

**§ 190.25-15 Guards in dangerous places.**

(a) Suitable hand covers, guards, or rails shall be installed in way of all exposed and dangerous places such as gears, machinery, etc.

**§ 190.25-90 Vessels contracted for prior to July 1, 1969.**

(a) Existing structures, arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction: *Provided*, That in no case will a greater departure from the standards of §§ 190.25-5 through 190.25-15 be permitted than presently exists.

[CGFR 67-83, 33 FR 1125, Jan. 27, 1968, as amended by CGFR 69-72, 34 FR 17503, Oct. 29, 1969]

**PARTS 191-192 [RESERVED]****PART 193—FIRE PROTECTION EQUIPMENT****Subpart 193.01—Application**

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- 193.60-10 Location.

AUTHORITY: 46 U.S.C. 2213, 3102, 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1.

SOURCE: CGFR 67-83, 33 FR 1145, Jan. 27, 1968, unless otherwise noted.

**Subpart 193.01—Application****§ 193.01-1 General; preemptive effect.**

(a) The provisions of this part shall apply to all vessels other than non-self-propelled vessels of less than 300 gross tons.

(b) Non-self-propelled vessels of less than 300 gross tons shall not be subject to the provisions of this part, except as provided otherwise by §§ 193.01-5 and 193.50-1.

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(c) The regulations in this part have preemptive effect over State or local regulations in the same field.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by USCG-2006-24797, 77 FR 33893, June 7, 2012]

### § 193.01-3 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. All approved material is available for inspection at the U.S. Coast Guard, Office of Design and Engineering Standards (CG-ENG), 2703 Martin Luther King Jr. Avenue SE., Stop 7509, Washington, DC 20593-7509, and is available from the sources listed below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

(b) ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, 877-909-2786, <http://www.astm.org>.

(1) ASTM F1121-87 (Reapproved 2010), Standard Specification for International Shore Connections for Marine Fire Applications, (approved March 1, 2010), incorporation by reference approved for § 193.10-10.

(2) [Reserved]

(c) National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169, 617-770-3000, <http://www.nfpa.org>.

(1) NFPA 13, Standard for the Installation of Sprinkler Systems, 2010 Edition, effective August 26, 2009, IBR approved for § 193.30-1.

(2) [Reserved]

[USCG-2009-0702, 74 FR 49240, Sept. 25, 2009, as amended by USCG-2012-0832, 77 FR 59789, Oct. 1, 2012; USCG-2012-0866, 78 FR 13252, Feb. 27, 2013; USCG-2013-0671, 78 FR 60165, Sept. 30, 2013; USCG-2012-0196, 81 FR 48301, July 22, 2016]

### § 193.01-5 Equipment installed but not required.

(a) On all vessels, including non-self-propelled vessels of less than 300 gross tons, where extinguishing systems or

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equipment are not required, but are installed, the system or equipment and its installation must meet the requirements of this part.

(b) Use of non-approved fire detection systems may be acceptable as excess equipment provided that—

(1) Components are listed by an independent, nationally recognized testing laboratory as set forth in 29 CFR 1910.7, and are designed, installed, tested, and maintained in accordance with an appropriate industry standard and the manufacturer's specific guidance;

(2) Installation conforms to the requirements of 46 CFR chapter I, subchapter J (Electrical Engineering), especially the hazardous location electrical installation regulations in 46 CFR 111.105; and

(3) Coast Guard plan review is completed for wiring plans.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by USCG-2012-0196, 81 FR 48301, July 22, 2016]

## Subpart 193.05—Fire Detecting and Extinguishing Equipment, Where Required

### § 193.05-1 Fire detecting, manual alarm, and supervised patrol systems.

(a) Fire detecting, manual alarm, and supervised patrol systems are not required, but if installed, the systems shall meet the applicable requirements of part 76 of Subchapter H (Passenger Vessels) of this chapter.

### § 193.05-5 Fire main system.

(a) Fire pumps, hydrants, hose, and nozzles shall be installed on all manned vessels.

(b) Except as provided for in § 193.10-10(e), the fire main must be a pressurized or a remotely controlled system.

(c) The arrangements and details of the fire main system shall be as set forth in subpart 193.10.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 75-031, 40 FR 48349, Oct. 15, 1975]

### § 193.05-10 Fixed fire extinguishing systems.

(a) Approved fire extinguishing systems must be installed in all lamp and

paint lockers, oil rooms, and similar spaces.

