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Introduction to Nano Particles Fire Extinguishing Technology

Currently, there are three types of fire extinguishing technologies:

- **Water based and foam technology.** They are the best choices for class A and B fire, but they cannot be used to extinguish electrical fire;
- **Gaseous fire suppression technology.** including CO₂, FM200 and Inert gases. While it's performance may not be as good as the first category, it can be used to extinguish electrical fire without damaging electrical devices;
- **Chemical powder technology.** which has good performance for class A, B, C (electrical fire) fires, but it will leave residue and may damage the equipments under protection.

Even though above three technologies have their own advantages, dry powder has been gaining popularity due to its advantages including non conductivity, good performance and compatible size. It is thus called omnipotent fire extinguisher. The performance of dry chemical extinguisher depends on its ingredient and the size of the particles released. After about a hundred years of study and research of all possible materials, phosphate has been chosen as the main chemical ingredient. There has been not much development in the ingredient for decades since then. For the size of particle, superfine dry powder has been launched. Currently, the diameter of the finest dry powder is 5 μ m, which has notably increased the performance of such powder.

The nature of nano particles fire extinguishing technology is that it has greatly reduced the size of dry chemical particles. The key point is to heat the fire extinguishing substance to generate Nano extinguishing particles, and to generate momentum to push such fine particles to the fire. The size of fire extinguishing particle under this technology is about 0.1 μ m. Dry chemical particles of this size not only has good fire extinguishing capacity, but also match the characteristic of gas fire extinguishing agent which is good at avoiding obstacle and suspending in air.

Therefore, this technology can be described as a nano extinguishing particle technology.

Product Introduction



Portable Fire Extinguisher
JE-50



Portable Fire Extinguisher
JE-100



Portable Fire Extinguisher
JE-150



Portable Fire Extinguisher
JE-300



Fixed Fire Extinguishing Device
FS0015



Fixed Fire Extinguishing Device
FS0050



Fixed Fire Extinguishing Device
FS0500



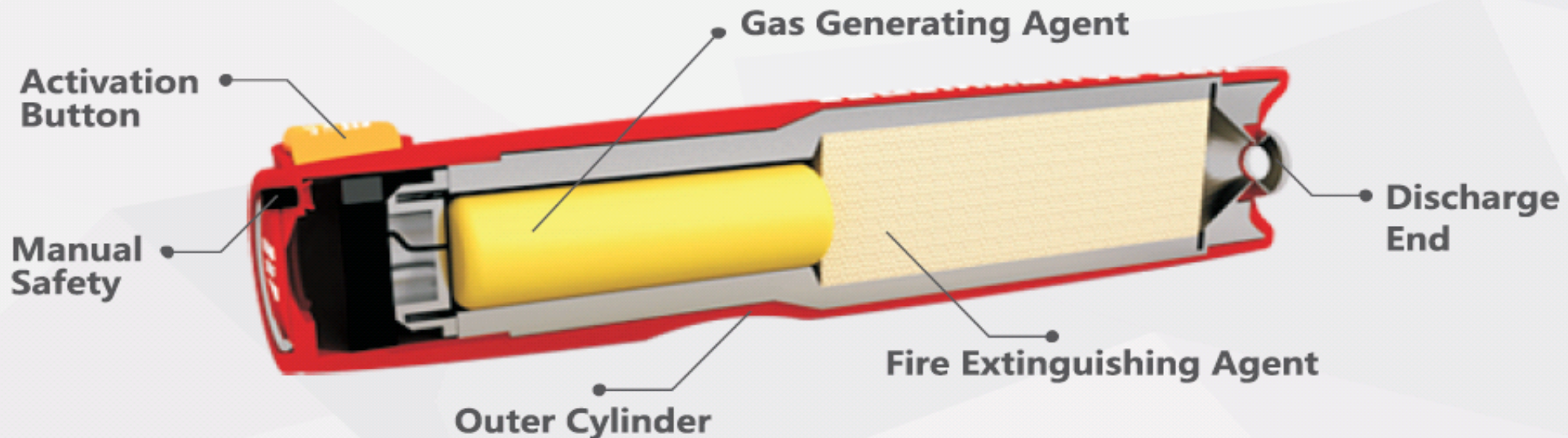
Fixed Fire Extinguishing Device
FS0800

Working Principle of Product

Compared to current technologies, this product is the first to generate Nano-meter level particles through high temperature for fire extinguishing, making this technology not only an improvement for current fire extinguishing method, but a discovery of a new fire extinguishing theory.

The principle of this technology is that fire extinguishing substance is made up by aerogenesis agent and fire extinguishing agent. Aerogenesis agent will generate a large volume of gas as well as heat by redox reaction. Fire extinguishing agent generates Nano fire extinguishing agent after being heated, which is then discharged from the nozzle carried by the gas generated from aerogenesis to achieve powerful fire extinguishing capacity.

The working principle of nano particles fire extinguishing product is as follows.



