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U.S. Department of
Homeland Security

United States
Coast Guard



COATINGS AND COLOR MANUAL

COMDTINST M10360.3D
January 2014



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U.S. Department of
Homeland Security

United States
Coast Guard



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COMDTINST M10360.3D
January 21, 2014

COMMANDANT INSTRUCTION M10360.3D

Subj: COATINGS AND COLOR MANUAL

- Ref: (a) Hazardous Waste Management Manual, COMDTINST M16478.1 (series)
 (b) Vessel Environmental Manual, COMDTINST M16455.1 (series)
 (c) Deck Coverings, General, NSTM CH. 634, NAVSEA S9086-VG-STM-010
 (d) Requirements for Preservation of Ship Structures, SFLC Standard Specification 6310
 (e) Rescue and Survival Systems Manual, COMDTINST M10470.10 (series)

1. PURPOSE. This Manual promulgates Coast Guard coating and color policy for all cutters and boats.
2. ACTION. Area, district, and sector commanders, SFLC commander, commanding officers of headquarters units, assistant commandants for directorates, Judge Advocate General, and special staff offices at Headquarters shall ensure that the provisions of this Manual are followed. Internet release is authorized.
3. DIRECTIVES AFFECTED. Coatings and Color Manual, COMDTINST M10360.3C is canceled.
4. MAJOR CHANGES. This revision incorporates all changes to previous editions of this Manual and the following significant new changes:
 - a. Chapter 4 has been re-titled Coatings Management.
 - b. Chapters 5, 6, 7, 8, and 9: Relocated to SFLC Technical Standard 631.
 - c. Chapters 10, 11, and 12 are now Chapters 5, 6, and 7 respectively.

DISTRIBUTION – SDL No. 163

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NON-STANDARD DISTRIBUTION:

- d. Chapters 13, 14, 15, and 16: These chapters have been removed, as this Manual is only applicable to vessel coating systems.
 - e. Appendices A, B, C, and D: Relocated to SFLC Standard Specification 6310.
 - f. Appendix E: Relocated to SFLC Standard Specification 6341.
5. REQUESTS FOR CHANGES. Units and individuals may recommend changes by writing via the chain of command to: Commandant (CG-452); U. S. Coast Guard; 2703 Martin Luther King Jr Ave SE Stop 7714; Washington, DC 20593-7714.
6. RECORDS MANAGEMENT CONSIDERATIONS. This Manual has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44 U.S.C. 3101 et seq., NARA requirements, and Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not have any significant or substantial changes to existing records management requirements.
7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.
- a. The development of this directive and the general policies contained within it have been thoroughly reviewed by the originating office in conjunction with the Office of Environmental Management, and are categorically excluded (CE) under current USCG CE # 4 from further environmental analysis, in accordance with Section 2.B.2 and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series).
 - b. This directive will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this directive must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), DHS and Coast Guard NEPA policy, and compliance with all other environmental mandates.
8. FORMS/REPORTS. NONE.

R. J. Rábago /s/
Assistant Commandant for Engineering and Logistics

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CHAPTER 1 INTRODUCTION

- A. Purpose. This Manual is published to promulgate Coast Guard coatings and color policy for all cutters and boats.
- B. Change Process. To ensure this Manual remains up-to-date, coincides with current practices, and continues to meet program needs, future change proposals shall be forwarded as specified in the following paragraphs.
1. Change proposals may be originated at any organizational level. Proposals shall be submitted by letter to Commandant (CG-45) via the Surface Forces Logistics Center (SFLC) Engineering Services Division (ESD) and the cognizant SFLC Product Line Manager. Headquarters units and program managers may submit their proposals directly to Commandant (CG-45).
 2. SFLC Engineering Services Division and the cognizant SFLC Product Line Manager shall review, endorse, and forward approved proposals to Commandant (CG-45). Disapproved requests shall be returned to the originator with an explanation for disapproval.
 3. Upon receipt, Commandant (CG-45) will initiate the following action:
 - a. Conduct a thorough investigation of each proposal to justify the need, identify possible conflicts with other directives and publications, and assess the effects of implementation.
 - b. Conduct technical review by SFLC-ESD-Survivability and Sustainment Branch (SSB).
 - c. Promulgate any approved changes by appropriate means, i.e., published change/new revision or advance change message.
 - d. Return any disapproved change request to the originator with an explanation for the disapproval.
 4. Commandant (CG-45) is the final approving authority and has overall responsibility for this Manual.
 - a. All approved changes will be promulgated by change notices to this Manual.
 - b. Changes that require immediate action shall be submitted directly to Commandant (CG-45) via message, information copy to the SFLC-ESD-SSB.
- C. Distribution. No paper distribution will be made of this Manual. An electronic version will be located on the following Commandant (CG-612) web sites.

COMDTINST M10360.3D

1. Internet: <http://www.uscg.mil/directives/>
2. Intranet: <http://cgweb.comdt.uscg.mil/CGDirectives/Welcome.htm>
3. CGPortal: <https://cgportal2.uscg.mil/library/directives/SitePages/Home.aspx>.

D. Points of Contact.

1. Manual Manager: Office of Naval Engineering, Environmental Policy (CG-452), (202) 475-5557
2. SFLC-ESD-SSB Coatings Subject Matter Expert: (410) 762-6936

CHAPTER 2 SAFETY AND OCCUPATIONAL HEALTH

- A. General. Ensuring the Occupational Safety and Health (OSH) of Coast Guard personnel shall be an intrinsic element of all operations. Personnel involved in the planning and execution of painting operations and/or the storage and disposal of painting materials shall ensure that management of OSH risks are their highest priority. Application of this principle is particularly important due to the variety and potential severity of the hazards associated with the use and storage of paint systems and supplies.
- B. Operational Risk Management (ORM). In accordance with Operational Risk Management, COMDTINST 3500.3 (series), personnel conducting painting operations shall apply ORM principles to manage all applicable OSH risks. Key steps to the ORM process are recognition of hazards, evaluation of the risks posed by those hazards, and use of risk vs. gain to determine how to control such hazards. The following sections discuss specific hazards often associated with paint operations; these are not all inclusive and are not a substitute for a full hazard analysis of a painting operation. The Health, Safety and Work-life Service Center (se) is available to assist in the ORM process.
- C. Storage of Coatings Onboard Vessels. Paint and paint-related products shall be stored and disposed of in accordance with Reference (a) and Chapter 3 of this Manual. Stowage aboard vessels should be minimized to only mission essential stock to prevent compounding of personnel and fire hazards. Stowage shall be limited to flammable liquid storerooms with the exception of in-use stock that may be stowed in paint mix rooms. For further guidance, see the Naval Engineering Manual, COMDTINST M9000.6 (series), Chapter 670 and Naval Ships' Technical Manual, Chapter 670.
1. Paints shall only be stored in tightly sealed containers. When the top is left off the can, or when the lid is not tightly closed, volatile liquids in the paints can more easily vaporize.
 2. Limit the amount of paint in the mixing areas to one day's supply. Paint left over from a day's work must be tightly closed and returned to the paint storage cabinet.
 3. Rags, rope, and other combustible material must be kept clear of the paint mixing room or storage area. Disposing of brushes is preferred to storing for later use. However, if wet brush stowage tanks are used, they shall be equipped with sheet metal covers to prevent evaporation of volatile solvents. For additional requirements, see 29 CFR 1910.106 which sets out OSHA requirements for flammable liquids.
 4. Oily rags shall not be stored in paint storage cabinets; they shall be stored in metal containers with self-closing lids. Oils dry by oxidation and produce heat that can lead to spontaneous combustion. If this heat cannot escape, it accumulates to the point of igniting the organic materials and results in fire. Oils such as linseed oil, turpentine, and fish oils can form serious fire hazards when left in rags.
 5. Mineral spirits evaporate rather than oxidize. While spontaneous combustion will not be caused by evaporation of mineral spirits, ventilation is important to rid the area of highly

explosive vapors. Containers of paints, paint thinners, paint removers, and all associated or similar materials, must be kept sealed and all rags or organic solid materials must be removed from the area and stored in metal containers with self-closing lids.

D. Storage of Vessel Coatings Ashore.

1. Storage cabinets. Required for the storage of in-use or working stocks of flammable or combustible paints and thinners, whether in manufacturer sealed containers or in containers which have been opened and resealed.
2. Storage Cabinet Specs. Types that comply with the National Fire Code #30 are commercially available and shall be used for paint storage. These cabinets are constructed in the following manner: The bottom, top, door, and sides of the cabinet are constructed of at least No. 18 gauge steel and are double walled and floored with a 1-1/2 inch air space between inner and outer surfaces. Joints are riveted, welded, or otherwise sealed. The door is secure at three points when latched. The doorsill is raised at least 2 inches above the inner bottom surface of the cabinet. Cabinets should be painted yellow (13538) or as supplied by the manufacturer and shall have the words, FLAMMABLE -- KEEP FIRE AWAY, conspicuously stenciled or painted in a contrasting color such as red or black.
3. Maximum Quantity. Sixty (60) gallons of flammable products and one hundred and twenty (120) gallons of combustible products are the maximum quantity allowed to be stored in any one cabinet. Not more than three such cabinets may be placed in any work center or room. Factory sealed stocks in excess of these amounts shall be stored in an outside storage building or specially designed interior room or compartment provided the storage facility is built, protected, and used as required by regulation.

E. Paint Operations Hazards.

1. General. Many paints, paint systems, and related solvents are hazardous. During mixing and application, they can create atmospheres which are explosive, can create highly flammable mixtures, and can be highly toxic to applicants and nearby occupants. Removal of these products can also create a number of chemical and physical hazards. Whenever feasible, hazardous coating materials should be replaced with less- or non-hazardous materials.
2. Special Hazards of Painting, Paint Removal, and Paint Evaluation in Confined Spaces.
 - a. A “confined space” is defined as a space that:
 - (1) is large enough and so configured that an employee can bodily enter and perform assigned work
 - (2) has limited or restricted means for entry or exit
 - (3) is not designed for continuous employee occupancy.