(b) A fixed carbon dioxide or clean agent fire extinguishing system complying with 46 CFR subparts 95.15 and 95.16 must be installed for:

- (1) Internal combustion engine installations;
- (2) Gas turbine installations;
- (3) Enclosed spaces containing gasoline engines;
- (4) Chemical storerooms;
- (5) Any space containing auxiliaries with an aggregate power of 1,000 brake horsepower (b.h.p.) or greater, or their fuel oil units, including purifiers, valves, and manifolds, on vessels of 1,000 gross tons and over; and
- (6) Enclosed ventilating systems installed for electric propulsion motors or generators.

(c) On vessels of 1,000 gross tons and over, a fixed carbon dioxide or clean agent fire extinguishing system complying with 46 CFR subparts 95.15 and 95.16 or a foam system complying with 46 CFR subpart 95.17 must be installed for any space containing main or auxiliary oil fired boilers or their associated fuel oil units, valves, or manifolds in the line between the settling tanks and the boilers.

(d) Systems for spaces containing explosives and other dangerous articles or substances must also comply with 46 CFR part 194.

[USCG-2006-24797, 77 FR 33893, June 7, 2012]

**§ 193.05-15 Hand portable fire extinguishers and semiportable fire extinguishing systems.**

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed on all manned vessels as set forth in subpart 193.50.

**Subpart 193.10—Fire Main System, Details**

**§ 193.10-1 Application.**

(a) The provisions of this subpart, with the exception of § 193.10-90, shall apply to all vessels contracted for on or after March 1, 1968.

(b) Vessels contracted for prior to March 1, 1968, shall meet the requirements of § 193.10-90.

**§ 193.10-5 Fire pumps.**

(a) Vessels must be equipped with independently driven fire pumps in accordance with Table 193.10-5(a) of this section.

TABLE 193.10-5(a)—REQUIRED FIRE PUMP SYSTEM

Gross tons		Minimum number of pumps	Hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
.....	100	1 <sup>1</sup>	1 1/2	1 1/2	50
100 .....	1,000	1	1 1/2	5/8	50
1,000 .....	1,500	2	1 1/2	5/8	50
1,500 .....	.....	2	2 1/2	2 7/8	250

<sup>1</sup> On vessels of 65 feet (19.8 meters) in length or less, 3/4 inch hose of good commercial grade together with a commercial garden hose nozzle may be used. The pump may be hand operated and the length of hose must be sufficient to assure coverage of all parts of the vessel.

<sup>2</sup> 75 feet (22.86 meters) of 1 1/2 inch hose and 5/8 inch nozzle may be used where specified by § 193.10-10(b) for interior locations and 50 feet (15.24 meters) of 1 1/2 inch hose may be used in exterior locations on vessels in other than ocean or coastwise services. Vessels on ocean or coastwise services may substitute two 1 1/2 inch outlets with two 1 1/2 inch hoses supplied through a wye connection in exterior locations.

(b) On vessels of 1,000 gross tons or more on an international voyage, each required fire pump, while delivering water through the fire main system at a pressure corresponding to that required by paragraph (c) of this section, must have a minimum capacity of at least two-thirds of that required for an independent bilge pump. However, in no case shall the capacity of each fire

pump be less than that otherwise required by this section.

(c) Each pump must be capable of delivering water simultaneously from the outlets having the greatest pressure drop from the fire pumps to the nozzles which may not always be the two highest outlets, at a Pitot tube pressure of not less than 50 p.s.i. Where 1 1/2-inch hose is permitted in lieu of 2 1/2-inch

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hose by footnote 2 of Table 193.10-5(a), the pump capacity must be determined on the same basis as if 2½-inch hose had been permitted. Where ¾-inch hose is permitted by Table 193.10-5(a), the Pitot tube pressure may not be less than 35 p.s.i.

(d) Fire pumps must be fitted on the discharge side with relief valves set to relieve at 25 p.s.i. in excess of the pressure necessary to maintain the requirements of paragraph (c) of this section or 125 p.s.i., whichever is greater. Relief valves may be omitted if the pumps, operating under shutoff conditions, are not capable of developing a pressure exceeding this amount.

(e) Fire pumps must be fitted with a pressure gage on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. In no case may a pump having connection to an oil line be used as a fire pump. Branch lines connected to the fire main for purposes other than fire and deck wash must be so arranged that adequate water can be made continuously available for firefighting purposes.

(g) The total area of the pipes leading from a pump must not be less than the discharge area of the pump.

