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approved by the Commandant (G–MSO).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.426 Design vapor pressure.

The P_o of a membrane tank must not exceed 24.5 kPa gauge (3.55 psig) unless special approval by the Commandant (G–MSO) allows a P_o between 24.5 kPa gauge (3.55 psig) and 69 kPa gauge (10 psig).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.427 Membrane tank system design.

A membrane tank system must be designed for:

(a) Any static and dynamic loads with respect to plastic deformation and fatigue;

(b) Combined strains from static, dynamic, and thermal loads;

(c) Preventing collapse of the membrane from:

(1) Over-pressure in the interbarrier space;

(2) Vacuum in the cargo tank;

(3) Sloshing in a partially filled cargo tank; and

(4) Hull vibrations; and

(d) The deflections of the vessel's hull.

§ 154.428 Allowable stress.

The membrane tank and the supporting insulation must have allowable stresses that are specially approved by the Commandant (G–MSO).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.429 Calculations.

The tank design load calculations for a membrane tank must include the following:

(a) Plastic deformation and fatigue life resulting from static and dynamic loads in the membrane and the supporting insulation.

(b) The response of the membrane and its supporting insulation to vessel motion and acceleration under the worst weather conditions. Calculations from a similar vessel may be submitted to meet this paragraph.

(c) The combined strains from static, dynamic, and thermal loads.

§ 154.430 Material test.

(a) The membrane and the membrane supporting insulation must be made of materials that withstand the combined strains calculated under § 154.429(c).

(b) Analyzed data of a material test for the membrane and the membrane supporting insulation must be submitted to the Commandant (G–MSO).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.431 Model test.

(a) The primary and secondary barrier of a membrane tank, including the corners and joints, must withstand the combined strains from static, dynamic, and thermal loads calculated under § 154.429(c).

(b) Analyzed data of a model test for the primary and secondary barrier of the membrane tank must be submitted to the Commandant (G–MSO).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.432 Expansion and contraction.

The support system of a membrane tank must allow for thermal and physical expansion and contraction of the tank.

SEMI-MEMBRANE TANKS

§ 154.435 General.

(a) The design of a semi-membrane tank, the supporting insulation for the tank, and the supporting hull structure for the tank must be specially approved by the Commandant (G–MSO).

(b) A semi-membrane tank must be designed to meet:

(1) § 154.425 through § 154.432;

(2) § 154.437 through § 154.440; or

(3) § 154.444 through § 154.449.

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]