



UNITED STATES COAST GUARD

U.S. Department of Homeland Security

MARINE SAFETY ALERT

Inspections and Compliance Directorate

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IMMERSION SUIT MAINTENANCE AND INSPECTIONS

U.S. Coast Guard (USCG) inspectors frequently find immersion suit defects caused by adhesive failures between the main zipper and the suit body. These failures, illustrated in Figures 1 and 2, compromise watertight integrity and pose serious survival risks from water ingress. Contributing factors to the defects include improper maintenance (e.g., the use of non-approved petroleum-based lubricants or scented powders), improper storage, and neglecting to conduct periodic pressure testing. Seam and closure deterioration may not always be detectable during routine visual inspections. Adhering to USCG regulations, manufacturer instructions, International Maritime Organization (IMO) regulations and guidance, and performing regular inspections and testing are essential to ensuring immersion suit reliability.



Figure 1: Zipper failure due to glue separation.



Figure 1: Bottom of zipper failure due to glue separation.

The International Convention for the Safety of Life at Sea (SOLAS) Chapter III Regulations 20.3 and 20.7 establish mandatory requirements for maintenance and monthly inspections of lifesaving appliances. IMO MSC/Circ.1047 and IMO MSC/Circ.1114 provide guidelines on how to meet the requirements of SOLAS Chapter III Regulation 20.7 and Regulation 36, which outline instructions for on board maintenance. For domestic vessels, Title 46 Code of Federal Regulations (CFR) Sections 199.180 and 199.190 provide requirements for inspection and maintenance of USCG-approved immersion suits.

The USCG **strongly recommends** vessel owners, operators, masters, and crew members:

- Conduct thorough inspections of all immersion suits, focusing on zipper-to-body seams and seam-taped areas such as boots, gloves, and hoods. Check for signs of delamination, seam tape lifting, adhesive failure, and zipper malfunction. Verify zipper function and proper lubrication using only manufacturer approved products.

- Store suits with zippers fully open and use monthly inspections as opportunities for crew donning practice.
- Conduct air pressure leak testing at least every three years, or at more frequent intervals for suits over ten years old.
- Address any identified defects immediately and ensure repairs are performed by an authorized repair station in accordance with manufacturer instructions and remove non-functional suits from service.
- Replace any suits that cannot be restored to a watertight condition to the satisfaction of the vessel's Flag Administration.
- Update maintenance procedures to ensure manufacturer directions are followed and only manufacturer-approved products are utilized to service and maintain equipment.
- Maintain detailed records of inspections, tests, defects, repairs, and replacements.

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