



REPORT

Electrical Testing Laboratories, Inc.

2 EAST END AVENUE

NEW YORK, N. Y. 10021

Order No. 83482-C

Date December 22, 1971

REPORT NO. 419071

ACCELERATED OXYGEN AGING AND ACCELERATED LIGHT AND
WEATHER RESISTANCE OF ONE SAMPLE OF METAL FOIL,
ADHESIVE BACKED IDENTIFICATION PLATES

RENDERED TO METALPHOTO CORPORATION

Client's Authorization:	Letter, November 1, 1971
Defense Electronics	
Supply Center Authorization:	DESC-EQE-71-1154 (Mott), dated October 14, 1971.
Data Requested:	Accelerated Oxygen Aging and Accelerated Light and Weather Resistance as required by Par. 4.7.6 and 4.7.7, respectively of Military Specification MIL-P-19834A, January 14, 1960 Amendment 6, November 6, 1970.
DESC Designation	Type I, Size 25 (Black Printing)
Manufacturer's Designation:	AMP-4

Results of Tests

<u>Accelerated Oxygen Aging</u>	<u>Visible Effect</u>	<u>Specified*</u>
Exposure for 96 hrs at 300 psi oxygen at 70°C, mounted on glass panels	None on identification characters	None on identification characters
<u>Accelerated Light and Weather Resistance</u>		
Exposure for 200 hrs. to ultraviolet light and intermittent water spray, mounted on phenolic panels	None on identification characters	None on identification characters

*In Military Specification MIL-P-19834A, Par. 3.4.5 and 3.4.6, respectively.



Report No. 419071

2.

Test Methods

Eight plates, each 7 x 7 inches bearing black lettering on adhesive backed aluminum foil were submitted for tests.

Accelerated Oxygen Aging

As described in Method 5852 of Federal Specification CCC-T-191b.

Apparatus used: Bierer-Davis oxygen bomb, manufactured by Emerson Apparatus Co. of Melrose, Mass.

Test specimen mounted on each of four glass panels 3 x 6 inches.

Accelerated Light and Weather Resistance

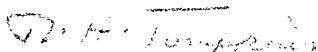
As described in Method 5804 of Federal Specification CCC-T-191b.

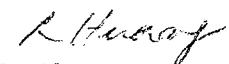
Apparatus used: XW-R Weather-ometer, Serial No. WO-2444, manufactured by Atlas Electric Devices Co. of Chicago, Illinois.

Test specimen mounted on each of five phenolic panels 3 x 6 inches.


Attached to and forming a part of this report are photographic prints of test specimens, made before and after exposure in oxygen bomb and Weather-ometer.

Report Approved by:


Chief Chemist


In Charge of Tests

Date of Tests: November 30 to December 14, 1971.

Copied by: apc
Checked by: 

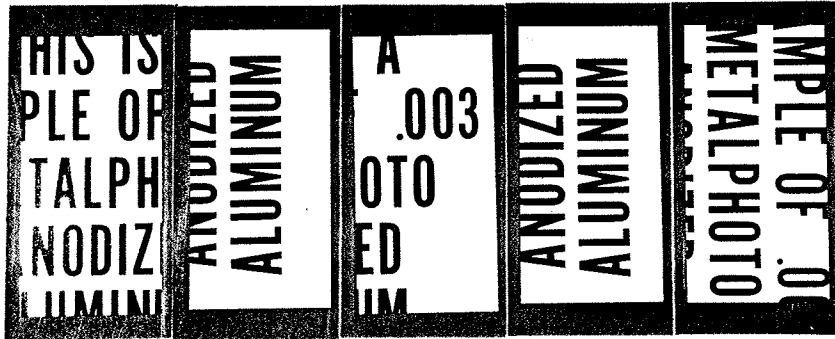


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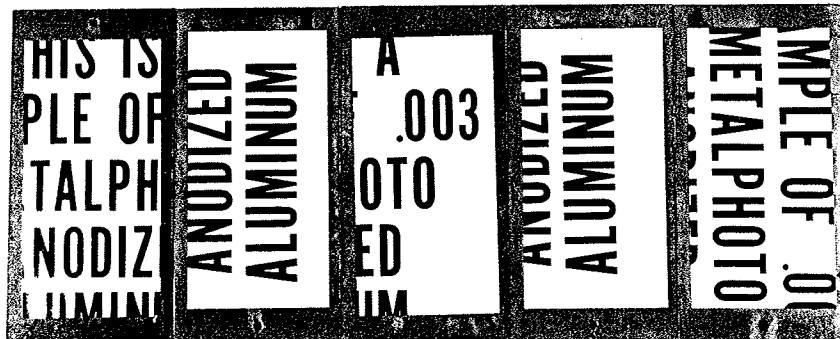
Before exposure in Oxygen Bomb on glass panel.

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After exposure in Oxygen Bomb on glass panel.



Before exposure in Weather-ometer on phenolic panel



After exposure in Weather-ometer on phenolic panel

July 5, 1972

ABRASION RESISTANCE

Abrasion Resistance as required by Par. 4.7.3 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing) Adhesive AMP-4.

