



# DSPA

**AEROSOL FIRE EXTINGUISHING SYSTEMS  
EFFECTIVE AND INNOVATIVE**

# 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 CO<sub>2</sub>, N<sub>2</sub> 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 CO<sub>2</sub> and H<sub>2</sub>O 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/JULC

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.

# DSPA 2



## Application

DSPA 2 has got an internal cooling system. The aerosol gases are cooled before the aerosol particles are released into the air, after the DSPA has been activated. Therefore, the DSPA 2 is very suitable for rooms in which cables, electric installations and electric appliances have been installed with a voltage not exceeding 40kV.

## Activation method

DSPA 2 can be activated in two ways: electrically and thermally.

## Figures

|                              | DSPA 2            |
|------------------------------|-------------------|
| Active substance             | 1.6 kg            |
| Discharging time             | 45 seconds        |
| Maximum temperature at 50 cm | < 200 °C          |
| Diameter                     | 175 mm            |
| Height                       | 350 mm            |
| Weight                       | 5 kg              |
| Capacity*                    | 21 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>



## Application

DSPA 4 has been developed especially for the transport sector and can be applied in trains, trucks, cars and ships. DSPA 4 is manufactured in two types: DSPA 4-1 and DSPA 4-2 which differ in the way in which the active material is released into the air: DSPA 4-1 releases the substance axially and DSPA 4-2 releases it radially. In addition, DSPA 4-1 is designed for plaster-depth installation and DSPA 4-2 for wall-mounted installation.

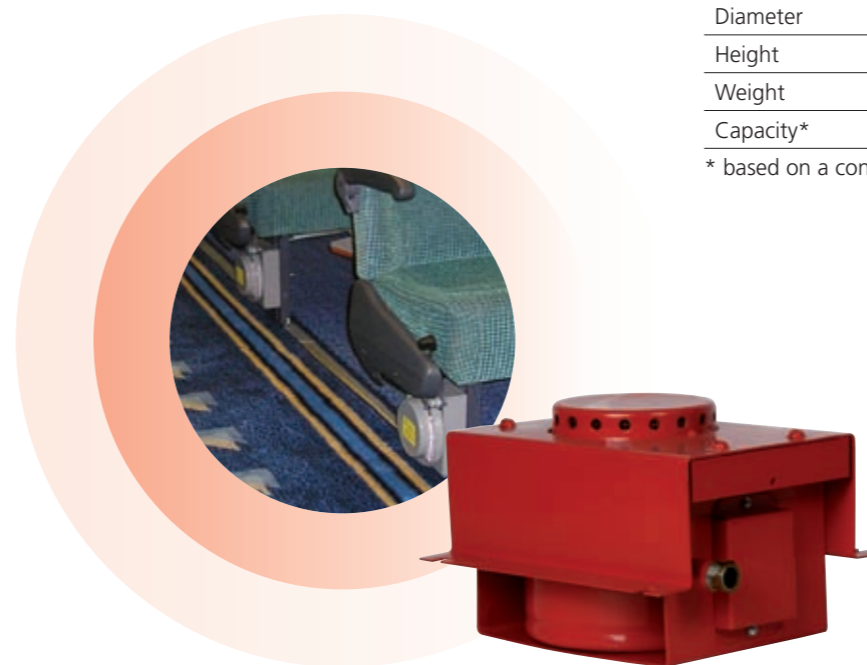
## Activation method

DSPA 4 can be activated in two ways: electrically and thermally.

## Figures

|                              | DSPA 4-1          | DSPA 4-2          |
|------------------------------|-------------------|-------------------|
| Active substance             | 1.6 kg            | 1.6 kg            |
| Discharging time             | 43 seconds        | 43 seconds        |
| Maximum temperature at 50 cm | < 120 °C          | < 120 °C          |
| Diameter                     | 165 mm            | 165 mm            |
| Height                       | 180 mm            | 180 mm            |
| Weight                       | 5.3 kg            | 5.3 kg            |
| Capacity*                    | 21 m <sup>3</sup> | 21 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>



# DSPA 5



## Application

Thanks to the versatility of its applications DSPA 5 is DSPA.nl's best sold article. DSPA 5, which is also nicknamed "extinguishing bomb" in the media, is a portable unit: its weight and dimensions are limited. On account of its portable design the DSPA can be applied even before the fire brigade arrives. The DSPA 5 is activated by means of a cord. By throwing this type of DSPA at the seat of the fire from a distance, it is no longer necessary to come close to the seat of the fire. The round construction makes for rapid and efficient dispersal of the active material.

