

PHIREX AUSTRALIA

FOGEX FOGEX FOGEX FOGEX



Company Profile

Phirex Australia are leaders in the field of water mist fire extinguishing systems. With over 1000 water mist projects successfully completed to date world-wide spanning marine and land projects, Phirex believe that they are experts in the water mist fire protection technology. With capability of design, manufacturing, supply, installation, commissioning, recommissioning and after sales service, Phirex has the expertise that you require.

FOGEX® Water Fog Fire Protection System is a state-of-the-art fire extinguishing system using high pressure to achieve fog formation to combat fires. Fogex has been tested in accordance with IMO Guidelines MSC/Circ. 668/728 for use in machinery spaces and cargo pump rooms (500m³), and Factory Mutual Research Corporation machinery spaces and cargo pump rooms, industrial hazards, combustion and gas turbine enclosures (>260m³). FOGEX® has also been tested in accordance with IMO MSC/Circ. 913 local application systems for use in machinery spaces and engine rooms on board marine vessels. System component testing and evaluation of the FOGEX® technology to determine its performance criteria by relevant test laboratories and approving authorities is ensuing.

Product Approvals

FOGEX® can be used on board passenger carrying and other marine vessels. FOGEX® is now approved by Det Norske Veritas (DNV), Bureau Veritas (BV) and American Bureau of Shipping (ABS). Lloyd's Register approvals is ensuing. FOGEX® has DNV MED-B approvals, certificate numbers MED-B 1800 and MED-B 1801. Wheelmark approvals pending. FOGEX® can also be used on land base applications such as, industrial hazards, machinery spaces, combustion and gas turbine enclosures or electric transformer substations and on off-shore platforms.

The FOGEX® F20 nozzles have a K-factor of 0.64L/min/bar^{1/2}. The FOGEX® F27 nozzle has a K-factor of 0.53L/min/bar^{1/2}. The FOGEX® F11 nozzles have a K-Factor of 1.0L/min/bar^{1/2}. The nozzle grid spacing is 3m x 4m on the ceiling at 5.0m height. Each Fogex nozzle has a surface area protective coverage of 17m². For local application systems the FOGEX® F11 nozzles are used. The F11 nozzle grid spacing is 4m x 4m with 2.0m minimum and 10.1m maximum distance from the fire source. System operating pressure is 100 bars. For marine projects, the FOGEX® system operating pressure is 110 bar pressure and for land base projects, the system operating pressure is 100 bar. Water droplet mean value diameters are in the Class 1 category.



FOGEX® Nozzles

Phirex Australia have invented their new multi-orifice open fog nozzles called FOGEX® F11, FOGEX® F20 and FOGEX® F27. These are the smallest multi-orifice water fog nozzles available on the international market place. With flow rates of just 5.3 - 6.4 litres per minute at 100 bar pressure, the volume of water required to extinguish severe hydrocarbon based fires in machinery spaces is minimal. This means less water damage, greater efficiency, smaller diameter pipes, smaller water pumps, and less system weight and cost.

Small size:

The FOGEX® F11, F20 and F27 water mist nozzles are the smallest multi-orifice open type nozzles available on the international market place. This means less weight, better appearance and less production costs.

Added Safety:

The FOGEX® F11, F20 and F27 nozzles have been tested in excess of 320 bar pressure without failure meaning increased safety. FOGEX® F11, F20 and F27 nozzles are a one piece construction and are supplied complete with a Stainless steel internal filter to prevent nozzle blockage.

Superior Performance:

Size for size, the FOGEX® F11, F20 and F27 fog nozzles demonstrated a formidable fire extinguishing capability against volatile hydrocarbon fuel fires, such as, concealed n-Heptane pan fires and cascading and pressure spraying n-Heptane and Diesel spray fires. The FOGEX® water fog fire protection system easily demonstrated its superior efficiency in extinguishing machinery space fires by using a total of 43.8 to 51.4 litres of water per minute. The water spray flux density is between 0.08 - 0.10 L/min/m².

