

RESPONSIBLE ENGINEER <i>R. R. R. R.</i>	NORTHROP Northrop Corporation Aircraft Group - Aircraft Division	IM-23	C REVISION
AIRCRAFT DIVISION <i>R. R. R. R.</i>			
SPECIFICATION CONTROL <i>two T 3</i>			
QUALITY CONTROL ENGINEER <i>H. J. J. J.</i>			
PROJECT OFFICE <i>D. H. H. H. 6-11-8*</i>	PROCESS SPECIFICATION	DATE <u>15 May 1980</u>	RELEASE EO <u>E37554</u>
		CODE IDENT. NO. 76023	

TITLE: IDENTIFICATION BY INK OR PAINT MARKING

(This revision supersedes Process Specification IM-23, Revision B, dated 3-9-76, and incorporates EO E36097. Changes from the previous issue, other than editorial changes, are shown by a bar (■) in the outer margin.)

1. SCOPE

- 1.1 This specification establishes the requirements for ink or paint marking of parts and assemblies for identification.
- 1.2 This specification conforms to the requirements of MIL-STD-130E, dated 8-5-77, for parts and subassemblies, but does not apply to commercial catalog items intended for use on ground support equipment.
- 1.3 Any ink marking method in this specification may be used on parts by manufacturing if no detail method is specified on the Engineering drawing.
- 1.4 Provisions for handling and use of hazardous materials listed herein are specified in HP-1 and SPP 10-8, Category 10 (Safety) of the Aircraft Division Standard Practice Procedures.
- 1.5 The customary units of measurement used herein are followed by converted metric units (and when applicable, calculated equivalent metric ratios), using International System (SI) units. Where appropriate in this specification, conversions are practical approximations.

2. APPLICABLE DOCUMENTS

2.1 The following publications of the issue in effect on the date of invitation for bid or request for proposal form a part of this specification to the extent specified herein.

- 2.1.1 MA-19.1 Screen Markings
- 2.2 The following specifications identify materials required by this specification. Use of these specifications is not required to perform the tasks described herein.
 - 2.2.1 Government
 - 2.2.1.1 TT-I-544 Ink; Marker, Felt Tip
 - 2.2.1.2 TT-I-735 Isopropyl Alcohol
 - 2.2.1.3 TT-N-95 Naphtha, Aliphatic
 - 2.2.1.4 TT-T-266 Thinner; Dope and Lacquer (Cellulose-Nitrate)
 - 2.2.1.5 CCC-C-440 Cloth, Cheesecloth, Cotton, Bleached and Unbleached
 - 2.2.1.6 TT-E-489 Enamel, Alkyd, Gloss (For Exterior and Internal)
 - 2.2.1.7 MIL-M-25047 Marking and Exterior Finish Colors for Airplanes, Airplane Parts and Missiles
 - 2.2.1.8 FED-STD-595 Colors
 - 2.2.2 Aircraft Division
 - 2.2.2.1 NAI-1299 Ink, Bleed-Through, Part Identification

3. REQUIREMENTS

3.1 Materials and Equipment

- 3.1.1 Ink, Stamp Pad
 - 3.1.1.1 Dri Marquette Acme Marking Device Co.

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Aircraft Group - Aircraft Division

MATERIAL SPECIFICATION: IM-23
Revision C

DATE 15 May 1980

3.1.1.2	Ink High Bleeding, Red No. HP68-715	NAI-1299	
3.1.1.3	Mastermarker No. 127 1/2, Various Colors	The Pannier Corp.	
3.1.1.4	Silver or Red No. 64; Red No. 68	Independent Ink Co.	
3.1.1.5	Various Colors No. 73X	Independent Ink Co.	
3.1.1.6	Wornowink Series (Bleeding) API (128-67-F)	NAI-1299	
3.1.1.7	Marking Paint, Cat-L-Ink 50-000 Series with Catalyst (specify Color)	Wornow Process Paint Co.	
3.1.2	<u>Ink Solvents</u>		
3.1.2.1	Alcohol, Isopropyl	TT-I-735	(27-26-00-4020)*
3.1.2.2	Thinner, Lacquer	TT-T-266	(27-26-29-0230)
3.1.2.3	Marsh T-1 Solvent	C.W. Draper Co.	
3.1.2.4	Mastermarker Ink Solvent, Medium Drying	The Pannier Corp.	
3.1.2.5	Reconditioner No. 64	Independent Ink Co.	
3.1.2.6	Reconditioner No. 73X	Independent Ink Co.	
3.1.3	<u>Marking Pens and Inks</u>		
3.1.3.1	Pen, Ball Point (Permanent Ink)	Commercial	
3.1.3.2	Pen, Felt Tip Dri Flow	Dri-Flo Co.	
3.1.3.3	Pen, Felt Tip Marsh No. 77	Marsh Co.	(01-21-07-0200)
3.1.3.4	Felt Pen Ink No. 27 Red, Green, or Blue	Independent Ink Co.	
3.1.3.5	Flo-Master Ink T-104 (Purple and Black)	Esterbrook Pen Co., Cado Division	
3.1.3.6	Marsh T-1 (Black) Ink	TT-I-544	
3.1.3.7	Pen, Nylon Point (Permanent Ink)	Commercial	
3.1.4	<u>Miscellaneous Materials and Equipment</u>		
3.1.4.1	Abrasive Sheet, 180- to 320- grit	Commercial	(17-36-02-80XX)
3.1.4.2	Naphtha, Aliphatic	TT-N-95	(27-26-34-1360)

