

SERVICE BULLETIN

Number 002/2012

Product	HI-FOG® Sprinklers
Subject	Testing and examination of HI-FOG sprinklers
Summary	To ensure the functionality and operability of a HI-FOG water mist system and to detect possible deterioration of the sprinklers regular examination and testing is to be performed. The purpose of this Bulletin is to underline the importance of testing and examination and to provide guidance on frequency and methods.
Date	20 June 2012

Background

A HI-FOG sprinkler is activated when the liquid filled glass bulb is exposed to heat and liquid expansion breaks the bulb (or it is mechanically broken), which allows the internal spindle to move, thus releasing the pressurized water creating the water mist. The HI-FOG sprinkler is a fine-mechanical device that should be tested and examined regularly to ensure full operational reliability.

See Quality Bulletin 002/2012 and Service Bulletin 001/2012 for reference.

Testing guidelines

1. Requirements for testing frequency and the number of sprinklers to be tested vary between different approval bodies and authorities in the land based industry and between classification societies, flag authorities and IMO guidelines in the marine field. For example "IMO MSC.1/Circ. 1432 Revised Guidelines for the Maintenance and Inspection of Fire Protection Systems and Appliances" requires a minimum of two (2) automatic sprinkler heads to be tested annually.
2. Marioff recommends that sprinklers are tested and examined annually as a minimum and that **at least 2 sprinkler heads in each section are tested. The tests may be limited to 20 sprinkler heads in at least 10 sections, where applicable. All sprinklers in an installation are to be visually examined.**
3. Classification societies' and flag authorities' local requirements are to be complied with.
4. For special areas, where sprinklers are exposed to aggressive atmospheres



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causing contamination (e.g. spas, saunas, pool areas, pool equipment rooms, kitchen areas, outer decks and similar), it is recommended that the testing and examination interval is shorter. Sprinklers in such areas are to be subjected to a close visual examination twice a year. The number of sprinklers tested should be 4 per section. Sprinklers showing any signs of deterioration should be replaced. All sprinklers in saunas, and equivalent locations with continuous elevated temperatures, should be replaced every second year. If the sauna is in a more frequent use (more than 15 hours/day or equivalent exposure) the sprinklers should be replaced once a year.

5. The water quality, both at the sprinkler water tank, the pump unit and in pipe branches, is to be monitored regularly, as a minimum annually. If the system's water quality is found to be out of the HI-FOG water specification it is recommended to test sprinklers in affected sections. The water quality should comply with Technical Data Sheet "Specification for water in HI-FOG systems".

Testing procedure

1. Sprinklers should be tested in different locations of the system (e.g. in a ship, from lower and upper decks and forward and aft parts of the ship) as water quality and the sprinklers' surrounding atmosphere might vary locally. Also different types of sprinklers used in the system should be tested (type 1000 and 2000 sprinklers, if applicable).

2. Sprinkler surroundings should be protected against possible water damage, where needed. The system should be in stand by mode during testing, with normal stand-by pressure in the piping system (usually 25 bar). Sprinkler test release can be done by exposing the sprinkler bulb to heat or mechanically breaking the bulb. The released water can be collected in a bucket or a hose (for example an old fire hose) can be attached to the sprinkler to lead the water into a drain or equivalent. The section valve is to be manned to enable closing once the sprinkler is released. Should the sprinkler not activate at stand-by pressure it is recommended that the section valve is closed and the sprinkler is replaced and sent for examination to Marioff. A water sample should be taken so that the water immediately behind the sprinkler is collected.

Alternatively the pump can be started manually or automatically by slowly opening the flushing valve. The release pressure can be approximately determined by reading the pressure gauge at the section valve.



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3. Water samples should be taken from representative sections in different locations of the ship and from the feed water tank(s) or the pump unit break water tank(s). Approximately 1 litre of water is to be collected in a clean sample bottle that is properly sealed and marked with the ship's name, date and location where the sample was taken. The parameters given in the Technical Data Sheet "Specification for water in HI-FOG systems" should be followed. Marioff can provide water analysis services, if required.

As a minimum an indicative quick test should be performed. An indication of the water quality can be established by measuring the conductivity and pH. If these parameters do not comply with the specification (conductivity <400 µS/cm and pH 7,0 – 9,0) samples are to be taken and full analysis performed.

4. After testing the tested sprinklers should be exchanged with new ones of the same type. After finalizing the testing the air is to be drained from the piping system and the system is to be put back in normal stand-by mode. The annual flushing of the pipelines to exchange the water in the system is recommended to be done in combination with drainage of air.

5. Sprinkler tests shall be documented properly so that it can be verified afterwards which sprinklers have been tested (location), when the tests were done and what the results were. Different sprinklers are to be tested during next tests.

Please note that Marioff has recently introduced sprinkler testing as part of its annual service program offering. Testing and servicing may also be carried out by properly qualified technicians engaged or employed by system operators. Testing reports should be made available during annual servicing and also during applicable Class or Flag State surveys.

Examination procedure

All sprinklers are to be visually examined annually to verify that they have not been mechanically damaged, that there are no obstructions preventing the release of water mist and that the glass bulbs are not damaged (see service bulletin 001/2010 Inspection of Sprinkler bulbs).

Sprinklers in locations difficult to access can be examined using for example binoculars.

Actions in case the tested sprinkler fails to activate

If, during testing, sprinklers failing to activate at standby pressure are found further sprinklers should be tested to establish extent of issue unless the reason for failure is obvious (mechanical damage, severe external contamination or empty glass bulb). Sprinklers failing to activate for obvious reasons are to be replaced and the reason



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for failure should be removed, if possible. See also Service Bulletin 001/2012.

If the failure rate is high the following actions are recommended to mitigate the risk that a sprinkler would fail to activate in a fire situation (pending full corrective action):

- The HI-FOG pump is to be started manually (see manual for start procedure) in the case of a fire alarm. This increases the system pressure which also ensures that sprinklers with increased release pressure are activated
- Increase the extent and frequency of fire patrol activities in the section(s) concerned

Marioff is to be contacted for advice and for examination of the problem in all cases where the failure rate is found to be considerable.

Flag administration (or class when authorized) or other authorities are to be informed, as applicable

For additional information and assistance (including product supplies) please contact Marioff's After Sales and Service Department.

Marioff Corporation Oy / After Sales & Service Operations
PO Box 86
FIN-01301 Vantaa
FINLAND

Tel. +358-10-6880 000
Fax. +358-10-6880 373
E-mail: aftersales@marioff.fi