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O T T A W A September 28, 1945.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1943.

Corrosion Protection of Dewatering Rust Preventive Compounds.

(Copy No. 10.)

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Background:

A letter dated March 19, 1945, from Dr. D. Wolochow, Secretary, Canadian Government Purchasing Standards Committee, National Research Council, Ottawa, Ontario, requested that the corrosion protection of a number of different rust preventive compounds be investigated. The letter stated, in part:

> "In connection with the work of our Wartime Subcommittee on Petroleum and Associated Products, it has been suggested that the several laboratories, who are equipped for testing rust preventive compounds to the specifications which we are sending you, be asked to test a number of exchange samples to be supplied by the producing companies."

The present report gives the results obtained in the investigation of the corrosion protection of four Dewatering Rust Preventive Compounds, numbered 702-1, 702-2, 702-3 and 702-4. These were tested to Specification D.N.D. 702.

Investigation Procedure:

The above-mentioned Dewatering Rust Preventive Compounds were tested for the following:

1. Water Displacement.

The tests were performed exactly according to Paragraph D-1f(3) of Specification D.N.D. 702 and the additional information received on May 23 from the Naval Service, Department of National Defence, Ottawa, through Dr. Wolochow.

The quantity of Compound 702-2 received was not sufficient to permit of testing for water displacement.

2. Protection At High Humidity.

(a) One group of tests on the four compounds was performed exactly according to Paragraph D-1f of Specification D.N.D. 702 except that the panels were prepared for testing in a different manner. This variation was necessary because the procedure outlined in the specification gave unsatisfactory results on very humid days.

Procedure Used in Preparing Panels for Testing:

After surfacing with the 150 grit wheel, the panels were wrapped in clean white paper. As soon as possible they were degreased in trichlorethylene vapour, scrubbed with a brush while immersed in trichlorethylene liquid, again suspended in trichlorethylene vapour, and, finally, wrapped in clean white paper until the coating could be applied.

(b) Other tests on two of the four compounds were performed exactly according to Paragraph D-1f of the specification except that

(i) the panels were surfaced with a 180 grit belt instead of a 150-200 grit wheel;

(ii) air was passed continually through the humidity cabinet.

In all other respects it was possible to prepare these panels for testing exactly according to the specifications because

(Investigation, cont'd) -

there was no trouble with high atmospheric humidity at that time of the year (early spring).

Results:

The results of the investigation were as follows:

COMPOUND	RESULTS OF TESTS		
		Protection at High Humidity	
	Water Displacement Test	Without Air Passing Through The Cabinet	With Air Passing Through The Cabinet
702-1	Failed.	Failed (see Figure 1).	Failed (see Figure 2).
702-2	Insufficient compound.	Failed (see Figure 3).	Failed (see Figure 4).
702-3	Passed.	Passed.	-
702-4	Failed.	Passed.	-

Remarks:

1. The compounds which failed when air passed through the humidity cabinet also failed when no air passed through the cabinet. However, Compound 702-1 failed to a somewhat greater extent when air did not pass through the cabinet than when it did. On the other hand, Compound 702-2 failed much more with air passing through than without it. In other words, the two methods of testing do not give exactly the same results.

2. The humidity cabinet used throughout this investigation was the one described by Todd in INDUSTRIAL AND ENGINEERING CHEMISTRY, Analytical Edition 16, 394 (June 1944).

3. Our humidity cabinet built to Specification AN8517 will be available for investigational work within the next few days.