*Aircraft Division Industrial Supplies and Equipment Code Number

3.2.4 (Continued)

EXAMPLE: 76823ASSYXX-XXXXX-X

MFG XXXXX or X

Manufacturer's Trademark

Manufacturer's Code Identification

3.2.5 Parts Made From Castings or Forgings

- 3.2.5.1 Whenever practicable, the part number marking on a casting or forging shall be modified and used to identify the machined part of the next assembly.
- 3.2.5.2 Dash numbers or characters shall be removed and new dash numbers or characters added as necessary to conform to the type of marking specified.
- 3.2.5.3 If not practicable to utilize the markings on the casting or forging, the original markings shall be removed or obliterated and completely new marking applied.
- 3.2.6 The marking shall be located as specified on the Engineering drawing.
- 3.2.7 The marking shall be of a color that contrasts to the surface to which it is applied; for example, white or silver ink shall be used on black surfaces.
- 3.2.8 Markings for Engine Removal or Power Plant Removal - Disconnect points of demountable power plants (engine removal), including all systems, lines, conduits, control rods, cables, bell-cranks and casting flanges, shall be marked at the point of disassembly in accordance with MIL-M-25047. The marking shall be a painted band not to exceed one inch (25.4 mm) in width. The color shall be international orange in accordance with 3.1.4.10.

CAUTION: To reduce fire hazards at Northrop facilities, aliphatic naphtha shall be used in preference to acetone and other low flash point solvents. Aliphatic naphtha is a flammable solvent and must be stored and handled accordingly.

3.3 Hand Stamping or Machine Stamping

- 3.3.1 Inks listed in 3.1 may be used for all materials except as noted in 3.6 for marking titanium.
- 3.3.2 Do not ink stamp close tolerance or bearing surfaces.
- 3.3.3 Castings and forgings may have final identification markings ink stamped if the raised marking or vibrator marking is not convertible or not present after machining operations (see 3.2.5).

3.4 Bleeding Ink Stamping

- 3.4.1 Bleeding ink may be used to identify certain parts when legibility of markings is desired through subsequent fabrication and process operations.
- 3.4.2 Wet a clean stamp pad with ink (3.1.1.2 or 3.1.1.6) or use a smooth surface plate and roller to disperse the ink to a constant thickness.
- 3.4.3 Clean the surface of the part where the marking is to be applied using 180- to 320- grit abrasive sheet, Scotch-Brite, or an equivalent abrasive cleaning method, followed by wiping with a clean cloth dampened in naphtha. Wipe dry with another clean cloth.
- 3.4.4 Apply the marking to the clean surface. Wet the stamp prior to each imprint. Clean stamp with naphtha to prevent ink build up.
- 3.4.5 Overcoat 3.1.1.2 ink markings with solvent resistant coating (3.1.4.4) within a few minutes after stamping. Apply one coat by smoothing with a finger brush, spray, or any convenient method. No overcoating of thoroughly cured 3.1.1.6 ink is necessary.

DATE 15 May 1980

- 3.4.6 Overcoated markings may be degreased after a minimum period of 30 minutes drying, but must be cured a minimum of 2 hours before being subjected to chemical surface treatment. When the part is to be subjected to a degreasing operations after chemical cleaning, the overcoat must be reapplied.

CAUTION: Spray rinsing and tumbling operations may affect the permanency of the marking.