- b. A “permit-required confined space” is a confined space that has one or more of the following characteristics:
- (1) contains or has a potential to contain a hazardous atmosphere,
 - (2) contains a material that has the potential for engulfing an entrant,
 - (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section, or
 - (4) contains any other recognized serious safety or health hazard.
- c. Guidance for confined space entry depends upon the location and function of the space in question. For Coast Guard boats and vessels in a yard or in a repair status, (e.g. dockside availability), NFPA 306 and 29 CFR 1915 apply. For Coast Guard vessels afloat, Safety and Environmental Health Manual, COMDTINST M5100.47 (series), Chapter 077 of the Naval Engineering Manual, COMDTINST M9000.6 (series) and Naval Ships Technical Manual (NSTM) 074 Volume 3 apply. In addition, when painting is to be conducted in a confined space, the following precautions shall apply:
- (1) Prior to the start of any work in confined spaces, a marine chemist, qualified industrial hygienist or gas free engineer shall assure the existence of a safe working atmosphere. Where the spaces have contained volatile liquid, paints, or toxic materials or irritants, or are immediately adjacent to such materials, the atmosphere shall be tested for contaminants and checked for residues of these materials. This atmosphere shall be checked periodically during the paint removal operations.
 - (2) Where tests show a deficiency of oxygen in the space (other than in spaces intentionally inerted against fire or explosion) no work shall commence until the application of appropriate ventilation measures have been effective.
- d. Fire and Explosion Hazards.
- (1) Sufficient ventilation shall be provided to keep concentrations of vapors below ten (10) percent of the lower explosive limit. Frequent tests by a competent person (see "competent person" as defined by 29 CFR 1915.7) shall be made to ascertain the concentration.
 - (2) If ventilation fails or the solvent concentration rises above ten percent of the lower explosive limit, painting shall be stopped and the area evacuated until safe conditions are established.
 - (3) Ventilation shall be continued after completion of work until the space is vapor free at less than one percent of the lower explosive limit. Tests to determine this

condition shall be made after the ventilation has been stopped for at least ten minutes.

- (4) Exhaust ducts shall discharge to outside environment, clear of working areas, away from ignition sources and away from all fresh air inlets.
- (5) All motors and control equipment shall be of the explosion proof type. Fans shall have nonferrous blades. Portable air ducts shall also be of nonferrous material. Metallic parts shall be bonded and grounded.
- (6) Only non-sparking paint buckets, spray guns and tools shall be used. Metallic parts of paint brushes and rollers shall be insulated. Staging shall be erected in a manner that ensures that it is non-sparking.
- (7) Only explosion proof lights, approved for use in Class I, Group D atmospheres, shall be used. A competent person shall inspect all power and lighting cables to ensure the insulation is in an acceptable condition, they are properly placed, and there are no connections or splices within the area of work or within fifty (50) feet of the area of work.
- (8) No matches, cigarette lighters or other ferrous articles shall be taken into the areas where work is being done.
- (9) All solvent drums or cans taken into the work area shall be placed on nonferrous surfaces and shall be bonded and grounded. Vessels being filled from a drum (or can) shall be bonded to the drum while materials are being transferred.
- (10) All personnel protective equipment shall be non-sparking, e.g. rubber soled safety shoes.

e. Personal Protective Equipment.

- (1) The face, hands, eyes, head and other exposed parts of personnel working with paints shall be protected. Coveralls and other clothing shall be cotton and shall conform to applicable Safety Data Sheet (SDS)/Material Safety Data Sheet (MSDS) for the products being used.
- (2) When required, personnel shall be protected by appropriate National Institute for Occupational Safety and Health (NIOSH) approved respirators.

3. Paint Application.

a. Some good general guidelines for all painting operations include:

- (1) Ensure all personnel applying, mixing, or removing paints have read the product's SDS/MSDS and are following its recommendations. Personal protective equipment, including respiratory protection and protective clothing, shall be used appropriately and proper handling procedures shall be followed.

- (2) Store paint and solvent containing materials and supplies in well ventilated areas, away from heating equipment, open flames, direct sunlight, and flammable/combustible materials.
- (3) Do not smoke, eat, or drink while mixing or applying these materials. No welding, grinding, or cutting (hot work) shall be allowed in areas adjacent to painting operations.

b. Special Hazards of Spray Operations.

- (1) Fire and Explosion. The possibility of an explosion varies with the flash point of the material and the ambient temperature of the air. The chance of explosion for outside painting is less than in enclosed spaces. Fire hazards associated with outside painting are essentially limited to the immediate vicinity of the spraying.
 - (a) During spray painting, atomizing produces much more vapor than would be expected by evaporation at temperatures that exceed the flash point. Solvent concentrations during spray painting operations may produce ideal conditions for ignition.
 - (b) No smoking, welding, burning, or other flame or spark-producing operations such as chipping or grinding, electrical repairs or electric bulb changing within a work area while painting and for at least one hour after painting has ceased.
 - (c) In any case where interior spray painting is being done with low flash point materials (flash point below 100°F.), follow all fire and explosion precautions noted for painting in confined spaces.
- (2) Health Hazards. Although harmful human health effects are associated with all paint processes, the potential for these to occur are increased due to the high levels of airborne paint components and solvents created during spray painting. Some examples include: 1) antifouling paints used on vessels and buoys contain toxic materials that are hazardous upon skin contact or ingestion/inhalation and 2) epoxy paints can cause dermatitis upon skin contact and some individuals may develop an allergy or sensitization upon exposure to small amounts of the material. The solvents commonly used in paint systems exhibit a wide range of toxicity. The less toxic solvents such as mineral spirits, some petroleum naphthas, and ethyl alcohol produce symptoms similar to those associated with alcohol intoxication. Others such as toluene, xylene, methyl ethyl ketone (MEK) and methyl isobutyl ketone (MIBK) produce symptoms of intoxication at much lower concentrations and in addition, may produce chronic damage to organs and/or cause extreme irritation to skin, eyes, and nose. All solvent materials found in non-water based paints can be hazardous to health if adequate protective measures are not taken; chronic exposure may cause permanent nervous system damage.

4. Paint Removal.

- a. Health Hazards. The major hazards associated with paint removal operations are those of explosion, skin or eye injury, electrical shock from removal equipment, and respiratory illnesses from inhalation of hazardous heavy metals and chemicals in paint dusts. All removal operations, including chipping, require use of proper protective equipment and procedures to control risk. For guidance, contact the Health, Safety and Work-life Service Center (se). Some examples of these specific health hazards are:
- (1) Heavy metals such as lead, chromates or organic tin compounds present in vessel primer, antifouling paints and primer coatings can accumulate in the body from ingestion and/or inhalation. Chronic exposures can produce disabling illness and possible death.
 - (2) Exposure to dust from plastic type (vinyl) paints may result in severe respiratory and skin irritation and some sensitive individuals may show an allergic response.
 - (3) Special attention must be given to operations where chromate coatings are abraded since inhalation or ingestion can cause various adverse health effects, including cancer.
 - (4) Biocide materials present in antifoulant coatings can produce severe burns upon skin or eye contact, can be transported into the body through the skin, and may produce damage to internal organs if inhaled or absorbed into the body. Hazardous exposures can result from biocidal antifouling coating dust in abrasive blasting, mist or vapor from spray painting and fume from cutting or burning painted surfaces. Although organotin antifouling coatings are now prohibited and have not been specified in a number of years, there is the possibility that they may still be found. Units shall hire licensed contractors for the removal of organotin paint. Coast Guard personnel are not authorized to perform this work.
 - (5) A health hazard secondary to any blasting operations may result from supplying contaminated breathing air to air supplied respiratory equipment. Oil, water, carbon monoxide and other products of incomplete combustion may be present in breathing air if proper precautions are not taken. Refer to Technical Guide: Practices for Respiratory Protection, COMDTINST M6260.2 (series).
- b. Abrasive Blasting. It has become general practice to enclose large, high volume blasting operations and provide dedicated ventilation/collection systems. In evaluating the need for enclosure of small, low volume blasting operations, primary consideration should be given to the toxicity of the abrasive used and to any pulverized coatings, the related potential for airborne contamination of adjacent work or living spaces, as well as compliance with EPA and State air pollution laws. Wet blasting may adequately suppress dust when operations such as blasting a ship's hull must be performed outdoors. In most states, open air blasting is not permitted through regulation of visible emissions. In some states, it is specifically prohibited. These constraints leave enclosed and vacuum blasting as the only viable alternatives.

- (1) Types of Abrasive: Various types of abrasive materials are used in blasting operations, each having its own particular advantages. The hazard potential of these various abrasives also varies considerably. Use of Silica is specifically prohibited; consult with the Health, Safety and Work-life Service Center (se) regarding the risk vs. gain of other types of abrasives.
 - (2) Personal Protective Equipment. All personnel in the vicinity of abrasive blasting operations must wear double hearing protection unless a sound level survey indicates that single hearing protection (earplugs or earmuffs) is adequate.
- c. Water Jetting (also called hydroblasting). Run off from water jetting operations must be contained, if not collected for processing, in order to prevent pollutants from entering the ground, waterways, storm water systems, or sewer systems. In considering the degree of containment or collection required, compliance with EPA and State pollution laws must be considered. Although not considered to be as hazardous as abrasive blasting, water jetting uses water at high pressure which can cut through a body, causing serious injury or death.

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CHAPTER 3 ENVIRONMENTAL LAW AND POLICY

- A. General. The activities associated with surface preparation and painting are regulated because of their potential to release significant amounts of pollutants (via air emissions and residual wastes), potentially endangering both human health and the environment. When conducting surface preparation and painting operations, all units must comply with applicable federal, state, and local laws. When in port, vessels should also confer with their host shore command and/or Senior Officer Present Afloat to determine if there are any additional requirements. Units are also responsible for complying with the Commandant's policies regarding the reduction of hazardous waste and materials as promulgated in Reference (a). Additionally, a summary of environmental responsibilities is found in Reference (b).
- B. Procurement. Maintaining and refurbishing equipment through painting can produce large amounts of hazardous waste and air emissions and is a particular focus for environmental regulatory agencies. Paying careful attention to environmental regulations is extremely important to reducing disposal costs and environmental liability associated with this activity.
1. Toxic Materials In Paints. Use of paints containing toxic materials is prohibited. Coatings with potentially toxic materials will be eliminated as acceptable substitutes with less toxicity are made available. The following is provided to clarify use of coatings containing toxic materials:
 - a. Lead. Paints shall contain no more than 0.009% lead by weight.
 - b. Chromate. Paints containing chromate pigments are prohibited except as primer for aircraft.
 - c. Heavy Metals. Paints containing cadmium, mercury, beryllium, and arsenic are prohibited.
 - d. Organotin Antifouling Paints. Organotin paints are those that contain trivalent tin compounds such as tributyl tin and are registered by EPA because of their toxicity. Organotin paints may only be removed by state licensed contractors in accordance with state and federal laws. Coast Guard personnel are not authorized to apply, remove, or maintain organotin paints or to have a license to apply or remove these coatings. Organotin coatings are not authorized on any Coast Guard cutters or boats.
 - e. Zinc. Units are authorized to use paints containing zinc dust. However, paints containing zinc dust are more prone to containing lead. Therefore, ensure paints with zinc dust contain no more than 0.009% lead by weight.
 - f. Isocyanates. Two-part paints containing isocyanates, including Toluene Diisocyanate (TDI), Hexamethylene Diisocyanate (HDI) and Diphenylmethane Diisocyanate (MDI), are prohibited. Examples of such paints include, but are not limited to, polyurethanes, polyureas, polyaspartics, and hybrids of these chemistries.

