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(1) Acceptable test results on a lifejacket of sufficiently similar design.

(2) Engineering analysis showing that the test is not applicable to the particular design or that by design or construction the lifejacket can not fail the test.

(e) *Alternative requirements.* A lifejacket that does not meet requirements in this subpart may still be approved if the device—

(1) Meets other requirements prescribed by the Commandant in place of or in addition to requirements in this subpart; and

(2) Provides at least the same degree of safety provided by other lifejackets that do comply with this subpart.

[CGD 78–1746, 54 FR 50320, Dec. 5, 1989, as amended by CGD 78–174b, 56 FR 29441, June 27, 1991]

§ 160.176–6 Procedure for approval of design or material revision.

(a) Each change in design, material, or construction must be approved by the Commandant before being used in lifejacket production.

(b) Determinations of equivalence of design, construction, and materials may only be made by the Commandant.

§ 160.176–7 Independent laboratories.

A list of independent laboratories which have been accepted by the Commandant for conducting or supervising the following tests and inspections required by this subpart, may be obtained from the Commandant:

(a) Approval tests.

(b) Production tests and inspections.

(c) Inspection of approved servicing facilities.

(d) Testing of materials for the purpose of making the certification required by § 160.176–8(a)(3) of this part.

§ 160.176–8 Materials.

(a) *General*—(1) *Acceptance, certification, and quality.* All components used in the construction of lifejackets must meet the requirements of subpart 164.019 of this chapter.

(2) *Condition of materials.* All materials must be new.

(3) *Temperature range.* Unless otherwise specified in standards incorporated by reference in this section, all materials must be usable in all weather conditions throughout a temperature range of −30 °C to +65 °C (−22 °F to +150 °F).

(4) *Weathering resistance.* Each nonmetallic component which is not suitably covered to shield against ultraviolet exposure must retain at least 40% of its strength after being subjected to 300 hours of sunshine carbon arc weathering as specified by Method 5804.1 of Federal Test Method Standard Number 191A.

(5) *Fungus resistance.* Each non-metallic component must retain at least 90% of its strength after being subjected to the mildew resistance test specified by Method 5762 of Federal Test Method Standard No. 191A when untreated cotton is used as the control specimen. Also, the gas transmission rate of inflation chamber materials must not be increased by more than 10% after being subjected to this test. Materials that are covered when used in the lifejacket may be tested with the covering material.

(6) *Corrosion resistance.* Each metal component must—

(i) Be galvanically compatible with each other metal part in contact with it; and

(ii) Unless it is expendable (such as an inflation medium cartridge), be 410 stainless steel, have salt water and salt air corrosion characteristics equal or superior to 410 stainless steel, or perform its intended function and have no visible pitting or other damage on any surface after 720 hours of salt spray testing according to ASTM B 117 (incorporated by reference, see § 160.176–4).

(7) *Materials not covered.* Materials having no additional specific requirements in this section must be of good quality and suitable for the purpose intended.

(b) *Fabric*—(1) *All fabric.* All fabric must—

(i) Be of a type accepted for use on Type I life preservers approved under subpart 160.002 of this part; or

(ii) Meet the Type V requirements for ''Fabrics for Wearable Devices'' in UL 1191 except that breaking strength must be at least 400 N (90 lb.) in both directions of greater and lesser thread count.

(2) *Rubber coated fabric.* Rubber coated fabric must be of a copper-inhibiting type.

(c) *Inflation chamber materials*—(1) *All materials.* (i) The average permeability of inflation chamber material, determined according to the procedures specified in §160.176–13(y)(3) of this part, must not be more than 110% of the permeability of the materials determined in approval testing prescribed in §160.176–13(y)(3) of this part.

(ii) The average grab breaking strength and tear strength of the material, determined according to the procedures specified in §§160.176–13(y)(1) and 160.176–13(y)(2) of this part, must be at least 90% of the grab breaking strength and tear strength determined from testing prescribed in §§160.176–13(y)(1) and 160.176–13(y)(2) of this part. No individual sample result for breaking strength or tear strength may be more than 20% below the results obtained in approval testing.

(2) *Fabric covered chambers.* Each material used in the construction of inflation chambers that are covered with fabric must meet the requirements specified for—

(i) ''Bladder'' materials in section 3.2.6 of MIL-L-24611(SH) if the material is an unsupported film; or

(ii) Coated fabric in section 3.1.1 of TSO-C13d if the material is a coated fabric.

(3) *Uncovered chambers.* Each material used in the construction of inflation chambers that are not covered with fabric must meet the requirements specified in paragraph (c)(2)(ii) of this section.

(d) *Thread.* Each thread must meet the requirements of subpart 164.023 of this chapter. Only one kind of thread may be used in each seam. Thread and fabric combinations must have similar elongation and durability characteristics.

(e) *Webbing.* Webbing used as a body strap, tie tape or drawstring, or reinforcing tape must meet §160.002–3(e), §160.002–3(f), §160.002–3(h) of this part respectively. Webbing used for tie tape or drawstring must easily hold a knot and be easily tied and untied. Webbing used as reinforcing tape must not chafe the wearer.

