

# Fire protection for forest machines



Fire suppression test by Fogmaker at the Focus on Forestry field day, Howick.

Far right: Fogmaker installations in forest machines.

With the fire season around the corner, the question on everyone's mind should be: "Is my machine protected?"

Due to the nature of the working environment, forestry machines are at a high risk of fires. Accumulation of flammable organic debris in hot areas within the engine compartment is by far the most common cause of fires in forestry equipment, followed by electrical faults.

"Automatic fire detection and fire suppression systems have gained much attention in industries where the consequential damages from a fire are exceptionally high with the potential to affect everyone from the operator, to the contractor, to the insurer as well as the land owner," commented John Russell,

Fogmaker South Africa's managing director.

"In the forestry industry for example, the replacement cost of a harvesting machine and the lost production from down time are just two costly considerations; however these are often overshadowed by the cost of loss of lives and the loss of surrounding property."

Several OEM and forestry contractors – Hitachi, Iningi, Riblore, SOS and PG Bison to name a few – have opted for Fogmaker's high pressure water mist fire suppression system to protect their forestry equipment.

Said Richard Blaylock, Branch Manager of Hitachi Construction Machines in Pinetown: "The neat and compact layout of the Fogmaker system means that it is not a hindrance when maintenance is conducted on our equipment. I also

commend Fogmaker South Africa for the quality of their workmanship when installing the system."

Leon van Eerden, owner of Iningi Contractors, said: "The fact that the Fogmaker system requires such low maintenance is very important to us as we operate in remote and diverse areas, and the cost of systems requiring frequent servicing is prohibitive."

Water in the form of mist offers an additional fire fighting benefit that no other fire-fighting agent has, i.e. blocking of radiant heat. The large number of droplets and the large combined surface area effectively absorbs and scatters heat radiation which prevents the spreading of the fire. This mist also needs to reach the flames, i.e. it needs to penetrate the outward flows induced by the fire. This is achieved by the high pressure, and consequently high discharge speed.

In summary, the efficiency of the Fogmaker high pressure water mist system for fire-fighting is based on the use of special, high pressure nozzles. This results in:-

- Good penetration of droplets into fire;

- Efficient cooling due to fast vaporization;
- Oxygen depletion due to expansion of vaporized droplets; and
- Blocking of radiant heat due to absorption and scattering of heat radiation.

This was demonstrated by Fogmaker at the Focus on Forestry Event in Howick earlier this year where a fire suppression test was simulated in an engine compartment with an approximate volume of 3m<sup>3</sup>. The fire source consisted of four 20 x 40 cm trays filled with diesel. Diesel spray is also applied at a rate of 2 liters per minute at a pressure of 5bar, which showers the engine. The heat effect reaches approximately 1,600kW. The Fogmaker high pressure water mist system suppressed the fire within 10 seconds and a cloud of harmless cold steam could be seen coming from the demonstration van. The deployed system left a steam cleaned engine compartment as an added bonus.

A fire involves a chemical reaction between combustible fuel and oxygen from the air. The prerequisites of sustained burning are:

- Combustible fuel – this can be solid (Class A), liquid (Class B) or gas phase;
- Oxygen – ambient air comprises 21% oxygen;
- Heat for re-ignition – once the fire starts, the fire itself will generate the heat to sustain burning;
- An uninterrupted chemical chain reaction between these three elements.

These elements form the 'Fire Triangle' (right).

Only taking out one element of the triangle can be sufficient to kill a fire. However, the complex nature of a vehicle engine fire does not leave guarantees. Re-ignition, or re-flash of fires does occur.

Therefore, a triple action fire suppression system attacking all three elements simultaneously is the safest and most logical method for minimizing damage, equipment downtime, business continuity and protecting human lives. These complex circumstances are all covered by Fogmaker high pressure water mist technology.

The insurance industry is also becoming aware of the benefits of fire suppression equipment, and there are cases where they have reduced premiums on a machine after the installation of a fire suppression system.

The Fogmaker system is manufactured in Sweden according to both ISO 9001 and ISO 14001 standards and has obtained approval from the Underwriters Laboratories (UL) in the USA, the Swedish Fire Defence Association's SBF 128 and Australia's AS 5062 standards.



For more information or to arrange a free demonstration, visit [www.fogmaker.co.za](http://www.fogmaker.co.za) or email [info@fogmaker.co.za](mailto:info@fogmaker.co.za).



## Fire and Fire Management: A Different Perspective

The editor of this esteemed mag came up with a rather challenging request when he asked me to write something on fire and fire management, but from a different perspective. The subject is well researched and there are plenty of very capable people in this industry who could do better than I on this subject.



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Nevertheless as a starting point I looked at the incidence of plantation fires and the areas burnt over the years to assess whether there were any trends. The graph below makes interesting reading.

We see from these graphs that there was a steady increase in the plantation area burnt from 1980 peaking with the two disastrous 2007 and 2008 seasons. The incidence of fires though, if one ignores 2013, hardly changed. In 2007, the Curry's Post fire that began in June burnt across many farms before entering Sappi's Shafton plantation. A month later, the Wakkerstroom fire ended up in Sappi's Usutu plantation in Swaziland and extensive losses were experienced in the Sabie/Barberton areas. The following season at the end of August beginning September 2008 fires in the Lothair, Zululand and Piet Retief areas caused extensive damage to plantations. This seems to have galvanised the industry and there appears to have been a dramatic change in attitude towards fire with positive results.

Prior to 2007 plantation losses were gradually increasing with the loss in plantation area doubling over a period of 13 to 14 years. The warning signs were there but it took catastrophic losses to focus attention on the underlying fire protection structure serving the industry. It would appear that fires up to this point were merely treated as events. "Deal with it and move on."

Post 2007/2008 the industry was compelled to review the whole fire-fighting/protection system. Focussing on the whole system, enabled the role players to understand the parts and to see the interconnections.

The result of this was some far-reaching and effective changes to the entire system. There was a huge drive to make the Fire Protection Associations (FPAs) more sustainable and FPA Officers became paid employees of the different FPAs. There were also changes made to the types of equipment used to fight fires with an emphasis on rapid response units and skilled personnel to tackle fires early before they got out of hand. Incident Command Systems were established, fire detection systems expanded, and larger water bombers were

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