

Principles-Tests

Principles for development of a North American PFD standard harmonized with ISO 12402

Code	Principle	ISO Pt 9 Tests	Other Pts
AAF	<b>Automatic Activation Functions</b> - Upon water immersion an automatic <u>inflation</u> system shall activate to inflate a PFD as intended without user action, to provide the intended performance.	5.6.5 Water entry test	Pt-7
BME	<b>Buoyant Material Effective</b> - A PFD shall provide adequate buoyancy to keep the airway above the surface in its intended use environments. <u>(All)</u>	5.5.9 Measurement of buoyancy of the whole device 5.6.1.4 In-water weight - Informational Note: Adds reference to this section is 5.6.1.2 5.5.6 Over-pressure test	
CASA	<b>Gas Does Not Exceed Design Pressure</b> - A PFD with gas <u>inflation</u> system shall not damage its inflation compartment due to the maximum, internal gas pressure it generates to provide adequate buoyancy.		
CLPA	<b>Cylinder Properly Loaded (Auto)</b> - A PFD with an automatic <u>inflation</u> system shall provide for the proper arming with of a filled gas cylinder and should provide positive indication of cylinder seal, except for conditional or restricted use PFDs.	5.6.4 Donning test [Rearming test To Be Added (TBA) per N.Am comments]	Pt-7
CLPM	<b>Cylinder Properly Loaded (Manual)</b> - A PFD with manual <u>inflation</u> system shall provide for the proper loading of a gas cylinder with positive indication of cylinder seal, except for conditional or restricted use PFDs.	5.6.4 Donning test [rearming test TBA]	Pt-7
CNDA	<b>Cylinder Not Defective (Auto)</b> - A PFD with automatic <u>inflation</u> system shall include an inflation medium that consistently provides adequate buoyancy.	5.5.9 Measurement of buoyancy of the whole device 5.5.10 Inflation test (5.5.11 Test of the resistance to inadvertent inflation)	
CNDM	<b>Cylinder Not Defective (Manual)</b> - A PFD with manual <u>inflation</u> system shall include an inflation medium that consistently provides adequate buoyancy.	5.5.9 Measurement of buoyancy of the whole device 5.5.10 Inflation test	
CNPAA	<b>Cylinder Not Previously Activated (Auto)</b> - A PFD with automatic <u>inflation</u> system shall have a method of indicating that the inflation medium has not previously been activated.	5.6.4 Donning test	Pt-7
CNPAM	<b>Cylinder Not Previously Activated (Manual)</b> - A PFD with manual <u>inflation</u> system shall have a method of indicating that the inflation medium has not previously been activated.	5.6.4 Donning test	Pt-7
DA	<b>Don PFD After</b> Entering the Water - A PFD requiring user action to become functional after donning or water immersion shall allow the user to achieve full in-water effectiveness in a timely manner. <u>(All)</u>	5.6.4 Donning test (3.7, 5.6.4.4?)	
DP	<b>Don PFD Prior</b> Entering the Water - A PFD shall lend itself to rapid, intuitive, and secure donning in emergency conditions. (If a PFD is an integral part of another garment, then only donning as a PFD is essential.) <u>(All)</u>	5.6.4 Donning test	

