

# High-pressure water mist fire protection systems for the protection of shopping centers in historical city centres

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## Abstract

*[Background]* Sprinkler systems are usually used for the protection of ordinary hazard 3 occupancies according to EN12845 like selling rooms, shopping centers, consumer markets and shops.

However, a demand for water mist fire protection systems has arisen when new shopping centers must be created within a palace to be restored in the historical centre of an art city, where it is very challenging to find a place for the water reservoir.

*[Objective]* The major shareholder of a retail corporation has bought a palace in the centre of Rome, which will host the new flagship store of the brand.



The aim of this case story is to show how the initial conventional sprinkler design was successfully converted in a high-pressure water mist design to solve, in the least invasive manner, all the installation issues arising from the complete revamping of 17.500 square meters distributed over the 7 floors of the building.

*[Method]* A comparative analysis between the conventional sprinkler system and the high-pressure water mist system was carried out in close cooperation with the fire consultant responsible for the fire strategy and the architect.

Technical aspects have been considered in the comparative analysis (e.g. water consumption, water damage, quantity of nozzles and fittings, sizes of pipes, etc.), as well as availability and reliability for a proper high-pressure water mist nozzle designed in accordance with the recommendations given in the CEN TS 14972 and with the aesthetic options requested by the architect (e.g. painted nozzles).

*[Results]* The benefits of the high-pressure water mist solution in terms of suppression performance, feasibility, easier integration in the building, easier installation, were appreciated by the end user as well as the idea to change the firefighting technology in the way to solve the problem of the water reservoir.

With a spacing, which allows to use less nozzles, the high-pressure water mist solution shows to be a cost-effective solution, leaving more space for other money generating activities and providing a lower total cost of ownership.

*[Main conclusions and recommendations]* It is concluded that high-pressure water mist fire protection systems should be considered for the protection of shopping centers in historical city centres as a suitable and competitive option.

However, a comparative analysis with a conventional sprinkler system must be conducted on the specific project to identify and quantify the savings and benefits.

**KEYWORD:** high-pressure water mist systems, conventional sprinkler systems, shopping centers, historical centre.