

INCH - POUND

A-A-56032D

21 March 2003

SUPERSEDING

A-A-56032C

31 January 2002

COMMERCIAL ITEM DESCRIPTION

INK, MARKING, EPOXY BASE

The General Services Administration has authorized the use of this commercial item description (CID) as a replacement for MIL-I-43553B and MIS-37271 by all federal agencies.

1. **SCOPE.** This commercial item description covers a catalyzed epoxy system of marking inks for metallic or other non-porous surfaces and printed wiring boards.

2. **CLASSIFICATION.**

2.1 **Type.** The marking ink and color shall be of the following types and colors, as specified:

Type I - General usage

Type II - Nonconductive ink (e.g., printed wiring boards)

Type III- Outside exposure

2.2 **Color** (see Tables I and II)

3. **SALIENT CHARACTERISTICS.**

3.1 **Materials.** The Contractor is given latitude in the selection of raw materials and in manufacturing processes provided the product meets the required levels of quality and serviceability.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any other data which may improve this document should be sent to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSMI-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5000.

AMSC N/A

FSC 7510

DISTRIBUTION STATEMENT A.
unlimited.

Approved for public release; distribution is

3.2 Color and quantity. The color and quantity of the cured ink shall be as specified in the purchase order or contract.

3.3 Composition. The ink shall be furnished in the form of two compounds - the basic ink compound and a hardener compound. The basic ink compound shall consist essentially of an epoxy resin in liquid, paste, or powder form. The hardener compound (catalyst) shall be in liquid, paste, or powder form for mixing with the ink compound just prior to use. The hardener shall cause the mixture to harden (cure) through chemical reaction at room ambient temperatures, or at other time/temperature ratios, as specified. The chemical composition of each compound shall be at the discretion of the manufacturer.

3.3.1 Additives. Ingredients may be added to the ink and hardener compounds to produce matte finishes. Other additives may be used to improve the leveling, flexibility, and adhesive qualities. No additives to Type II ink shall affect its electrical resistance requirements (see 3.8).

3.3.2 Thinner. When specified in the contract or purchase order, a non-toxic thinner shall be furnished for reducing the ink for optimum application consistency. The thinner shall be compatible with the wiring board substrate.

3.4 Mixing properties. The ink and hardener compound shall mix freely to produce a homogeneous mixture, free from skins, lumps, sediment, and precipitant materials, and shall be of a consistency suitable for the intended method of application. After mixing, the chemical components shall not gel during the specified pot life of the ink at room ambient temperature, and chemicals that may separate shall be readily dispersible.

3.5 Pot life. The useful life of the combined two-part ink when mixed as specified by the manufacturer shall be not less than four hours, unless otherwise specified by the manufacturer.

3.6 Curing. The ink, mixed and applied to a vertical or horizontal surface and cured at times and temperatures recommended by the manufacturer, shall be completely cured for testing purposes.

3.6.1 Cure for handling. The combined two-part ink, when mixed as specified by the manufacturer, shall be cured for handling when exposed to a temperature of 65.5°C for 30 minutes.

3.6.2 Cure for handling (Type III). When the ink is mixed as specified by the manufacturer, the set-to-touch drying time shall be 1-2 hours at room ambient temperature. It shall be cured for handling in 60 minutes when baked at 93.0° C.

3.7 Adhesion. Cured ink impressions on glass, steel, aluminum, copper, and plastic shall not deteriorate when subjected to trichloroethylene vapors at 86.5° to 88°C for a period of not less than three minutes and not greater than six minutes.

3.8 Electrical resistance (Type II only). The material cured, as specified herein, and prior to high humidity conditioning, shall have an electrical resistance of not less than 10^{12} ohms. After conditioning, the material shall have an electrical resistance of not less than 10^{10} ohms.

3.9 Environmental and storage conditions.

3.9.1 Abrasion resistance. Cured ink impressions shall retain their legibility after subsection to 300 to 303 revolutions of the CS-10 abrasive wheel while under a minimum load of 2.2 pounds in accordance with ASTM D4060.