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Core Technology—Certification progress



Certification Obtained

CE, RINA, UKAS, BRE, CEC, India, Brunei, Vietnam, Turkey, Indonesia, Thailand

Certifications under process: UL, LPCB, VDS

Advantages

- **Patent Technology:** Principle owns more than 300 patents in Nano particles fire extinguishing technology. Those patents have been applied in 20 countries, including Europe, USA, Japan, Russia, Canada, Australia, India, Korea, South Africa, Malaysia, Indonesia, Mexico, Vietnam, Philippines, Thailand, Israel, Turkey, Nigeria, etc.
- **Pricing:** Compared to other fire extinguisher Nano particle fire extinguisher has low cost of ownership.
- **Ease of Use:** Can be used by a common man without training in a crisis situation. Increases confidence to use in a crisis. No wastage of precious time to put into action in a crisis.
- **Handy:** Blends with modern decor. Can be kept up front in a visible area, therefore, immediately visible and accessible in a crisis, thereby no loss of precious time. Can be easily carried to the scene of the fire. Can be used by the lady staff in the crisis.
- **Environment Friendly:** Nano particle fire extinguisher leaves almost no residue. Thus a green product.
- **Service Network:** Bagged with Svam Fire Service network for a hassle free ownership.

Application—Replacement of ABC portable fire extinguishers (1)

ABC type fire extinguisher has been used for around one hundred years, and it's also the most widely used fire extinguisher in the world. Its market is estimated to be about 1 billion USD. JE - 50 has the same capacity compared to a 2kg ABC fire extinguisher, and it has the following advantages:

- Fashionable outlook:** Conventional ABC fire extinguisher is heavy and not easy to carry in the event of a fire. Our product has competitive size with nice appearance which can be hang on the wall of kitchen or living room.
- No maintenance required:** The shelf life of this product is 4-6 years with no maintenance needed. In contrast, ABC fire extinguisher needs to be checked every year and refilled if needed.
- Green:** Conventional fire extinguishing agent leaves residue, which will damage electrical equipments, artwork and antiques. Products under this technology is green with only a few residue.
- Small size:** This product is much lighter and smaller compared to ABC fire extinguisher with the same fire extinguishing capacity, and it can be carried on the waist belts of security personnel, policemen and fire fighters.
- Can be thrown into the fire:** The discharging time of this product is 8-10 seconds. It can also be thrown into the fire after extinguishing the fire and reduce the temperature to buy more time for fire fighters.

Application—Replacement of CO₂ Fire Extinguisher (2)

CO₂ fire extinguisher has a history of around one hundred years. It puts out fire mainly by means of O₂ depletion and partially by cooling effects. It can be used to protect valuable equipments, files, instruments, electrical equipments under 600V and grease from fire because it has good fluidity and high discharge rate. It's non-corrosive, stable, and it doesn't leave any residue and traces.

Compared to CO₂ fire extinguisher, this product not only has the same capacity as CO₂ fire extinguisher, but it also has four major advantages: small in size, light in weight, non-toxicity, and no maintenance required, making it the ideal product to replace CO₂ extinguisher.

The comparison of the 2 types of products is as follows:

Product	Capacity	Weight	Volume	Safety	Toxicity	Maintenance
CO ₂ (5kg)	34B	14Kg	Φ136mm×645mm	Bad	Yes	Yes
JE-300	34B	2.25Kg	Φ120mm×236mm	No pressure	No	No

We can see from this table that this type of product has very obvious advantages compared to Co₂ and can well replace Co₂ fire extinguisher.

Application—Replacement of FM200 Gas Fire Extinguishing Device (3)

Gaseous suppression system is mainly used at places where water-based fire extinguishing systems can't be used, such as computer rooms, libraries, archives, mobile communication rooms, UPS rooms, Battery rooms and diesel engine rooms, etc.

FM200 and IG-541 are among the gaseous fire suppression systems most widely used.

A comparison of different fire suppression systems is shown as follows (assuming that a 200m³ space with electrical equipment needs to be protected):

Product	Cost (Comparative value)	Weight	Volume	Safety	Toxicity	Maintenance
Fm200	1	280Kg	0.45m ³	No	No	Complicated
IG-541	1.7	1000Kg	3m ³	No	No	Complicated
Nano particles system	0.4	72kg	0.09m ³	Yes	No	Not needed

From above table, we can see that nano particles fire extinguisher is small, light-weighted, cost efficient, and requires no maintenance, but it also emits large amount of smoke during discharge, making it not suitable for densely populated areas; and it does leave some residue (little as it is), making it not the best choice for super clean area such as chip factory. But for most of the places, this product is an ideal replacement of most of the gaseous fire suppression systems.

Compared to other gas systems, our Nano particles system has obvious advantages in the following applications:

- Electrical rooms of less than several hundreds cube meters, such as telecommunication stations, control rooms, transformer stations, railway signal stations, military radar stations, equipment rooms of high-rise buildings, pump valve rooms of petrification industry and well drilling platforms.
- The power rooms and equipment rooms of transportation vehicles, such as engine room of vehicles, military shelter and cabin of ship.
- All other areas where gaseous fire systems are installed, such as the replacement of CO2 fire protection systems in metal rolling mill.

Application

- **Automobiles**
- **House Hold**
- **Fire Fighters**
- **Police**
- **Mobile Base Station**
- **Locomotives**
- **Power Plants**
- **Electrical Sub Stations**
- **Commercial Spaces**
- **Offices**
- **Shops**
- **.....many more**



Thank you!

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