

TT-C-490C  
 AMENDMENT 1  
30 June 1967

# FEDERAL SPECIFICATION

## CLEANING METHODS FOR FERROUS SURFACES AND PRETREATMENTS FOR ORGANIC COATINGS

This amendment, which forms a part of Federal Specification TT-C-490C, dated March 18, 1965 is approved by the Commissioner, Federal Supply Services, General Services Administration, for the use of all Federal agencies.

Page 1

### Paragraph 1.2.2

ADD: under "type I - Zinc phosphate coatings", the following coating weight classifications:

Class 1 - Spray application (150 mg/sq ft min - 400 mg/sq ft max)

Class 2A - Immersion or Dip application (300  $\pm$  50 mg/sq ft)

Class 2B - Immersion or Dip application (600 mg/sq ft min - to 1000 mg/sq ft max)

CHANGE: "Type II - Iron phosphate", to the following coating weight:

Type II - Aqueous iron phosphate (35 mg/sq ft min)

ADD: under "Type IV - Non-aqueous iron phosphate", the following coating weight classifications:

Class 1 - 75 mg/sq ft min

Class 2 - 50  $\pm$  15 mg/sq ft

Add the following new paragraph:

"1.2.2.1 Types I and IV. New design documents, engineering drawings and ordering data shall indicate specific coating weight classification required (See 6.17)."

ANSC N/A

/AREA EFFF/

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TT-C-490C -  
AMENDMENT 1

Page 6

Paragraph 3.5.2

Delete paragraph and change as follows:

"3.5.2 Phosphate coating weight (Types I, II and IV only) (not applicable to incidental nonferrous metal). Coating weight shall be controlled or tested as in paragraph 4.2.6. Unless otherwise specified, the coating weight shall be tested at least every four hours." The following coating weights are applicable.

3.5.2.1 Type I covers three classifications (Class 1, Class 2A, and Class 2B). Class 1 is for spray processes and requires a minimum coating weight of 150 mg/sq ft. There are two classes for the immersion or dip application. Class 2A calls for a coating weight of  $300 \pm 50$  mg/sq ft while class 2B covers a coating weight range of 600 mg/sq ft to 1000 mg/sq ft (see 6.16.1).

3.5.2.2 Type II has a minimum coating weight of 35 mg/sq ft.

3.5.2.3 Type IV covers two classifications (class 1 and class 2). Class 1 has a minimum coating weight requirement of 75 mg/sq ft and class 2 calls for a coating weight of  $50 \pm 15$  mg/sq ft.

Page 8

Paragraph 4.2.6.1

DELETE: (under paragraph 4.2.6.1, the following formula:

$$\text{g/sq m} = \frac{(\text{Initial weight in grams} - \text{final weight in grams})}{\text{Total surface area in square inches}}$$

REPLACE deleted formula with the following:

$$\text{mg/sq m} = \frac{(\text{Initial weight in milligrams} - \text{final weight in milligrams})}{\text{Total surface area in square meters}}$$

ADD: At the end of the paragraph 4.2.6.1, insert the following note:

NOTE: See section 6, paragraph 6.16.

TT-C-490C  
AMENDMENT 1

Page 11

## Paragraph 6.4

CHANGE: part (a) listed under ordering data from "(a) Title, number and date of this specification" to the following:

"(a) Specification identification includes title, revision letter and date of specification and existing amendment. Type of coating and applicable classification must also be specified."

## Paragraph 6.5.1.1

DELETE: entire paragraph and change as follows:

"6.5.1.1 Type I. The U.S. Army Materials Technology Laboratory (MTL) is the referee agency responsible for Army preproduction procedure approval and when requested by the procuring agency, phosphatized test panels and technical information shall be submitted through the contracting officer to: U.S. Army Materials Technology Laboratory, Watertown, MA 02172-0001. When MTL is used as the referee laboratory, MTL requires prospective contractors to submit the following information:

a. Specification identification including revision letter and amendment if issued. Also indicate the classification for which preproduction procedure approval is requested.

b. A cover letter designating contract number, component or part number and contractor/subcontractor (Company name and Commercial and Government Entity (CAGE) code number if available) shall be furnished by the procuring activity for documentation purposes.

c. Detailed information shall be included in the proposed procedure with respect to chemicals and equipment used. The supplier's chemical product profile or technical data instructives for both make-up and the limiting/optimum operating condition shall be included for the purpose of formulation verification.

d. The title page of the detailed procedure shall indicate: company name, date of preparation/date of revision, identification code or manufacturing process number if available and the total number of pages within the procedure (Note: each page within the procedure should be numbered to reflect the total page count).

e. A preliminary process cycle shall list the necessary steps needed to carry out the phosphate coating procedure. Tank numbers shall be assigned to the processing baths so that the finishing cycle will correspond to the detailed description within the procedure.

f. Describe processing tank material, size, working capacity (volume), and chemical make-up for each bath and indicate the specific parameters used within each bath for each operation.

g. Quality control procedures shall be included which will be used for monitoring each bath used within the procedure.

h. Coating weight requirements shall be specified and quality assurance control procedures shall be specified which will assure proper control.

~~TT-C-490C~~  
AMENDMENT 1

i. Specify hydrogen embrittlement relief procedures and the quality assurance provisions employed to alleviate embrittlement problems prior to shipment of parts.

j. The contractor/subcontractor shall prepare six (preferably 3 inch X 6 inch) phosphatized panels for the procuring agency or designated laboratory (see 4.2.2 TT-C-490) using the proposed phosphate coating procedure designated for use in contract and shall indicate the average test results of three representative panels (coating weights) tested in accordance with paragraph 4.2.6.1. The contractor shall forward three of these phosphatized panels to the designated laboratory, so that panels can be evaluated for conformance to paragraphs 3.5.1.1 and 3.5.2.

Page 15

Add the following paragraphs:

"6.16 Phosphate coating weights. EPA regulations are imposed by both Federal and State agencies which place a financial burden on the contractor. Therefore, accurate alternative stripping methods may be substituted for the chronic acid stripping solution described in paragraph 4.2.6.1 provided the same accuracy can be maintained. The Infracast (model No. 450) manufactured by Foxboro analytical is an instrument which has been used for determining coating weights on flat surfaces having a minimum surface area of 1 1/4 inch. It may also be beneficial to note that the scanning electron microscope (SEM) has been utilized to study the zinc phosphate crystal morphology.

6.16.1 Coating weight conversions. Coating weights are given in mg/sq ft. throughout this specification. However, because there may be a need to express the coating weight in mg/sq m, the following conversion factor is noted for informational purposes:

$$\text{mg/sq m} = \text{mg/sq ft} \times 10.764$$

6.17. Existing documents and/or drawings. All existing documents and/or drawings which call for pretreatment per TT-C-490, types I or IV do not presently identify classification but future revisions should be updated to include appropriate classification."

**Military custodians:**

Army - MR  
Navy - YD  
Air Force - 20

**Review interest:**

Army - MI, FE, AV, AL, AR, AT, ME  
Navy - AS  
Air Force - 70, 82, 99

**User interest:**

Army - ME, AL  
Navy - MC, OS, SH  
Air Force - 80

**Preparing activity:**

Army - MR

**Civil agency interest:**

GSA

**Coordinating activity:**

GSA-FSS

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