

BUILDINGBUILDINGTUNNELINDUSTRYRAIL



TUNNEL FIREFIGHTING WITH HIGH PRESSURE WATER MIST

FIREFIGHTING **IS RESPONSIBILITY**

We are a leading international supplier of high pressure water mist firefighting systems, based in Linz, Austria. As part of an owner managed company group, we benefit from extensive experience in the fields of fluid engineering systems.

Our personal approach to each customer's specific application enables us to provide expert advice and highly cost effective solutions.

We also maintain close contact with our partners in research and the fire service, as well as with fire safety institutions, and are always ready to meet new technological challenges.



EFFECTIVE & INCONSPICUOUS

Tunnels are important lifelines in each economic area; millions of highly efficient and reliable fire protection system is required. The people worldwide use tunnels for road traffic as well as for rail trafinstallation of a high pressure water mist system not only ensures fic every day. Due to the immense construction costs and the coma prompt response, less damage and reduced downtime for a tunmercial and economic relevance of such tunnels, fire protection is nel, but also the usability of escape routes and access for the fire important to ensure the safety of people as well as buildings, and a brigade.



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TUNNEL

Section valve units

PRODUCT OVERVIEW & SERVICES

WATER RESERVOIR •••••

- Round plastic tanks or
- Concrete tanks with coated walls and floors, with cover
- Permanent fill level monitoring, redundant
- Automatic replenishment



•••••• NOZZLE HEADS

- Patented nozzle design inline construction
- Different sizes to match the pipe diameter
- Droplet size < 500 μm</p>
- Suitable for very small installation space
 - Specially designed nozzle arrangement for tunnel applications
 - High quality design, made of stainless steel

••••• PUMP STATIONS

- Electric motor drive, optionally with soft start or variable frequency drive
- Diesel-powered pumps for energy self-sufficient operation
- Low maintenance high pressure pumps
- Test unit for performance checks in maintenance mode
- Position monitoring of all shut-off valves
- Factory performance tests before delivery

WALL HYDRANT •••••

- Maximum pressure: 140 bar
- Hose reel with up to 60 m high pressure hose
- Multifunctional water mist gun 20 l/min
- Optional: piercing tool for water mist gun
- Activation via pressure drop or electric signal (e.g. limit switch)

- ••••• WETTING AGENT
 - Wetting agent admixing (optional)



•••••• FIRE TESTS & SIMULATIONS

- CFD-supported calculation models
- Pool fires of up to 100 m² and solid fires
- Application-specific fire scenarios

SECTION VALVES

- Remote controlled valves for activation of water mist sections
- Maintenance controls and instruments with status surveillance
- Fully automatic maintenance cycling operation (optional)
- Fire retardant housing when installed in tunnel traffic area
- Integrated heater

DELIVERY, INSTALLATION & COMMISSIONING

- Prefabrication of assemblies and pipe units at the factory
- Turnkey installation of all system components
- Site management at the construction site
- Start-up and commissioning by experienced service engineers

PIPING •••••

- Welded stainless steel pipes or
- Highly corrosion-resistant plastic coated steel pipes
- Thermal insulation for wet piping
- Monitored trace heating for highest availability



SERVICE & MAINTENANCE •••••

- Extensive spare parts store
- Quick and straightforward support
- 24/7 on-call service



























Solid fuel fire 200 MW heat release rate

tems, we carry out fundamental research as a basis for the conti- pirical values derived from full scale fire tests enables us to acquire nuous improvement of our technology. Our R&D process is based scientific expertise for the improvement of simulation models, as on well known traditional fire engineering accompanied by com- well as to design fire tests with optimum benefit for the developplex CFD simulations and validated by full scale fire testing. The ment of water mist systems and hence for the benefit of our clients.

As a leading manufacturer of modern high pressure water mist sys- interaction between results gained from scientific models and em-



Performance on 200 MW liquid fire







SIMULATIONS



ØRESUND TUNNEL

TUNNEL BETWEEN DENMARK & SWEDEN (DK-SE)

The 12 km long tunnel and bridge construction through the Øre- A 4 km long section of this link is routed in tunnels under the sea. sund Strait connects Denmark and Sweden and is used daily by To ensure its constant availability, this technologically vital energy 17,000 motor vehicles and 200 trains. In addition, power and data and data tunnel is protected with an AQUASYS high pressure water lines are carried in a separate, dedicated tunnel, making the Øre- mist system. sund link an essential lifeline of this economic region in the Baltic.