4. Information regarding the results obtained by other investigators would be much appreciated.

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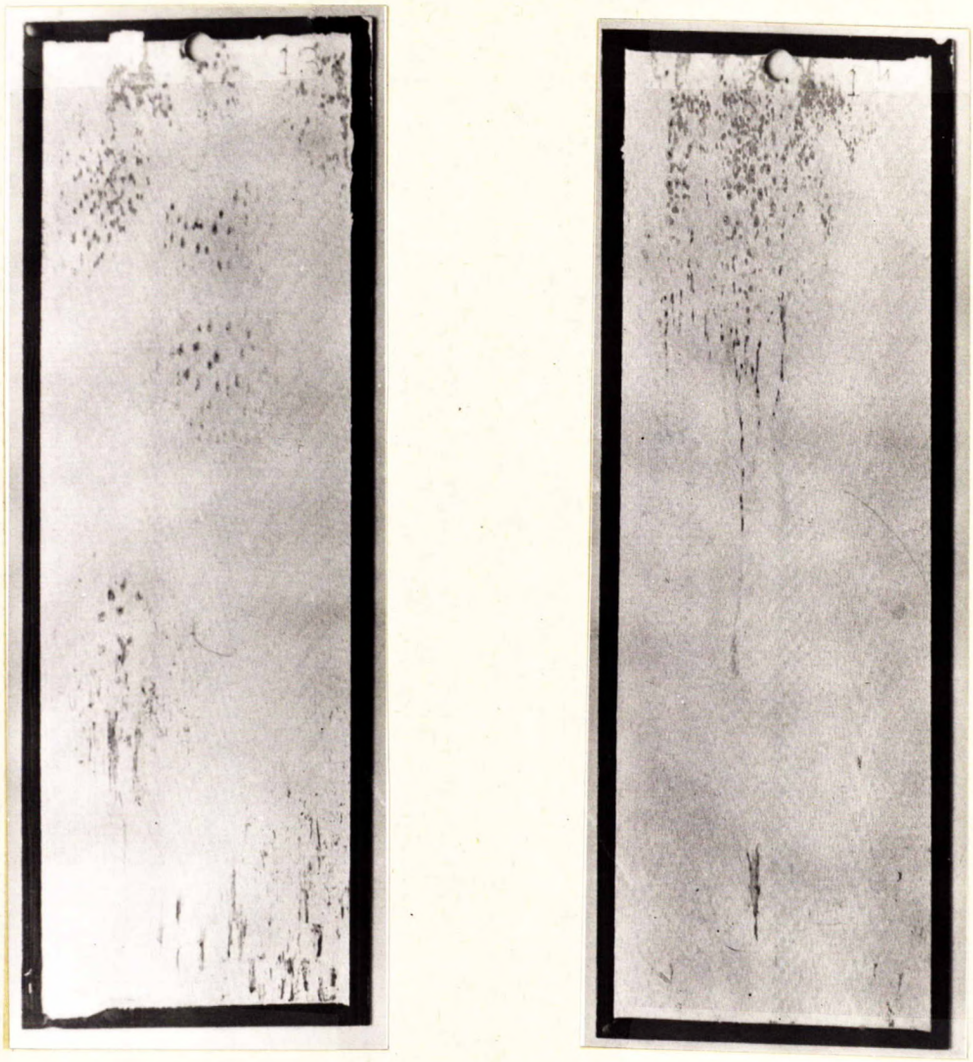
(Figures 1 to 4 follow on Pages 4 to 7.)

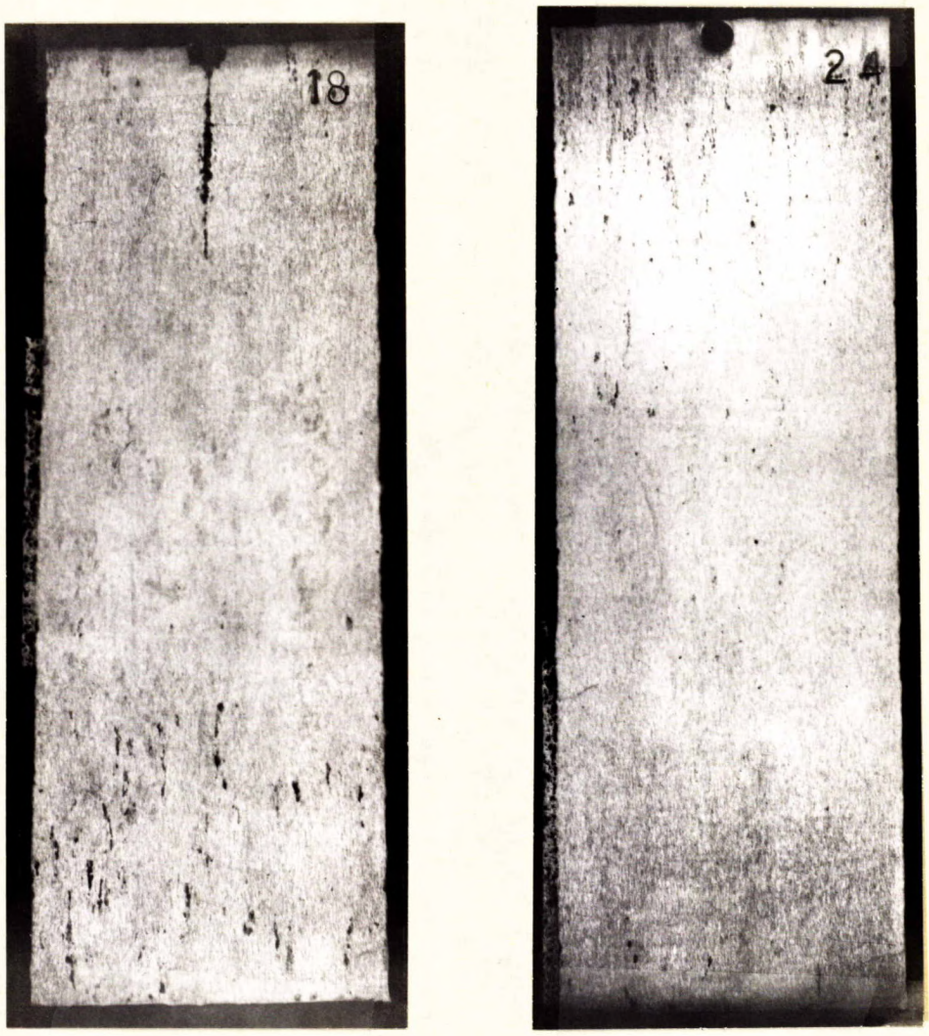
Figure 1.



