YOUR CONTACT WORLDWIDE FOR FIRE TOPICS

Our locations

ENGIE AXIMA France - AXIMA CONCEPT SA
15 Rue Nina Simone
CS 39601 44096 Nantes Cedex 1
France
Phone: +33 2 40 41 00 00
Fax: +33 2 40 41 00 41

ENGIE AXIMA Germany GmbH
Ruwoldtweg 12
22309 Hamburg
Germany
Phone: +49 40 8544-2339
Fax: +49 40 8544-2410

ENGIE AXIMA India Pvt Ltd
Gala No 211, 2nd Floor, New Udyog Mandir 2
Moghu Lane, Mahim West
Mumbai -400 016
India
Phone: +91 22 2444 2349
Fax: +91 22 2437 9207

OUR AREAS OF WORK

SURFACE VESSELS
SUBMARINES
SPECIAL-PURPOSE VESSELS
PASSENGER VESSELS
YACHTS
OFFSHORE PLATFORMS

FIRE FIGHTING TECHNOLOGY & FIRE DETECTION
INTEGRATED FIRE PROTECTION ONBOARD NAVAL SHIPS.

Modern warships contain sophisticated high value weapon systems, aviation facilities, electronic equipment, sensors and last but not the least dedicated and trained manpower. Each of these is vulnerable to fire onboard ships. Uncontrollable fire onboard can have catastrophic effect on the men and equipment onboard.

Areas of Fire Risks: Onboard ships, there are many spaces which are at risk of fire. If not controlled in time, fire spreads fast throughout the ship. The picture above has been used to identify fire risk areas onboard ships.

It is essential to know the spaces which are at risk of fire and to have an effective and efficient fire fighting system. The system so selected must also be cost effective and must have less weight so that it does not have serious cost and weight implications on the overall design of the ship.

The following are the main fire risk areas onboard ship.

- Ammunition Room
- Accommodation spaces
- Galley
- Electronic spaces
- Machinery compartment
- Hangar
- Heli deck

ENGIE SOLUTIONS PROVIDES FOLLOWING FIRE FIGHTING SYSTEMS ON SHIPS

- Fixed Gas Based System: Nitrogen, CO₂, FM200™ (HFC-227ea) and Novec™ 1230 (FK-5-1-12)
- Fixed Water Based System: Sprinkling System, Low and High pressure Water Mist System, Low pressure Water Mist System with Foam (HyFEx System)
- Foam Based System: Low and High Expansion AFFF Foam
- Wet Chemical and CO² Fire Fighting System for Galley (KyFEx System)
- Dry Powder Fire Fighting System
- Fire Main System
GAS BASED FIRE FIGHTING SYSTEM

CO₂ FIRE FIGHTING SYSTEM

• Total Flooding System for Machinery Space
• CCOE approved CO₂ cylinders
• Type approved CO₂ cylinder valve
• Type approved hose (SAE 100 R2AT)
• Type approved Directional Control Valve
• Anti-magnetic versions for Minehunters available

DESCRIPTION:

Engie Solutions provides the complete range of CO₂ Fire Fighting Systems for use on Naval Ships. Especially for unmanned spaces which are required to be equipped with automatic fire fighting systems, CO₂ System is the right choice. Typically sound enclosures for Diesel Engines and Gas Turbines are protected with our CO₂ Systems.

Minehunters and Minesweepers are other typical application areas. For these types of ships, anti-magnetic version of the CO₂ System is available. Fixed installed CO₂ Local Protection Systems are replacing the mobile units that are required by the classification societies.

CLEAN AGENT FIRE FIGHTING SYSTEM FM200™ & NOVÈCTM1230 (HFC-227ea/ FK-5-1-12)

Engie Solutions provides HFC-227ea / FK-5-1-12 Fire Fighting Systems for use on Naval Ships.

The system is designed in accordance with NFPA 2001, IMO MSC/Cir 848 and 1267. Fixed type manually and electro pneumatically operated total flooding arrangement is provided for machinery room, AVCAT room, sound enclosures of diesel engines and gas turbines, and protection of special compartments like IT-rooms.

Clean agent system consists of Cylinder with quick opening valve, check valve, discharge hose, safety valve, nozzles, annunciation panel and alarms.

Clean agent system for spaces that are normally occupied is designed to concentrations upto NOAEL. Exposure to clean agent at the design concentration upto NOAEL is not hazardous to health.
Engie Solutions provides Nitrex® System based on over 30 years of experience in design of submarine fire fighting systems.

The Nitrex® System is the only Nitrogen Fire Fighting System in the world that is designed especially for Submarines.

