

ENGINEERING
TOMORROW

Danfoss

Case story | SEM-SAFE® high-pressure water mist system

Shanghai Metro in China

The fastest-growing rapid transit system in the world

Danfoss Fire Safety A/S



Situated in China's largest city by population, Shanghai Metro was opened in 1955 and has since become one of the fastest-growing rapid transit systems in the world.

Biggest metro in China

The metro system includes 11 metro lines, 278 stations and more than 434 km of tracks. Shanghai Metro is the biggest metro in China and the third biggest in the world. With an annual passenger volume of 1,884 billion, the Shanghai Metro System is extremely busy during peak hours and remains busy during the rest of the day as it is located near important tourist destinations.

The system continues to grow, with new lines and extensions currently under construction. In such crowded places, ensuring people's safety was a challenge as evacuation of such a large number of passengers in case of a fire is very difficult. It was a prerequisite for the metro to be equipped with a reliable fire protection system that will make evacuation of the people possible and facilitate access to the fire fighting crew.



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SEM-SAFE®

SEM-SAFE® high-pressure water mist system

In 2008, an agreement concerning the installation of SEM-SAFE® high-pressure water mist system from Danfoss was signed. The project covers metro lines, public space, electrical equipment rooms and technical rooms.

In 2009 all fire tests necessary were passed successfully, proving the reliability of the SEM-SAFE® system. The SEM-SAFE® high-pressure water mist acts efficiently in controlling the fire, with minimum water consumption and close to no water damage. In order to ensure the safe evacuation of the people from the train, in case of a fire, micro nozzles were installed at every door opening in the station.

Upon activation, dense water is rapidly discharged, forming a “water curtain”, which will keep the smoke inside the train. It offers control over the heat, smoke and toxic gas, thus ensuring safe evacuation of people and easy access for the fire fighting crew. The system will prevent fire from spreading from the train to the platform, while lowering the temperature and scrubbing the smoke.



SEM-SAFE® pump unit installed in the project site.



Access area to the metro protected with SEM-SAFE®.



Key operation equipment protected with SEM-SAFE®.

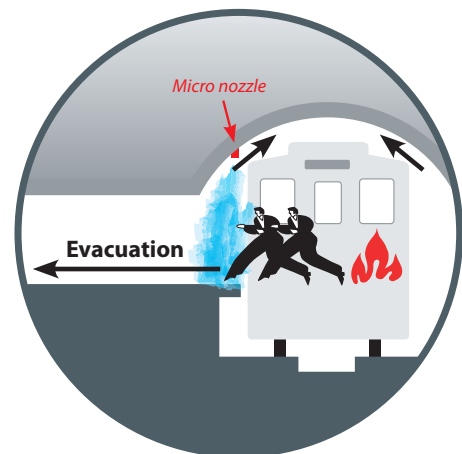
The benefits of SEM-SAFE®

The benefits of the SEM-SAFE® high-pressure water mist from Danfoss are immense:

- It was recorded to be harmless to electrical equipment, with excellent results during the tests
- It is totally safe for human beings
- Damage to surrounding equipment is minimal
- Release and disposal of water is a simple process
- The extinguishing time is reduced due to rapid and dense water discharge
- The cooling process is uniform and the smoke and toxic gas is kept under control

The benefits provided by the SEM-SAFE® system as well as the fact that it has been proven to be a money saving investment formed the reasons why SEM-SAFE® high-pressure water mist system was chosen as the best solution for fire protection of the Shanghai Metro.

Until the end of 2011, a total of approximately 6,000 nozzle heads and 40,000 micro nozzles had been installed in the metro stations in Shanghai in addition to more than 100 pump units. The protection of the metro line is an ongoing process because of the expansions of current line and construction of new ones.



The SEM-SAFE® micro nozzle creates a water curtain, which will keep the level of toxic gas under control, while simultaneous cooling.