

# Program Announcement

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## Marine Engine Manufacturer Develops Low Emission Inboard Marine Engines

*Over the past several years, EPA, the marine industry, U.S. Coast Guard, California Air Resources Board, Southwest Research Institute, and others have worked on a series of development programs geared toward emission-reducing technologies for gasoline-powered marine engines. These programs have had promising results. Now, one manufacturer, who participated in these programs, Indmar Marine Engines, is selling inboard marine engines with catalytic exhaust aftertreatment, which reduces emissions from these engines.*

### **Background**

Exhaust emissions from marine engines contribute to pollution: hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter. These pollutants can cause a variety of serious health effects, from respiratory problems to cancer. In order to protect public health and the environment, the Clean Air Act directed EPA to take steps to reduce these emissions.

In 1996, EPA published exhaust emission standards for outboard and personal watercraft marine engines. These standards, phased in from 1998 to 2006, were largely based on engine technology and achieved approximately a 75 percent reduction in ozone-forming gases from new engines.

In 2001, the California Air Resources Board adopted emission standards for new sterndrive and inboard marine engines that are expected to require use of catalytic converters, beginning in 2007.

In 2002, EPA gave notice of its intent to develop a proposal for further emission reductions from marine engines. This notice included a discussion on the potential emission benefits that can be achieved through the use of catalytic controls and the ongoing development and testing of catalysts on sterndrive and inboard marine engines. EPA is now in the process of developing proposed new emission regulations for gasoline-powered marine engines.

## **Overview of Catalyst Development Efforts**

Over the past several years, EPA has worked with the marine industry, U.S. Coast Guard, California Air Resources Board, Southwest Research Institute, and others, including several marine engine manufacturers on a series of development and test programs for the use of catalytic exhaust aftertreatment on stern-drive/inboard (SD/I) marine engines. These efforts include:

- Laboratory testing of six catalyst designs on a SD/I engine
- In-water testing of boat with catalysts over severe operation (fresh and salt water)
- Full useful life testing of 4 boats with catalysts in fresh water
- Ongoing testing of 3 boats with catalysts in salt water

Results from this testing suggest that significant emission reductions can be achieved from SD/I engines through the use of catalysts. The fresh water durability study has shown that these emission reductions can be achieved over the lifetime of the engine. We anticipate that the salt water testing will show similar results.

This year, one of the manufacturers involved in the catalyst test programs, Indmar Marine Engines, successfully completed their own catalyst development and durability testing program in parallel with the work listed above. Now, Indmar Marine Engines is selling inboard marine engines equipped with catalysts, and they report excellent emission performance without any loss in performance. Their efforts will help promote this clean emission technology, which is capable of reducing smog-forming gases by more than two-thirds and carbon monoxide by more than half.

## **For More Information**

You can access documents related to gasoline-powered marine engine standards on EPA's Office of Transportation and Air Quality web site at:

[www.epa.gov/otaq/marines1.htm](http://www.epa.gov/otaq/marines1.htm)

You can also contact us at:

Assessment and Standards Division  
2000 Traverwood Drive  
Ann Arbor, MI 48105  
Voice-mail: (734) 214-4636  
E-mail: [asinfo@epa.gov](mailto:asinfo@epa.gov)