

FINE X

The High-Tech Fire Fighting Technology

Condensed aerosol self-operating extinguishing system





Creating a safer world!

FINEX “A leader in next generation of the fire extinguishing system”

The Fire Prevention industry is expected to have great growth potential and a huge impact on the national economy since nowadays the need for Advanced Fire Prevention Technology is growing as the society develops and disasters diversify. Also now that we are facing with serious worldwide environmental problems such as global warming and ozone layer depletion, the universally used halon-based fire extinguishing system has been banned according to the Montreal Protocol in 2010, due to environmental issues. Hence, this eco-friendly, Condensed Aerosol Extinguishing System is emerging as the next generation of the fire extinguishing system that can replace halon.

The Condensed Aerosol Extinguishing System is a technology that can be developed only when possessing core technologies such as precision explosives, propellants etc. **Hanwha CO., LTD.**, retaining a world-leading technology in the field of chemicals/explosives, has succeeded to be the first to develop a successful Condensed Aerosol Extinguishing System product by an independently developed technology under the brand name of “**Fine X**”

We, **Kangwoon Fine-X**, acquired Condensed Aerosol Self-operating System technology and it's patent from Hanwha and will enter the fire prevention industry based on this superior technology, lead the advancement of firefighting techniques through continuous research and product development, and endeavor to gain national technology competitiveness by localizing environmentally-friendly fire prevention technology which contributes to the national and industrial security.



Korea Fire Institute
KFI certification



Registration and
acquisition of
Domestic and Foreign
patent



2008 Korea Safety
Award first prize



100 most Excellent
patented products
2008



FINE X

PATENTED

Condensed aerosol self-operatingextinguishing system



FineX is the first independently developed self-operating condensed aerosol fire extinguishing device, sold by **Kangwoon CO., LTD** with acquired technology and patent based on **Hanwha's** advanced technology in the field of defense and aerospace.

This fire extinguishing system uses high densified extinguishment ingredient which is generated when combusting a solid material made from the application of rocket propellant technique and is particularly excellent in initial fire suppression.

As a result of overcoming previous international technical disadvantages, **Fine-X** obtained a national patent related to excellent extinguishing capacity and operating system of high reliability, and acquired KFI recognition of The Korea Fire Institute and also obtained an oversea patent.

Superiority

1. Eco-friendly system

Does not have any effect on global warming and ozone layer depletion.
{GWP (Global Warming Potential) & ODP (Ozone Depletion Potential) = 0}

4. 5 times more effective fire extinguishing performance compared to halon

Fine X has an extinguishing concentration of 65g/ m³ , presenting better extinguishing capacity than halon 1301's concentration of 330g/ m³

2.Small, lightweight, and has excellent space efficiency

FineX is the smallest and lightest fire extinguishing system in existence.
It requires only 1/40 of storage space compared to inert gas and is only about 10% of the weight of other equipments.

5. Saving of installation and maintenance expense

FineX does not require special pressure vessel, injection equipment, pipe etc., so it hardly has any initial installation cost. Also, since periodic maintenance is unnecessary, it is an economic extinguishing system capable of cost reduction.