(h) Where two fire pumps are required on vessels with main or auxiliary oil-fired boilers or with internal combustion propulsion machinery, the pumps must be located in separate spaces. The pumps, sea connections, and sources of power must be arranged to ensure that a fire in any one space will not put all of the fire pumps out of operation. However, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement, the installation of a fixed fire extinguishing system may be accepted as an alternate method of extinguishing any fire that would affect the powering and operation for the required fire pumps.

(i) Except as provided for in § 193.10-10(e), a sufficient number of hose streams for fire fighting purposes must be immediately available from the fire main at all times by either of the following methods:

(1) *Maintenance of water pressure.* (i) Water pressure must be maintained on the fire main at all times by the continuous operation of:

- (A) One of the fire pumps; or
- (B) Another suitable pump capable of supplying one hose stream at a Pitot tube pressure of not less than 50 p.s.i. (35 p.s.i. for ¾-inch hose); or,
- (C) A pressure tank capable of supplying one hose stream at a Pitot tube pressure of not less than 50 p.s.i. (35 p.s.i. for ¾-inch hose) for five minutes.

(ii) An audible alarm must be installed to sound in a continuously manned space if the pressure in the fire main drops to less than that necessary to maintain the minimum Pitot tube pressures specified in § 193.10-5(i)(1)(i)(B).

(2) *Remote control of fire pumps.* (i) At least one fire pump must be capable of remote activation and control.

(ii) If the fire pump is in a continuously manned machinery space, the controls for operating it and the controls for all necessary valves must be located on the manned operating platform in that space.

(iii) If the fire pump is in an unmanned machinery space, the controls for its operation and the controls for all necessary valves must be located in:

- (A) The fire control station, if any; or,
- (B) The bridge, if there is no fire control station; or,
- (C) A readily accessible space acceptable to the Officer in Charge, Marine Inspection.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 75-031, 40 FR 48349, Oct. 15, 1975; CGD 95-028, 62 FR 51220, Sept. 30, 1997; USCG-2006-24797, 77 FR 33893, June 7, 2012; USCG-2012-0196, 81 FR 48302, July 22, 2016]

**§ 193.10-10 Fire hydrants and hose.**

(a) The size of fire hydrants, hose, and nozzles and the length of hose required must be as noted in Table 193.10-5(a) of this subpart.

(b) In 2½-inch hose and hydrants specified in Table 193.10-5(a) of this subpart, on vessels of more than 1,500 gross tons, the hydrants in interior locations may have wye connections for 1½-inch hose. In these cases, the hose must be 75 feet (22.86 meters) in length, and only one hose will be required at

each fire station; however, if all such stations can be satisfactorily served with 50-foot lengths, 50-foot hose may be used. The hydrants for exterior locations may substitute two 1½-inch outlets, each with a 1½-inch hose, supplied through a wye connection.

(c) On vessels of 500 gross tons or more there must be at least one shore connection to the fire main available to each side of the vessel in an accessible location. Suitable cutout valves and check valves must be provided for furnishing the vessel's shore connections with couplings mating those on the shore fire lines. Vessels of 500 gross tons or more on an international voyage, must be provided with at least one international shore connection complying with ASTM F 1121 (incorporated by reference, see §193.01-3). Facilities must be available enabling an international shore connection to be used on either side of the vessel.

(d) Fire hydrants must be of sufficient number and so located that any part of the vessel, other than main machinery spaces, may be reached with at least 2 streams of water from separate outlets, at least one of which must be from a single length of hose. In main machinery spaces, all portions of such spaces must be capable of being reached by at least 2 streams of water, each of which must be from a single length of hose from separate outlets; however, this requirement need not apply to shaft alleys containing no assigned space for the stowage of combustibles. Fire hydrants must be numbered as required by §196.37-15 of this subchapter.

(e) All parts of the fire main located on exposed decks must either be protected against freezing or be fitted with cutout valves and drain valves so that the entire exposed parts of such piping may be shut off and drained in freezing weather. Except when closed to prevent freezing, such valves must be sealed open.

(f) The outlet at the fire hydrant must be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead horizontally or downward to minimize the possibility of kinking.

(g) Each fire hydrant must be provided with a single length of hose with

nozzle attached and a spanner wrench. A suitable hose rack or other device must be provided for the proper stowage of the hose. If the hose is not stowed in the open or behind glass so as to be readily seen, the enclosures must be marked in accordance with §196.37-15 of this subchapter.

