

## The importance of coolant for internal combustion engines

Users of liquid-cooled diesel generator sets must understand that the use of pure water is bad for engine. Pure water in radiator will cause:

1. Scale formation inside radiator core, hoses and engine water jacket, absorbing more heat.
2. Scale formation causes blockage of liquid flow leading into increased pressure and leaks.
3. Pure water will boil creating bubbles causing piston cylinder cavitation. (Figure 1).
4. Rust formation inside radiator, radiator cap and engine block.
5. Radiator cap acts as a valve during pressure and vacuum relief in radiator tank (Figure 2). A rusty radiator cap will malfunction due to seizure of its valve springs. (Figure 3).
6. Rust formation will cause water pump seizure or damage.



Figure 1. Piston cylinder cavitation.

To prevent these, it is recommended to use a mixture of 50% distilled water and 50% ethylene-glycol based coolant. Distilled water does not contain minerals which are the source of scale formation. 50-50 mixture will provide the following benefits:

1. Prevents scale formation.
2. Extends the boiling point of water and prevents bubble formation.
3. Prevents rust formation, lubricates water pump, radiator cap, hoses and engine block.
4. Efficient cooling system; prevents overheating.
5. Prevents engine breakdown.



Figure 2. Functional parts of a radiator cap.



Figure 3. A rusty radiator cap.