- b. Encapsulating paints containing lead. Once paint containing lead has cured, the health risks usually only arise from the direct ingestion of paint chips. This should not place Coast Guard personnel at risk for routine day to day operations. If the need for touch up arises, the in-place paint containing lead can be directly overcoated with fresh paint, thereby encapsulating the paint containing lead and further reducing the risk of direct lead paint exposure. It should be noted that this overcoating must take place without abrading the surface of the existing paint containing lead. Any abrasion can release dust that may contain lead, and as such special PPE procedures must be in place.
 - c. Identification of paints containing lead. Often vessels will need to remove coatings from a surface for a variety of reasons. Prior to this removal, identification must be made to determine if the paint contains lead. While the presence of lead could be confirmed via commercial home use kits, the specific quantity of lead contained in the paint is necessary to ensure required follow-on procedures are followed. Units seeking to determine if paint contains lead should work with their Health, Safety and Work-life Service Center (se) to take paint samples for lab analysis. This identification and documentation ensures that removal and disposal procedures are followed as required for the actual quantity of lead documented. It is vital that vessels which will be undergoing commercial contracts for the disturbance of paint containing lead document this fact early in the contract process, specifically during the initial A-team meetings. This prevents extremely costly adjustments after the contract has been awarded as the contractor changes the scope of work and performance.
 - d. Surface abrasion of paints containing lead. If a surface is comprised of paint containing lead, depending on the scope of work, engineering controls, work practices, and specific PPE must be in place prior to any abrasion (sanding, blasting, chipping, etc) taking place. For the most up-to-date PPE requirements, please contact your Health, Safety and Work-life Service Center (se).
 - e. Disposal of paint containing lead. After paint containing lead has been removed, the debris (waste stream) should be treated as hazardous waste until proven otherwise. At this point, sampling again may need to take place as different quantities of lead present in the debris will trigger different disposal procedures. For example, paint containing lead mixed in with blast media (sand, grit, etc) may be in such low quantities that the lead may be negligible. However paint containing lead removed by water jetting will have a higher concentration of lead waste. These disposal procedures may differ between states also, so units must contact their Health, Safety and Work-life Service Center (se) to ensure that all applicable local, state and federal regulations are followed.
2. Asbestos. If surface preparation involves disturbing or removing asbestos containing material, special legal requirements may apply. Contact your Health, Safety and Work-life Service Center (se). Also, refer to the Asbestos Control Exposure Manual, COMDTINST M6260.16 (series).

3. Abrasive Blasting. In states enforcing a "no visible dust" rule, abrasive blasting must be performed inside a temporary structure. Knowledge of state and local regulations is critical; review the regulations applicable to your area for visible dust rules as well as any specific requirements for the temporary structure construction.
 4. Water Jetting. Paint chips, debris and contaminants from water jetting operations are considered "pollutants" under the Clean Water Act and may also qualify as hazardous waste. Run off from water jetting operations must be contained, and may potentially require collection for processing before release in order to prevent pollutants from entering the ground, waterways, storm water systems, or sewer systems. In considering the degree of containment or collection, processing and disposal required, compliance with Federal (EPA), State and local pollution laws must be considered. Usually, state and local authorities will grant permits to allow waste water to be disposed of in the sewage treatment system as long as the water does not contain toxins which can kill the microbes used in the treatment process. Contact your Health, Safety and Work-life Service Center (se) for advice on proper waste water disposal procedures.
 5. Paint Removal on Cutters and Boats. Top-side maintenance surface preparation for cutters and boats poses special problems in controlling paint chips and dust so that they are not released to the water. Reference (a) requires that Commanding Officers and Officers in Charge of vessels appoint a Hazardous Waste Coordinator (HWC). The HWC shall develop policy to ensure that all equipment (such as vacuum-equipped surface prep tools) and containment systems (such as drop cloths and wrapping materials) are working and in place such that no paint chips or dust are allowed to enter the water. Paint chips and dust are considered "pollutants" under the Clean Water Act and may also qualify as hazardous waste. The Health, Safety and Work-life Service Center (se) can assist in determining the proper procedures to use for top-side surface preparation.
- D. Painting Issues. Depending on the method used, painting can produce significant air emissions or potentially hazardous waste. Air emissions could include release of VOCs and hazardous air pollutants (HAPs) from paint overspray, from equipment cleaning solvents, or from the solvent volatilizing as the paint dries. Potentially hazardous waste could include the residual waste of leftover paint and solvents, or spent equipment. These emissions and waste can cause health problems and damage the environment. For this reason, proper precautions must be taken. Regulations must be followed to prevent environmental violations.
1. Ensure that the paint is lower than or equal to the maximum as applied (i.e. at time of application to the substrate) VOC content limits set out in this chapter or, if more stringent, state and local as applied VOC content limit requirements (see paragraph B.2.a and B.2.b).
 2. Paint thinners, other than water, usually have a very high VOC content; thus, adding a thinner to paint increases the paint's VOC content (transforming a low VOC content paint to a high VOC content paint). Minimize the use of paint thinner. Paint thinners should not be added unless necessary. Paint thinner that is a substance other than water will not be used unless the following condition exists: prior to any paint thinner being added, the paint has a VOC content that is lower than the maximum as applied VOC content limit. If this condition exists, then thinner can be added, but only in an amount

that ensures that the paint with thinner added is lower than or equal to the maximum as applied VOC content limit. Too much thinning of paint reduces its dry film thickness giving shorter life to the paint system. Use of thinners should be minimized as they defeat the purpose of using low VOC coatings. At no time shall thinning the coating exceed the manufacturer's recommendation found in the latest revision of the product data sheet.

The following formula may be used to ensure that the as applied VOC content does not exceed the Coast Guard allowable limits.

$$R = \frac{(V_s)(\text{VOHAP limit}) - M_{\text{voc}}}{D_{\text{th}}} \quad \text{where:}$$

R = Maximum allowable thinning ratio for a given batch, i.e., Gallons of thinner

V_s = Volume fraction of solids in the batch as supplied (found on product data sheet or SDS/MSDS).

VOHAP limit = Maximum allowable as-applied VOHAP content of the coating (grams VOHAP/ liter solids). This is not the same as maximum VOC level. Use 765 grams/liter solids for antifouling coatings and 571 grams/liter solids for all other coatings.

M_{voc} = VOC content of the batch as supplied (found on product data sheet or SDS/MSDS).

D_{th} = Density of the thinner in grams/liter (found on product data sheet or SDS/MSDS).

Following is a practical example for the above calculation of the maximum allowable thinning ratio using PPG PSX-700 with Amercoat 911 thinner.

$V_s = 90\% = 0.90$ (Taken from product data sheet)

$M_{\text{voc}} = 120$ grams/liter (Taken from product data sheet)

$D_{\text{th}} = 7.34$ pounds/gallon = 880 grams/liter (Taken from SDS/MSDS)

$$R = \frac{(0.90)(571 \text{ grams/liter solids}) - 120 \text{ grams/liter}}{880 \text{ grams/liter}} = 0.45$$

Therefore, a maximum of 0.45 gallons (1.8 quarts) of Amercoat 911 thinner can be added to one gallon of PSX-700.

3. Spray painting operations require knowledge of and compliance with all federal, state and local requirements relating to the control of air pollution. Prior to starting spray painting operations, painting supervisors shall ensure their procedures comply with the law and obtain all necessary permits (including state and local permits). If possible, conduct spray painting inside a booth or prep station rather than an open bay. If a booth or prep station is used, ensure it is appropriately constructed and ventilated and workers use proper protection.
- E. Waste and Air Emission Management Reduction. Disposing of waste paint is costly. The best way to reduce disposal costs is to carefully estimate how much paint is required for a particular application and have little or nothing remaining for disposal. In addition to careful

procurement, stocking, and application practices, there are a variety of other methods to reduce waste which also may decrease air emissions:

1. Solvents. Solvents are often used to clean equipment used in applying oil-based paints. In some instances, you can completely avoid using solvents for equipment cleanup by painting with disposable brushes, rollers, paint cans and trays. When using solvent to clean spray guns and lines, you can recycle it by storing for several days to allow the pigment and resin to settle out. Separate the paint fines, which are the particles and fragments that have settled to the bottom, by pouring off the solvent and reusing it to clean equipment. Remember, remaining sludge is hazardous wastes and must be disposed of in accordance with applicable regulations. Avoid using solvent to wipe down or clean painted surfaces and substitute a detergent or adhesion promoter.

2. Shelf Life Extension Program. To minimize waste, Coast Guard units, cutters and boats shall extend the shelf life of coatings and use them when it is reasonable to expect they will work correctly. This applies to all paints; military and federal specification coatings as well as commercial products. Regardless of what other military or government manuals dictate, if a coating passes the inspections outlined in this chapter, and it is reasonable to believe that the coating will work correctly, then extend the shelf life for one year by filling out a shelf life extension label like the one below and fasten the label to the can with heavy duty clear tape. If it is not reasonable to expect the coating to work correctly, the material should be discarded as hazardous waste. If possible, use paint before the storage life expiration date through careful inventory management.

Previous shelf life expiration date:
New shelf life expiration date:
Signed:
Date:

- a. Inspections. New coatings and coatings with expired shelf life should not be used if they do not pass the following tests:
 - (1) Stir the paint. Stir all components separately if the paint has more than one part. If the stirred paint product does not result in a uniform mixture and contains abnormal clumping, jelling, skinning, or other objectionable properties, then it is not suitable for use.

 - (2) Apply the paint to a test patch. If it does not brush or spray evenly and consistently or if it does not dry in the correct amount of time to the appropriate hardness, it is not suitable for use.