TEST METHOD:

Two plates, each 3-3/4" x 4-1/4", bearing black lettering on adhesive backed aluminum foil mounted on 1/4" aluminum panels were tested.

Abrasion resistance as described in Method 5306 of Federal Specification CC-T-191.

Apparatus Used: Taber Abraser, manufactured by Taber Instrument Corporation of North Tonawanda, New York.

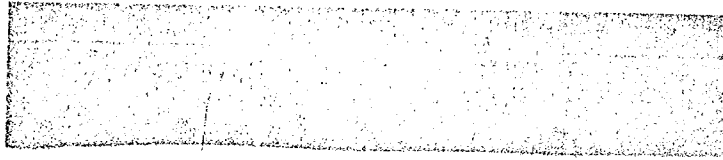
<u>TEST</u>	<u>RESULTS</u>	
<u>Abrasion Resistance</u>	<u>Visible Effect</u>	<u>Specified*</u>
Test panels were run 500 cycles using CS-17 calibrase wheels and 1,000 gram loading.	None on Identification Characters	None on Identification Characters.

* In Military Specification MIL-P-19834A, Par. 3.4.2

Photographs of Before and After:

See Following Page

ABRASION RESISTANCE

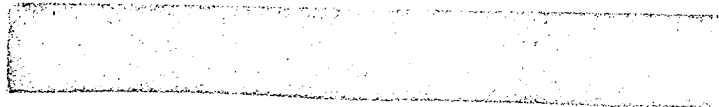


THIS IS
A
SAMPLE OF
METAL
SURFACE

FACE OF A
CYLINDRICAL
INDENTOR
LOADING

Before Abrasion

BEFORE ABRASION WITH TABER ABRASER



THIS IS
A
SAMPLE OF
METAL
SURFACE

After Abrasion

AFTER ABRASION WITH TABER ABRASER

July 5, 1972

WATER RESISTANCE

Water Resistance as required by Par. 4.7.9 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing) Adhesive AMP-4.

TEST METHOD:

Ten plates, each 7" x 7", bearing black lettering on adhesive backed aluminum foil mounted on painted and unpainted test panels were tested.

Apparatus Used: One tank, Metalphoto image intensifying size, manufactured by Arco Plastic Company of Cleveland, Ohio.

TEST RESULTS

<u>Water Resistance</u>	<u>Visible Effect</u>	<u>Specified*</u>
Test panels were submerged in tap water for a period of 12 hours.	None on Identification Characters	None on Identification Characters

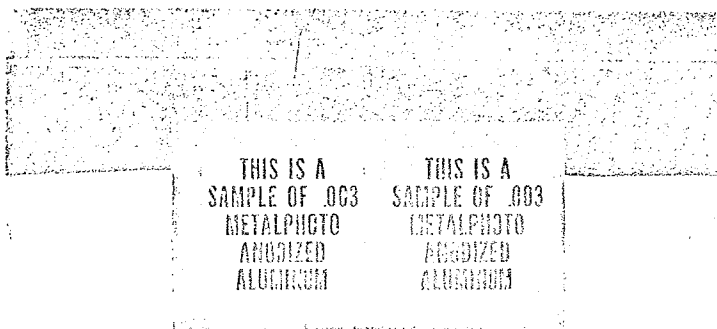
* In Military Specification MIL-P-19834A, Par. 3.4.8.

Photographs of Before and After:

See Following Pages.

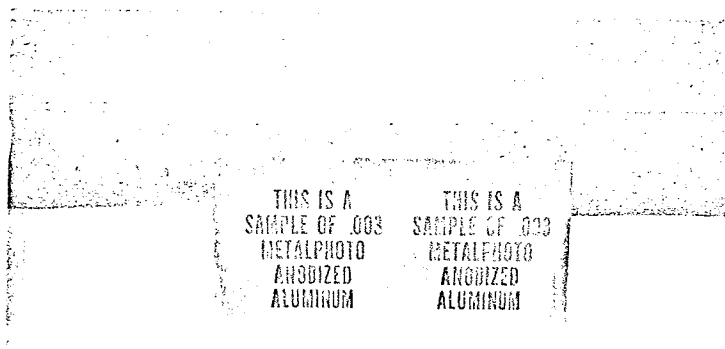
July 5, 1972

WATER RESISTANCE



Al.