Dutch and Swedish tests have shown that the DSPA 5 can prevent a backdraft or a flashover; even for a longer time. DSPA 5 is a good solution in cases when an indoor attack does not seem to be an option any more. The DSPA 5 is thrown into the closed room from a distance. The active substances, the aerosol gases, lower the temperature in the room and the fire changes into a glowing [fire]. Then the fire brigade can enter the room and fight the fire effectively. In this way the damage can be limited.

### Main reasons:

1. Increases personal safety
2. Creates time to develop further actions
3. Limits the damage caused by the fire/water damage

DSPA 5 can be used to fight both early stage and advanced fires. Moreover, DSPA 5 does not create any increase in pressure and gives a normal oxygen content. This is of great importance in case there are still victims present in the nearby room.

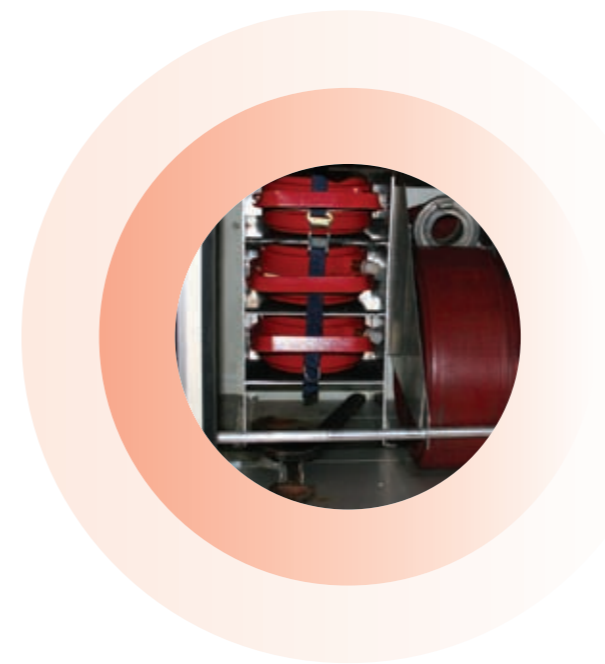
## Activation method

The unit is activated as soon as the cord is pulled abruptly. This should be done in a straight line from the unit. When the DSPA 5 has been activated, it starts producing a special sound. From that moment the DSPA 5 must be thrown at the seat of the fire within 10 seconds.

## Figures

|                              | DSPA 5            | DSPA 5-4           | DSPA 5-3          |
|------------------------------|-------------------|--------------------|-------------------|
| Active substance             | 3.3 kg            | 0.3 kg             | 0.9 kg            |
| Discharging time             | 25 seconds        | 20 seconds         | 25 seconds        |
| Maximum temperature at 50 cm | < 170 °C          | 75 °C              | 75 °C             |
| Diameter                     | 210 mm            | 135 mm             | 165 mm            |
| Height                       | 110 mm            | 72 mm              | 94 mm             |
| Weight                       | 5.4 kg            | 1.3 kg             | 2.0 kg            |
| Capacity*                    | 60 m <sup>3</sup> | 6,0 m <sup>3</sup> | 18 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>



