

DSPA

DSPA.nl B.V. is one of the ten companies within the AFG family.

It develops, produces and supplies highly effective and innovative aerosol fire extinguishing systems. These systems, called DSPA, have been designed for extinguishing both early stage fires and advanced fully developed fires, and for the protection of buildings against fires by means of automatic fire extinguishing systems. Thanks to its experience of many years and a history of continually testing its products DSPA.nl has developed into an expert in the field of aerosol fire extinguishing systems. In the following chapter an explanation is given as to what the term aerosol fire extinguishing systems means.



AFG Group

AFG Group is one of the largest companies in the field of fire prevention in the Benelux region with over one hundred and fifty employees. Fire prevention is a broad field with numerous subject areas, and specialist companies like AFG Group are taking an active part in all of those areas.

AFG Group consists of ten ambitious subsidiaries which employ well-trained and highly motivated specialists. It is one group of companies under one umbrella. The unique combination of universal knowledge and expertise makes AFG Group an unrivalled partner in advising and services.

It is a financially strong multidisciplinary company, very much capable of accelerating its business growth in the field of fire prevention. AFG Group aims at expanding its solid base through its core values of integrity, customer-orientatedness, innovation and socially responsible entrepreneurship.



DSPA, Dry Sprinkler Powder Aerosol

It seems that over the past few years, fires have broken out more and more frequently which developed into large uncontrollable and destructive seats of fires. Until now it seems as if these fires could only be extinguished by means of lots of ground water and expensive (drinking) water. This has resulted, among other things, in a strong pollution of surface water and ground water. Furthermore, such fires claim a lot of lives and cause much damage to movable and immovable property. Aerosol fire extinguishers bring about radical changes in to this situation.

As early as 1987, DSPA.nl started the development of DSPA. DSPA means Dry Sprinkler Powder Aerosol or aerosol fire protection systems. DSPA has been developed to replace Halon (BCF). The ban on Halon fire extinguishing systems stems from the Montreal Protocol, which was signed worldwide in 1987. In 2001 the first arrangements on this came into force, which led to a definite ban on the use of Halon in 2003. DSPA works volumetrically, just like Halon: it affects the combustion process.

DSPA.nl has developed intervention equipment for the fire brigade and in-house emergency and first aid services as well as permanent fire extinguishing systems for trade and industry and the Ministry of Defence. Intervention requires other specifications than permanent fire extinguishing systems. In the following sections the specific qualities of the various materials will be discussed.

Werking van DSPA

Dry Sprinkler Powder Aerosol, called aerosol for short, is composed of micro-sized particles. DSPA is composed of various potassium compounds.

When the DSPA is activated, thermally or electrically, the micro particles leave the DSPA-unit. Solid micro particles and a gas mixture (mainly CO², N² and water vapour) are mixed to form an extinguishing mixture. The DSPA contains a large amount of absorbing mass (the 'body'), which causes the mixture to lose the greater part of the heat, before it is released.

The extinguishing principle is two-sided

Potassium compounds require the least amount of energy for ionization. Ionization is the process in which an atom loses an electron or gains an ion. A very small amount of energy is required to remove the electrons from the atoms. The required amount of energy is supplied by the abundance of energy present in the fire. The energetic content of the flames is reduced in proportion to the ionization potential. During the extinguishing process the potassium ionization can be recognized by the pale violet discoloration of the flames.

During the combustion process specific reactions take place between atoms and fragments of instable molecules (radicals) in a rapid succession. This is a so-called chain reaction of radicals. This may continue until the stable end products of any combustion are formed, such as CO² and H²O or that the potassium in the potassium compounds reacts with the instable molecule fragments and the very stable potassium hydroxide (KOH) is formed. In this stage the radical chain reaction is interrupted and the flame is extinguished.

Interventie

By using DSPA the flames are extinguished and the fire changes into a glowing [fire]. There is no re-ignition for some time. The active substances of DSPA lower the temperature and the room can be entered by the fire brigade. In this way the fire brigade can act effectively, rescue possible victims beyond the fire and prevent further extension of the fire.

The DSPA fire extinguishing system is especially designed for fighting flashovers and backdrafts. Rooms threatened by a flashover or a backdraft are difficult to approach. An aerosol fire extinguishing system takes away the threat, which makes it possible to enter the room as yet. DSPA can be applied very well in fires in basements, attics or in ships. In no other way can a fire be fought brought under control so effectively as with DSPA.

When less water is available, DSPA is the ideal solution. After the use of DSPA the main fire has to be fought with a minimal quantity of water. This can prevent a lot of water damage. At the same time the extinguishing time is reduced.

Vaste blusinstallaties

The systems developed by DSPA.nl can be applied for A, B, C and F type fires and are suitable for early stage fires as well as for advanced fires. The systems can be linked, so that large spaces can be protected preventively.