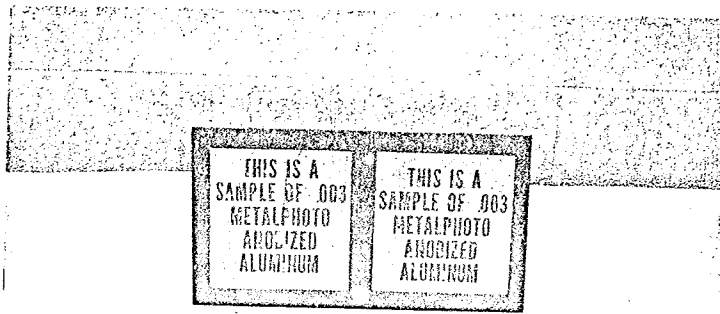
BEFORE WATER RESISTANCE - PANEL ALUMINUM



AFTER WATER RESISTANCE TEST

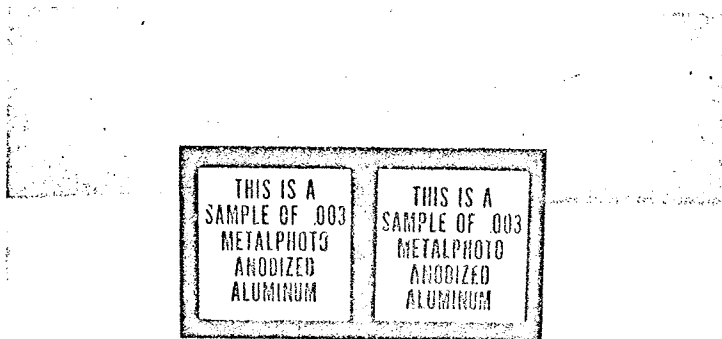
July 5, 1972

WATER RESISTANCE



Sea Blue Al.

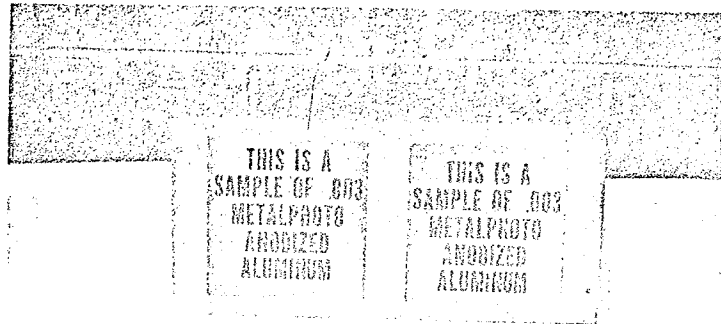
BEFORE WATER RESISTANCE TEST - PAINTED ALUMINUM



AFTER WATER RESISTANCE TEST

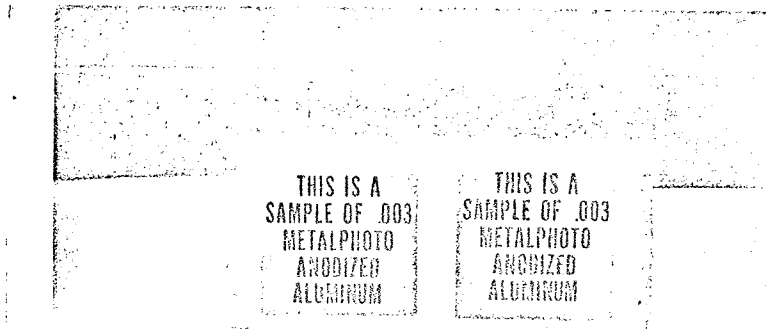
July 5, 1972

WATER RESISTANCE



Steel

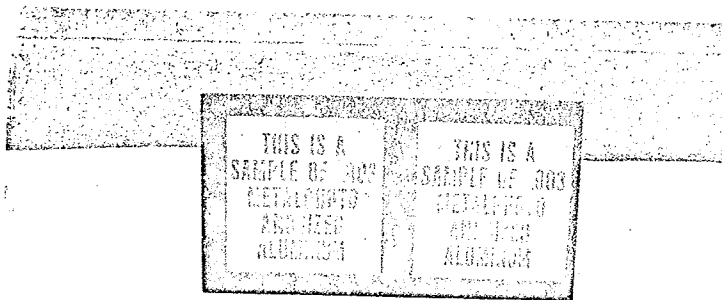
BEFORE WATER RESISTANCE TEST - PANEL PAINTED STEEL



AFTER WATER RESISTANCE TEST

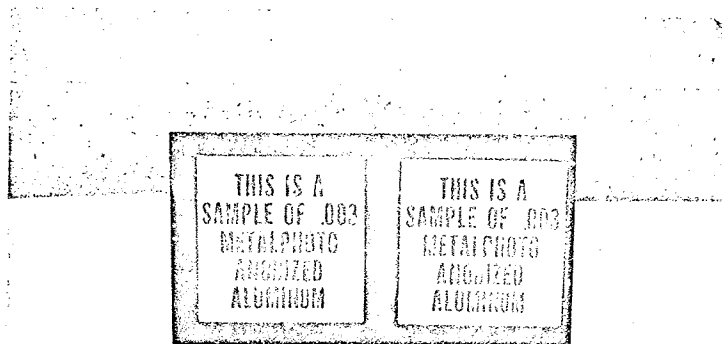
July 5, 1972

WATER RESISTANCE



P1-101/c

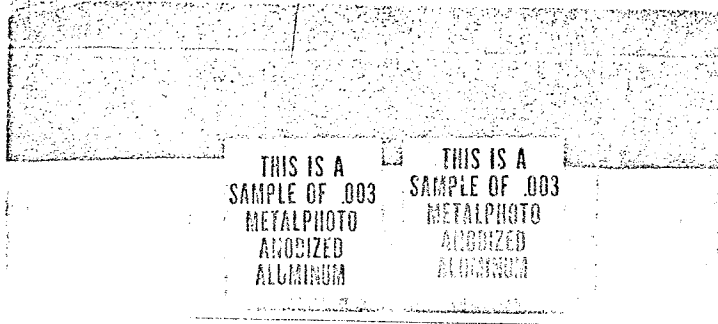
BEFORE WATER RESISTANCE TEST - PANEL PHENOLIC