3.9.2 Chemical resistance. Cured ink impressions shall retain their legibility when immersed for a minimum of 30 minutes in water, denatured ethyl alcohol, and non-ODC (Ozone Depleting Chemical) cleaning solvent. Type III cured ink impressions shall not deteriorate when immersed separately for 30 minutes in water and denatured ethyl alcohol.

3.9.2.1 Chemical resistance (Type II only). In addition to 3.9.2, Type II cured ink shall be resistant to hot solder and solder flux.

3.9.3 Salt spray resistance. Cured ink impressions shall not deteriorate when exposed to a 5 percent salt spray solution at 33° to 37°C for a period of not less than 48 hours.

3.9.4 Light fastness. Type I and Type II cured ink impressions shall not fade and shall remain legible when tested by a light fastness test. To determine conformance, one half of the surface of the test specimens (glass, copper, aluminum, steel and plastic in accordance with 3.9.4.1) shall be covered to obscure the light, and the remaining half shall be exposed for 24 hours to the light source outlined in ASTM G153 using daylight filter and exposure cycle 7 or ASTM G155 using window glass filter and exposure cycle 4.

3.9.4.1 Specimen preparation. Prepare test specimens by applying the ink to two 4 x 4-inch pieces of the following materials: glass, copper, aluminum, steel and plastic. Stencil the letters "ABCDE" approximately 0.75 inches high. Use sufficient ink to obtain neat, legible letters, but not enough to cause to ink to smear. Cure in a flat (horizontal) position (see 3.6).

3.9.5 Stability. Cured ink impressions shall not fade, chip, peel, or flow and shall remain legible when exposed to a temperature of 118° to $\pm 3^\circ\text{C}$ for a period of not less than 24 hours.

3.9.6 Fungus resistance. Cured ink impressions shall not support fungi growth when inspected. To determine conformance, cured ink impressions - one glass test specimen of 3.9.4.1 and one plastic test specimen of 3.9.4.1, shall be tested in accordance with MIL-STD-810, method 508.

3.9.7 Storage life. The ink compounds shall be free from grit, lumps, and skins and shall not gel, settle, harden, or otherwise deteriorate while stored for not less than one year in the original containers.

3.9.8 Accelerated weathering. The Type III ink shall be tested in accordance with ASTM G153 using daylight filters and exposure cycle 4 or ASTM G155 using daylight filters and exposure cycle 1 for 300 hours. When tested, Type III cured ink impressions shall show no cracking, chalking, loss of adhesion, or appreciable loss of color.

Note: Appreciable loss of color means a change that is immediately noticeable in comparing the test specimen with an original unexposed specimen. If closer inspection or a change of angle of light is required to make an apparent slight change of color, the change is not considered appreciable.

3.10 Workmanship. The materials shall be free of foreign particles and other contamination and shall be of uniform quality, condition, and appearance.

4. REGULATORY REQUIREMENTS.

4.1 The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. QUALITY ASSURANCE PROVISIONS.

5.1 Product conformance. The product provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

5.2 Market Acceptability (MA). The following market acceptability criteria are necessary to document the quality of the product to be provided under this CID.

5.2.1 The company producing the item must have been producing a product meeting the requirements of this CID for at least two years.

5.2.2 The company must have sold 1000 units meeting the requirements of this CID in the commercial marketplace over the past two years.

5.3 Inspection requirements. Bid samples may be required for CID items when necessary to ensure product quality.

5.3.1 Sampling for visual examination. Sampling for fill, color, workmanship, packaging, packing, and marking may be performed on one unit package.

5.3.2 Sampling for testing. Unless otherwise specified, the sample shall consist of one sample approximately equal in weight and volume to a unit package drawn from a single homogeneous mixture.

6. PACKAGING.

Preservation, packing, and marking shall be as specified in the contract or order.

