

AquaSafe  
Water spray mist  
Extinguishing system

# Extinguishing technique

## Introduction

There is nothing new about the use of conventional water as an effective extinguishing medium. However, if the spray technique is refined and optimised the extinguishing effectiveness can be dramatically improved. In the today's world water is also ideal for ecological reasons. Water is a natural resource, nearly unlimited amounts are available, and it is harmless for human beings and the environment.

## Fundamentals

The extinguishing performance of water derives from its physical properties. Its ability to absorb heat is very high due to its high specific calorific capacity and its extremely high latent heat of evaporation. Due to the fact that the ability to absorb heat increases with the degree of dispersion of the water, the extinguishing performance increases with the reducing diameter of the droplets. Furthermore, water dissolvable gases and smoke particles are absorbed.

## Technology

The AquaSafe system differs from conventional water spray and sprinkler systems in that smaller droplets extinguish the fire much more quickly. The result of more than 10 years KIDDE-DEUGRA research in this field shows that droplets with a diameter of 80 - 200  $\mu\text{m}$  with sufficiently high kinetic energy and extinguishing effectiveness achieve the best extinguishing success. The specially developed KIDDE-DEUGRA nozzle is charged with a pressure between 12 - 15 bar and forms exactly the right droplets in front of the nozzle. The combination of extinguishing times that are normally less than 30 seconds and the high extinguishing effectiveness of the water mist mean that water consumption is drastically reduced. As a result, expenditure on wastewater basins is reduced or totally avoided in some cases. The water supply for the nozzles is secured by a special developed extinguishing aggregate. It consists of a pressurised water storage container with a volume that is proportional to the size of the object being protected.

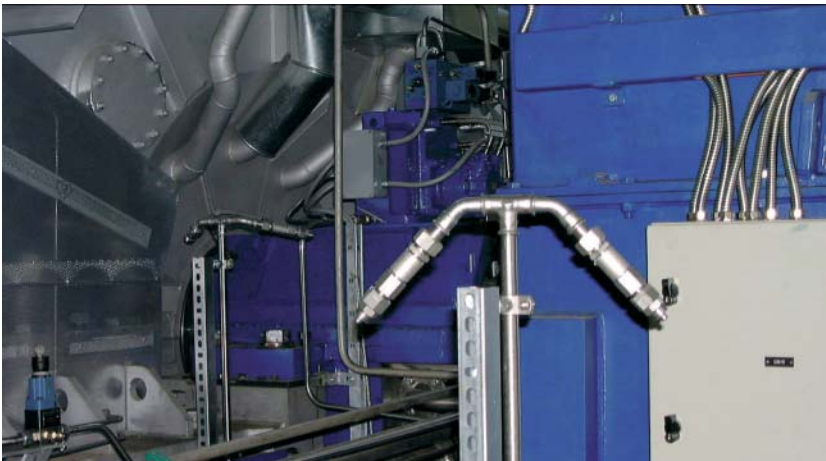


Extinguishing aggregate

# Examples of application



- In the car industry for the protection of motor test stands and as an extinguishing system for motor rooms
- In power plants for the protection of stationary gas and steam turbines, generators, fuel systems and gear spaces
- In the oil and gas industries for the protection of process systems and rotating machines



- Cable channels  
Cable floors  
Supply shafts
- Transformers
- Machines for the production of packing materials, pressed chip plates, etc.
- In the printing industry for the protection of folder machines



# System demonstration



Test fire:  
Full fire on an insulation  
soaked with gas oil



Instant dampening of the flames  
on actuation of the AquaSafe system



Instant, complete extinguishment  
of the full fire

# System technique



Pump set with storage container

The AquaSafe system can also be supplied with a pump set. This brings the water from a storage container to the nozzles. The performance of the pump and the size of the container are specified by a hydraulic calculation.

## System design

The physical properties of water spray mist systems mean that they are primarily local protection systems, and so the following factors are considered during the design of a system:

- Type and size of the fire risk (type of combustibles, quantity of combustible materials and possible sources of ignition)
- Geometry and environment of the area to be protected
- Ventilation and its effects
- Ambient temperature

From these parameters KIDDE-DEUGRA will determine the positioning of the nozzles and the corresponding pipe network. The number of nozzles required dictates the quantity of water that needs to be stored.



Internal set up of the extinguishing aggregate



KIDDE-DEUGRA Brandschutzsysteme GmbH  
P. O. box 10 12 60 • 40832 Ratingen  
Halskestraße 30 • 40880 Ratingen  
Telephone +49(0) 2102 405-0  
Telecopy +49(0) 2102 405-109  
Service dept. +49(0) 2102 405-0

Email: [info@kidde-deugra.com](mailto:info@kidde-deugra.com)  
Internet: [www.kidde-deugra.de](http://www.kidde-deugra.de)

KIDDE-DEUGRA Brandschutzsysteme GmbH  
Sales office North  
Hauptstraße 2 • 22145 Stapelfeld  
Telephone +49(0) 40 675 818 66  
Telecopy +49(0) 40 675 818 67

KIDDE-DEUGRA Brandschutzsysteme GmbH  
Sales office South  
Steinerne Furt 78 • 86167 Augsburg  
Telephone +49(0) 821 74 82 95-0  
Telecopy +49(0) 821 74 82 95-10

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KIDDE-DEUGRA Brandschutzsysteme GmbH

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