(h) Firehoses must be connected to the outlets at all times. However, at open decks where no protection is afforded to the hose in heavy weather, the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

(i) Each fire hydrant must have at least 1 length of firehose. Each firehose must have a combination solid stream and water spray nozzle that is approved under subpart 162.027 of this subchapter, except 19 millimeters (3/4 inch) hose may have a garden hose nozzle that is bronze or metal with strength and corrosion resistance equivalent to bronze. Combination solid stream and water spray nozzles previously approved under subpart 162.027 of this chapter may be retained so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(j) When the firehose nozzle in the below locations was previously approved under subpart 162.027 of this chapter, a low-velocity water spray applicator, also previously approved under subpart 162.027, of this chapter must be installed as follows:

(1) At least 1 length of firehose on each fire hydrant outside and in the immediate vicinity of each laboratory; and

(2) Each firehose in each propulsion machinery space containing oil-fired boiler, internal combustion machinery, or oil fuel unit on a vessel of 1,000 gross tons or more—the length of each applicator must be 1.2 meters (4 feet).

(k) Fixed brackets, hooks, or other means for stowing an applicator must be next to each fire hydrant that has an applicator under paragraph (j) of this section.

(l) Firehose must not be used for any other purpose than fire extinguishing, drills, and testing.

(m) Fire hydrants, nozzles, and other fittings must have threads to accommodate the hose connections noted in

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this paragraph. Firehose and couplings must be as follows:

(1) Couplings must be of brass, bronze, or other equivalent metal. National Standard firehose coupling threads must be used for the 1½-inch and 2½-inch sizes, *i.e.*, 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(2) Unlined hose must not be used in the machinery spaces.

(3) Where ¾-inch hose is permitted by Table 193.10-5(a) of this subpart, the hose and couplings must be of good commercial grade.

(4) Each section of firehose used after January 1, 1980 must be lined commercial firehose that conforms to Underwriters' Laboratories, Inc. Standard 19 or Federal Specification ZZ-H-451E. Hose that bears the label of Underwriters' Laboratories, Inc. as lined firehose is accepted as conforming to this requirement. Each section of replacement firehose or any section of new firehose placed aboard a vessel after January 1, 1977 must also conform to the specification required by this paragraph.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 74-60, 41 FR 43152, Sept. 30, 1976; CGD 76-086, 44 FR 2394, Jan. 11, 1979; CGD 88-032, 56 FR 35830, July 29, 1991; CGD 95-027, 61 FR 26012, May 23, 1996; USCG-2000-7790, 65 FR 58465, Sept. 29, 2000; USCG-2012-0196, 81 FR 48302, July 22, 2016]

## § 193.10-15 Piping.

(a) All piping, valves, and fittings, shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All distribution cut-off valves shall be marked as required by § 196.37-10 of this subchapter.

(c) For vessels on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This requirement is in addition to § 193.10-5(c). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants must be at a minimum Pitot tube pressure of 50 pounds per square inch.

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imum Pitot tube pressure of 50 pounds per square inch.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 75-031, 40 FR 48349, Oct. 15, 1975]

## § 193.10-90 Installations contracted for prior to March 1, 1968.

Installations contracted for prior to March 1, 1968, must meet the following requirements:

(a) Except as specifically modified by this paragraph, vessels must comply with the requirements of §§ 193.10-5 through 193.10-15 insofar as the number and general type of equipment is concerned.

(b) Existing equipment, except firehose nozzles and low-velocity water spray applicators, previously approved but not meeting the applicable requirements of §§ 193.10-5 through 193.10-15, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installations. However, all new installations or major replacements must meet the applicable requirements in this subpart for new installations.

(c) Vessels must comply with the general requirements of § 193.10-5 (c) through (g), § 193.10-10 (d) through (m), and § 193.10-15 insofar as is reasonable and practicable.

(d) Each firehose nozzle must meet § 193.10-10(i), and each low-velocity water spray applicator must meet § 193.10-10(j).

[CGD 95-027, 61 FR 26013, May 23, 1996]

## Subpart 193.15—Carbon Dioxide and Clean Agent Extinguishing Systems, Details

### § 193.15-1 Application.

(a) The provisions of this subpart shall apply to all new installations contracted for on or after March 1, 1968.

(b) Installations contracted for prior to March 1, 1968, shall meet the requirements of § 193.15-90.

(c) The requirements of this subpart are based on a "high pressure system,"

*i.e.*, one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for ‘low pressure systems,’ *i.e.*, those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

**§ 193.15-5 Quantity, pipe sizes, and discharge rates.**

(a) *General.* The amount of carbon dioxide required for each space shall be as determined by paragraphs (b) through (d) of this section.