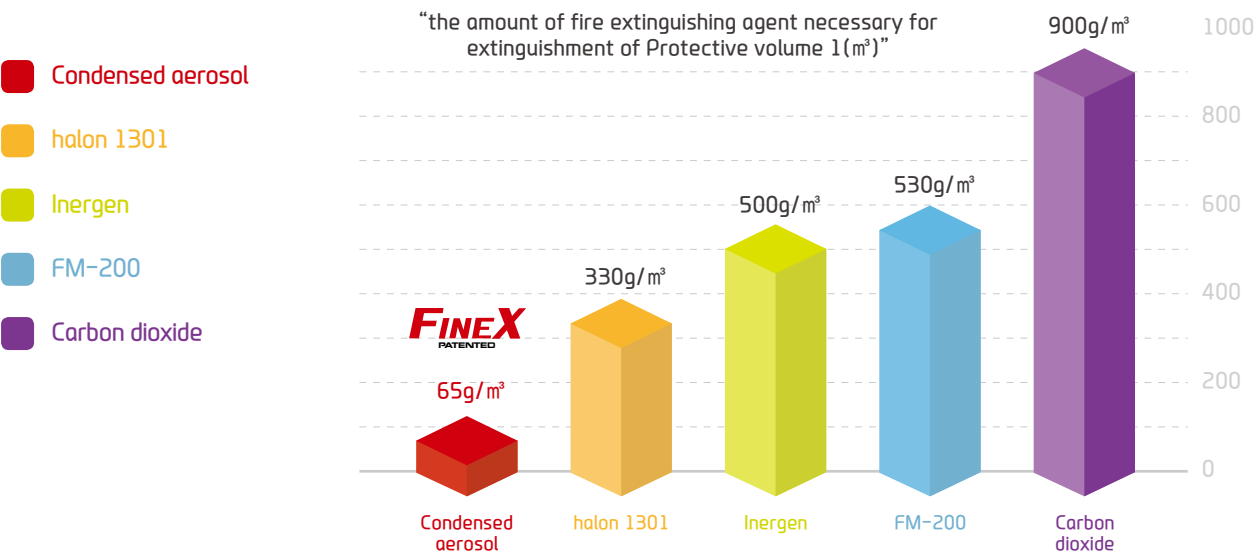
3. Non-toxic

Unlike other halon replacement chemicals, FineX does not generate toxic chemicals, does not remove oxygen while extinguishing fire and does not generate chlorine nor fluorine. Therefore it is safe for a person to be in the firefighting sight.

6. Easy installation and replacement

Installation and transition is very convenient, therefore the system can be easily handled by anyone.

Comparison of fire-extinguishing capacity



Comparison of fire extinguishing agent

Extinguishing agent	FineX	Halon 1301	Other gas systems	Carbon dioxide
ODP (OzoneDeplete Potential)	0	12	0	0
GWP (Global Warming Potential)	0	56,000	About 3,000	1
ALT	0	54	About 30	1
Conductivity	Very Low	Low	Low	Low
Causticity	Low	High	Medium	Medium
Extinguishing Performance (g/m³)	65	330	530	900



◆ Stand alone self-operating system



◆ fire sensing device: glass-bulb

◆ Multi-linked operating system



◆ fire sensing device: glass-bulb/electronic

Stand alone self-operating system, Glass bulb type

DIVISION		KW-60GB-ES	KW-100GB-ES	KW-250GB-ES	KW-500GB-ES	KW-750GB-ES	KW-1000GB-ES	KW-1200GB-ES
Amount of extinguishing agent(g)		60	100	250	500	750	1000	1200
Protective volume (m ³)	Integrated fire accidents	0.64	1.07	2.67	5.35	8.03	10.7	12.84
	Oil fire accidents	0.71	1.19	2.97	5.93	8.9	11.85	14.24
Distance (m)	Human body	1	1	1.5	2	2	2	2
	Extinguishing target	0.2	0.3	0.4	0.7	0.8	1	1
Release time(Sec)		7.5	10	12.5	20	16	21	24
Working temperature		-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃
Size (mm)	External diameter	76.2	76.2	127	127	165.1	165.1	165.1
	Whole length	207.2	217.7	224	273	304	323.5	350