Compared to conventional fire extinguishing equipment DSPA has a large number of advantages. We have listed the advantages below:

DSPA used as an intervention tool

- works volumetrically
- prevents backdrafts or flashovers
- re-ignition does not occur immediately
- can be applied for early stage fires as well for advanced fires
- breaks down and interrupts flames
- brings solutions when an indoor attack is no longer possible
- reduces the fire seat temperature
- is harmless to humans and animals
- does not damage movable and immovable property
- is environmentally friendly
- is maintenance-free for five years
- is light-weight and very compact

DSPA used as a permanent fire extinguishing system

- keeps the oxygen content in the room in tact
- is released only after ignition
- does not create an increase of pressure in the room to be extinguished
- can be applied in a large temperature range of – 70 °C to + 70 °C
- is harmless to humans and animals
- does not damage movable and immovable property
- is environmentally friendly
- is maintenance-free for five years
- is light-weight and very compact
- is cheap, because it does not require mains water
- does not require expensive water storage

Safety

The fire extinguishing agent DSPA is very user friendly and safe in use. Depending on the type of DSPA the units are activated manually, thermally or electrically. Once activated the system cannot be halted. It will continue as long as the active aerosol material has been fully dispersed in the air. It stands to reason that all DSPA-units may only be carefully applied according to the instructions for use.

Research

AFG Group has its own research laboratory. At this location quality tests and age tests are performed. DSPA.nl also carries out tests in close cooperation with various fire brigades. Only in this way can DSPA guarantee the highest quality of its products.

Certification

All DSPA-systems are manufactured and distributed in accordance with ISO 9001:2000 standards and in this way they meet the highest quality standards.

In addition all DSPA.nl products have been tested by the following organizations:

UL/JLC
RINA
ISO
BRE (part of LPCB)
PrCEN/TR 15276-1
PrCEN/TR 15276-2
NFPA 2010
TNO

Products

DSPA.nl develops, manufactures and supplies various DSPA-systems. The correct use of DSPA depends on the unit, its function and the room. In short, every DSPA-unit has its own application. DSPA.nl has mapped out these applications on the basis of its products. Deviating Different sizes and tailor-made systems can be supplied on request.



Application

DSPA 8-1 en 8-2 are universal systems which bring a much colder extinguishing agent into the room, which gives them a wider applicability. DSPA 8 is especially designed for fighting fires of flammable liquids, such as oil products, petrol and organic solvents, but also for solid materials such as wood, insulation materials and plastics.

DSPA 8 should be installed in closed rooms which are difficult to access, so that in case of fire DSPA 8 is applied as first fire fighting tool, when it is activated in the room thermally or electrically.

DSPA 8 is manufactured in two designs, namely DSPA 8-1 and DSPA 8-2. They differ in content of the active aerosol material. DSPA 8-2 contains a larger quantity of aerosol, so that it can handle a larger capacity. The following survey gives the capacities.

Activation method

DSPA 8 is activated electrically.

Figures

	DSPA 8-1	DSPA 8-2
Active substance	3.25 kg	6.7 kg
Discharging time	80 seconds	160 seconds
Maximum temperature at 50 cm	< 120 °C	< 120 °C
Diameter	220 mm	220 mm
Height	220 mm	350 mm
Weight	11.5 kg	20 kg
Capacity*	65 m³	134 m³

* based on a concentration of 50 gram/m³



Application

DSPA 11 has been developed for fighting A and B type fires and electric fires in industrial buildings, railways and road transport. DSPA 11 can also be applied in rooms where there are cables, electrical installations and equipment.

DSPA 11 is a series of small ‘cold’ systems, which by their dimensions can very easily be installed in small rooms, such as switch boxes and engine compartments.

DSPA 11 should be installed in closed rooms which are difficult to access, so that in case of fire DSPA 11 is applied in the room as the first fire fighting tool.

For DSPA 11 a series of seven different types has been manufactured. Which type should be applied depends on the capacity of the room to be protected.

Activation method

DSPA 11 can be activated in two ways: electrically and thermally.

Figures

	DSPA 11-0,5	DSPA 11-1	DSPA 11-2	DSPA 11-3	DSPA 11-4	DSPA 11-5	DSPA 11-6
Active substance	0.045 kg	0.11 kg	0.17 kg	0.3 kg	0.9 kg	1.4 kg	2.4 kg
Discharging time	35 sec	9 sec	12 sec	20 sec	25 sec	40 sec	40 sec
Maximum temperature at 50 cm	80 °C	75 °C	75 °C	75 °C	75 °C	120 °C	120 °C
Diameter	35 mm	122 mm	124 mm	135 mm	165 mm	187 mm	187 mm
Height	65 mm	23 mm	32 mm	72 mm	94 mm	94 mm	94 mm
Weight	0.160 kg	0.5 kg	0.8 kg	1.3 kg	2.0 kg	4.,5 kg	4.7 kg
Capacity*	1 m³	2.2 m³	3.4 m³	6.0 m³	18 m³	28 m³	48 m³

* based on a concentration of 50 gram/m³