(a) (b)

PANELS COATED WITH COMPOUND 702-1, AFTER 7 DAYS IN THE HUMIDITY CABINET WITHOUT AIR PASSING THROUGH.

Figure 2.



(a) (b)

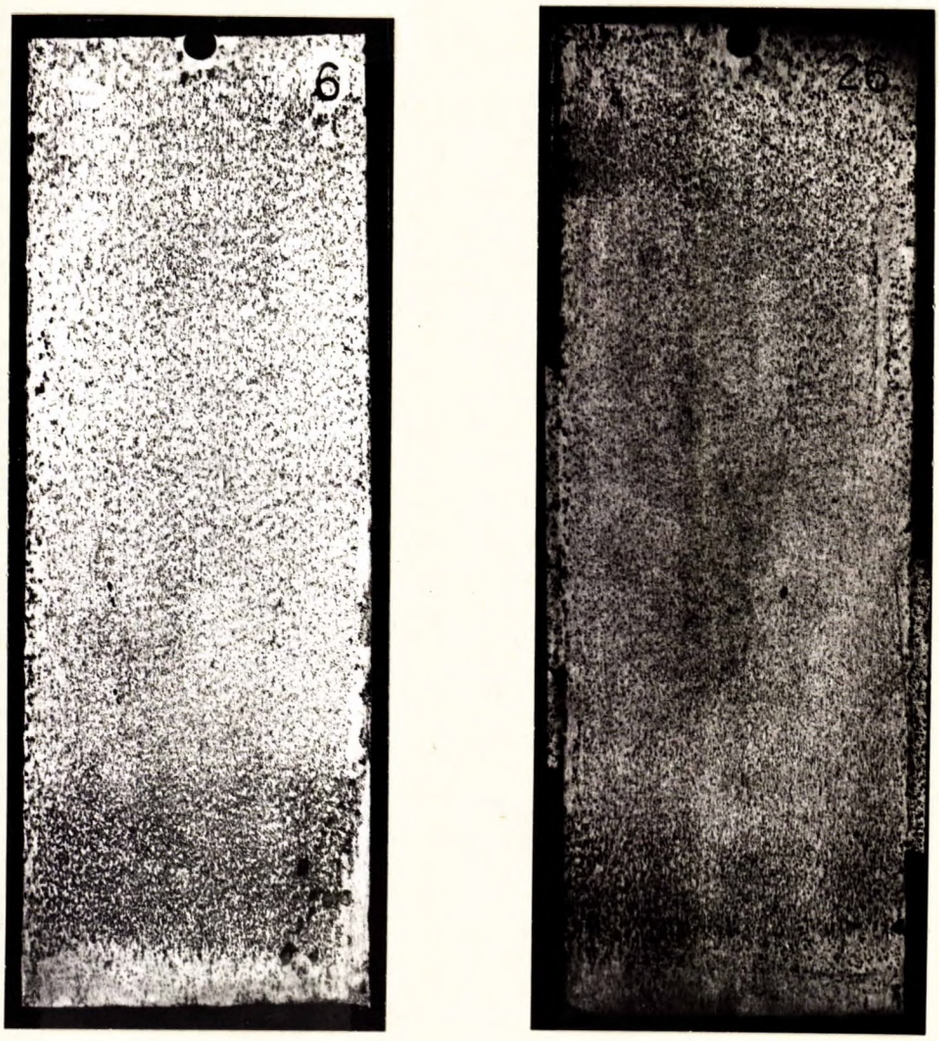
PANELS COATED WITH COMPOUND 702-1, AFTER
7 DAYS IN THE HUMIDITY CABINET WITH
AIR PASSING THROUGH.

Figure 3.

(a) (b)

PANELS COATED WITH COMPOUND 702-2, AFTER 7 DAYS IN THE HUMIDITY CABINET WITHOUT AIR PASSING THROUGH.

Figure 4.



(a) (b)

PANELS COATED WITH COMPOUND 702-2, AFTER 7 DAYS IN THE HUMIDITY CABINET WITH AIR PASSING THROUGH.

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