Because only pure nitrogen is used as extinguishing agent, there is no contamination of the submarine atmosphere.

Nitrogen total flooding system for machinery spaces and battery compartments
- Natural extinguishing agent
- No contamination of the submarines atmosphere by extinguishing agent
- Shock proof installation

Engie Solutions provides AFFF Foam Fire Fighting Systems for use on Naval Ships.

The system is designed in accordance with NFPA 11 and IMO MSC/Circ 1384. Both Low expansion and high expansion AFFF foam fire fighting system can be provided for ships.

The whole system was tested by the German Navy in their own test facilities. The Nitrex® System is the only type approved fire fighting system for submarines by German Lloyd.

The arrangement of cylinders and valves can be adjusted based on the space and dimensions available inside the submarine. Standing and hanging versions of the system have been developed to suit such requirements.

Our Foam Fire Fighting system includes skid mounted foam tank containing foam pump, proportioner, motorized valve, overflow valve etc. Other Foam Fire Fighting equipment includes Foam Monitor, Branch Pipe, Variable flow nozzles, Foam water sprinklers.
LOW PRESSURE WATER BASE SYSTEM

LOFEX - LOW PRESSURE WATER MIST SYSTEM

- Total Flooding System for Machinery space
- Local protection for Machinery equipment
- Bilge protection
- Protection of all Accommodation areas (including cold rooms, electrical rooms, ...)

DESCRIPTION:

LoFEx is an ENGIE Solutions supplied low pressure water mist system to protect accommodation areas, for total flooding of engine rooms as well as for local protection.

The LoFEx system offers the optimum compromise between the cooling effect of a water mist system and the robustness of a conventional sprinkler system. The system is primarily intended for a fresh water supply, but the LoFEx nozzles can also be operated with sea water without any problems in contrast to a high-pressure water mist system.

The special design of the nozzle prevents long-term clogging of the nozzle and at the same time forms a fine spray mist with droplet sizes of approx. 300 μm.

The nozzles develop their optimum extinguishing effect from approx. 7 bar and can therefore also be connected to the main seawater fire extinguishing system without restrictions.

HYFEX ® - LOW PRESSURE WATER MIST SYSTEM

The HyFEx system was developed in cooperation with the German Navy as a replacement of HALON systems, and was designed to provide a maximum of redundancy. Since then set on all types of German naval ships.

It is also suitable to feed monitors for the protection of landing decks.

With HyFEx ® system, the seawater is not mixed just after a tank in the Machinery space, but directly in the protected room, in dedicated HyFEx Fire Extinguishing Stations. So, your seawater network is not filled by foam after fire operation, and your redundancy is fully maximised.

- Hangars
- Landing decks
- Vehicle decks
- Total Flooding System for Machinery space
- Local protection for Machinery equipment
- Bilge protection
- Sound enclosures of diesel engines
- Monitors

Pressurized Fresh water tank

Fire detection panel

alarm valve station

nozzles

LoFEx

• Total Flooding System for Machinery space
• Local protection for Machinery equipment
• Bilge protection
• Protection of all Accommodation areas (including cold rooms, electrical rooms, ...)

Description:

LoFEx is an ENGIE Solutions supplied low pressure water mist system to protect accommodation areas, for total flooding of engine rooms as well as for local protection.

The LoFEx system offers the optimum compromise between the cooling effect of a water mist system and the robustness of a conventional sprinkler system. The system is primarily intended for a fresh water supply, but the LoFEx nozzles can also be operated with sea water without any problems in contrast to a high-pressure water mist system.

The special design of the nozzle prevents long-term clogging of the nozzle and at the same time forms a fine spray mist with droplet sizes of approx. 300 μm.

The nozzles develop their optimum extinguishing effect from approx. 7 bar and can therefore also be connected to the main seawater fire extinguishing system without restrictions.
HIGH PRESSURE WATER MIST SYSTEM

ULTRA FOG MARINE CLASSIFICATION TESTING AND APPROVALS

Engie Solutions provides Ultra Fog high pressure water mist system. The Ultra Fog Water Mist System is rated as Class 1 according to the National Fire Protection Association Code (NFPA, USA), attesting that Ultra Fog has the smallest average droplet size, which ensures an effective cooling of the fire and surrounding area.

The Ultra Fog’s Water Mist System has been fire tested by the Swedish Test Laboratory (SP) and SINTEF, Norway, both of which are fully authorised by IMO, the Southwest Research Institute (SwRI), United States and laboratories in Denmark.