AFTER WATER RESISTANCE TEST

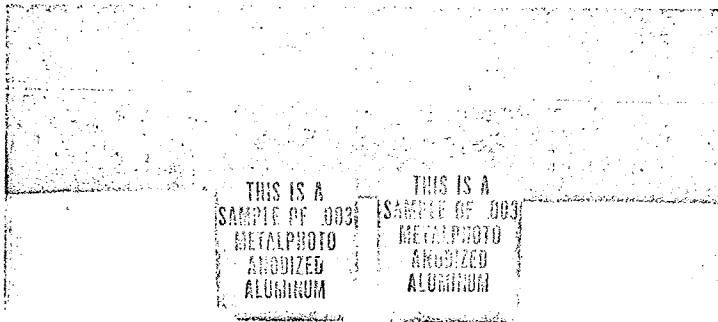
July 5, 1972

WATER RESISTANCE



Glass.

BEFORE WATER RESISTANCE TEST - PANEL GLASS



AFTER WATER RESISTANCE TEST

July 7, 1972

SALT SPRAY

Salt Spray as required by Par. 4.78 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing).

TEST METHOD:

Two plates, each 7" x 7", bearing black lettering on adhesive-backed foil mounted on phenolic test panels were tested.

As described in Method 606.1 of Standard FED-STD-141.

Apparatus Used: Salt Spray Cabinet Model SCCH-20, manufactured by Albert Singleton.

Range Room Temperature: To 110° F.

TEST RESULTS

<u>Salt Spray Resistance</u>	<u>Visible Effect</u>	<u>Specified*</u>
Test panels were exposed for 200 hours at 95° F. in 20 per cent salt spray.	None on Identification Characters	None on Identification Characters

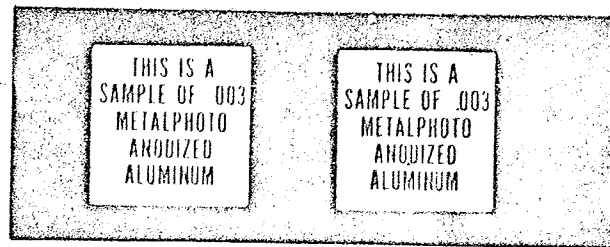
* In Military Specification MIL-P-19834A, Par. 3.4.7

Photographs of Before and After:

See Following Page

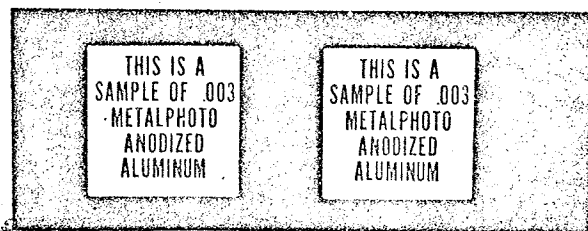
July 7, 1972

SALT SPRAY RESISTANCE



Phenolic Salt Spray

BEFORE



AFTER

August 1, 1972

CLEANING RESISTANCE

Cleaning resistance as required by Par. 4.7.11 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing).

TEST METHOD:

Ten plates, each 7" x 7" bearing black lettering on adhesive backed aluminum foil mounted on painted and unpainted test panels were tested.

Apparatus Used: A Spray King hose nozzle, hose, scrub brush, and No. 57 Paper Towels, made by Top-Towels.

<u>TEST</u>	<u>RESULTS</u>	
<u>Cleaning Resistance</u>	<u>Visible Effect</u>	<u>Specified*</u>
Janitor-in-the-Drum was used as cleaning agent and was applied by cold steam process, hose, brush, and hand-wiped for a period of one minute each.	None on Identification Characters	None on Identification Characters

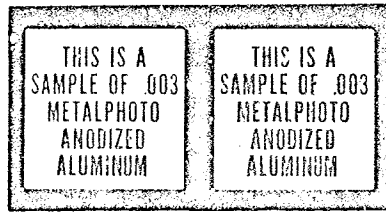
* In Military Specification MIL-P-19834A, Par. 3.4.10

Photographs of Before and After:

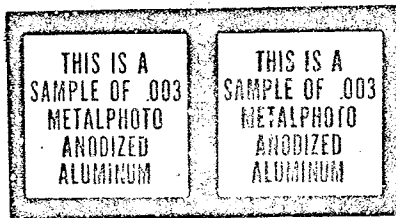
See Following Pages

August 1, 1972

CLEANING RESISTANCE



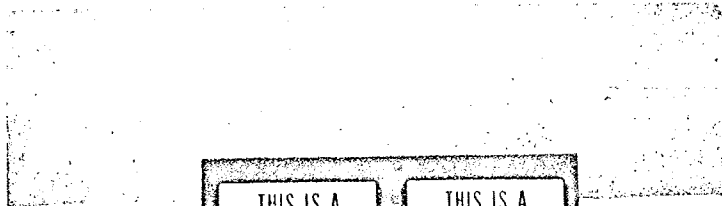
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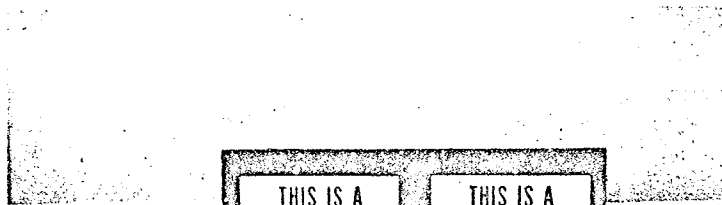
August 1, 1972

CLEANING RESISTANCE



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AFTER

August 1, 1972

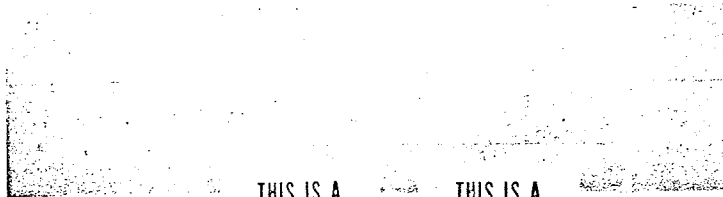
CLEANING RESISTANCE



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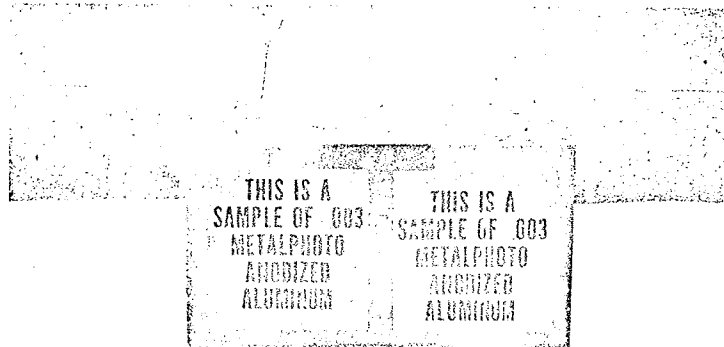


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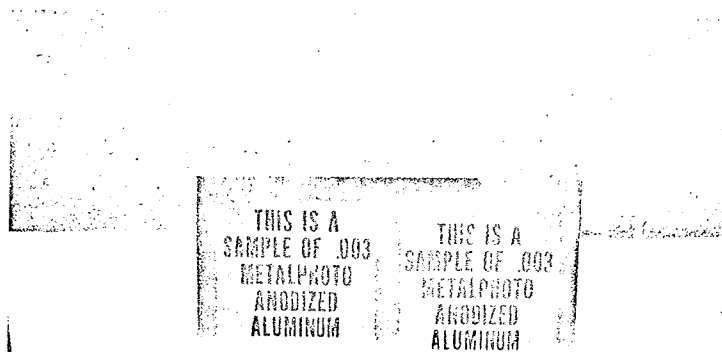
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AFTER

CLEANING RESISTANCE



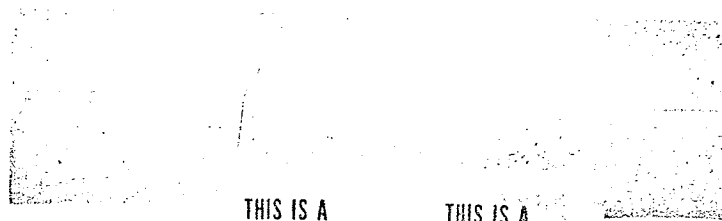
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August 1, 1972

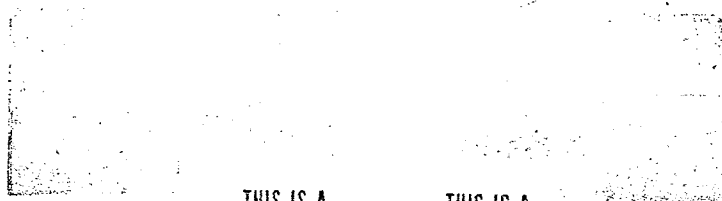
CLEANING RESISTANCE



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AFTER

TEMPERATURE RANGE

Temperature range as required by 4.7.12 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing).

TEST METHOD:

Ten plates, each 7" x 7", bearing black lettering on adhesive backed aluminum foil mounted on painted and unpainted test panels were tested.

Apparatus Used: One tank, Metalphoto Image Intensifying size, manufactured by Arco Plastic Co. of Cleveland, Ohio. One Blue Line oven (range 35° C. to 180° C.), manufactured by Blue M Electric Co., Chicago, Illinois.