(b) *Total available supply.* A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Enclosed ventilation systems for rotating electrical propulsion equipment.* (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) In addition to the amount required by paragraph (c)(1) of this section there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25-percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(3) The piping for the delayed discharge shall not be less than  $\frac{1}{2}$ -inch standard pipe, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(4) The piping for the initial charge shall be in accordance with Table 193.15-5(d)(4), and the discharge of the required amount shall be completed within 2 minutes.

(d) *Machinery spaces, paint lockers, tanks, chemical storerooms, and similar spaces.* (1) Except as provided in para-

graph (d)(3) of this section, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 193.15-5(d)(1). If fuel can drain from the compartment being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 193.15-5(d)(1)  
[Gross volume of compartment, cubic feet]

Over	Not over	Factor
.....	500	15
500 .....	1,600	16
1,600 .....	4,500	18
4,500 .....	50,000	20
50,000 .....	.....	22

(2) For the purpose of the requirements of this paragraph, the volume of the machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion machinery, or fuel oil installations extend into such space, in which case the volume shall be taken to the top of the casing or the next material reduction in casing area, whichever is lower. ‘Normal machinery casing’ and ‘material reduction in casing area’ shall be defined as follows:

(i) By ‘normal machinery casing’ shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By ‘material reduction in casing area’ shall be meant a reduction to at least 40 percent of the casing area.

(3) For vessels on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by paragraphs (d)(1) and (2) of this section or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(4) Branch lines to the various spaces shall be as noted in Table 193.15-5(d)(4).

**§ 193.15-10****46 CFR Ch. I (10-1-24 Edition)****TABLE 193.15-5(d)(4)**

Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches
100 .....	1/2
225 .....	3/4
300 .....	1
600 .....	1 1/4
1,000 .....	1 1/2
2,450 .....	2
2,500 .....	2 1/2
4,450 .....	3
7,100 .....	3 1/2
10,450 .....	4
15,000 .....	4 1/2

(5) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(6) The number, type, and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(7) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the normal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inch.

(8) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

**§ 193.15-10 Controls.**

(a) Except as noted in § 193.15-20(b), all controls and valves for the operation of the system shall be outside the space protected and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one hazard, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one hazard, a normally closed stop valve shall be installed between the cylinders and the hazard except for systems of the type indicated in § 193.15-5(d) which contain not more than 300 pounds of carbon dioxide.

(c) One of the stations controlling the system for the main machinery space and the chemical storerooms shall be located as convenient as practicable to one of the main escapes from these spaces. All control stations and the individual valves and controls shall be marked as required by §§ 196.37-10 and 196.37-13 of this subchapter.

(d) Systems of the type indicated in § 193.15-5(d) shall be actuated by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Those systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 193.15-5(d), other than systems for tanks, which are of more than 300 pounds of carbon dioxide, shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for those systems for tanks and for spaces which have a suitable horizontal escape.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the systems must be located in a conspicuous place at or near all pull boxes, stop valve controls and in the CO<sub>2</sub> cylinder storage room. On systems in which the CO<sub>2</sub> cylinders

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are not within the protected space, these instructions must also include a schematic diagram of the system and instructions detailing alternate methods of discharging the system should the manual release or stop valve controls fail to operate. Each control valve to branch lines must be marked to indicate the related space served.

(i) If the space or enclosure containing the carbon dioxide supply for controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 74-100R, 40 FR 6209, Feb. 10, 1975]

**§ 193.15-15 Piping.**

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 pounds per square inch.

(b) All piping, in nominal sizes not over  $\frac{3}{4}$  inch shall be at least Schedule 40 (standard weight) and in nominal sizes over  $\frac{3}{4}$  inch, shall be at least Schedule 80 (extra heavy).

(c) All piping valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 pounds per square inch shall be installed in the distribution manifold or such other location as to protect the piping in the event that all branch line shutoff valves are closed.

(e) All dead-end lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire-detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements are:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 pounds per square inch. With no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 pounds per square inch per minute for a 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding subparagraph with the exception that the pressure used shall be 600 pounds per square inch in lieu of 1,000 pounds per square inch. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in the preceding paragraphs in this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, chemical storerooms, etc., may be tested by blowing out the piping with air at a pressure of at least 100 pounds per square inch.

**§ 193.15-16 Lockout valves.**

(a) A lockout valve must be provided on any carbon dioxide extinguishing system protecting a space over 6,000 cubic feet in volume and installed or altered after [July 9, 2013. "Altered" means modified or refurbished beyond the maintenance required by the manufacturer's design, installation, operation and maintenance manual.