Easy Installation & Service:

Simplicity is our goal and this means less component failure and less down time. All FOGEX® components are carefully selected to suit the hazard requiring protection and to provide a long and trouble free service life. All pipe runs are of Stainless steel materials and are of compression welded or flanged type fittings for easy installation and maintenance.

FOGEX® F11, F20 & F27 Water Fog Nozzles

The FOGEX® F11, F20 & F27 multi-orifice type fog nozzles revealing their minute size and simplistic designs. The picture below shows FOGEX® nozzle's size compared to a gentleman's wrist watch. All FOGEX® nozzles have in-built Stainless steel filters to prevent nozzle blockage. FOGEX® nozzles are patent applied for and design mark applied for.

▼ F20 Nozzles



▼ F11 Nozzles



FOGEX® Nozzles - Designed to Last



◀ The FOGEX® F20 & F27 fog nozzles are manufactured from Aluminium Bronze material to prevent corrosion and to withstand high operating pressures and temperatures.

Facts about FOGEX®

Greater efficiency:

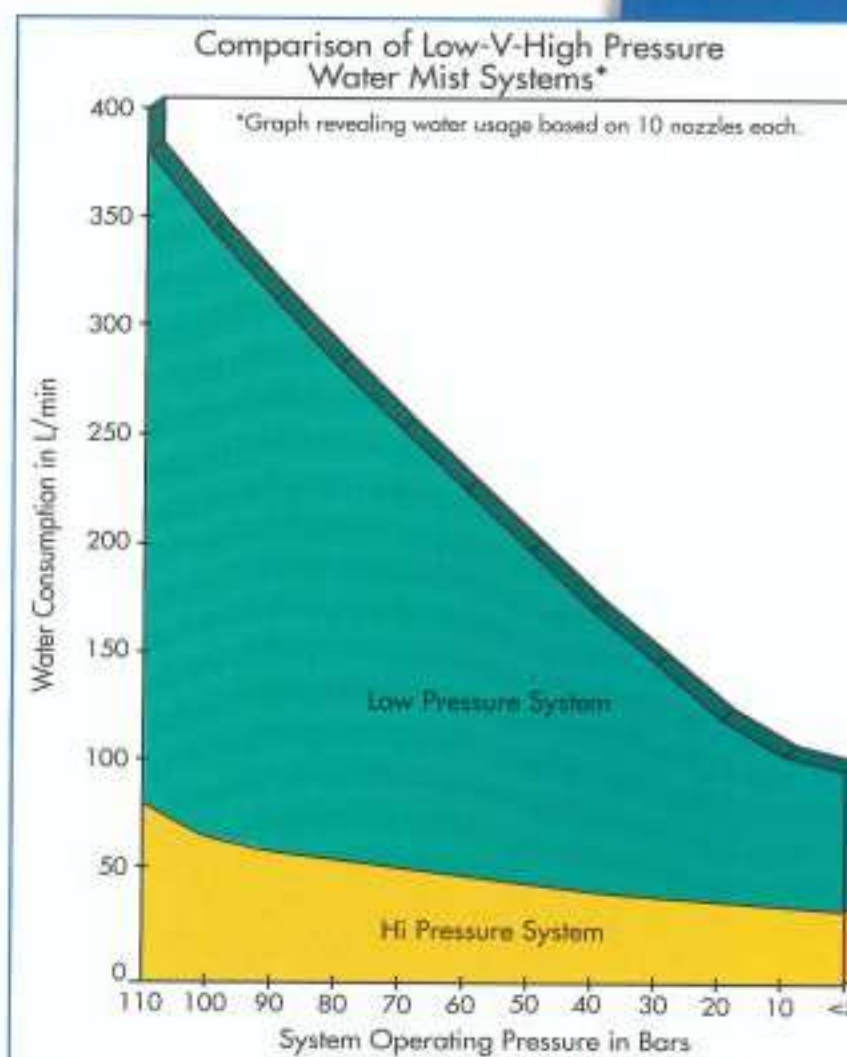
FOGEX® high pressure water fog fire protection technology is more efficient in combating Class A, B and Class E (Electrical) fires than low to intermediate pressure water mist systems. FOGEX® uses smaller quantities of water and lower water spray flux densities approximating 0.08 - 0.10 litre per minute per cubic metre of space to be protected. This is in accordance with the Phirex Australia international patents.