7. NOTES.

7.1 Part Identification Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor. The PIN to be used for marking ink acquired to this CID is created as follows:

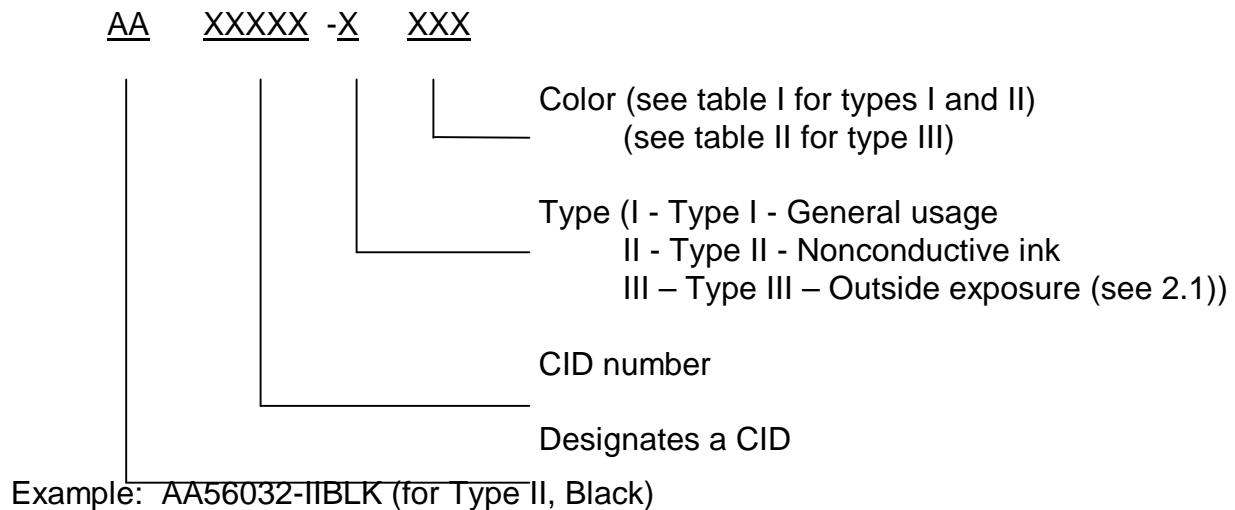


TABLE I. Color identification (Types I and II).

Color	Dash identification character
Black	BLK
Red	RED
Orange	ORN
Yellow	YEL
Green	GRN
Blue	BLU
White	WHT

TABLE II. Color identification (Types III).

Color	FED-STD-595 Color Number	Dash identification character
Red	11140	RED
Yellow	13655	YLL
Black	17038	BLK
White	17875	WHT
Yellow	33538	YLV
Brown	30117	BRO
Blue	15102	BLU
Silver	17178	SIL
Gold	17043	GLD

7.2 Handling precautions. Handling precautions shall be per manufacturer instruction.

7.3 Cross-reference data. Applications which reference MIL-I-43553, dated 12 January 1968, and which are in use prior to the approved date of Revision A, dated 25 November 1985, apply to Type I ink (general usage), which is not to be used for marking printed wiring boards.

7.4 Source of Documents.

7.4.1 The Code of Federal Regulations (CFR) may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

7.4.2 Military Standards may be obtained from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094.

7.5 Substitution. This ink is not intended to be used as a substitute for Chemical Agent Resistant Covering (CARC) Paint or on any plated surface or any other surface intended to function as a CARC paint substitute. It should be used to mark such a

surface only with permission of the government design activity involved with such a surface.

7.6 Product availability. This epoxy base marking ink is available commercially from Union Ink Company Inc, 453 Broad Avenue, Ridgefield, NJ 07657, Haven Corporation, 6630 Quad Avenue, Baltimore, MD 21237 for Types I and II, and Dexter Corporation, 144 Harvey Road, Londonderry, NH, 03053 for Type III; however, competition is not limited to products supplied by these manufacturers.

Custodian:
Army-MI
Navy - AS
Air Force – 99

Preparing Activity:
Army - MI

(Project No. 7510-0433)

Review Activities:
Army - GL, MD, AR, EA
Navy - OS
Air Force – 84