<u>Temperature Range</u>	<u>Visible Effects</u>	<u>Specified*</u>
Test panels were subjected to temperature extremes of minus 55° C. and plus 105° C. for 3 hours at each temperature and inspected at the end of each temperature conditioning period.	None on Identification Characters	None on Identification Characters

* In Military Specification MIL-P-19834A, Par. 3.4.11.

Photographs of Before and After:

See Following Pages.

August 8, 1972

TEMPERATURE RANGE - GLASS PANEL

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AFTER

TEMPERATURE RANGE - PAINTED STEEL PANEL

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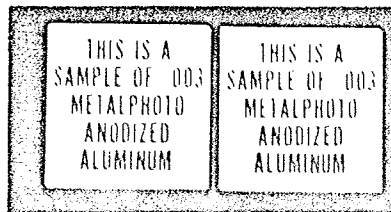
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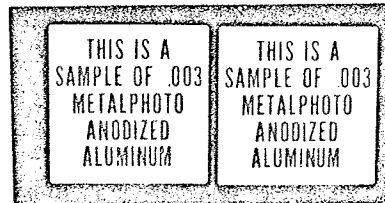
AFTER

August 8, 1972

TEMPERATURE RANGE - PHENOLIC PANEL



BEFORE



AFTER

TEMPERATURE RANGE - ALUMINUM PANEL

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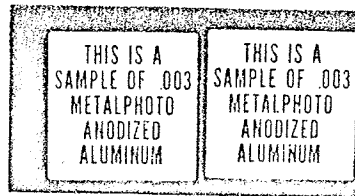
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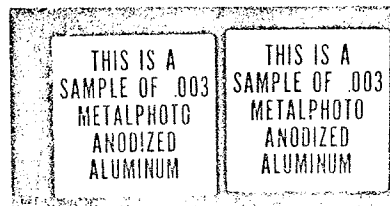
AFTER

August 8, 1972

TEMPERATURE RANGE - PAINTED ALUMINUM PANEL



BEFORE



AFTER

FUEL RESISTANCE

Fuel resistance as required by Par. 4.7.11 of Military Specification MIL-P-19834A, January 14, 1960, Amendment 6, November 6, 1970, Type I, Size 25 (Black Printing).

TEST METHOD:

Twenty plates, each 7" x 7", bearing black lettering on adhesive backed aluminum foil mounted on painted and unpainted test panels were tested.

Apparatus Used: One tank, Metalphoto Image Intensifying size, manufactured by Arco Plastic Company of Cleveland, Ohio.

TEST RESULTS

<u>Fuel Resistance</u>	<u>Visible Effects</u>	<u>Specified*</u>
Ten plates were immersed half their width in hydrocarbon test fluid conforming to Type III of Specification MIL-H-3136 for one hour. Ten additional plates were immersed half their width in jet fuel conforming to Specification MIL-F-5161 for one hour. Plates examined immediately after removal and after 24 hours of air drying.	None on Identification Characters	None on Identification Characters

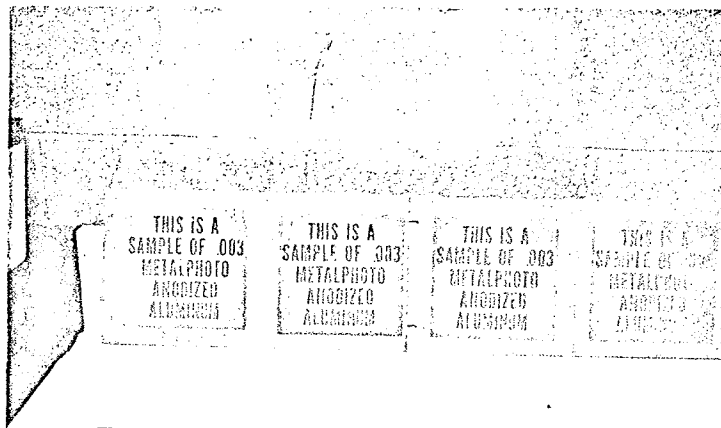
* In Military Specification MIL-P-19834A, Par. 3.4.9

Photographs of Before and After:

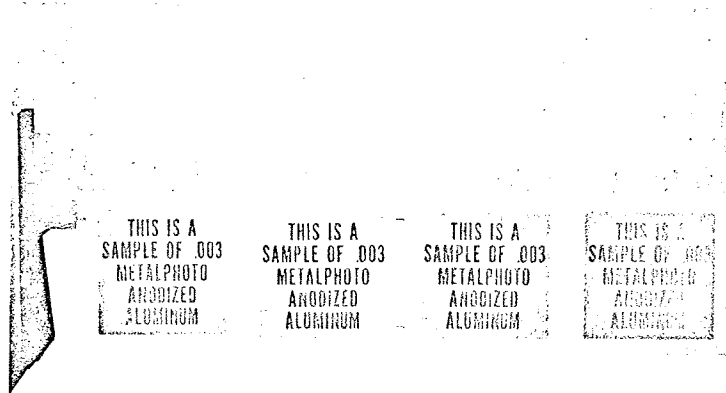
See Following Pages.

In the photographs, the two plates on the left were immersed in the jet fuel and the two plates on the right were immersed in the hydrocarbon test fluid.

