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All fluid power and control systems and components thereof shall be tested as required by this section.

(b) Accumulators constructed as pressure vessels under the provisions of part 54 of this subchapter shall be tested and retested as required by parts 54 and 61 of this subchapter.

(c) Fluid power and control systems and piping assemblies shall be given an installation test as follows:

(1) Fluid power and control systems and piping assemblies and associated equipment components, including hydraulic steering gear, in lieu of being tested at the time of installation, may be shop tested by the manufacturer to 11⁄2 times the maximum allowable pressure of the system. The required test pressure shall be maintained for a sufficient amount of time to check all components for strength and porosity and to permit an inspection to be made of all connections.

(2) Fluid power and control systems and associated hydraulic equipment components which have been tested in conformance with paragraph (c)(1) of this section and so certified by the manufacturer, may be tested after installation as a complete assembly by stalling the driven unit in a safe and satisfactory manner and by blowing the relief valves. Otherwise, these systems shall be hydrostatically tested in the presence of a marine inspector at a pressure of 11⁄2 times the maximum allowable pressure.

(3) Fluid power and control systems incorporating hydropneumatic accumulators containing rupture discs may be tested at the maximum allowable working pressure of the system in lieu of 11⁄2 times this value as prescribed in paragraphs (c)(1) and (2) of this section provided the accumulators have been previously tested in accordance with paragraph (b) of this section and welded or brazed piping joints are not employed in the system. If welded or brazed joints are employed, the system shall be tested in accordance with the requirements of paragraphs (c)(1) and (2) of this section except that the accumulators may be isolated from the remainder of the system.

(d) Fluid power and control systems shall be purged with an inert gas or with the working fluid and all trapped air bled from the system prior to any shipboard testing. In no case shall air, oxygen, any flammable gas, or any flammable mixture of gases be used for testing fluid power systems.

(e) Fluid control systems, such as boiler combustion controls, containing components with internal parts, such as bellows or other sensing elements, which would be damaged by the test pressure prescribed in paragraphs (c) (1) and (2) of this section may be tested at the maximum allowable working pressure of the system. In addition, all fluid control systems may be tested using the system working fluid.

§ 58.30–40 Plans.

(a) Diagrammatic plans and lists of materials must be submitted for each of the fluid power and control systems listed in §58.30–1(a) that is installed on the vessel. Plan submission must be in accordance with subpart 50.20 of this subchapter and must include the following:

(1) The purpose of the system.

(2) Its location on the vessel.

(3) The maximum allowable working pressure.

(4) The fluid used in the system.

(5) The velocity of the fluid flow in the system.

(6) Details of the system components in accordance with §56.01–10(d) of this subchapter.

§ 58.30–50 Requirements for miscellaneous fluid power and control systems.

(a) All fluid power and control systems installed on a vessel, except those
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Gasoline fuel tanks.

(a) Construction—(1) Shape. Tanks may be of either cylindrical or rectangular form, except that tanks for emergency electrical systems shall be of cylindrical form.

(2) Materials and construction. The material used and the minimum thickness allowed shall be as indicated in Table 58.50–5(a) except that consideration will be given to other materials which provide equivalent safety as indicated in §58.50–15.

(3) Prohibited types. Tanks with flanged-up top edges that may trap and hold moisture shall not be used.

(4) Openings. Openings for fill, vent and fuel pipes, and openings for fuel level gages where used, shall be on the topmost surface of tanks. Tanks shall have no openings in bottoms, sides, or ends, except that an opening fitted with threaded plug or cap may be used for tank cleaning purposes.

TABLE 58.50–5(a)

<table>
<thead>
<tr>
<th>Material</th>
<th>ASTM specification (all incorporated by reference; see 46 CFR 58.03–1)</th>
<th>Thickness in inches and gage numbers vs. tank capacities for—</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Thickness in inches and gage numbers vs. tank capacities for—</td>
<td>1- through 80-gallon tanks</td>
</tr>
<tr>
<td>Alumnum</td>
<td>B 209, Alloy 5086</td>
<td>0.250 (USGG 3)</td>
</tr>
<tr>
<td>Nickel-copper</td>
<td>B 127, Hot rolled sheet or plate</td>
<td>0.037 (USGG 20)</td>
</tr>
<tr>
<td>Copper</td>
<td>B 122, Alloy No. 5</td>
<td>0.045 (AWG 17)</td>
</tr>
<tr>
<td>Copper-silicon</td>
<td>B 96, alloys C65100 and C65000.</td>
<td>0.057 (AWG 15)</td>
</tr>
<tr>
<td>Steel or iron</td>
<td>0.0747 (MfgStd 14)</td>
<td>0.1046 (MfgStd 12)</td>
</tr>
</tbody>
</table>

1Gauges used are U.S. standard "USGG" for aluminum and nickel-copper; "AWG" for copper, copper-nickel and copper-silicon; and "MfgStd" for steel.

2Tanks over 400 gallons shall be designed with a factor of safety of four on the ultimate strength of the material used with a design head of not less than 4 feet of liquid above the top of the tank.

3Nickel-copper not less than 0.031 inch (USGG 22) may be used for tanks up to 30-gallon capacity.

4Fuel tanks constructed of iron or steel, which is less than 3/8-inch thick shall be galvanized inside and outside by the hot dip process.

5Anodic to most common metals. Avoid dissimilar metal contact with tank body.

6And other alloys acceptable to the Commandant.