- (3) Check the adhesion on oil based and water based paints. Cut a series of cross-hatched lines into the dried paint with a razor blade down to the base metal. Then apply and remove a strip of duct tape. If 90% of the paint stays in place, it is suitable for use.
 - (4) Check the adhesion of epoxy paints. Tap the dried paint film with a hammer 10-20 times with enough force to drive a nail 3/4" into a piece of pine. If the paint does not stay intact, it is not suitable for use.
 - (5) On previously opened cans of paint, strain the paint through cheese cloth to separate clotted material and use the coating for a non-critical application if it appears normal.
 - (6) Do not extend shelf life on paints with; improperly sealed or corroded containers, two part epoxy paints stored above 140°F, water based paints which have been frozen, or oil based paints which do not mix to a smooth consistency.
 - (7) Some state hazardous waste laws issue notices of violation for storing paint that is past the manufacturer's storage life expiration date. It may not be possible to extend shelf life in these areas.
- b. Paint Storage Life. Most two-part epoxies can be properly stored in ambient temperature conditions and remain functional for up to 10 years. Water based and oil based paints, can be stored at ambient conditions for up to 3-5 years. Previously opened cans of water based and oil based paints are usually not suitable if stored for longer than one year. Previously opened cans of unmixed two-part epoxy paint in good condition may still be good after 3-4 years storage.
- F. Waste Disposal. Surface preparation operations can generate potentially hazardous waste, including the residual waste of paint chips, spent abrasives from blasting or contaminated water. Painting operations can generate significant amounts of potentially hazardous waste, including leftover paint and solvents, spent equipment, rags and other materials contaminated with paint.
1. Waste Water. After water is used in blasting surfaces or to clean equipment, the water may become waste water that contains hazardous materials, e.g., biocidal antifouling agents, solvents and petroleum products. This waste water may not be poured on the ground or into the storm water or sewage system. Disposal of waste water used for cleanup of paint is governed by federal, state and local laws. Usually, state and local authorities will grant permits to allow waste water to be disposed of in the sewage treatment system as long as the water does not contain toxins which can kill the microbes used in the treatment process. Contact environmental compliance or legal staff for advice on proper waste water disposal procedures.
 2. Antifouling paint. Waste associated with antifouling bottom paints may be collected separately from the typically less toxic topside and interior paints.

3. Hazardous Waste Management. To determine if the residual waste is hazardous, refer to Reference (a). Reference (a) should be consulted to determine the records keeping requirements. Hazardous waste must be managed and disposed of in accordance with Reference (a). Particularly relevant sections include:
 - a. Chapter 4 GENERATION OF HAZARDOUS WASTE; Section 4-B, Hazardous Waste Determination; Figure 4-2 Summary of characteristics and properties of hazardous waste under 40 CFR 261; and, Figure 4-3 Common hazardous waste items at USCG units.
 - b. Chapter 7, MANAGEMENT/DISPOSAL PRACTICES FOR TYPICAL CG WASTE ITEMS; Section 7-F, Paint Slops and Waste Paint; Section 7-G, Solvents; and, Section 7-J, P Blasting Grit.
 - c. Chapter 8, STORAGE AND CONTAINER REQUIREMENTS (for hazardous waste).

CHAPTER 4 COATINGS MANAGEMENT

- A. Coast Guard Coatings Policy. Coatings and painting practices are changing rapidly in response to environmental laws and occupational health concerns. Coast Guard policy requires products which meet minimum technical needs and which have the lowest potential for injuring personnel and causing environmental damage. Federal and Military specifications developed by other federal agencies, primarily the Naval Sea Systems Command (NAVSEA), are used when possible in order to avoid duplicating costly research and development work. However, there is a need for commercially developed products to meet specific Coast Guard requirements. All such coatings and systems are reviewed technically to determine suitability for Coast Guard use. Projects are established to test and develop new coatings when Federal/Military specifications do not meet minimum technical needs. Requirements for qualifying new products, performance requirements, and lists of Coast Guard approved commercial products can be found in Reference (d). All units shall comply with the requirements of this Manual and Reference (d) unless otherwise authorized. Any request for variance must follow the process outlined in the SFLC Time Compliance Technical Order (TCTO) Process Guide, CGTO PG-85-00-40-S.
- B. Frequency of Painting/When to Paint. Painting of cutter surfaces should be considered only when it is necessary to prevent corrosion or deterioration of the surfaces. Soiled surfaces shall be cleaned rather than repainted when practical. The policy for conducting wash downs of cutters and boats can be found in Reference (b).
1. Interior Surfaces. Interior surfaces are generally painted more frequently than necessary. Repainting too frequently results in paint film failure due to films which are too thick or incompatible. The interior paints that have been recommended are designed to hold up under repeated washing. Scrubbing the surface with detergent and water will usually result in a clean, fresh appearance. Interior repainting shall normally not be required more often than once every three years. The minimum number of coats required for hiding a surface should be applied. One coat is usually sufficient.
 2. Hull Exterior and Superstructure Surfaces. Exterior surfaces should be repainted prior to failure of the paint film. Exterior steel surfaces on cutters and boats above the main deck shall not normally be top coated more often than every two years. Exteriors of hulls above the boot-topping should not normally be top coated more often than every year. Touch-up painting rather than complete repainting should be considered. Units should refer to the Class Maintenance Plan (CMP) for determining frequency of painting. For example, WMECs are now on an eight-year schedule for painting freeboard and superstructure.
 3. Underwater Body and Boot-Top Surfaces. Underwater body and boot-top surfaces shall be repainted at intervals prescribed by the cognizant Product Line under the guidance of the Commandant. The anticorrosion primer used with ablative paints should remain in place for the life of the paint (approximately 9-12 years). Do not remove the antifouling system if it is not necessary.

4. Weather Deck Surfaces (Non-Flight Deck). The various non-skid/slip resistant coating systems used for weather decks should provide about 3-6 years of service. Cosmetic "wash" topcoats are allowed for broadcast grit and MIL-PRF-24667 non-skid systems, but shall not be used on slip resistant sheeting. Cosmetic "wash" topcoats should be used sparingly because they will have an adverse effect on the ability of the non-skid system to prevent slips and falls.
5. Flight Deck Surfaces. Flight decks are certified by the Navy and must be applied and maintained in accordance with Reference (c). Flight deck coatings shall be applied by commercial contractor or Coast Guard Yard in accordance with NAVSEA STD ITEMS 009-32 (series) or latest NAVAIR directive. An item to be determined on a pre-award survey is whether contractor personnel are competently trained and recognized by the manufacturer to ensure that the non-skid is applied according to coating manufacturer's instructions and that the manufacturer will honor the warranty. Contracts may specify a warranty by the contractor but care should also be taken to preserve any standard warranty provided by the manufacturer. In lieu of top coating, decks shall be washed following guidance provided in Reference (b). Ship's work force is authorized to spot repair flight decks up to fifty (50) square feet in order to control underlying corrosion in accordance with the guidelines set out in Reference (c).

CHAPTER 5 CUTTER AND BOAT SAFETY COLORS AND MARKINGS

- A. Colors For Safety. The Coast Guard safety color code for marking physical hazards on cutters and boats is in accordance with the standards set forth at 29 C.F.R. § 1910.144 (OSHA Safety color code for marking physical hazards).
- B. Coast Guard Safety Marking System.
1. Red for Fire Protection. Red (11105) is standard for the identification of damage control and fire protection equipment. It shall be used for fireplugs, fire alarm boxes, fire main valves, flooding valves on dry-docks, transmitting antenna hardware and sprinkler lines (with the exception of magazine sprinkler lines). In painting fire main valves, the valve body, bonnet and handle shall be painted. Valve stems and threads on the valve body shall not be painted.
 - a. Panels of red (11105) shall be painted behind firefighting equipment on walls and columns.
 - b. Extinguishers should not be painted a color that differs from the color supplied by the manufacturer. However, if they are painted, care must be taken to ensure that use and hydrostatic test data are not obliterated.
 - c. Safety cans or other portable containers of flammable liquids having a flash point at or below 80°F, excluding shipping containers, shall be painted red (11105). The name of the liquid shall be conspicuously stenciled or painted on the can in yellow along with the word FLAMMABLE. Fifty-five gallon drums are not considered portable and are therefore painted yellow (13538) with black lettering.
 - d. Fire axes are painted red (11105). The areas three quarters of an inch from the cutting edge and one and one quarter of an inch from the tip of the head are not painted and the handle is not painted except for the last six inches from the end. Preserve the unpainted metal and wood with varnish.
 - e. Emergency stop bars or buttons on machines shall be painted red.
 - f. Electrical circuit breakers or switches that are used for emergency shutdown of equipment or electrical service shall be painted red. The equipment or service controlled and the applicable voltages will be stenciled (or otherwise marked) in yellow (13538) on the base of the breaker box if the equipment it controls is not otherwise evident.
 - g. To relate extinguisher types to classes of fire, further symbols and color designations are recommended. Extinguishers suitable for more than one class of fire should be identified by multiple symbols placed in a horizontal sequence.

- (1) For Class A fires (wood, paper, rubbish, deep-seated fires), the symbol is a green triangle containing the letter A in white. An applicable extinguisher is a multipurpose dry chemical.
 - (2) For Class B fires (oil, gasoline and other flammable liquids which do not mix with water), the symbol is a red square containing the letter B in white. Applicable extinguishers are carbon dioxide and dry chemical.
 - (3) For Class C fires (electrical equipment), the symbol is a blue circle containing the letter C in white. Applicable extinguishers are carbon dioxide and dry chemical.
 - (4) For Class D fires (metal), the symbol is a yellow five-pointed star containing the letter D in black. Fire of high intensity may occur in metals such as titanium, magnesium, zirconium, sodium, potassium, etc. Ignition is usually the result of friction (grinding), exposure to fire or high heat, and in some cases exposure to moisture. Normal extinguishing agents should not be used for Class D fires. Approved extinguishing agents are available in dry powder form that may be applied with a scoop or shovel or by means of an extinguisher designed for dry powders.
2. Yellow For Hazard Marking. Yellow (13538) is the accepted color used to paint striking, stumbling, and falling hazards. Where suitable, alternate bands of black (17038) and yellow shall be used. Thus, yellow (or black and yellow) shall be applied to low overhead hazards, guard railings, the edges of platforms and pits, crane beams, pulleys, blocks, skids, hand trucks, and the bottom panel (or lower 12 in.) of rollup doors and moldings, holding the door track to a height of 5 ft. (inside and out).
 - a. On stairways, yellow (13538) shall be applied in 4 in. bands immediately under the tread on top and bottom risers. Yellow markings are not required on ladders, inclined ladders and stairways without risers. Yellow shall also be used to mark the emergency gate which connects tanks in dry-docks.
 - b. Drums and storage tanks containing flammable liquids and gasoline-powered equipment shall be painted yellow (13538). Aerial-Floatable Drop Pump Canisters (AFDPC) shall be painted international orange (12197).
 3. Orange For Hazard Marking. International orange (12197) is standard for hazards that are likely to cut, crush, burn, or shock personnel. It shall be applied on or near dangerous parts: gears, shears, planers, brakes, rolling/crushing devices, forming presses, punch presses, and riveting machines. It is desirable to use orange on the underside of guards over belts or gears in order to signal against carelessness by exposing a gaudy color to the eye. The exteriors of such guards shall be gray.
 - a. It shall be used for guards around hot pipes, exposed electrical wires and connections.
 - b. Overhead electric wires or rails for conveying and hoisting equipment should be conspicuously marked with orange on adjacent beams, covers or supports. The inside

of switch and fuse box doors and covers are painted orange to reveal a vivid color and encourage the proper closing of panel doors at all times.