Lower Installation Costs:

Less water means smaller diameter and lighter pipes saving costs on installation. High speed craft benefit in carrying less deadweight thus enhancing cruising speeds and increasing payload. FOGEX® is a more cost effective technology compared to other systems.

Less Fire & Water Damage:

FOGEX® has faster fire extinguishment using less water and minimises fire related damage to a hazard area or to a passenger vessel. Vessel downtime is thereby reduced. FOGEX® also assists by "scrubbing" the air within a fire hazard area causing the soot and other combustion by-products to fall to the ground, it also cools the ambient room temperature thus reducing damage to the area being protected. FOGEX® may also be used in retro-fit situations thereby saving costs and enhancing profitability to the ship owner.



IMO Machinery Space Testing

Phirex Australia have successfully tested their FOGEX® Water Fog Fire Protection System at VTT Building Technology, Fire & Research Laboratories, in Espoo, Finland during June, August and September 2000. All live fire tests as per the IMO Guidelines MSC/Circ. 668/728 have been successfully completed. FOGEX® has also been tested for local application systems in accordance with IMO MSC/Circ. 913 and has passed all prescribed tests

All Factory Mutual Research Group live fire tests have been completed for machinery spaces, industrial hazards, combustion and gas turbine enclosures. Environmental nozzle testing has been completed by factory testing laboratories and the nozzles have passed these stringent tests. System evaluation is expected to be finalised in the very near future.

IMO Machinery Space Tests



◀ Recent fire testing conducted at VTT Building Technology, independent Fire and Research Laboratory, Espoo, Finland. Shown is a 3.0MW 2.0m² n-Heptane pan fire with wooden crib inside. The fire was rapidly extinguished using FOGEX®.



◀ Fire Test Photo 1

Local application 6.0 MW pressurised Diesel spray fire shortly after ignition and FOGEX® system actuation.



◀ Fire Test Photo 2

6.0 MW pressurised Diesel spray fire on top of machinery space engine mock-up is quickly suppressed and extinguished by FOGEX®. Photograph taken shortly after FOGEX® system has been actuated.



◀ Fire Test Photo 3

>12MW n-Heptane flowing fire from top of machinery space engine mock-up shortly after ignition and prior to FOGEX® actuation. The fire spread to the bilge areas under the mock-up and was quickly suppressed and extinguished by FOGEX®.

FOGEX® High Pressure Pumps

Phirex have a range of high quality, heavy duty high pressure water pumps to suit any project size. Smaller pump sizes range from several litres per minute flow rate and up to 780 litres per minute flow rate for each pump. Only listed or approved fire pumps are used.

Smaller pump units are usually mounted into a sturdy metal frame, or skid, for easy installation and mobilisation. Where a series of smaller water pumps are used to deliver the desired total water flow, these are manifolded together. IMO and SOLAS marine regulations stipulate the use of a redundant pump(s), for vessels.

All high pressure water pumps are designed and manufactured to ISO9000 Quality Assurance Procedures.

High pressure water pumps can be either Electric, Diesel or Compressed air driven types, or any combination of the above.

Bertolini piston type high pressure pumps that can be used with FOGEX® system applications.



High pressure Bertolini pumps that can be used with FOGEX® for marine, off-shore and land base applications.



A typical multi-pump skid accommodating CAT pumps. Pumps are manifolded together for larger projects or to service various zones. Marine regulations require the use of a redundant pump configuration.