# DSPA 8



## 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.

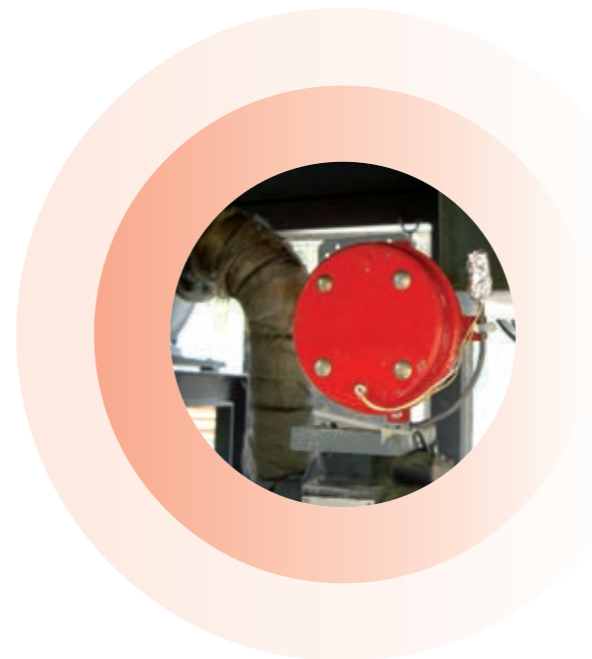
## Activation method

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 m <sup>3</sup> | 134 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>



## 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 m <sup>3</sup> | 2.2 m <sup>3</sup> | 3.4 m <sup>3</sup> | 6.0 m <sup>3</sup> | 18 m <sup>3</sup> | 28 m <sup>3</sup> | 48 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>

# DSPA12

## Application

DSPA 12 is the result of the continued development of the DSPA 8. The maximum temperature of the active substances as they are released into the air has been further reduced. Moreover, the principle of circular discharge has been applied in order to realize a more rapid dispersal into the room.

## Activation method

DSPA 12 can be activated in two ways: electrically and thermally.

## Figures

|                              | DSPA 12-1         | DSPA 12-2          |
|------------------------------|-------------------|--------------------|
| Active substance             | 4.0 kg            | 6.7 kg             |
| Discharging time             | 60 seconds        | 80 seconds         |
| Maximum temperature at 50 cm | < 100 °C          | < 100 °C           |
| Diameter                     | 165 mm            | 165 mm             |
| Height                       | 275 mm            | 360 mm             |
| Weight                       | 13 kg             | 13 kg              |
| Capacity*                    | 80 m <sup>3</sup> | 134 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>

# DSPA6

## Application

DSPA 6 has a very special appearance. The construction causes the fire extinguishing agent to be blown into the room in a circle around the device. Moreover, one of the properties of this system is that the active extinguishing substance is dispersed into the room at a low temperature.

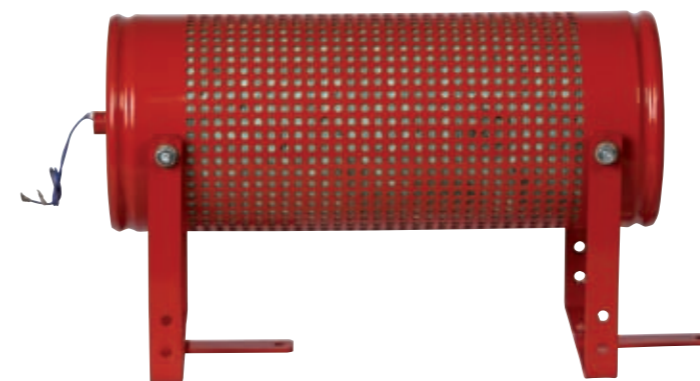
## Activation method

DSPA 6 can be activated in two ways: electrically and thermally.

## Figures

|                              | DSPA 6            |
|------------------------------|-------------------|
| Active substance             | 3.4 kg            |
| Discharging time             | 35 seconds        |
| Maximum temperature at 50 cm | < 75 °C           |
| Diameter                     | 165 mm            |
| Height                       | 420 mm            |
| Weight                       | 14.3 kg           |
| Capacity*                    | 52 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>





# DSPAD



## Application

DSPA D has been especially developed for application in explosion-sensitive rooms, such as rooms where dust explosions may occur.

## Activation method

DSPA D can only be activated electrically.