4. Blue For Electrical Equipment.
 - a. Blue (15123) shall be used in industrial areas for switch and fuse box control panels and off-and-on control boxes on machinery. In personnel facilities and offices, electrical control panels may be in the wall color. In all instances the inside areas of such boxes should be colored Orange (12197) using paint or colored decals. Emergency shutdown and main circuit breakers or switches shall be painted red in accordance with this chapter.
 - b. Blue is also applicable to electrical control mechanisms, receiving antenna hardware, electric shore tie connections, welding gear, the control boxes of hoists, winches, and cranes.
5. Green For First Aid. Green (14260) shall be used for the identification of first aid equipment. It shall be painted on first aid and medicine cabinets, stretcher boxes, cabinets for gas masks, safety showers, and for all signs relating to first aid and safety. Green is also used for discharge valves on dry-docks.
6. Purple For Radiation Hazards. Ample protection must be provided against exposure to nuclear radiation hazards. Such radiation, associated with radioactive isotopes, chemicals, and fissionable materials, is invisible but may lead to severe injury. The storage, packing, and handling of radioactive chemicals are stringently controlled by the United States Department of Energy. To safeguard personnel, the radiation symbol shall be applied in all facilities where radiation hazards exist.
 - a. Radiation areas and hazards shall be marked in accordance with 10 C.F.R. § 20.1910 (cautionary signs). The three-bladed, propeller shaped radiation symbol shall be purple (27142) on a background of yellow (23538). The CFR permits either magenta or purple for the symbol. Consequently, when the symbol is furnished by others, it may be either color.
 - b. Special tags and labels shall be attached to all containers, receptacles, storage areas, or rooms, in order to caution against handling or entry. For further protection, the specific type of hazard should be described with any special instructions. Where necessary, special cautions to be observed can be lettered on or immediately adjacent to the radiation caution symbol.
7. Aisle Marks. It is good practice to use aisle marks and lines to indicate safety aisles and storage areas. White marks and lines shall be used where floors are dark; black marks and lines where floors are light. Lines and marks around hazards or along pit and platform edges shall be yellow (13538).
8. Safety Helmets. Safety helmets (hard hats) are required at all Coast Guard Units to provide protection against injuries caused by falling and swinging objects, and electrical

shock. The color of the safety helmets and corresponding work assignments are shown in Table 5-1. Safety helmets should not be painted.

TABLE 5-1: COLOR FOR SAFETY HELMETS	
<u>COLOR</u>	<u>ASSIGNMENT</u>
WHITE	Officers/CPOs/Safety Observer
YELLOW	Rig captain/Deck Supervisor
GREEN	Signalmen/phone talkers or Break-in riggers
BROWN	Winch and Boom Operators
RED	Line-throwing gunners (or line heavers) and torch operators on ATON vessels.
WHITE (with red cross)	Corpsman
BLUE	Deck riggers/line handlers
ORANGE	Supply personnel
GRAY	All others/Deck Workers

CHAPTER 6 CUTTER AND BOAT COLORS - EXTERIOR AND INTERIOR

A. General. This chapter presents the required colors for various exterior and interior areas/components of Coast Guard cutters and boats. The areas are listed in alphabetical order. The specified coating systems and requisition information are found in Reference (d), Appendices A through C. If a specific vessel is not referenced in this chapter, Commandant (CG-45) shall be consulted for the required coating system. In general, miscellaneous exterior objects whose colors are not specifically prescribed in the following paragraphs shall be painted the same color as the structures to which they are attached or adjacent. Exterior objects that are fabricated from corrosion resistant materials are not required to be painted unless there are mission or safety requirements. References are by section heading/page number and include:

1. Exterior Spaces.

- a. Anchors, Anchor Chains. (pg. 6-2)
- b. Antenna Hardware, Radio and Radar, DF Loops. (pg. 6-2)
- c. Boot-Top. (See Underwater Body/Boot-Top). (pg. 6-3)
- d. Electric Cables, Armored, Exterior. (pg. 6-3)
- e. Flight Deck. (pg. 6-3)
- f. Freeboard. (pg. 6-3)
- g. Machinery, Deck. (pg. 6-4)
- h. Masts. (pg. 6-4)
- i. Miscellaneous Details and Fittings. (pg. 6-5)
- j. Open Hulls, Cockpits and Cargo Space. (pg. 6-8)
- k. Ordnance Equipment. (pg. 6-8)
- l. Piping Systems. (pg. 6-9)
- m. Running Light Screens. (pg. 6-9)
- n. Smoke Stacks. (pg. 6-9)
- o. Spuds. (pg. 6-9)
- p. Superstructure. (pg. 6-9)

- q. Underwater Body/Boot-Top. (pg. 6-10)
- r. Weather Decks. (pg. 6-11)

2. Interior Spaces.

- a. Interior Colors - Epoxy. (pg. 6-11)
- b. Interior Colors - Fire Retardant Paint. (pg. 6-12)
- c. Miscellaneous Interior Spaces. (pg. 6-12)
- d. Piping Systems. (pg. 6-14)

B. Exterior Spaces.

1. Anchor, Anchor Chains. (See Appendix A, Reference (d), Anchor and Anchor Chain) Anchors stowed in the hawse shall be the color of the hull; white (17925), black (17038) or red (11105). Anchors stowed against the superstructure shall be, white (17925). Anchors stowed on deck shall be spar (10371). Anchor systems consisting of lightweight aluminum anchors with line vice chain shall not be painted. Anchor chain will be painted black (17038) with the exception of the depth markings. The detachable link between shots, excluding the detachable link for the 5 fathom connecting section, will be painted in the following pattern starting at the anchor end and working inboard, repeating the pattern as necessary:

15 fathom, first shot detachable link, red (11105)
30 fathom, second shot detachable link, white (17925)
45 fathom, third shot detachable link, blue (15182)

- a. Additionally, the first link on each side of the 15 fathom detachable link shall be painted white (17925). The first link at each side of the detachable link shall also be marked by one turn of wire around the stud. The first two links on each side of the 30 fathom (second shot) detachable link shall be painted white (17925). The second link at each side of the detachable link shall also be marked by two turns of wire around the stud.
 - b. The same pattern of marking detachable links shall be continued up to the next to last inboard shot. All of the links in the next to last inboard shot shall be painted yellow (13538), and all of the links in the last inboard shot shall be painted red (11105).
2. Antenna Hardware, Radio and Radar, DF Loops. Do not paint radar waveguides, gaskets, contact points, insulators or rubber stock mounts. Wire or whip antennas may be painted white or black to enhance appearance of the cutter or boat. Top coat the antenna with a commercial grade of acrylic paint. Four inch wide red (11105) warning lines shall be painted on the deck to designate Radio Frequency Radiation Hazard Areas. Location of the warning lines will be found in a modification to the ship's drawings. Warning

signs shall be posted where personnel enter the hazardous areas. Further guidance can be found in Electronics Manual, COMDTINST M10550.25 (series). Antennas are not to be painted with metallic based paints. If unsure, do not paint and refer painting maintenance to the supporting electronics facility.

TABLE 6-1: ANTENNA HARDWARE COLORS	
Hardware	Color
Direction Finder Stand and Loops	White (17925)
Radar	Match Mast Color
Whip Antennas	White (17925)
Antenna base (receive)	Blue (15182)
Antenna base (transmit)	Red (11105)
NOTE: Radio antennas may be painted black for aesthetic reasons. The manufacturer's recommended coating should be used for this purpose. Usually, the recommended coating is a water based acrylic. Coatings with metallic pigment shall not be used on antennas.	

3. Boot-Top. (See Underwater Body/Boot-Top).
4. Electric Cables, Armored, Exterior. Paint in the color of the structure to which the cable is attached. Do not paint identification labels.
5. Flight Deck. All vessels with helicopter flight decks shall follow the instruction set forth in the Shipboard-Helicopter Operational Procedures Manual, COMDTINST M3710.2 (series), Chapter 4, for proper marking and identification of this area.
6. Freeboard (See Table 6-2: Underwater Body, Boot-top, and Freeboard Colors). The freeboard coating system shall extend from the upper limit of the boot-topping, antifouling or underwater area to the top of the hull, bulwark, or sheer line, including all fittings.