FUEL RESISTANCE - PAINTED STEEL PANEL

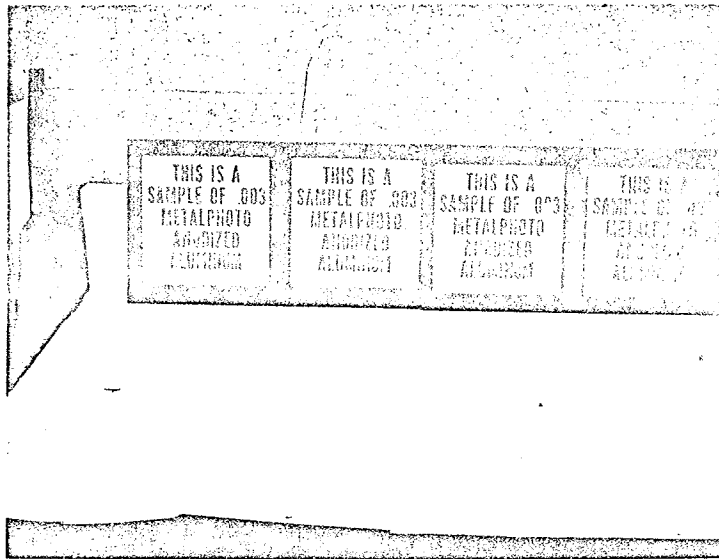


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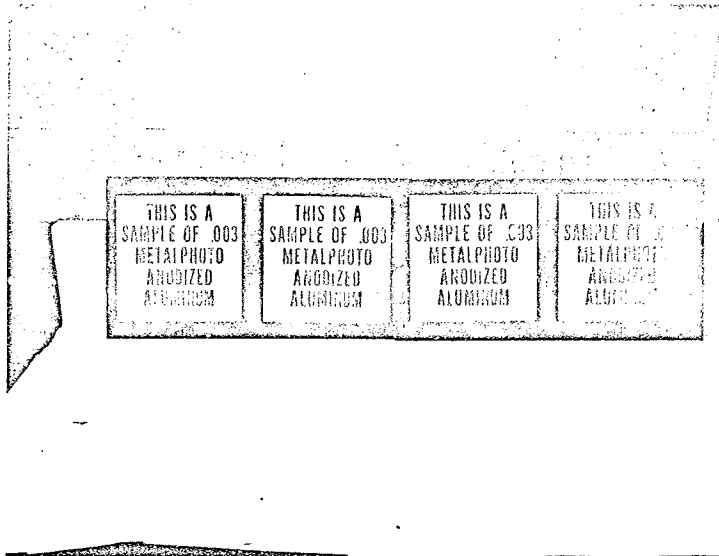