FOGEX® Water Mist Fire Protection System

Comparison Chart

Halon Replacement Environmental Properties

Product	GWP2	ODP1	ATM Life (Years)
Halon 1211	4	N/A	15
Halon 1301	5800	12-16	100
FOGEX®	N/A	N/A	N/A
Halotron 1	90	0.014	3.5-11
Triodide	<5	N/A	1 Day
CEA 614	5200	N/A	3100
CEA 410	5500	N/A	2600
FE13	9000	N/A	280
FE25	3400	N/A	41
FE241	440	0.022	7
NAFP111	~290	0.0172	3.3
NAFS111	1358	0.044	14
FM-200	2050	N/A	31
CO2	1	N/A	120

Activity/Features:	Sprinkler	Halon	CO ₂	FOGEX®
Non-Toxic	Yes	No	No	Yes
Extinguish Class A & B Fires	No	Yes	Yes	Yes
Environmentally Friendly	Yes	No	No	Yes
Requiring Fire Pump*	Yes	No	No	Yes
Light Weight	No	Yes	No	Yes
Service Accessibility	Yes	Yes	Yes	Yes
High Heat Absorption	Yes	No	No	Yes
Cost Effectiveness	No	No	No	Yes
Running Time (in-built safety)	N/A	No	No	Yes
Evacuation Plan Requirement**	No	Yes	Yes	No
Service/Refill Cost Effectiveness	N/A	No	No	Yes

* Depending on size and design of system installed - generally small enclosure/cabinets etc do not require auxiliary fire pump.

** FOGEX® does not produce any toxic by-products, however, evacuation is a procedural safety requirement in the event of a fire due to toxic gases being liberated as a result of combustion.

Manufacturing Facilities



- ▲ Phirex utilises the latest in computer hardware and machine tools to manufacture quality nozzle specimens within fine tolerances for its customers.



- ▲ These pictures show a water mist nozzle being manufactured to fine tolerances utilising advanced computer software machine tools.

High Pressure Pumps



▲ Shown is a typical 30kW electric driven mobile 150 bar pressure, 100 litres/minute High Pressure water pump. In fixed installations, the fire pump is not mobile, instead it is skid mounted. This pump was used for conducting fire testing at VTT.



▲ Shown is a typical Hammelmann high pressure V12 Cat Diesel driven fire pump. Designed for extremely large projects, this pump can supply water to more than 120 FOGEX® nozzles at any one time. This unit is one of the larger pump sets available for use by Phirex Australia.

Continuing Research & Development

Phirex Australia is keeping abreast of the needs of the international fire service industry and standards for water mist fire suppression technologies and has its own internal policy for continual product innovation and improvement. Phirex wishes to bring only the best products and technologies to its diverse customers at all times.

Our recent R&D program witnessed the innovation and development of a new breed of FOGEX® fog nozzles. New R&D projects have now identified the need for even smaller automatic glass bulb type nozzles with even fewer parts. The new automatic glass bulb nozzles have already been invented and shall be subjected to fire testing in the near future. These nozzles will save further weight and costs to the customer.

With even more fire testing earmarked for the near future, the FOGEX® water fog fire protection system will excel at all levels.

▼ FOGEX® automatic glass bulb nozzles ▼ FOGEX® F11 nozzle



Shown are FOGEX® automatic glass bulb nozzles revealing their small size. These are useful for accommodation, corridors, public spaces and service areas etc.

▼ FOGEX® FA20 automatic glass bulb nozzles ▼ FOGEX® FA27 nozzle



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▼ FOGEX® automatic glass bulb nozzles



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▼ FOGEX® FA20 automatic glass bulb nozzles



▼ FOGEX® FA27 nozzle



Uses for FOGEX®

FOGEX® can be used in a multitude of possible applications, upon gaining product acceptance by recognised approving authorities, such as:



▲ Electrical switch gear rooms



▲ Petro-chemical refineries



▲ Machinery spaces & cargo pump rooms on board marine vessels



▲ Industrial hazards on land



▲ Combustion & gas turbine enclosures

Uses for FOGEX®



▲ Telecommunications & computer rooms



▲ Cable tunnels



▲ Fat fryers & cookers



▲ Restaurants & public spaces



▲ Offices & retail stores



▲ Residential

Uses for FOGEX®



▲ Warehouses



▲ Off-shore oil producing platforms



▲ Electric transformer sub-stations



▲ Hotels, motels, old age hostels



▲ Historic buildings