Engineering Material Specification

Material Name	Specification Number
CORROSION PROTECTIVE COATING, ZINC/CHROMATE/ORGANIC TYPE - 144 h	ESA-M21P2-A1
CORROSION PROTECTIVE COATING, ZINC/CHROMATE/ORGANIC TYPE - 240 h	ESA-M21P2-A2
CORROSION PROTECTIVE COATING, ZINC/CHROMATE/ORGANIC TYPE - 336 h	ESA-M21P2-A3
CORROSION PROTECTIVE COATING, ZINC/CHROMATE/ORGANIC WITH AQUEOUS TOPCOAT SEALER - 400 h	ESA-M21P2-A4

1. SCOPE

These specifications define four performance levels of a proprietary corrosion protection coating for steel which is heat converted from an aqueous dispersion of zinc flake, chromium salts, and organic materials.

2. APPLICATION

These specifications were released originally for a corrosion protection coating on steel where salt spray resistance in excess of 144 h is required. Since hydrogen embrittlement is not induced, this coating is suitable for springs and other high hardness parts. It is not suitable for parts which contact stainless steel or other metals which are unfavorable to zinc due to bimetallic corrosion, or which are adversely affected by baking temperatures in the range 260 - 315°C.

3. REQUIREMENTS

3.1 APPEARANCE

The coating shall be uniform in color and free from discontinuities. The coating shall be metallic grey unless otherwise specified on the engineering drawing.

3.2 CORROSION RESISTANCE (ASTM B 117)

	Salt Spray h, min
ESA-M21P2-A1	144
ESA-M21P2-A2	240
ESA-M21P2-A3	336
ESA-M21P2-A4	400, or as specified on engineering drawing.

3.2.1 Salt Spray Evaluation

Parts shall pass salt spray requirements if the tested coatings have six red spots or less for any 930 cm^2 area that is visible to the unaided eye. A part is allowed one red rust spot on the significant surface for any size area, however, the total area of the number of parts tested, if over 155 cm^2 in area, shall not have more than one red spot per 155 cm^2 of area. Also, a part showing a red rust spot larger than 1.6 mm in diameter on a significant surface shall be evaluated as a failure.

Date	Para. No.	Revisions	Approval
983-03-28		Added ESA-M21P2-A4 CEM2-897050-C2	
1979 01 10		Released CAH2-822530-C	

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3.3 COATING WEIGHT AND THICKNESS

A minimum coating weight or thickness is not required if the coated parts meet the other requirements of this specification.

The coating shall not adversely affect the normal installation or removal of the coated parts.

3.4 CLEANING

Prior to coating, the parts shall be free of oil, scale, and similar foreign materials. The cleaning process shall have no damaging effect on the substrate, including freedom from embrittlement.

3.5 ADHESION

The coating shall withstand normal handling, storage, and installation without flaking or peeling or other loss of adhesion.

3.6 SUPPLIER'S RESPONSIBILITY

Material supplied to this specification must be equivalent to that originally approved. Changes in formulation or processing shall not be made without prior approval as described in Supplier Procedure I-A.

4. APPROVAL OF SUPPLIERS

Suppliers to this specification must be approved by the affected product engineering office. Procedure for gaining approval of a specific material to a new/existing ES-M specification is contained in Supplier Procedure I-A. Approved new suppliers will be added to the Engineering Materials Approved Source List.

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