Multi-linked operating system utilizing spring electric generator

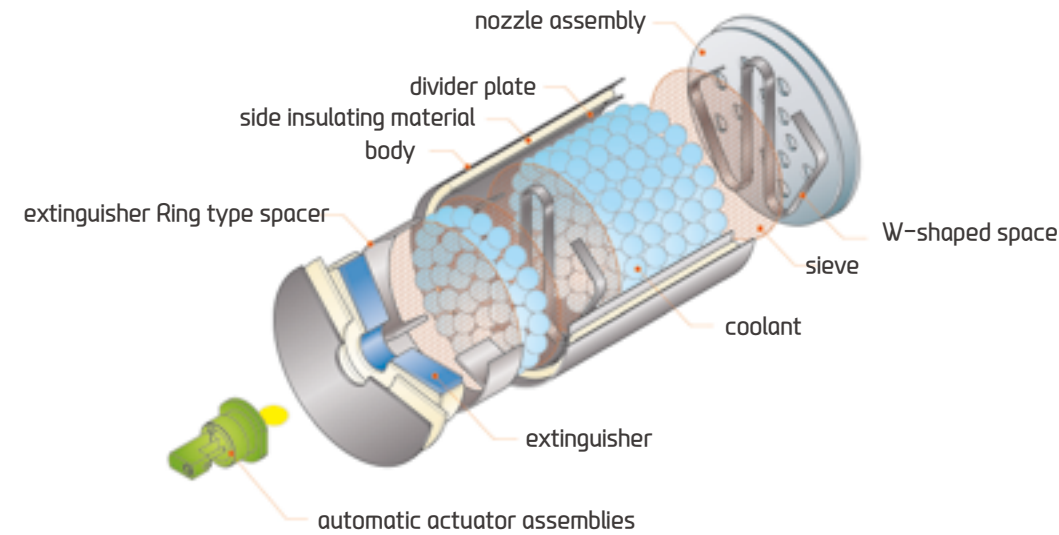
DIVISION		KW-1200 x2 -SEG	KW-1500 x 2- SEG	KW-2000 x 2-SEG	KW-2500 x 2 -SEG	KW-1200 x 3- SEG	KW-1500 x 3 -SEG	KW-2000 x 3 -SEG	KW-2500 x 3 -SEG	KW-2000 x 4- SEG	KW- 2500 x 4 - SEG
Amount of extinguishing agent(g)		2,400	3,000	4,000	5,000	3,600	4,500	6,000	7,500	8,000	10,000
Protective volume (m ³)	Integrated fire accidents	25.69	32.12	42.83	53.53	38.54	48.17	64.23	80.3	85.65	107.06
	Oil fire accidents	28.49	35.61	47.48	59.35	42.72	53.4	71.2	89.01	94.94	118.68
Distance (m)	Human body	2	2.5	2.5	2.5	2	2.5	2.5	2.5	2.5	2.5
	Extinguishing target	1	1.5	1.5	1.5	1	1.5	1.5	1.5	1.5	1.5
Release time(Sec)		24	20	24	28	24	20	24	28	24	28
Working temperature		-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃
Size (mm)	External diameter	165.1	216	216	216	165.1	216	216	216	216	216
	Whole length	270	233	263	304	270	233	263	304	263	304

Electric operating system utilizing control pannel

DIVISION		KW-250 x 4 -CP	KW-500 x 4 -CP	KW-750 x 4 -CP	KW-1000 x 4 - CP
Amount of extinguishing agent(g)		1,000	2,000	3,000	4,000
Protective volume (m ³)	Integrated fire accidents	10.68	21.4	32.12	42.8
	Oil fire accidents	11.88	23.72	35.6	47.44
Distance (m)	Human body	1.5	2	2	2
	Extinguishing target	0.4	0.7	0.8	1
Release time(Sec)		12.5	20	16	21
Working temperature		-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃	-40℃ ~ 50℃
Size (mm)	External diameter	127	127	165.1	165.1
	Whole length	147	230	262.5	282.5



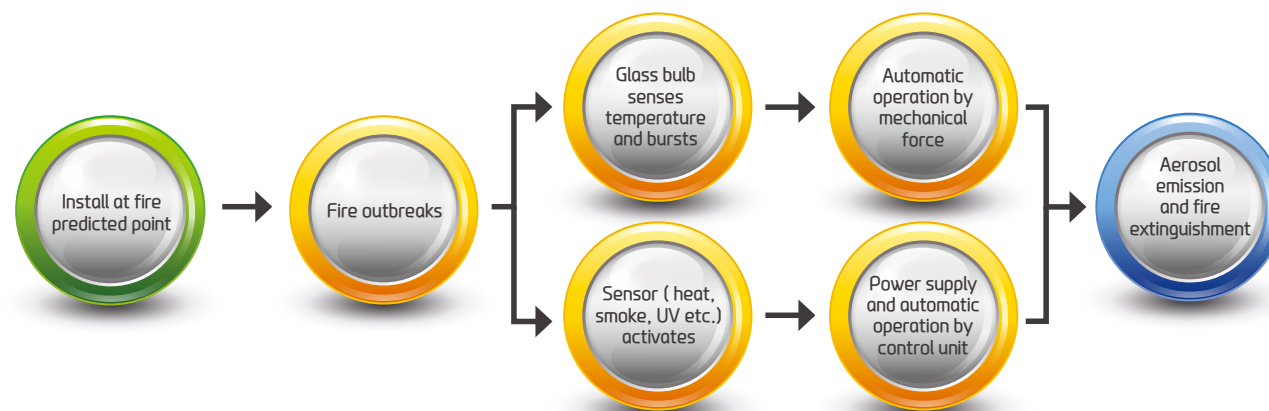
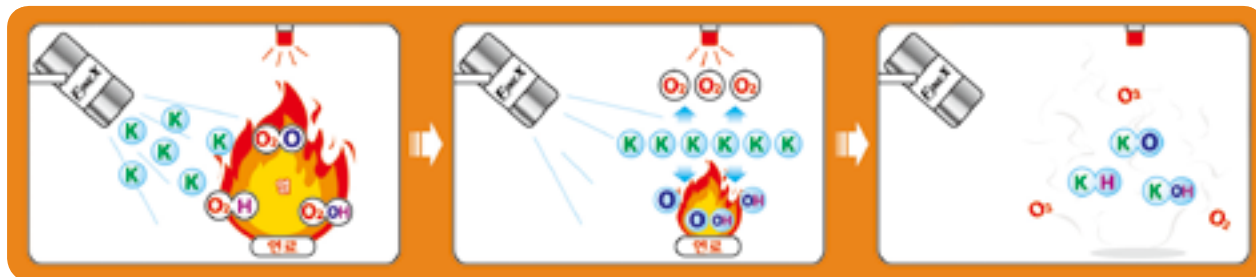
Structure of Condensed Aerosol Fire