- Ultra Fog has been tested and approved according to the IMO Res. A.800(19) and IMO Res MSC.265(84) for accommodation areas, stores and service areas.
- IMO MSC/Circ. 847, activation by detectors as an alternative to the glass bulb.
- IMO MSC/Circ. 1165 and MSC/Circ. 913, machinery areas, total flooding in pump rooms and local applications.
- IMO MSC 1272, protection of RoRo and special category spaces.
- IMO MSC 1268, protection of balconies.
- ISO 13571, for protection of galley ducts and cooking equipment (including deep fat fryers).
- A performance Effectiveness Analysis was carried out by DNV, Norway.
- Component testing by the laboratory of FM (Factory Mutual), USA.
- USCG (United States Coast Guard) approved.

Based on area of 1015 m²

<table>
<thead>
<tr>
<th>Competitor1</th>
<th>Competitor2</th>
<th>ULTRA FOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nozzle Type</td>
<td>Public space</td>
<td>Public space</td>
</tr>
<tr>
<td>Spacing</td>
<td>4m</td>
<td>4m</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>50 bar</td>
<td>100 bar</td>
</tr>
<tr>
<td>Maximum Coverage</td>
<td>16m²</td>
<td>16m²</td>
</tr>
<tr>
<td>K Factor</td>
<td>3.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Flow l/min</td>
<td>27.6</td>
<td>24.0</td>
</tr>
<tr>
<td>Simulation with 300m² of area, height 8m, single section valve, we calculate the number of nozzles 19 nozzles 19 nozzles 12 nozzles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on number of nozzles we calculate the flow rate 5.24 l/min 456 l/min 251 l/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on the above pressure we calculate the total kw requirement 44kw 78kw 42kw</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Accommodation areas, service spaces, control stations, corridors and stairways
• Machinery compartments
• Sound enclosures of diesel engines
• Foam system for bilge area
• Outlet pressure: 100 – 140 bar
• Flow range: 94 – 150 litres/min/high pressure pump
• Power consumption: 22 – 30kw/high pressure pump
• Control system with PLC and output/input for section valves, fire alarm system, power supply for feeder pumps etc
• External connections for alarm and control cabinets and operating panels through serial or TCP/IP communication
KiFEx® - GALLEY FIRE FIGHTING SYSTEM

- Local Protection System for Cooking Range, Deep Fat Fryer, Galley Hood and Exhaust Duct
- Shock proof installation
- Anti-Magnetic
- Meets Classification Society Requirements
- Type Approved by German Lloyd and German Navy
- KiFEx® System - Newest Version already in three projects

Engie Solutions provides Automated Galley Fire Fighting system which uses wet chemical agent for extinguishing fire on hot plates, deep fat fryers, galley hood, plenum and galley exhaust duct. For exhaust duct, CO2 Fire Extinguishing system can also be provided.

The Fire detection system includes various options, such as Fusible links, pneumatic pressure tubing or spot heat detectors.

KiFEx®

KiFEx® cabinet

Heat Detector

Fusible Link

Sprinkler

colored agent nozzle

CO2 nozzle

KiFEx® - DRY POWDER FIRE FIGHTING SYSTEM

- Local Protection System for Helicopter Landing Area
- Well proven design
- Shock proof installation
- Tank Capacity 250 kg
- 3.5 kg/s Powder Output
- Meets Classification Society Requirements

According to the regulations of the classification societies dry powder fire fighting units are to be provided to fight fires on the helicopter landing deck or directly at the helicopter.

To fulfill many naval regulations a fixed dry powder fire fighting system with a dry powder capacity of 250 kg is required.

The Engie Solutions Powder Fire Fighting System consists of the powder tank, the high pressure powder hose, powder gun and nitrogen cylinders.

By means of the nitrogen the dry powder is pressed out of the tank and led to the powder gun.

System with more than one powder gun is possible.

Sprinkler

colored agent nozzle

CO2 nozzle

Nitrogen Cylinders

Powder Gun

Dry Powder Fire Fighting System

Engie Axima galley fire extinguishing system operates in automatic mode, remote mode through push button panel and manual mode using manual actuator on pilot CO2 cylinder. All three modes can operate independently.

The Galley Fire Fighting system includes Cylinder locker, control panel, push button panels, nozzles, detection system, alarms, pipes and fittings.
CBRN PRE-WETTING SYSTEM

ConWad® System

Components:
- ConWad® nozzles
- Piping system

Typical application areas:
- Superstructure
- Decks
- Objects
- Areas not belonging to citadel

AMMUNITION SPRAY SYSTEM

Ammunition Spray System

Components:
- Test valve
- Shut-off valves
- Piping system
- Spray nozzles

Typical application areas:
- All types of ammunition magazines

System is for cooling of bulkheads and ceilings in case of fire in adjacent spaces.

FIRE DETECTION SYSTEM