TABLE 6-2: UNDERWATER BODY, BOOT-TOP, AND FREEBOARD COLORS			
Vessel Class	U/W Body ¹	Boot Top ¹	Freeboard
BOATS/OTHER:			
14' Skiffs - ops on ice	Int'l Orange (12197)	Int'l Orange (12197)	Int'l Orange (12197)
ANB	Red (11105)	Black (17038)	Black (17038)
ASB	Hull and freeboard no longer painted. Remove coatings in lieu of repainting.		
Barges	Red (11105)	Black (17038)	Black (17038)
BUSL	Red (11105)	Black (17038)	Black (17038)

Vessel Class	U/W Body ¹	Boot Top ¹	Freeboard
Flood Relief Punts	Int'l Orange (12197)	Int'l Orange (12197)	Int'l Orange (12197)
LCM	Black (17038)	Black (17038)	Black (17038)
LCVP	Hull and freeboard no longer painted. Remove coatings in lieu of repainting.		
Motor Lifeboats (47')	Black (17038)	Black (17038)	No Coating
Motor Surf Boats	White (17925)	White (17925)	White (17925)
RB-M	Black (17038)	Black (17038)	No Coating
RB-S	Do not paint.		
Reduced Visibility³	Light Gray (26373)	Light Gray (26373)	Light Gray (26373)
TANB	Hull and freeboard no longer painted. Remove coatings in lieu of repainting.		
UTB/ATB	Black (17038)	Black (17038)	White (17925) ²
CUTTERS:			
Black Hulls - WLB, WLM, WTGB, WLI, WLIC, WLR, WYTL	Red (11105)	Red (11105)	Black (17038)
White Hulls – WMSL, WHEC, WMSM, WMEC, WIX, WPB	Red (11105)	Black (17038)	White (17925) ⁴
Red Hull – WAGB, WLBB	Black (17038)	Black (17038)	Red (11105)

Notes:

¹ Many of the coatings specified for the boot-top/underwater body are not available in the FED-STD-595 color numbers listed. Use the color which best approximates the FED-STD-595 color number. For example, cuprous oxide-based antifouling coatings are not available in red. A red oxide (brownish red) would be used instead.

² 41 UTBs that have had the paint removed from the freeboard are not required to repaint.

³ The Reduced Visibility scheme shall be applied to all Port Security Unit (PSU) boats and any other boats designated by the Office of Boat Forces (CG-731). The freeboard of aluminum boats does not require painting.

⁴ A “tear-drop” or other appropriate pattern may be painted around through-hull diesel exhausts – see cutter class drawing.

- 7. Machinery, Deck.** All deck machinery including winches, capstans, davits, and cranes, along with their associated appendages such as booms, cradles, frames, equipment safety bumpers, controls, and control stands shall be painted spar (10371). Any exceptions will be specified in Table 6-3: Miscellaneous Details and Fittings. Working surfaces in contact with wire rope or synthetic lines may be coated with gray or green-gray Inorganic Zinc.

8. Masts.

- a. Masts, including ladders, crow's nests, platforms and their supports and foundations, shall be spar (10371). Equipment secured to the masts, such as pedestals, searchlights or bullhorns shall also be spar.
- b. Mast areas which are directly in the way of stack gases may be black (17038 or 37038). Areas on masts painted black when the vessel is commissioned will continue to be painted black in service. 399' WAGB, 378' WHECs, 270' WMECs and 210' WMECs have black masts. Any extension of these areas beyond that originally authorized or the painting of additional areas black without authorization from Commandant (CG-45) is prohibited.

9. Miscellaneous Details and Fittings. In general, miscellaneous objects whose color is not specifically prescribed elsewhere in these instructions shall be painted white (17925) if attached or immediately adjacent to some part of the superstructure that is also painted white. They shall be painted spar (10371) if attached or immediately adjacent to masts, spars, or other objects whose prescribed color is spar. Objects standing alone on the deck shall be spar. Stumbling hazards, such as deck pad eyes, deck clips, and other projections, shall be painted white for better night visibility.

- a. LCMs and barges are exceptions and will have all miscellaneous objects painted black (17038).
- b. Refer to Table 6-3 for a list of miscellaneous objects most frequently encountered. The general rules shall be applied to objects not listed.
- c. For working vessels such as buoy tenders, harbor tugs and construction tenders, miscellaneous deck fittings/details, such as the inboard bow bulwark on icebreakers or the back side of the jack staff, and vertical bulkheads except superstructure shall be painted flat black (37038) to reduce glare.

On newer vessels, first refer to the Vessel Painting Schedule. If not listed there, follow the miscellaneous painting instructions listed in this Section. If a conflict between this Manual and the vessels painting schedule occurs, the requirements of this Manual shall take precedence.

TABLE 6-3: MISCELLANEOUS DETAILS AND FITTINGS	
Item	Color
Aerial - Drop Pump Canisters	International Orange (12197)
Alarms, Chemical	Green (14260)
Alarms, Collision	Yellow (13538)
Alarms, Emergency, Fire and General	Red (11105)
Applicators	Red (11105)
Applicator nozzles	Polish

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Item	Color
Awning Ridgepoles and Stanchions	White (17925)
Battle Lanterns	As manufactured or Yellow (13538)
Bits, side, mounted on gunwales on harbor tugs	Black (17038)
Bits, side, mounted on gunwales on seagoing tugs	Spar (10371)
Bits, mooring and towing	Spar (10371) ²
Blocks (except those in black areas on mast or stack)	Spar (10371) ¹
Blocks, in black area on mast or stack	Black (17038) ¹
Blocks, traveling or fall type, and related swivels and headache balls made of corrosion resistant material.	Painting not required; outline major component with Yellow, or Yellow/Black stripe safety tape/edging. Yellow (13538) if painted
Blocks, traveling or fall type, and related swivels and headache balls made of non-corrosion resistant material.	Yellow (13538); or Yellow (13538)/Black (17038) stripe; or Spar (10371) with Yellow/ Black stripe safety tape/edging for large blocks.
Boarding Ladders	Spar (10371)
Boarding Ladders, Wood	Do not paint. Coat with linseed oil.
Brightwork	Polish and coat with clear plastic or lacquer
Canvas or fabric covers, removable	No coating. Fabric color to match color of item covered or blue, black, or white for non-emergency deck gear
Chocks, brass/bronze	Uncoated ²
Chocks, bulwark	Bulwark color ¹
Chocks, except bulwark and roller type	Spar (10371) ¹
Chocks, Roller	Black (17038) ¹
Collars, Sponsons and Fixed Fendering	International Orange (12197) ⁴
Compass Stands, except binnacle and bright work	White (17925) or Blue Gray (16099)
Davits, all type	Spar (10371)
Deck chests	White (17925)
Deck treads, Non Skid	No coating
Diaphones	Spar (10371)
Dodgers (Windscreen), Canvas	Fabric color to be white, blue or black
Dogs	Grease moving parts, do not Paint. Do not grease oil tight bearings, add oil if required.
Flag Staffs (on white hulls)	Spar (10371)
Flag Staffs (on black & red hulls)	Spar (10371)
Fire Pumps	Red (11105)
Firemain valves, (except threaded and machined parts)	Red (11105)
Flag lockers	White (17925)
Foam valves and outlets (AFFF)	1" wide diagonal stripes, approximately 45° alternating Red (11105) and Green (14062)
Fuel Can, P-100 pump	IAW NSTM 555-4.11.2.9.5.1. Units may deviate from NSTM by replacing Purple stripe with Yellow (13538) and replacing the word "JP-5" with "DIESEL" in Black (17038) letters. ³

Item	Color
Gangplanks, metal, except aluminum	White (17925)
Gangplanks, aluminum	No coating
Gasoline cans, portable	Red (11105)
Gasoline drums	Yellow (13538) with "GASOLINE" in Black (17038) letters
Gasoline storage racks	Color of bulkhead
Glare Reduction	Flat Black (37038)
Handrails and lifeline stanchions	White (17925) ⁵
Hatch coamings	Spar (10371) or Blue Grey (16099) if deck mounted
Hatch covers	White (17925)
Hooks (boat davit, crane or cargo boom) and related swivels and headache balls; corrosion resistant material	Painting not required; outline major component with Yellow, or Yellow/Black stripe safety tape/edging. Yellow (13538) if painted.
Hooks (boat davit, crane or cargo boom) and related swivels and headache balls; other than corrosion resistant material	Yellow (13538); or Yellow (13538)/Black (17038) stripe
Hose racks, saddles and reels for fire hose	Red (11105)
Hull numbers and markings	See Chapter 7
Insulators, Electrical	No coating
Jack staffs (on white hulls)	Spar (10371)
Jack staffs (on black and red hulls)	Spar (10371)
Knife edges on watertight doors and hatches	Do not paint. Clean with aluminum oxide abrasive cloth, grit #320
Ladders, except those on masts	White (17925)
Ladders, leading from Buoy Deck	Black (17038)
Ladders, on masts	Spar (10371)
Leather coverings	Oil with preservative, neat's-foot 0-L-165
Name plates	No coating
Pelorus pedestals	White (17925)
Pilot House Visor, underside	White (17925) or Blue Grey (16099)
Probe, refueling	Black (17038)
Pump, gasoline powered	Yellow (13538)
Ready service lockers	White (17925)
Release mechanisms	Grease
Rigging, running	Lubricate per SFLC Technical Standard 613.
Rigging, standing	Lubricate per SFLC Technical Standard 613.
Searchlights, except on masts	White (17925)
Searchlights, on masts	Spar (10371)
Searchlight shutters	No coating
Sheaves	Block color or Spar (10371) ¹
Spray shield on bridge, inboard	White (17925) or Blue Gray (16099)
Towing bits See: Bits, towing	
Towing rail (corrosion resistant material)	No coating

Item	Color
Turtle Back (distinct area adjacent to superstructure where cargo handling gear is attached to deck)	Black (17038)
Ventilators, all types, including gooseneck pipe vents, not attached or immediately adjacent to the superstructure	Spar (10371)
Winches, WLR/WLIC air winches for spud or crossdeck service	Black (17038) ¹

Notes:

¹ Working surfaces in contact with wire rope or synthetic lines may be coated with gray or green-gray Inorganic Zinc.

² Corrosion resistant materials such as stainless steel/CRES and aluminum are not required to be painted.

³ With regard to P-100 pump markings, the Coast Guard allows deviation from NSTM because cutters do not always carry JP-5/F-76. The choice between following the NSTM or the modified version provided in this Manual is at the discretion of the individual unit.

⁴ Color may vary depending on construction material limitations. Color shall be Haze Gray (26270) when in Reduced Visibility configuration.

⁵ Aft handrails on the 49 BUSL shall be painted black (17038).

10. Open Hulls, Cockpits and Cargo Spaces. The exterior freeboard and boot top of open hulls are painted according to Table 6-2. The interiors of shipboard open hulls are painted spar (10371) and the interiors of all others are painted as follows: The inside of open hulls and the cockpits and cargo spaces of decked hulls shall be white (17925) down to the side seats or risers, or down to the cockpit deck, grating, or floorboards if there are no side seats or risers. UTLs will have blue gray (16099) decks unless these decks are of color-impregnated material. Blue-gray (16099) will be applied below the white including seats, thwarts, inside of hull, cockpit decks, gratings, floorboards or open bilges. Engine trunks not extending appreciably above the sheer line will be blue gray (16099) overall. This color scheme will apply to all boats except as noted below.