- 3.4.7 The 3.1.1.6 ink requires curing at 75 F (23.9 C) for 24 hours or heat cure at 250 to 260 F (121.1 to 126.7 C) for 6 minutes minimum before being subjected to chemical cleaning.

- 3.4.8 For thinning inks, use applicable solvent (3.1.2).

3.5 Pen Hand Marking

- 3.5.1 Pen marking of parts may be accomplished when ink stamping is not practicable due to size and contour of the part, or for other practical reasons.
- 3.5.2 Felt tip pens using specified ink are desired, followed in order by nylon point and ball point pens as specified. Permanent ink shall be used in all pens. Use materials specified in 3.1.3.

- 3.6 Titanium Alloy Marking - Ink stamp or felt pen marking shall be used for identification using only the inks and related materials listed in 3.1.1.5 (black), 3.1.2, 3.1.3.5, and 3.1.3.6.

- 3.7 Magnesium Alloy Marking - Ink stamp or felt pen mark "MAG" or "MG" on magnesium parts in a contrasting color to the final paint color of the part, using one of the materials listed in 3.1.1.3, 3.1.1.4, 3.1.1.5, 3.1.3.2, 3.1.3.4, 3.1.3.5, or 3.1.3.6.

- 3.8 Marking Tags - When parts and subassemblies cannot be physically marked, the information shall be ink marked on identification tags which shall be securely attached to the parts or subassemblies.

3.9 Chemical Resistant Markings

- 3.9.1 Where chemical resistant markings are required for in-service use or to resist subsequent manufacturing processes, Cat-L-Inks (3.1.1.7) may be used (specify color). Do not use on titanium parts.
- 3.9.2 Mix ink and catalyst in accordance with manufacturer's instructions. Catalyzed inks have a limited work life.
- 3.9.3 Inks may be applied by either of the following methods.
- Apply ink with a rubber stamp, working from an inked smooth surface plate. Use a rubber roller to dispense the ink to a thin uniform thickness.
 - Apply ink markings by silk screen process in accordance with MA-19.1 Silk screened markings for such items as circuit boards may carry the part number of the final assembled item.
- 3.9.4 Cure ink for one hour at 180 F \pm 10 (82 C \pm 5).

3.10 Safety

- 3.10.1 Solvents - The following protective measures shall be employed wherever solvents are used.
- 3.10.1.1 Electrical Grounding - Electrically operated equipment shall be grounded prior to and during operation and shall be rated by the Underwriters Laboratory as "explosion-proof" if located within 25 feet (7.62 m) of spraying or mixing operations. Major assemblies shall be electrically grounded prior to and during cleaning and coating with materials containing flammable solvents to prevent explosion or fire caused by static discharges.
- 3.10.1.2 Solvent Storage - Solvents shall be stored in approved metal containers with identifying labels permanently attached. Static bonding and grounding of containers used for storing flammable solvents shall conform to the California General Industry Safety Orders section on Flammable Liquids, or equivalent local safety regulations.

- 3.10.1.3 Solvent Usage - Safety cans shall be used for handling and dispensing solvents and shall be properly labeled. Static bonding and grounding of containers for flammable solvents shall conform to the California General Industry Safety Orders section on Flammable Liquids, or equivalent local safety regulations. The following precautions shall be observed wherever solvents are used.
- a. Avoid the use of excessive amounts of solvents
 - b. Use only in well ventilated areas.
 - c. Avoid inhaling vapors. If toxic vapors are present, respiratory protection approved by the Safety Department shall be used.
 - d. Avoid contact with eyes and skin. Eye protection, protective gloves, and protective clothing approved by the Safety Department shall be used.
 - e. Store or dispose of solvent saturated cloths in metal containers with self closing lids.
 - f. No smoking or open flame within 25 feet (7.62 m) of any area where solvents are used or painting operations are performed.
 - g. Disposal of used solvents shall be accordance with local health and safety regulations.

4. QUALITY ASSURANCE PROVISIONS

- 4.1 Quality Assurance shall determine that identification marks meet the requirements specified herein.
- 4.2 Inspection to verify correct marking medium was used.

5. PREPARATION FOR DELIVERY

This section is not applicable to this specification.

6. NOTES

- 6.1 Information pertaining to this specification may be obtained from Materials and Process Department (3883/62), Aircraft Division.
- 6.2 Suppliers may obtain information pertaining to, or additional copies of, this specification from Northrop Corporation, Aircraft Division, Materiel and Procurement Department (6000/32), 3901 West Broadway, Hawthorne, California 90250.