Principle of operation and extinguishment

FineX is a very stable solid compound, used as an extinguishing agent.

It operates automatically by electrical signals or the rise of ambient temperature. At this time, a stable solid compound is combusted and aerosol, a high concentrated extinguishing ingredient is generated. The radical of this aerosol reacts with O, H, and OH radical and extinguishes fire.



Condensed Aerosol Extinguishing System_International standards

Standard for the Condensed Aerosol Extinguishing System – National Fire Protection Association (NFPA) 2010

(Original title: Standard for Fixed Aerosol Fire-Extinguishing Systems)

- 2005.6 Run as NFPA at American Association of Technology Conference (June AssTechnical Meeting)
- 2005.7 register Standards Council
- 2005.8 NFPA effect occurs

Fixed extinguishing system – Condensed Aerosol Extinguishing system – European standard

(Original title: Fixed Firefighting System-condensed aerosol extinguishing systems)

- 2004.4 revision and supplementation of CEN/TC 191 European standards (ver.9)

Condensed aerosol fire extinguishing systems – ISO (International Organization for Standardization) standards

- 2008.1. Arranged standard/standard arranged at ISO TC21 (firefighting and fire prevention)

Domestic Legislation of Condensed Aerosol Fire Extinguisher

- ◆ Registered Condensed Aerosol Extinguisher installation and usage related matters in Fire Safety Standards (2010.12)
- ◆ Confirmed Condensed Aerosol Extinguisher's excellent extinguishment performance and adaptability

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Major Clients' Installation Status



Major Clients



Application areas

- Industrial plants: petro chemistry, semiconductor, chemical, gas production and supply
- Building: EPS, TPS, AD, PS
- Electrical room of power plant: substation room, transformer room, generator room, cable room, underground power district
- Electronic machine room: computer room, peripheral equipment room, data management room, control room, communication equipment room
- Hazardous commodities processing office: oil reservoirs, gas stations, pump chamber, laboratory
- Cultural heritage archives: museums, art museums, cultural properties, historical documents archives
- Car, ship, aviation: bus, special vehicle, racing cars, engine room, cargo compartment
- Military equipment: fighters, bombers, helicopters, armored vehicles, tanks, warships
- Plants handling hazardous or flammable material: gas station, laboratory, paint room

Patents and Merits

1. Independent development and registration/acquisition of domestic and foreign patent
: Manufacturing method and automatic operating device of Aerosol fire extinguisher
2. Korea Fire Institute's "Condensed aerosol self-operating extinguishing system KFI certification"
: Extinguishing capacity 1.5 times excellent compared to the existing Condensed Aerosol automatic self-operating extinguishing system
3. Combination of high-reliability defense technology and the latest firefighting technology
: Defense industrial technique's operation rate of high-reliability and the exact operating temperature and rapid reaction time of the glass bulb

Patents and KFI certification



Awards



Tookout Hanwha product liability insurance





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