- a. LCMs, Barges, and Buoy Boats will have the interior of their cargo spaces black (17038). Bulk barge storerooms will have a white (17925) overhead and bulkheads.
- b. Flood Relief Punts and Ice Skiffs will have the entire interior, including hull, thwarts, floor boards, and bilges painted international orange (12197).

11. Ordnance Equipment. Interior and exterior surfaces of enclosed gun mount shields are to be painted white (17925). The interior gun mechanism and equipment shall be painted gray (16376). Gun barrels shall be painted black (27038). The foundations of all gun mounts, mortars, launchers, and gun directors shall be painted the same color as the deck on which they are mounted. All open gun mounts and mortars shall be painted black (27038). Close-in-Weapons System (CIWS) shall be maintained in the delivered preservation color. Super Rapid Blooming Outboard Chaff (SRBOC) launching systems shall be maintained in the delivered preservation color in accordance with NAVSEA Technical Manual SW393-AI-MMM-010/MK36/1-2. MK92 FCS CAS RADOMES shall be spray painted white (17925) with Silicone Alkyd Paint MIL-PRF-24635, Type II.

Dry film thickness shall not exceed 6 mils total. Film thickness tolerance must be maintained to avoid interference with radar transmission.

- a. Ready service lockers, pyrotechnic lockers, explosive lockers, and detonator lockers shall be painted white (17925) and conspicuously labeled with the content of each locker. The label shall be stenciled in red (11105) letters of the largest practical size.
- b. Bulkheads and magazine overheads shall be painted white (27886). Magazine decks shall be painted blue gray (16099). Ammunition dredger hoists and their controllers shall be painted equipment gray (16376). Gun directors and all fire control equipment shall also be painted equipment gray.

12. Piping Systems. See interior piping systems, section 6.C.4 and Table 6-8.

13. Running Light Screens. Shall be painted flat black (37038).

14. Smoke Stack. Stack exteriors shall be painted spar (10371) with a black (17038) band around the top of the stack, unless otherwise authorized by the Commandant (CG-45). The width of the band shall equal 1/2 the fore-and-aft diameter of the stack or 1/5 the height of the stack, whichever is smaller. If the stack has a hood, the hood shall also be painted black and will form an extension of the band. WHEC's (378 ft.) and WMEC's (270 ft. and 210 ft.) shall follow the Vessel Painting Schedule of a white (17925) stack with a black band.

15. Spuds. Shall be flat black (37038) or black (17038). A red (11105) 6 inch wide band shall be painted completely around the spud 6 feet from the top. This is to prevent personnel from lowering the spud too far. Further down the spud where the pin inserts, paint a red (11105) 6 inch wide band and above the red band paint a yellow (13538) 6 inch wide band. The yellow band will act as a warning and the red band will locate the pin hole so that the spud is not raised any higher.

16. Superstructure. The superstructure and all attachments secured, bracketed or adjacent to the superstructure shall be white (17925) with the exception of boats in a Reduced Visibility configuration that shall be Light Gray (26373) or unpainted aluminum. This includes:

- a. Aircastles, in board and outboard,
- b. Breakwaters,
- c. Bridge wings,
- d. Bulwarks, bulwark supports and brackets (bulwarks forming an extension of the hull shall be painted the hull color outboard. The inboard bow bulwark on icebreakers shall be painted with dull black to cut glare),

- e. Cabins, where there is no distinct demarcation between vertical and horizontal surfaces, white shall be used over the entire cabin,
- f. Canvas dodgers attached to superstructure, bulwarks or bridge wings (optional blue or black; inboard side on the bridge may be painted blue gray (16099) to reduce glare),
- g. Deck houses,
- h. Electrical conduits,
- i. Engine trunks,
- j. Gun shields,
- k. Gun tubs,
- l. Ladders,
- m. Passageways, including overheads,
- n. Pilothouses (underside of visor over pilothouse windows may be painted blue gray (16099) to reduce glare),
- o. Shelters, including overheads,
- p. Spray shields (inboard side on the bridge may be painted blue gray (16099) to reduce glare),
- q. Stanchions,
- r. Switch boxes, and
- s. Ventilation ducts.

17. Underwater Body/Boot-Top. (See Table 6-2.)

- a. Underwater Body. The underwater body coating systems include the area from the bottom of the keel to the upper edge of the boot-topping. It also includes rudders, bilge keels, skegs, sea chests and gratings. Use alternating colors for the different coats of anticorrosive (AC) epoxy paint and antifouling (AF) paint. Table 6-4 contains the recommended schemes.

TABLE 6-4: UNDERWATER BODY PAINT SCHEME						
<u>Freeboard</u>	<u>Underwater Body (including Boot-Top)</u>					<u>Boot-Top Only</u>
	1 st Coat	2 nd Coat	3 rd Coat	4 th Coat	5 th Coat	Last Coat
	AC-1	AC-2	AF-1	AF-2	AF-3	AF(Boot-Top)
Black Hull:						
7-Year System	Red	Gray	Black	Red	-	Red
12-Year System	Red	Gray	Black	Red	Red	Red
Fresh Water (No Boot-top)	Gray	Red	-	-	-	-
White Hull:						
7-Year System	Red	Gray	Black	Red	-	Black
12-Year System	Red	Gray	Black	Red	Black	Black
Red Hull:						
Single Coat System	Black	-	-	-	-	-
Multi-Coat System	Gray	Red	-	-	-	Black

- b. Boot-Top. The location/placement of the boot-top shall conform to Coast Guard Drawing No. FL-2804-021 for boats and Coast Guard Drawing No. FL-2804-022 for cutters.

18. Weather Decks. When painted, weather decks shall be CG gloss dark gray (16099) if a broadcast grit system is applied or Navy flat dark gray (36076) if a MIL-SPEC non-skid is applied. When slip resistant sheet material (color approximating dark gray -16099) is applied, steel weather decks shall be painted CG gloss dark gray (16099) prior to application while aluminum weather decks may be left unpainted. Where there is a coaming at the deck edge, the deck paint will be extended up the inboard surface of the coaming. Deck paint shall also be applied to bounding angles between decks and superstructure or hatch coaming where superstructure and hatch coamings are welded to the deck. A dado of dark gray shall be applied to the vertical surfaces and shall not exceed 12 inches in height. Waterways shall also be painted dark gray. Water tight door jams in the dado may be painted black to mask scuff marks. Buoy tender working decks should be gray (36231). Proprietary coatings authorized for use on buoy tender working decks may be green-gray in color. Red-gray colors are not authorized.

C. Interior Spaces.

1. Interior Colors - Epoxy (See Table 6-5). In all spaces requiring an epoxy as the topcoat, use a high build epoxy which approximates the following colors:

TABLE 6-5: INTERIOR COLORS – EPOXY	
<u>COLOR</u>	<u>FED STD 595</u>
Black	27038
Dark Gray	26099
Gray	26270
Light Gray	26373
Green	24272
Red	20152
White	27886
Yellow	23594

2. Interior Colors - Fire Retardant Paint (See Table 6-6). All specifications shall include the requirements of this Manual. All vessels shall use the coating systems in this Manual for painting the vessel interior. In all spaces requiring fire retardant paint, colors are limited to those found in the Chlorinated Alkyd Fire Retardant Paint (DOD-E-24607) and Water Based Fire Retardant Paint (MIL-PRF-24596) specifications. The authorized colors can be found in Table 6-6. COs and OICs are authorized to select any color combination from the above list if it is not in conflict with the safety color code requirements found elsewhere in this Manual. At CO/OIC discretion, miscellaneous interior details, such as the pilothouse overhead or bridge consoles, may be painted flat black (37038) to reduce glare.

TABLE 6-6: INTERIOR COLORS - FIRE RETARDANT PAINT	
<u>COLOR</u>	<u>FED STD 595</u>
Soft White	27880
Pastel Green	24585
Bulkhead Gray	26307
Beach Sand	22563
Rose Wood	22519
Clipper Blue	24516
Sun Glow	23697
Green Gray	26496
Yellow Gray	26400
Pearl Gray	26493
Pastel Blue	25526

3. Miscellaneous Interior Spaces (See Table 6-7).

TABLE 6-7: MISCELLANEOUS INTERIOR SPACES				
Interior Space	1st Coat ^{1,2}	2nd Coat	3rd Coat	Topcoat ³
Bilges and Cofferdams	Light Gray (26373)	-	-	Red (20152)
Bilges and Cofferdams – Optional color system to allow for easier inspection	Red (20152)	-	-	Light Gray (26373)
Bulkheads and Overheads, Uninsulated Aluminum	Green (24272)	-	-	Soft White (27880) or Pastel Green (24585)
Bulkheads and Overheads, Uninsulated Steel	Green (24272)	Light Gray (26373)	-	Soft White (27880) or Pastel Green (24585)
Bulkheads and Overheads, Uninsulated Metal-wet areas	Green (24272)	-	-	As required
Bulkheads and Overheads, Uninsulated Steel/Aluminum-appearance not a factor	Green (24272)	-	-	Gray (26270)
Chain Lockers	-	-	-	Gray (26270)
Condensation, Space Subjected to	Light Gray (26373)	Green (24272)	Light Gray (26373)	Soft White (27880) or Pastel Green (24585)
Deckplates, Steel/Aluminum (Bottom and edges)	-	-	-	Gray (26270)
Decks, Steel/Aluminum-wet areas	Green (24272)	-	-	Color as required
Decks, Steel/Aluminum-dry areas and non-skid	Green (24272)			Deck Red (10076) or Light Gray (16251)
Doors, Joiner	Green (24272)	-	-	Soft White (27880) or Pastel Green (24585)
Electric Cable, Armored	Green (24272)	-	-	Match adjacent bulkhead
Furniture and Galley Equip.	Green (24272)	-	-	Soft White (27880) or Pastel Green (24585)
Inaccessible Areas, Steel/Aluminum	Green (24272)	-	-	Gray (26270)
Insulation Surfaces, Fiberglass Sheet	-	-	-	Soft White (27880) or Pastel Green (24585)
Insulation Surfaces, Closed Cell PVC	White	-	-	White (Can be tinted to match adjacent bulkhead)
Machinery, Operating Temp. < 200°F	Green (24272)	-	-	Gray (26307) or match OEM color
Machinery, Operating Temp. > 200°F	-	-	-	Aluminum
Piping, Insulated/Uninsulated < 200°F	-	-	-	See Next Section.
Piping, Uninsulated > 200°F	-	-	-	Aluminum
Tanks and Voids, General	Use appropriate system from MIL-PRF-23236. Choose white as topcoat unless it is not manufactured in that color. Undercoats should be contrasting colors.			
Wood, Painted Interior	Green (24272)	-	-	Soft White (27880) or Pastel Green (24585)
Wood, Stained and Varnished Interior	Choose appropriate stain from list for Fed Spec TT-S-711			

Notes:

¹ Mist coats are not included.² Color of underlying primer coat(s) is not critical; however, each coat should provide color contrast to ensure complete coverage

during application.