## Figures

|                  | DSPA D            |
|------------------|-------------------|
| Active substance | 1.6 kg            |
| Discharging time | 40 seconds        |
| Diameter         | 167 mm            |
| Height           | 180 mm            |
| Weight           | 7 kg              |
| Capacity*        | 21 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>

# DSPA0.3

## Application

DSPA 0.3 is the smallest generator in the DSPA-range and is smaller than a beer mat. This small generator is preferably applied in small rooms containing electrical equipment such as computers, telephone exchanges, monitors, sound equipment and small switchboxes.

## Activation method

DSPA 0.3 can be activated in two ways: electrically and thermally.

## Figures

|                  | DSPA 0.3                        |
|------------------|---------------------------------|
| Active substance | 0.015 kg                        |
| Discharging time | 5-7 seconds                     |
| Diameter         | 71 mm                           |
| Height           | 22 mm                           |
| Weight           | 0.112 kg                        |
| Capacity*        | 0.3 m <sup>3</sup> / 300 litres |

\* based on a concentration of 50 gram/m<sup>3</sup>



# DSPA M



## Application

DSPA M has especially been developed for maritime purposes. The overall construction and design are based on durability and maximum reliability in operation. A hand fire extinguisher is also available. It is the DSPA M5, which is based on the DSPA 5. A special feature of the DSPA M series is that it is salt water resistant.

In addition to the DSPA M5 DSPA.nl has developed two more types for this maritime series, namely DSPA M1 and DSPA M2. DSPA M1 and DSPA M2 differ in the way in which the active substance is released. DSPA M1 releases the substance axially and DSPA M2 releases it radially. DSPA M1 is designed for plaster-depth installation and DSPA M2 for wall-mounted installation.

## Activation method

The activation method of the DSPA M5 is identical to that of the DSPA 5. The unit is activated as soon as the cord is pulled abruptly. This should be done in a straight line from the unit. When the DSPA5 has been activated, it starts producing a specific sound. From that moment the DSPA M5 must be thrown at the seat of the fire within 10 seconds. It is also possible to apply DSPA M5 in large spaces. In such cases more DSPA M5 units should be thrown at the seat of the fire. For a room of 300 m<sup>3</sup> 5 DSPA M5 units are required.

The DSPA M1 and M2 have an electric activation method.

## Figures

|                  | DSPA M1           | DSPA M2           | DSPA M5           |
|------------------|-------------------|-------------------|-------------------|
| Active substance | 3,3 kg            | 1,6 kg            | 3,3 kg            |
| Discharging time | 100 seconds       | 40 seconds        | 25 seconds        |
| Diameter         | 178 mm            | 167 mm            | 210 mm            |
| Height           | 350 mm            | 180 mm            | 101 mm            |
| Weight           | 7,5 kg            | 5,9 kg            | 5,4 kg            |
| Capacity*        | 60 m <sup>3</sup> | 21 m <sup>3</sup> | 60 m <sup>3</sup> |

\* based on a concentration of 50 gram/m<sup>3</sup>

# FIRE SQUID



## Application

The latest in portable fire extinguishing tools by DSPA.nl, based on aerosol technology, is the Fire-Squid. The Fire-Squid is a very effective fire extinguisher with a unique design, which has a total weight of less than 1.5 kg. It has especially been designed for one-handed operation and therefore, it is easy to use. With its extinguishing time of 45 seconds and an extinguishing range of a maximum of 4 metres the Fire-Squid is very much suited for extinguishing starting fires in the home, but also in the car, the caravan or on board ships. This innovative fire extinguisher is environmentally friendly and does not harm humans and animals. Moreover, the Fire-Squid is fully maintenance-free during the first 5 years.

## Voordelen

- Unique design
- Very effective
- One-handed operation
- Weight: less than 1.5 kg
- Extinguishing time: 45 seconds
- Extinguishing range: 3 to 4 metres
- Environmentally friendly
- Harmless to humans and animals
- Fully maintenance-free during the first 5 years

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Ontwikkeling, productie en verkoop van innovatieve aerosol blussystemen.

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