(b) The lockout valve must be a manually operated valve located in the discharge manifold prior to the stop valve or selector valves. When in the closed position, the lockout valve must provide complete isolation of the system from the protected space or spaces, making it impossible for carbon dioxide to discharge in the event of equipment failure during maintenance.

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(c) The lockout valve design or locking mechanism must make it obvious whether the valve is open or closed.

(d) A valve is considered a lockout valve if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it.

(e) The master or person-in-charge must ensure that the valve is locked open at all times, except while maintenance is being performed on the extinguishing system, when the valve must be locked in the closed position.

(f) Lockout valves added to existing systems must be approved by the Commandant as part of the installed system.

[USCG-2006-24797, 77 FR 33893, June 7, 2012]

## § 193.15-17 Odorizing units.

Each carbon dioxide extinguishing system installed or altered after July 9, 2013, must have an approved odorizing unit to produce the scent of wintergreen, the detection of which will serve as an indication that carbon dioxide gas is present in a protected area and any other area into which the carbon dioxide may migrate. "Altered" means modified or refurbished beyond the maintenance required by the manufacturer's design, installation, operation and maintenance manual.

[USCG-2006-24797, 77 FR 33893, June 7, 2012]

## § 193.15-20 Carbon dioxide storage.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in § 193.15-5(d), consisting of not more than 300 pounds of carbon dioxide, may have cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated

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ambient temperature in excess of 130 °F.

(d) Cylinders shall be securely fastened and supported, and where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent siphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide must be fabricated, tested, and marked in accordance with the requirements of §§ 147.60 and 147.65 of this chapter.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by CGD 84-044, 53 FR 7753, Mar. 10, 1988]

## § 193.15-25 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

## § 193.15-30 Alarms.

(a) Space normally accessible to persons on board while the vessel is being navigated which are protected by a carbon dioxide extinguishing system and are required to be fitted with a delayed discharge system other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm which will be automatically sounded when the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by § 196.37-9 of this subchapter. Such alarms shall be so arranged as to sound during the 20-second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend

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on no source of power other than the carbon dioxide.

**§ 193.15-35 Enclosure openings.**

(a) Where mechanical ventilation is provided for spaces which are protected by carbon dioxide extinguishing systems provisions shall be made so that the ventilation system is automatically shut down with the operation of the system to that space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all other openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

**§ 193.15-40 Pressure relief.**

(a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

**§ 193.15-50 Clean agent systems.**

A clean agent system complying with 46 CFR subpart 95.16 may be used as an alternative to a carbon dioxide fire extinguishing system.

[USCG-2006-24797, 77 FR 33893, June 7, 2012]

**§ 193.15-90 Installations contracted for prior to March 1, 1968.**

(a) Installations contracted for prior to March 1, 1968, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations,

and replacements may be permitted to the same standards as the original installations. However, all new installations or major replacements shall meet the applicable requirements in this subpart for new installations.

(2) The details of the systems shall be in general agreement with §§193.15-5 through 193.15-40 insofar as is reasonable and practicable, with the exception of §193.15-5(d) (1), (2), and (4), covering machinery spaces, etc., which systems may be installed in accordance with paragraphs (a) (3) through (6) of this section.

(3) In boilerrooms, the bilges shall be protected by a system discharging principally below the floorplates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boilerroom taken to the top of the boilers divided by 36. In the event of an elevated boilerroom which drains to the machinery space, the system shall be installed in the engineroom bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(4) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the under side of the deck forming the hatch opening divided by 22.

(5) In miscellaneous spaces other than cargo or main machinery spaces the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(6) Branch lines to the various spaces other than cargo and similar spaces shall be as noted in Table 193.15-90(a)(6). This table is based on cylinders having discharge outlets and siphon tubes of  $\frac{3}{8}$ -inch diameter.

TABLE 193.15-90(a)(6)

Number of cylinders		Nominal pipe size, inches
Over	Not over	
.....	2	$\frac{1}{2}$ —standard.
2	4	$\frac{3}{4}$ —standard.
4	6	1—extra heavy.
6	12	$1\frac{1}{4}$ —extra heavy.
12	16	$1\frac{1}{2}$ —extra heavy.
16	27	2—extra heavy.

**§ 193.30-1****46 CFR Ch. I (10-1-24 Edition)****TABLE 193.15-90(a)(6)—Continued**

Number of cylinders		Nominal pipe size, inches
Over	Not over	
27 .....	39	2½—extra heavy.
39 .....	60	3—extra heavy.
60 .....	80	3½—extra heavy.
80 .....	104	4—extra heavy.
104 .....	165	5—extra heavy.

