

# MSC Guidelines for Engine Exhaust Systems

Procedure Number: E1-07

Revision Date: 07/27/2010



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## References:

- a. 46 CFR 58.10-10 (Subchapters D, I, I-A)
  - b. 46 CFR 119.430 (Subchapter K)
  - c. 46 CFR 128.320 (Subchapter L)
  - d. 46 CFR 182.430 (Subchapter T)
  - e. American Boat and Yachting Council (ABYC) standard P-1
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## Contact Information:

If you have any questions or comments concerning this document, please contact the Marine Safety Center by e-mail or phone. Please refer to the Procedure Number: **E1-07**.

E-mail: [msc@uscg.mil](mailto:msc@uscg.mil)

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## Responsibilities:

The submitter shall provide sufficient documentation and plans to indicate compliance with the applicable requirements; this includes a complete bill of materials, component technical data sheets, and arrangement plans. The submission shall be made in triplicate.

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## General Guidance:

### **Vessels subject to Subchapters L, D, H, I, I-A**

- The exhaust manifold shall be water-jacketed and cooled by discharge from a pump, which operates whenever the engine is running. Alternatively, woodwork within nine inches of the engines shall be insulated (CFR 58.10-5(c)).
- All exhaust installations operating at pressures above 15 psig or employing runs passing through living or working spaces shall meet the materials requirements of 46 CFR 56.60.
- Diesel engines air intake and exhausts on MODU's shall not be in a classified location (46 CFR 58.10-10(b & c)).

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## General Guidance (cont):

- ❑ Exhaust Pipe installations shall conform to the requirements of the ABYC Standard P-1, "Safe Installation for Exhaust Systems", and NFPA Standard 302 Part 1, Section 23 (46 CFR 58.10-5(d)).
- ❑ Horizontal dry exhausts shall:(46 CFR 58.10-5(d)(1)):
  - ❑ Not pass through living or berthing spaces
  - ❑ Terminate above the deepest load waterline
  - ❑ Be arranged to prevent backflow of water from reaching the engine
  - ❑ Be constructed of corrosion resistant material at the hull

## Vessels subject to Subchapters K and T

### Wet Exhaust Systems

- ❑ Piping materials shall be in accordance with 46 CFR 56.60. Pipes used for wet exhaust lines must be at least Schedule 80 or corrosion resistant material and adequately protected from mechanical damage. Aluminum piping must have a wall thickness not less than that of schedule 80. (46 CFR 119.710, 46 CFR 119.430(d), 182.430(d))
- ❑ Water for cooling the exhaust pipe should be obtained from the engine cooling water system or a separate engine driven pump. (46 CFR 119.425(b)(1), 182.425(b)(1))
- ❑ When the exhaust cooling water system is separate from the engine cooling water, a suitable warning device must be installed at the operating station to indicate any reduction in normal water flow in the exhaust cooling system. (46 CFR 119.425(b)(5), 182.425(b)(5))
- ❑ Water for cooling an exhaust pipe, other than vertical exhausts, must be injected into the exhaust system as near to the engine manifold as practicable, and the water must pass through the entire length of the exhaust pipe. (46 CFR 119.425(b)(2), 182.425(b)(2))
- ❑ The part of the exhaust system between the point of water cooling injection and the engine manifold must be water-jacketed or effectively insulated and protected as required to prevent injury. (46 CFR 119.425(b)(3), 182.425(b)(3))
- ❑ Each vertical exhaust pipe must be water-jacketed or suitably insulated between the engine manifold and the spark arrester. (46 CFR 119.425(b)(4), 182.425(b)(4))

## General Guidance (cont):

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- ❑ A suitable hull strainer must be installed in the circulating raw water intake line for the exhaust cooling system. (46 CFR 119.425(b)(6), 182.425(b)(6))
- ❑ Engine exhaust cooling systems built in accordance with ABYC standard P-1 will be considered as meeting the above requirements. (46 CFR 119.425(c), 182.425(c))
- ❑ Nonmetallic hose may be used for wet exhaust systems provided it is especially adapted to resist the action of oil, acid, and heat, and has a wall thickness sufficient to prevent collapsing or panting, and is double clamped where practicable. (46 CFR 119.430(e), 182.430(e))

## Dry Exhaust Installations

- ❑ Exhaust installations operating at pressures above 15 psig or employing runs passing through living or working spaces shall meet the materials requirements of 46 CFR 56.60. Aluminum piping is prohibited.
- ❑ Vertical dry exhaust pipes must be suitably insulated to protect against personnel injury (46 CFR 119.425(a)(1), 182.430(a)(1))
- ❑ Horizontal dry exhaust pipes shall: (46 CFR 119.425(a)(2))
  - ❑ Not pass through living or berthing spaces
  - ❑ Terminate above the deepest load waterline
  - ❑ Be constructed of corrosion resistant material at the hull
- ❑ Dry exhaust pipes must (46 CFR 119.430(g), 182.430(g)):
  - ❑ Be kept clear of, and be suitably insulated or shielded from, combustible material
  - ❑ Be provided with noncombustible hangers and blocks for support

## All Engine Exhaust Pipe Installations

- ❑ Exhaust gas must not leak from the piping or any connections. The piping must be properly supported by non-combustible hangers or blocks. (46 CFR 119.430(b), 182.430(b))
- ❑ Exhaust piping must be arranged to prevent backflow of water from reaching the engine. (46 CFR 119.430(c), 182.430(c))

**General Guidance  
(cont):**

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- ❑ Where flexibility is necessary, a section of flexible metallic hose may be used. (46 CFR 119.430(e), 182.430(e))
  - ❑ An exhaust pipe discharge terminating in a transom must be located as far outboard as practicable so that exhaust gasses cannot reenter the vessel. (46 CFR 119.430(h), 182.430(h))
  - ❑ All exhaust installations operating at pressures above 15 psig or employing runs passing through living or working spaces shall meet the materials requirements of 46 CFR 56.60.
  - ❑ Engine exhaust installations built in accordance with the requirements of ABYC standard P-1 will be considered as meeting the above requirements. (46 CFR 119.430(k), 182.430(k))
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## **Disclaimer:**

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact the Marine Safety Center, the unit responsible for implementing this guidance.

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