³ Applies to final two coats of coatings such as DOD-E-24607 Chlorinated Alkyd and MIL-PRF-24596 Fire Retardant.

4. Piping Systems. All piping and valve bodies with the exception of that for oxygen and firemain shall be painted to match adjacent bulkheads or overheads. Packing glands, valve stems, threads and similar working surfaces shall not be painted.
 - a. Where feasible, all piping shall be marked to show the name of the service, destination and the direction of flow where practical.
 - b. The name of the service and destination shall be painted on by stencil or hand lettering or by applying adhesive-backed tape, previously printed, stenciled or lettered. Lettering shall be one inch high for two inch or larger outside diameter bare pipe or insulation. For smaller sizes, lettering size may be reduced or label plates attached by wire or other suitable means.
 - c. Direction of flow shall be indicated by an arrow three inches long pointing away from the lettering. For reversible flow, arrows are to be shown on each end of the lettering.
 - d. Lettering and arrows shall be black except for dark colored pipe, including oxygen piping, for which they shall be white.
 - e. Markings shall be applied to piping in conspicuous locations, preferably near control valves and at suitable intervals so that every line shall have at least one identification marking in each compartment through which it passes. Piping markings in cabins, officers' wardroom and messrooms, and warrant officers' messrooms are optional.
 - f. Valves are marked by inscribing the rims of handwheels, by a circular label plate secured by the handwheel nut, or by label plates attached to the ship's structure or to the adjacent piping.
 - g. Piping system valve handwheels and operating levers shall be provided with a standardized color code identification for training and casualty control purposes (see Table 6-8.)
 - h. Valve handwheels and operating levers may be painted with brush or spray. Paint these items with the same coatings used on the machinery which they are fastened to.
 - i. Oxygen pipes, including valve bodies, shall be light green (14449).
 - j. Firemain valves, magazine sprinkler valves and fire hose connections, except threaded parts, valve stems and other working parts, shall be painted red (11105). The remainder of firemain and sprinkler main piping system shall be painted to match the surrounding areas. Aluminum sprinkler piping in magazines area shall not be painted.

TABLE 6-8: PIPING SYSTEM IDENTIFICATION COLOR CODE		
Piping Contents	Valve Handwheel/ Operating Lever	Fed Std 595 Color Number
AFFF (Foam)	Striped Red/Green	(11105)/(14062)
Cleaning Fluid	Brown	(10080)
Feedwater	Light Blue	(15200)
Firemain & Plugs	Red	(11105)
Fuel Oil/Gasoline	Yellow	(13538)
H.P. Air	Dark Gray	(16081)
Halon	Striped Gray/White	(16187)/(17925)
Helium	Buff	(10371)
Helium/Oxygen	Striped Buff/Green	(10371)/(14449)
Hepta Fluoro Propane (HFP)	Striped Gray/White	(16187)/(17925)
Hydraulic Fluid	Orange	(12246)
Hydrogen	Chartreuse	(23814)
JP-5	Purple	(17142)
L.P. Air	Tan	(10324)
Lube Oil	Striped Yellow/Black	(13538)/(17038)
Nitrogen	Light Gray	(16376)
Oxygen	Light Green	(14449)
Potable Water	Dark Blue	(15044)
Refrigerants	Dark Purple	(17100)
Salt Water	Dark Green	(14062)
Sewage	Gold	(17043)
Steam	White	(17925)
Water Mist	Striped Red/Dk. Blue	(11105)/(15044)

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CHAPTER 7 CUTTER AND BOAT IDENTIFICATION MARKINGS

- A. General. All vessels and boats including boats assigned to cutters shall be identified by distinctive visual identification markings consisting of the Coast Guard emblem and diagonal stripes as well as numerals and letters. U.S. Coast Guard Heraldry, COMDTINST M5200.14 (series) authorizes use of the Coast Guard Emblem and Seal and discusses the authorized display of the Coast Guard Emblem and stripes. The size, style, spacing, and location of all markings shall be in accordance with the detailed drawings for each individual cutter and boat class. Requirements for size, style, spacing, and location of all markings can be found in Coast Guard Drawing No. FL-2804-021 for boats and Coast Guard Drawing No. FL-2804-022 for cutters. In rare cases, deviation from the prescribed use of the emblem, stripes and seal as well as other ship markings may be advantageous to provide a more optically appropriate and esthetically pleasing appearance. However, any such change must be specifically approved by the acquisition program manager and shall be reflected in the detailed drawings for each individual cutter and boat class. Note that individual class drawings take precedence over the fleet drawings.
- B. Other Markings. The following sections cover markings that are not found in Coast Guard Drawing No. FL-2804-021 for boats and Coast Guard Drawing No. FL-2804-022 for cutters.
1. Individual Ship Emblems. Individual ship emblems shall not be painted on, nor affixed to, the exterior of vessels. An emblem which is in keeping with the dignity of the service may be displayed at the quarterdeck or gangway.
 - a. Requests for approval of ship emblems will be submitted to the district commander or area commander, as appropriate, together with a replica of the emblem design in full color. Following approval, district commanders shall furnish a copy of the design to the program manager and facilities manager. The replica of the emblem design shall be an 8" x 10" photograph, drawing or other copy marked to indicate colors if not a colored replica.
 - b. Direct liaison with the Institute of Heraldry, Department of the Army, is authorized to assist in the design or procurement of drawings and molds. Requests should be addressed to:

Director
U. S. Army Institute of Heraldry
9325 Gunston Road Room S-112
Fort Belvoir, VA 22060-5579
(703) 806-0055.
 2. Commendation and Service Insignia. Display of commendation and service insignia is optional. When displayed, they will consist of replicas of the ribbons of the awards to which the vessel would be entitled under the same rules and regulations as prescribed in the Medals and Awards Manual, COMDTINST M1650.25 (series).

- a. Replicas of authorized operation and engagement stars as well as stars representing second and subsequent awards are authorized to be painted on the authorized ribbons.
- b. The sizes and locations designated in Table 7-1 shall be a guide for the ship types listed and shall be used as a general rule for ship types not listed. Where symmetrical arrangements permit, the painted replicas will be displayed on both sides of the vessel in corresponding locations, port and starboard.
- c. Painted replicas of commendation and service insignia shall be arranged in the same order as ribbons worn by personnel with a maximum of three replicas in a horizontal line.

TABLE 7-1 PAINTED REPLICAS OF COMMENDATION AND SERVICE INSIGNIA		
<u>Type Vessel</u>	<u>Insignia Size</u>	<u>Location</u>
378' WHEC	5" wide x 18" long	Centered on outboard side of bridge wing bulwark both port and starboard
270' WMEC	5" wide x 18" long	Centered on outboard side of bridge wing bulwark 12" below top, forward of conning platform
210' WMEC	5" wide x 18" long	Centered on outboard side of bridge wing bulwark, 12" below top
110' WPB	3-1/4" wide x 12" long	Centered on superstructure 6" below the window

- 3. Cutter Achievement Awards. The requirements for visual display of cutter achievement awards such as the Engineering "E" or Damage Control "DC" can be found in Tab F to Appendix 23 to Annex C to COMLANTAREA SOP or Enclosure 2 to Tab B to Appendix 3 to Annex C to COMPACAREA SOP.
- 4. Controlled Substance Contraband Seizure Logos. The decision to display, or not to display such logos will remain a command prerogative. Those units desiring to display logos shall do so in accordance with contraband symbols approved by Commandant. Vessels with broken service/commission time (such as post MMA and FRAM cutters) may display all contraband decals earned since original Coast Guard commissioning. Display of these logos shall be as follows:
 - a. Contraband decals are only earned for seizures resulting in the issuing of a Federal Drug Identification Number (FDIN). FDINs will only be issued when seizures meet the weight/number requirements set forth in Chapter 5, section D.11, of the U.S. Coast Guard Maritime Law Enforcement Manual (MLEM), COMDTINST M16247.1 (series).
 - b. Individual seizures may be symbolically displayed by a green marijuana leaf (or blue snowflake) with a red "X" of equivalent size superimposed on it.
 - c. Upon attainment of seizures totaling one hundred thousand pounds of a single type of contraband, the individual seizure logos contributing to this milestone shall be removed and replaced by a single, normal-sized, silver logo with a superimposed red "X" of equivalent size.

- d. The largest maritime seizure in Coast Guard history may be symbolically displayed by a gold snowflake (or gold marijuana leaf), normal-sized, with a red "X" of equivalent size superimposed on it. Units are authorized to retain this symbol even after another unit's seizure supersedes it.
 - e. Size, location, composition, and color shading of symbols displayed shall remain at the unit CO/OINC's discretion, with the general guidance that their size be appropriate to the size of the displaying unit, and that the color shades chosen do not detract from mandated unit color schemes.
5. Ring Type Life Buoys. The vessel's name or number will be placed on the top semicircle of the ring. Place on the bottom semicircle the legend "U.S. COAST GUARD". Black letters 2 inches in height will be used. Retroreflective tape shall be applied as illustrated in Reference (e).
 6. Life Floats. Markings will always be placed on the longer legs of the raft. The vessel's name or number will be placed on one leg and the legend "U.S. COAST GUARD" will be placed on the other leg. The markings will be placed to be readily seen and placed so the vessel's name or the vessel's number shall be read first. Retroreflective tape shall be applied as specified in Reference (e).
 7. PFD's. On Navy standard vest-type PFD's the vessel's name or number will be placed across the middle of the back of the PFD in letters 3/4 inch in height. Coast Guard approved Type III PFD's shall be marked as specified in Reference (e).
 8. Wood Articles. Deck chests, boat boxes, oars, or other wood articles which may be washed overboard will have the vessel's name preceded by USCGC or designating number preceded by CG burned into the article in 1/2 inch letters to leave a clear impression.
 9. Radio Call Numbers. There is no longer a requirement for radio call numbers on the top of a vessels superstructure.

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