**Subpart 193.30—Automatic Sprinkler Systems****§ 193.30-1 Application.**

Automatic sprinkling systems must comply with Chapter 25 of NFPA 13 (incorporated by reference, see § 193.01-3).

[USCG-2012-0196, 81 FR 48302, July 22, 2016]

**Subpart 193.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements and Details****§ 193.50-1 Application.**

(a) The provisions of this subpart, with the exception of § 193.50-90, apply to all vessels, including non-self-propelled vessels of less than 300 gross tons, contracted for on or after March 1, 1968.

(b) All vessels other than unmanned barges contracted for prior to March 1, 1968, must meet the requirements of § 193.50-90.

(c) All unmanned barges are exempted from the requirements in this subpart. However, if such barges carry on

board hand portable fire extinguishers and semi-portable fire extinguishing systems, then such equipment must be in accordance with this subpart for manned barges.

[CGFR 67-83, 33 FR 1145, Jan. 27, 1968, as amended by USCG-2012-0196, 81 FR 48301, July 22, 2016]

**§ 193.50-10 Location.**

(a) Approved portable fire extinguishers and semi-portable fire extinguishing systems must be installed in accordance with Table 193.50-10(a) of this section. The location of the equipment must be to the satisfaction of the Officer in Charge, Marine Inspection (OCMI). Nothing in this paragraph must be construed as limiting the OCMI from requiring such additional equipment as he or she deems necessary for the proper protection of the vessel.

(b) Table 193.50-10(a) indicates the minimum required classification for each space listed. Extinguishers with larger numerical ratings or multiple letter designations may be used if the extinguishers meet the requirements of the table.

(c) Semi-portable fire extinguishing systems must be located in the open so as to be readily seen.

(d) If portable fire extinguishers are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the firehose, provided such enclosures are marked as required by § 196.37-15 of this subchapter.

**TABLE 193.50-10(a)—CARRIAGE OF PORTABLE FIRE EXTINGUISHER AND SEMI-PORTABLE FIRE EXTINGUISHING SYSTEMS**

Space	Minimum required rating	Quantity and location
<b>Safety Areas</b>		
Wheelhouse or fire control room .....	.....	None.
Stairway and elevator enclosures .....	.....	None.
Communicating corridors .....	2-A .....	1 in each main corridor not more than 150 ft apart. (May be located in stairways.)
Lifeboat embarkation and lowering stations .....	.....	None.
Radio room .....	20-B:C1 .....	2 in the vicinity of the exit. <sup>1</sup>
<b>Accommodations</b>		
Staterooms, toilet spaces, public spaces, offices, lockers, isolated storerooms, pantries, open decks, etc.	.....	None.

TABLE 193.50-10(a)—CARRIAGE OF PORTABLE FIRE EXTINGUISHER AND SEMI-PORTABLE FIRE EXTINGUISHING SYSTEMS—Continued

Space	Minimum required rating	Quantity and location
<b>Service Spaces</b>		
Galleys .....	40-B:C .....	1 for each 2,500 sq ft or fraction thereof.
<b>Machinery Spaces</b>		
Paint and lamp rooms .....	40-B .....	1 outside space in the vicinity of the exit.
Accessible baggage, mail, and specie rooms, and storerooms.	2-A .....	1 for each 2,500 sq ft or fraction thereof located in the vicinity of the exits, either inside or outside the spaces.
Carpenter shop and similar spaces .....	2-A .....	1 outside the space in the vicinity of the exit.
Coal-fired boilers: Bunker and boiler space .....	.....	None.
Oil-fired boilers: Spaces containing oil-fired boilers, either main or auxiliary, or their fuel-oil units.	40-B .....	2 required. <sup>2</sup>
Internal combustion or gas turbine propelling machinery spaces.	160-B .....	1 required. <sup>3</sup>
.....	40-B .....	1 for each 1,000 brake horsepower, but not fewer than 2 nor more than 6. <sup>4</sup>
Electric propulsive motors or generators of open type.	120-B .....	1 required, <sup>5</sup> <sup>6</sup>
.....	40-B:C .....	1 for each propulsion motor or generator unit.
Enclosed ventilating systems for motors and generators of electric propelling machinery.	.....	None.
<b>Auxiliary Spaces</b>		
Internal combustion gas turbine .....	40-B .....	1 outside the space in vicinity of the exit. <sup>6</sup>
Electric emergency motors or generators .....	40-B:C .....	1 outside the space in vicinity of the exit. <sup>7</sup>
Steam .....	.....	None required.
Trunks to machinery spaces .....	.....	None required.
Fuel tanks .....	.....	None required.
<b>Scientific Spaces</b>		
Chemistry laboratory or scientific laboratory .....	40-B:C .....	2 for each 300 sq ft of deck space or fraction thereof, with one (1) of each kind located in the vicinity of the exit.
Chemical storeroom .....	40-B:C .....	Same as for the chemistry laboratory.
<b>Spare Units</b>		
	2-A .....	10 percent of required units rounded up.
	40-B:C .....	10 percent of required units rounded up.