Water reservoi

008**009**

MONA LISA TUNNEL

ROAD TUNNEL LINZ (AT)

Linz's industrial zone. It runs directly under the main east-west rail- cular, guarantees the unhindered use of the railway lines running way line and a tramway line. An AQUASYS water mist firefighting above even in the event of fire in the tunnel. system ensures a high level of safety and availability of the road

This 850 m long inner-city tunnel is an important transport link to tunnel for the 22,000 vehicles that use it every day and, in parti-



Safe escape routes





Pump rooms with diesel-po HP pump units FELBERTAUERN-TUNNEL

LINK TUNNEL SALZBURG - EAST TYROL (AT)

The Felbertauern tunnel is one of the most important north-sou- temperatures well below zero, the system must have a high availath road links in the Alps. The elevation at 1650 m above sea level bility, since any closure (however infrequent) of the toll connection and length of 5.3 km places special demands on the AQUASYS between the provinces of Salzburg and East Tyrol requires extensive firefighting system used. As well as having to function reliably at traffic diversions.

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ROERTUNNEL & TUNNEL SWALMEN

PAIR OF TUNNELS (NL)

Winter road conditions at the north portal of the Felbertauern tunnel

important transport artery for both private and commercial road portion of heavy and hazardous goods traffic, the two tunnels were release rate of up to 200 MW equipped with state of the art safety equipment. The heart of the

Both tunnels are located on the A73 motorway and are part of the safety system is the AQUASYS high pressure water mist system for fighting solid substance fires, as well as liquid fires resulting from traffic between Germany and the Netherlands. Due to the high pro- accidents involving hazardous goods vehicles with an expected heat



Tunnel portal of the 2000 m long, twin-tube Roer tunnel





CITY TUNNEL

Highest operational readiness

TUNNEL IN BREGENZ (AT)

The City Tunnel in Bregenz directly connects the A14 motorway Due to the design of the AQUASYS high pressure water mist system, with the city area and is the first tunnel operated by Austrian mo- its installation required only one lane to be closed. This also means torway and express road operator ASFINAG to be equipped with a that the tunnel will not have to be closed for future maintenance high pressure water mist firefighting system. The AQUASYS system work or during exercises by the emergency services. ensures the three safety objectives set by ASFINAG are met:

- Building protection for the tunnel
- Maximum protection for people in an emergency
- Support for emergency services in the event of a fire

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City Tunnel Bregenz south portal

TUNNEL LIEFERING

FIRE PROTECTION IN THE LIEFERING TUNNEL (AT)

With 80,000 vehicles passing through it each day, the Liefering twin-resulting from this road layout, tunnel operator ASFINAG decided tube tunnel in the city of Salzburg is one of the most heavily used to install an AQUASYS high pressure water mist firefighting system. tunnels in Austria, as well as being an important transport hub. This system protects both the tunnel tubes as well as the entran-In addition to the three carriageways, the tunnel has a motorway ces and exits. Triggered as soon as a fire is detected, it effectively junction in each direction. To reduce the significant risk potential protects both the tunnel infrastructure and the city streets above.



Redundant HP pump units

HP water mist system in the Liefering tunnel









ARLBERGTUNNEL

The supply air duct above the tunnel's suspended ceiling

serves as an escape route to the safe caverns in an em

ROAD TUNNEL AT THE ARLBERG PASS (AT)

Measuring 14 km in length, the Arlberg tunnel is Austria's longest and water tanks at the tunnel portals. An Aquasys HPWM system road tunnel and the longest tunnel in the world to be equipped with was chosen due to the hydraulic requirements resulting from the a water mist firefighting system. The only reliable winter connec- tunnel's length and to provide effective, reliable protection of the tion between the provinces of Tyrol and Vorarlberg is protected by escape and rescue routes, which are located in the supply air duct 24,000 water mist nozzles, which are fed from the two pump rooms directly above the roadway.

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HEATHROW MAIN TUNNEL

LONDON HEATHROW AIRPORT MAIN TUNNEL (UK)

London Heathrow (LHR) is one of Europe's largest airports. The airport operations. As soon as a fire is detected, the AQUASYS water airport's passenger terminals and central area are accessed via tun- mist firefighting system ensures that it is extinguished and the tunnels located under the runways. The uninterrupted availability of nel infrastructure cooled to prevent the fire from causing structural the access tunnel and the runways above them is naturally vital for damage, thereby ensuring continued operation of the runways.



Europe's largest airport with 80 mil passengers per year

at the tunnel portals









Firefighting is responsibility! We are committed to the safety of people, property and productivity. This is a responsibility that we assume every day. To this end, we rely on the innovative ideas and know-how of our experienced and motivated team.

Close cooperation between R&D, sales, project management and production all on one site guarantees the flexibility and customer focus necessary in all sectors.

We invite you to set us a challenge! We would be happy to identify how high-pressure water mist technology can best help you with your requirements and goals. My team and I are aware of our responsibility and are available to answer any questions you may have.

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