



# !! WARNING !!

## **WARNING: CARBON MONOXIDE GAS IS DEADLY**

GAS ENGINES, WHETHER USED FOR PROPULSION OR ELECTRICAL POWER GENERATION, PRODUCE DANGEROUS LEVELS OF CARBON MONOXIDE THAT WILL PASS THROUGH CENTEK'S SEPARATORS OR OTHER COMPONENTS AS PART OF A PROPERLY DESIGNED AND INSTALLED EXHAUST SYSTEM. **PROPER INSTALLATION AND MAINTENANCE IS REQUIRED TO ENSURE THE SAFETY OF THE CRAFT AND THE PEOPLE ON BOARD.**

IN ADDITION, **THIS PRODUCT MUST BE USED IN CONJUNCTION WITH CARBON MONOXIDE DETECTORS INSTALLED IN YOUR BOAT'S LIVING QUARTERS.** THE CARBON MONOXIDE DETECTORS SHOULD BE MANUFACTURED FOR THE MARINE INDUSTRY AND SHOULD BE CHECKED FOR PROPER FUNCTIONING ON A REGULAR BASIS.

CARBON MONOXIDE IS A DANGEROUS, ODORLESS AND COLORLESS GAS THAT CAN CAUSE UNCONSCIOUSNESS AND DEATH. SOME OF THE SYMPTOMS OR SIGNS OF CARBON MONOXIDE INHALATION OR POISONING ARE: DIZZINESS, NAUSEA, HEADACHE, WEAKNESS AND SLEEPINESS, THROBBING IN THE TEMPLES, MUSCULAR TWITCHING, VOMITING, INABILITY TO THINK COHERENTLY. IF YOU EXPERIENCE ANY OF THE ABOVE SYMPTOMS, GET INTO FRESH AIR IMMEDIATELY.

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The proper performance of all products designed and manufactured by Centek Industries for use in marine exhaust systems is highly dependent on the proper design, installation and subsequent maintenance of the system into which they are incorporated. **CEN TEK INDUSTRIES IS NOT RESPONSIBLE FOR, DID NOT PARTICIPATE IN, THE DESIGN, MANUFACTURE, OR INSTALLATION OF ANY MARINE EXHAUST SYSTEMS ON ANY BOAT OR VESSEL WHICH MIGHT INCLUDE A CENTEK EXHAUST COMPONENT, AND CENTEK HEREBY DISCLAIMS ANY LIABILITY THEREFORE.**

Centek's products are used by a wide variety of boat manufacturers in various systems and applications. Therefore, it is impossible for Centek to provide specific installation instructions for all possible configurations of exhaust systems that may be incorporated on a marine vessel by the vessel manufacturer. **IT IS THE RESPONSIBILITY OF THE BOAT MANUFACTURER TO PROPERLY DESIGN AND INSTALL AN EXHAUST SYSTEM APPROPRIATE FOR THE VESSEL THAT IT MANUFACTURES.**

## Additional Installation Guidelines:

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While it is impossible for Centek to provide specific installation instructions for every possible application, the following general guidelines should be followed in every application:

- The exhaust pipes (hoses) in any exhaust system must be of a sufficient size to carry the exhaust gases and cooling water throughout the length of the exhaust system without exceeding the engine manufacturer's allowable back pressure and not result in restriction of flow which might be detrimental to the intended proper operation of the system.
- Gasoline engines generally have a greater tolerance to higher back pressure than diesel engines. A diesel engine having the same power rating as a gasoline engine will require a larger exhaust pipe diameter since its exhaust gas flow and cooling water flow will be higher. Diesel engines will also have a lower back pressure limit.
- The muffler/separator must be positioned in such a way to avoid any dips or unnecessary bends in the exhaust piping.
- For system employing water separation, the separator does not separate 100% of the exhaust gases from the cooling water. Some of the cooling water exhausted through the hull will still contain a small amount of gas exhaust, and should be vented to the exterior of the boat in a manner to avoid exposure to the vessel's occupants, or anyone around the exterior of the vessel.
- For systems employing water separation with the de-watered exhaust gases routed to a vertical stack exhaust pipe ("dry stack"), the cooling water exhaust should be sent to a properly positioned drain at a through hull fitting, and the exhaust gas piping should be installed to avoid any excessive bends or elbows. The dry stack exhaust pipes should extend a sufficient height above the top deck of the vessel to ensure proper dissipation into the atmosphere.
- Under certain atmospheric conditions, properly routed and vented exhaust gases through a dry stack exhaust system may still create a cloud of dangerous carbon monoxide gas around the vessel. It is, therefore, extremely important to use functioning carbon monoxide detectors throughout the living quarters of the vessel.
- Centek strongly recommends that exhaust systems be initially and periodically tested for proper operation. This testing can be accomplished by utilizing a hand held carbon monoxide meter such as a Fluke model number CO-220. In a properly operating system, the CO level within a few feet of the water drain through hull fitting should never exceed 50ppm. There should be a continuous, ample flow of exhaust gases at the discharge of the gas exhaust port.
- Please refer to ABYC Standards A-24, P-1, TH-22 and TH-23 for additional information.