(f) *Closures*—(1) *Strength.* Each buckle, snap hook, dee ring or other type of fastening must have a minimum breaking strength of 1600 N (360 lbs). The width of each opening in a closure, through which body strap webbing passes, must be the same as the width of that webbing.

(2) *Means of Locking.* Each closure used to secure a lifejacket to the body, except a zipper, must have a quick and positive locking mechanism, such as a snap hook and dee ring.

(3) *Zipper.* If a zipper is used to secure the lifejacket to the body, it must be—

(i) Easily initiated;

(ii) Non-jamming;

(iii) Right handed;

(iv) Of a locking type; and

(v) Used in combination with another type of closure that has a quick and positive means of locking.

(g) *Inflation medium.* (1) No inflation medium may contain any compound that is more toxic than CO_2 if inhaled through any of the oral inflation mechanisms.

(2) Any chemical reaction of inflation medium during inflation must not produce a toxic residue.

(h) *Adhesives.* Adhesives must be waterproof and acceptable for use with the materials being bonded.

(i) [Reserved]

(j) *Retroreflective Material.* Each lifejacket must have at least 200 sq. cm. (31 sq. in.) of retroreflective material on its front side, at least 200 sq. cm. on its back side, and at least 200 sq. cm. of material on each reversible side. The retroreflective material must be Type I material that is approved under subpart 164.018 of this chapter. The retroreflective material attached on each side must be divided equally between the upper quadrants of the side. Attachment of retroreflective material must not impair lifejacket performance or durability.

(k) *PFD light.* Each lifejacket must have a PFD light that is approved under subpart 161.012 of this chapter and that meets the requirements of Regulations III/30.2 and III/32.3 of the 1983 Amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74/83). The light must be securely attached to the front shoulder area of the lifejacket. Attachment

of the light must not impair lifejacket performance.

(l) [Reserved]

(m) *Whistle.* Each lifejacket must have a whistle of the ball type or multi-tone type and of corrosion-resistant construction. The whistle must be securely attached to the lifejacket by a lanyard. The lanyard must be long enough to permit the whistle to reach the mouth of the wearer. If the lanyard would normally allow the whistle to hang below the waist of the average size wearer, the whistle must be stowed in a pocket on the lifejacket. The attachment of the whistle must not impair lifejacket performance.

[CGD 78–1746, 54 FR 50320, Dec. 5, 1989, as amended by CGD 78–174b, 56 FR 29441, June 27, 1991; CGD 84–068, 58 FR 29494, May 20, 1993; USCG–2000–7790, 65 FR 58464, Sept. 29, 2000]

§ 160.176–9 Construction.

(a) *General Features.* Each inflatable lifejacket must—

(1) Have at least two inflation chambers;

(2) Be constructed so that the intended method of donning is obvious to an untrained wearer;

(3) If approved for use on a passenger vessel, be inside a sealed, non-reusable package that can be easily opened;

(4) Have a retainer for each adjustable closure to prevent any part of the closure from being easily removed from the lifejacket;

(5) Be universally sized for wearers weighing over 40 kg. (90 pounds) and have a chest size range of at least 76 to 120 cm. (30 to 52 in.);

(6) Unless the lifejacket is designed so that it can only be donned in one way, be constructed to be donned with either the inner or outer surface of the lifejacket next to the wearer (be reversible);

(7) Not have a channel that can direct water to the wearer's face to any greater extent than that of the reference vest defined in § 160.176–3(h) of this part;

(8) Not have edges, projections, or corners, either external or internal, that are sharp enough to damage the lifejacket or to cause injury to anyone using or maintaining the lifejacket;

(9) Have a means for drainage of entrapped water;

(10) Be primarily vivid reddish orange, as defined by sections 13 and 14 of the ''Color Names Dictionary,'' on its external surfaces;

(11) Be of first quality workmanship;

(12) Unless otherwise allowed by the approval certificate—

(i) Not incorporate means obviously intended for attaching the lifejacket to the vessel; and

(ii) Not have any instructions indicating attachment to a vessel is intended; and

(13) Meet any additional requirements that the Commandant may prescribe, if necessary, to approve unique or novel designs.

(b) Inflation mechanisms. (1) Each inflatable lifejacket must have

(i) At least one automatic inflation mechanism;

(ii) At least two manual inflation mechanisms on separate chambers;

(iii) At least one oral inflation mechanism on each chamber; and

(iv) At least one manual inflation mechanism or one automatic inflation mechanism on each inflation chamber.

(2) Each inflation mechanism must

(i) Have an intended method of operation that is obvious to an untrained wearer;

(ii) Not require tools to activate the mechanism;

(iii) Be located outside its inflation chamber; and

(iv) Be in a ready to use condition.

(3) Each oral inflation mechanism must

(i) Be easily accessible after inflation for the wearer to ''top off'' each chamber by mouth;

(ii) Operate without pulling on the mechanism;

(iii) Not be able to be locked in the open or closed position; and

(iv) Have a non-toxic mouthpiece.

(4) Each manual inflation mechanism must

(i) Provide an easy means of inflation that requires only one deliberate action on the part of the wearer to actuate it;

(ii) Have a simple method for replacing its inflation medium cartridge; and

(iii) Be operated by pulling on an inflation handle that is marked ''Jerk to Inflate'' at two visible locations.