.

(1) Standard Specification for Zinc Coated (Galvanized) Steel Sheets of Structural Quality, Coils and Cut Lengths.

$$C = \frac{W_1 - W_2}{W_2} \times G \times K$$

where:

- C = wt. of coating (oz/ft² of sheet)
- W₁ = original weight of specimen (g)
- W₂ = weight of stripped specimen (g)
- G = thickness of stripped sheet (in)
- K = a constant (655)

The weights of coating thus obtained for the specimens were 0.87 oz/ft² and 0.94 oz/ft². Both samples had coating weights within the specification limits for 1.25 commercial coating class. The original weight of coating on the samples may have been greater than that determined, as any corrosion during service would have reduced the amount of zinc on the surface.