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DTC	<b>Detectability</b> - Availability, adequacy and effectiveness of detection aids for a PFD user measured as the probability of detection of a user by rescuers. (All)	To Be Added (TBA) per outline developed on March workshop	Pt 1-6; Pt-7
EFF	<b>Effectiveness</b> - A PFD shall improve the potential for its user to survive and to be rescued from a marine event. (All) (EFF is the weighted aggregate of FB, FBA, HP, PS, TT, and DTC.)	5.6.3 Boarding test 5.6.7.2.4 Encumbrance assessment	
FB	<b>Freeboard</b> - A PFD shall maintain a user's airway out of water under various environments and use conditions. (All)	5.6.2 Measurement of freeboard	
FPA	<b>Face Plane Angle</b> - A PFD shall maintain an appropriate FPA (face plane angle) that balances competing performance attributes in the following order of importance for life saving capability: airway protection, maintenance of head temperature, and beneficial field of vision. (All)	5.6.6 Self-righting and stability test 5.6.6 Self-righting and stability test	
HP	<b>Heave Period</b> - A PFD shall maintain a user's airway out of water under various wave environments and use conditions. (All?)	To Be Added (TBA); 5.6.6 Self-righting and stability test	
MAMF	<b>Manual Device Functions Before</b> entering water - A PFD with manual gas <u>inflation</u> system shall enable activation and proper functioning while a user is out of the water.	5.6.4 Donning test (TBA)	
MAMFA	<b>Manual Device Functions After</b> entering water - A PFD with a manual gas <u>inflation</u> system shall enable activation and proper functioning while a user is in the water.	5.6.5 Water entry test	Pt-7
MAWA	<b>Mouth Activation After</b> entering water - A PFD shall have a method of mouth <u>inflation</u> that allows provision of adequate buoyancy after a user enters the water.	5.6.5 Water entry test 5.6.7.2.2 Inflation	Pt-7
MAWB	<b>Mouth Activation Before</b> entering water - A PFD shall have a method of mouth <u>inflation</u> that allows provision of adequate buoyancy before a user enters the water.	5.6.7.2.3 Oral inflation	
PMB	<b>PFD Maintains Buoyancy</b> during Usage - A PFD's means of providing buoyancy shall be durable for its useful life in the expected use environments, including temperature extremes, compression, wear and tear, etc. (All)	5.6.4 Donning test 5.6.7.2.2 Inflation	Pt-7
PS	<b>Placement Security</b> - A PFD shall maintain a fit on a user's body under various environments and use conditions to meet all the effectiveness requirements and associated user physiological aspects.	5.5.9 Measurement of buoyancy of the whole device	
ROC	<b>Reliability of Other Components</b> Vital to Providing Structural Integrity, Environment Stability, and Buoyancy - The buoyancy of the PFD shall remain secured when in use and when removing the user from water by its structure integrity and intended retrieval mechanism and shall have adequate stability against temperature variation and common chemicals to keep its functionality in the expected range of exposures in which it will be used and stowed. (All)	5.6.4 Donning test 5.6.5 Water entry test 5.6.6 Self-righting and stability test	Pt-7
RVF	<b>Relief Valve Functions</b> - A PFD having an overpressure relief valve shall not be damaged when excessive gas is injected in its <u>inflation</u> compartments and the relief valve seals to prevent leakage within lower pressure design limits.	5.5 Mechanical properties tests Horizontal and vertical load tests Lifting loop test Buddy line test Strength of Attachment Temperature cycling test Fuel resistance test, inflatable PFDs Resistance to inadvertent inflation Resistance to burning for lifejackets 5.5.6 Over-pressure test	

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SNDF	<b>Shell Not Defective</b> - A PFD shall have adequate strength to keep its buoyancy securely on the user. (All)	<b>5.5.1 Horizontal and vertical load tests</b> <b>5.5.2 Rotating shock bin test method</b>	Pt-7
SNDMA	<b>Shell Not Damaged After</b> Entering the Water - A PFD shall have adequate strength to keep its buoyancy securely on the user when subjected to appropriate dynamic or tensile loading. (All)	<b>5.5.1 Horizontal and vertical load tests</b>	
SNDMB	<b>Shell Not Damaged Before</b> Entering the Water - (Definition - Probability the shell is not damaged before entering the water.) (All)	<b>TBD</b>	Pt-7
STB	<b>Stability</b> - In the absence of turning ability (TT) a PFD shall provide face-up stability and associated resistance to being turned face down from a relaxed face-up position in calm water. (All)	<b>5.6.5 Water entry test</b> <b>5.6.6 Self-righting and stability test</b> <b>5.6.8 In-water stability test for Lifejackets</b>	
TT	<b>Turning Time and Ability</b> - For challenging environments and incapacitated users, a PFD shall turn a face-down user such that the user's airway is not impeded by water. (All)	<b>5.6.6 Self-righting and stability test</b>	
W	<b>Wearability</b> - A PFD should possess wear-enhancing features to accommodate a wide range of motion, seating comfort, appearance and color, perceived comfort, breathable shell (mesh shoulders and side panels), appropriate body coverage, appropriateness to activity, accepted user practice, flexibility, and minimal bulkiness. (All)	<b>5.6.7 Ergonomics</b> <b>5.6.7.2.4 Encumbrance assessment</b>	
(EFF is the weighted aggregate of FB, FBA, HP, TT, PS, and DTC, which are repeated below.)			
EFF	<b>Effectiveness</b> - A PFD shall improve the potential for its user to survive and to be rescued from a marine event.	<b>5.6.3 Boarding test</b> <b>5.6.7.2.4 Encumbrance assessment</b>	
FB	<b>Freeboard</b> - A PFD shall maintain a user's airway out of water under various environments and use conditions. (All)	<b>5.6.2 Measurement of freeboard</b>	
FPA	<b>Face Plane Angle</b> - A PFD shall maintain an appropriate FPA (face plane angle) that balances competing performance attributes in the following order of importance for life saving capability: airway protection, maintenance of head temperature, and beneficial field of vision.	<b>5.6.6 Self-righting and stability test</b> <b>5.6.6 Self-righting and stability test</b>	
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PS	<b>Placement Security</b> - A PFD shall maintain a fit on a user's body under various environments and use conditions to meet the all effectiveness requirements and associated user physiological aspects.	<b>5.6.4 Donning test</b> <b>5.6.5 Water entry test</b> <b>5.6.6 Self-righting and stability test</b>	
DTC	<b>Detectability</b> - Availability, adequacy and effectiveness of detection aids for a PFD user measured as the probability of detection of a user by rescuers.	<b>To Be Added (TBA)</b>	Pt 1-6; Pt-7