<sup>1</sup> For vessels on an international voyage, substitute one 40-B:C in vicinity of the exit.<sup>2</sup> Vessels of fewer than 1,000 GT require one.<sup>3</sup> Vessels of fewer than 1,000 GT may substitute one 120-B.<sup>4</sup> Only one required for motorboats.<sup>5</sup> If oil burning donkey boiler fitted in space, the 160-B previously required for the protection of the boiler may be substituted.

Not required where a fixed carbon dioxide system is installed.

<sup>6</sup> Not required on vessels of fewer than 300 GT if fuel has a flash-point higher than 110 °F.<sup>7</sup> Not required on vessels of fewer than 300 GT.

(e) Portable fire extinguishers and their stations must be numbered in accordance with § 196.87-15 of this subchapter.

(f) Portable or semi-portable extinguishers, which are required on their nameplates to be protected from freezing, must not be located where freezing temperatures may be expected.

[USCG-2012-0196, 81 FR 48302, July 22, 2016]

#### § 193.50-20 Semi-portable fire extinguishers.

(a) The frame or support of each semi-portable fire extinguisher required by Table 193.50-10(a) of this subpart must be welded or otherwise permanently attached to a bulkhead or deck.

(b) If an approved semi-portable fire extinguisher has wheels and is not required by Table 193.50-10(a) of this subpart, it must be securely stowed when not in use to prevent it from rolling

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out of control under heavy sea conditions.

(c) Semi-portable extinguishers must be fitted with suitable hose and nozzle, or other practicable means, so that all areas of the space can be protected.

[CGD 77-039, 44 FR 34133, June 14, 1979, as amended by USCG-2012-0196, 81 FR 48304, July 22, 2016]

### § 193.50-80 Locations and number of fire extinguishers required for vessels constructed prior to August 22, 2016.

Vessels contracted for prior to August 22, 2016, must meet the following requirements:

(a) Previously installed extinguishers with extinguishing capacities smaller than what is required in Table 193.50-10(a) of this subpart need not be replaced and may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(b) All new equipment and installations must meet the applicable requirements in this subpart for new vessels.

[USCG-2012-0196, 81 FR 48304, July 22, 2016]

### § 193.50-90 Vessels contracted for prior to March 1, 1968.

(a) Vessels contracted for prior to March 1, 1968, must meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of § 193.50-10 must be complied with insofar as the number and general type of equipment is concerned.

(2) Existing installations previously approved, but not meeting the applicable requirements of § 193.50-10, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, and they are in general agreement with the degree of safety prescribed by Table 193.50-10(a) of this subpart. Minor modifications may be made to the same standard as the original installation, provided that in no case will a greater departure from the standards of Table 193.50-10(a) of this subpart be permitted than presently exists.

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(3) All new equipment and installations must meet the applicable requirements in this subpart for new vessels.

[USCG-2012-0196, 81 FR 48304, July 22, 2016]

## Subpart 193.60—Fire Axes

### § 193.60-1 Application.

(a) The provisions of this subpart shall apply to all vessels other than unmanned barges.

(b) Unmanned barges are exempted from the requirements in this subpart. However, if such barges carry on board fire axes, then such equipment shall be in accordance with this subpart for manned barges.

### § 193.60-5 Number required.

(a) All vessels shall carry at least the minimum number of fire axes as set forth in Table 193.60-5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the vessel.

TABLE 193.60-5(a)

Gross tons		Number of axes
Over	Not over	
	50	1
50 .....	200	2
200 .....	500	4
500 .....	1,000	6
1,000 .....	.....	8

### § 193.60-10 Location.

(a) Fire axes shall be distributed throughout the spaces available to persons on board so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open, or behind glass, so that they may be readily seen, they may be placed in enclosures together with the firehose, provided such enclosures are marked as required by § 196.37-15 of this subchapter.

## PART 194—HANDLING, USE, AND CONTROL OF EXPLOSIVES AND OTHER HAZARDOUS MATERIALS

### Subpart 194.01—Application

Sec.

194.01-1 General; preemptive effect.