

# Firefighting with Water Motor-Driven Foam Pump System

A water motor-driven foam pump system is a mechanical way of dosing foam concentrate and other firefighting additives into the water, without the need of external power or pressure balance.

There are mainly two different fundamental solutions to how to mix the foam concentrate into water flow:

## ■ Systems Using Pressure Balance

Systems using this method are for ex. in-line inductor, balance pressure proportioner, bladder tank proportioner, and around-the-pump proportioner. These systems dose the foam concentrate mainly by achieving a pressure balance between water and foam concentrate.

## ■ Systems Measuring Water Flow vs Foam Flow. In this group there are mainly two systems:

**1** Systems using electronically controlled flow meters for water and foam concentrate in conjunction with a variable output foam pump control system.

**2** Systems using a mechanical solution with a water motor-driven foam pump. These systems consist of two volumetric parts, one water motor and one foam pump, connected to each other through a direct drive coupling. With this solution the water motor acts like a combined flow meter/drive for the foam pump, so

automatically achieving the correct ratio between water motor and foam pump, without any external flow meters, foam pumps or orifices.

The water motor in this type of system may either be a turbine or a positive displacement type motor. The difference between these two options is that, with a turbine as drive, the flow and pressure range will be limited as a turbine (and Pelton wheel) is only partly volumetric.

With a positive displacement (= fully volumetric) water motor it is possible to maintain the mathematical ratio between water motor and foam pump in a wider pressure and flow range. FIREMIKS is such a fully volumetric system.

FIREMIKS can be used anywhere between a water source (hydrant or main water pump) and any type of nozzle (monitor, spray pipe, foam chamber, sprinkler head, low- ex, medium-ex or high-ex.) It does not need a pressure tank; only connect it to an atmospheric foam tank, which may well be the container from the foam liquid supplier. Furthermore it does not need any external energy.

## Operating Principle

The water flow goes through the FIREMIKS water motor. This generates a circular rotor motion, transferred to the pump over the direct-drive coupling. The concentrate is pumped into the water motor outlet, where

dosing occurs. (= Direct Injection Variable Pump Output Proportioning, NFPA 11)

Since the water motor and the pump are directly connected, the system is flow-proportional. Dosing is automatically adjusted from the amount of water that passes through the FIREMIKS. The water motor rotor has ten working wings, which gives an early and stable volumetric function of the water motor. The narrow interior design, along with low friction vanes, reduces noise level and creates long lasting durability.

With FIREMIKS a fire brigade can lay out a system consisting of one FIREMIKS and for ex. Three, four or five nozzles working independently of each other, at different heights and lengths from main water pump.

FIREMIKS is offered in mainly three versions; fixed, mobile (both with gear foam pump) and sprinkler (with piston foam pump), High-pressure versions are available on request. Suitable markets are industry, fire brigades, sprinkler, offshore/ shipping, forest firefighting. FIREMIKS is available in different flow sizes, from capacity 300 litres-a-minute to 12,000 litres-a-minute, and with dosing alternatives 0.5%, 1%, 2%, 3% and 6% as standard. Other options are available on request, including units with selectable dosing rates.

Due to its comparable low weight and compact design and no need of external energy, installation of a FIREMIKS is relatively easy. It can, if requested, be supplied with a dosing return valve enabling regular tests without consuming any foam liquids, an economical and environmental-friendly option. FIREMIKS meets applicable parts of NFPA 11 and NFPA 1901 and production is made according to European directive 2006/42/EC. Third-party inspection reports from DNV, Bureau Veritas are available.

Some reference examples are Pertamina, Indonesia, Oliver Tham Airport, South Africa, Jotun A/S, Norway, British Petroleum, Mozambique, Singapore Marin, Singapore, Nynas Petroleum AB, Sweden.

For more information, go to [www.firemiks.com](http://www.firemiks.com)



▲ FIREMIKS FM 4000-3-RP-F, Pertamina Oil and Gas, Indonesia.

Image courtesy of Firemiks