AFTER

FUEL RESISTANCE - PAINTED ALUMINUM PANELS

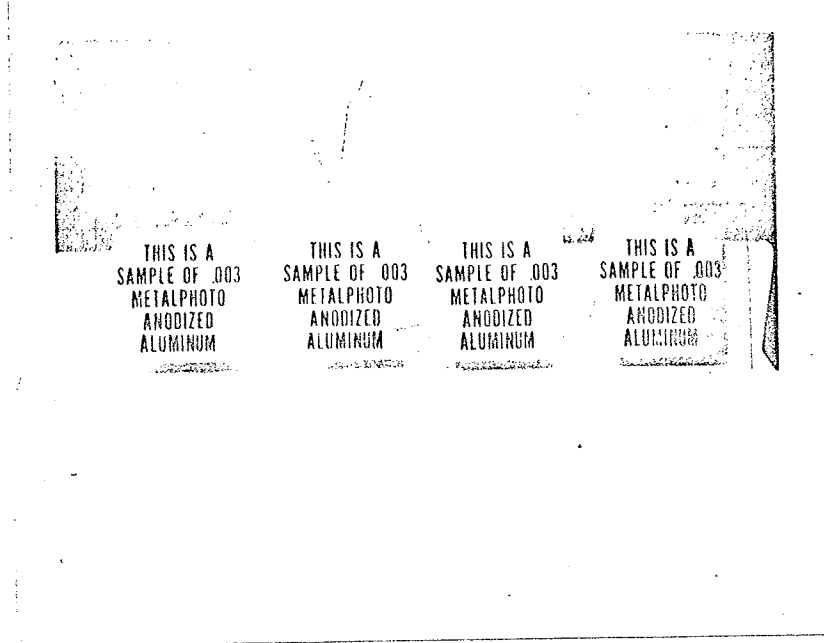


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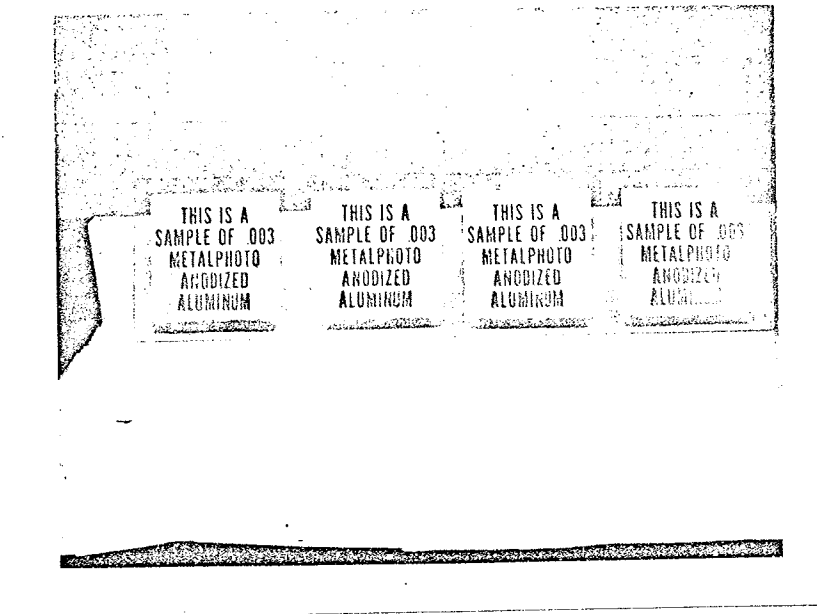


AFTER

FUEL RESISTANCE - GLASS PANEL

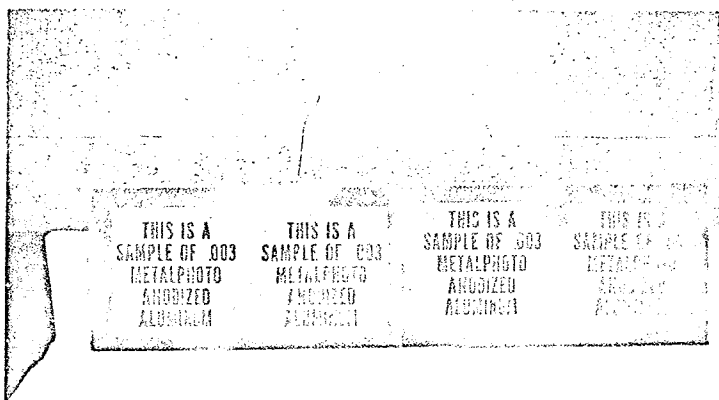


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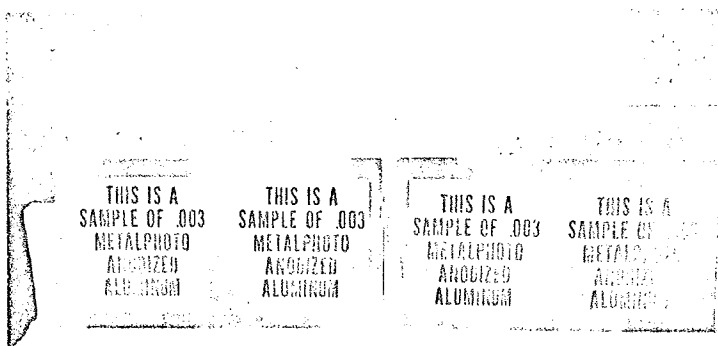


AFTER

FUEL RESISTANCE - ALUMINUM PANELS

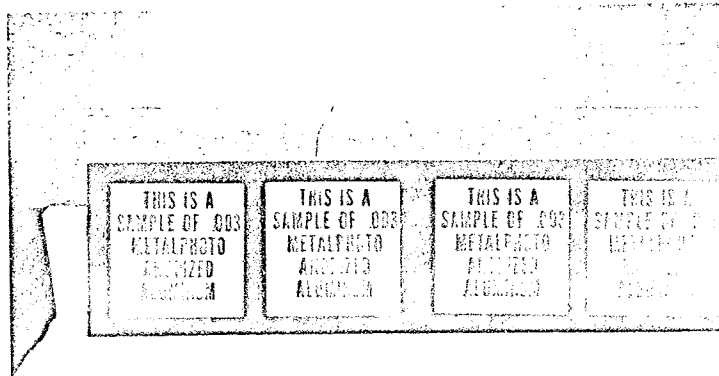


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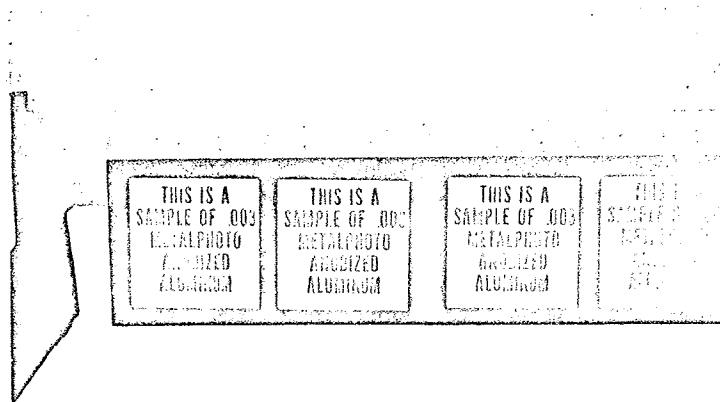


AFTER

FUEL RESISTANCE - PHENOLIC PANEL



BEFORE



AFTER