



Road Tunnel Fire Protection with Alvenius Piping Systems



Alvenius piping systems – where top safety is paramount

Alvenius supplies reliable and safe steel piping for fire protection in road tunnels. Piping that is designed to protect both life and property in these very demanding environments.

Because they are developed to meet the toughest requirements of the marine environment, Alvenius piping systems are ideal for use in road tunnels, where before the only alternative was stainless steel.

Alvenius FlowMax® piping is supplied in diameters of 89 – 508 mm and is available for both low and high pressure systems and the standard range can withstand up to 80 bars. For special applications, systems that withstand more than 100 bars can be provided.

To keep exact measurements Alvenius pipes are fitted with welded-on precision-made rings.

Unbeatable durability

Alvenius FlowMax® pipes are treated outside and inside with CorroFlo® - a thermoplastic coating that is the supreme solution for these types of environment, where you require 100% functionality decade after decade.

Due to the CorroFlo® coating the corrosion protection is second to none, because it withstands acidic and alkaline substances and chemicals.

Our CorroFlo® coated products are certified according to ISO 12944-6 for corrosion resistance and comply with the requirements for C5 classification.

Independent tests indicate that the life of CorroFlo®-coated FlowMax® pipes is at least 75 years. (Testing Institute - University of Stuttgart. MPA Stuttgart, Otto-Graf-Institut).

Always ready for operation. Maximum reliability.

Even if an extinguishing system is unused for long periods of time and contains corrosive water, no corrosion occurs. The system is therefore 100% ready for operation when required.

Alvenius FlowMax® pipes have a smooth interior, preventing accumulations of water. The outlet couplings between all pipes are also self-draining.

Another advantage in these environments is that pipes that are coated with CorroFlo® are non-conductive.

FlowMax® – low flow resistance

High steel quality and spiral welding makes it possible to produce thin-walled pipes. Thin walls offer many benefits as they give a maximum inner diameter relative to the outer diameter:

- Lower flow resistance due to the larger inner diameter
- The possibility to use smaller pumps – or existing pumps at less power
- The lower flow resistance may also make it possible to reduce the number of pumps in the system



Reliable couplings Recommended for Fire Protection

One of many advantages with Alvenius solutions is that installation is very easy due to the quick-coupling systems.

No welding. No special tools. No time-consuming training plus entirely without hot work.

Quick couplings (Victaulic type)

For road tunnel systems Alvenius offers quick coupling systems in ISO standards for pressure from 15 bar up to over 100 bar.

Different types of rigid or flexible quick coupling are available, depending on the type of installation, the dimensions and the pressure class.

- Standard gasket of EPDM rubber
- Working temperature -35° to + 110°
- Deflection up to 2.5°
- Insensitive to vibrations
- Absorbs axial movement in the pipe system thanks to axial play in the coupling

Ten times faster assembly

No welding. No special tools. No time-consuming training.

All you need are pipes, gaskets, couplings and a box spanner. Compared with welding, assembly goes at least ten times faster and entirely without special training or hot work.



Our range of couplings

– when needed

Choose the right couplings for the system parameters
– pressure, temperature, bend angles, and types of media.
Alvenius has the solutions that match your needs!

K10/K70. Up to 40 bar.

Alvenius K10 Shouldered is our own branded, metric standard self-quick-coupling system for pressures up to 40 bar depending on dimensions.

The K10 system is very flexible, easy to assemble and each coupling can manage deflection up to 4°.

K70 is a hinged coupling for even faster and more flexible assembly – only a single bolt needs to be tightened.



Plain end couplings (Straub)

Plain end couplings eliminate the need for any pipe end preparation and are available in different types, depending on the type of installation, the dimensions and the pressure class.

- Self-anchoring
- Resists axial force
- Detachable
- Reusable

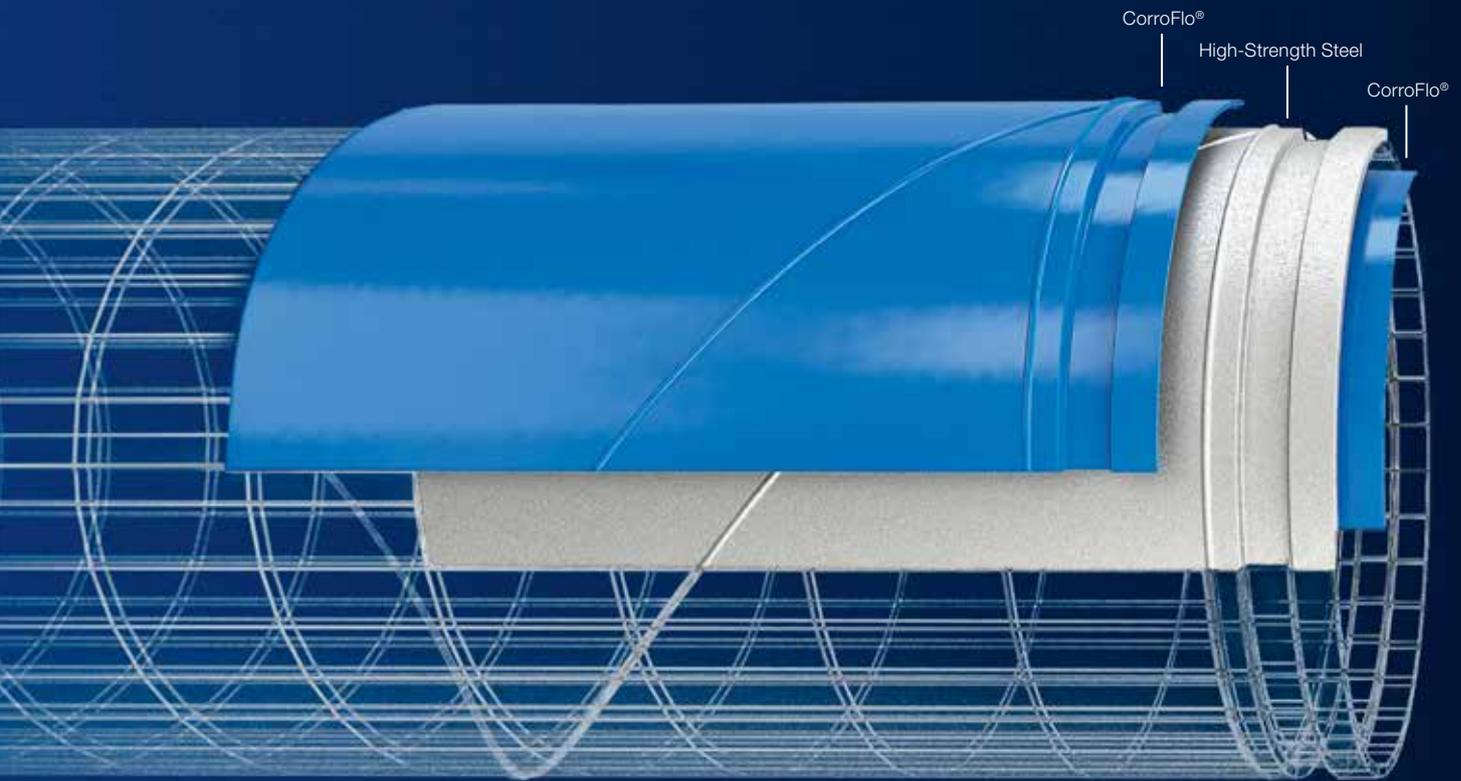


Flanges

Alvenius pipes are available with flanges welded onto the pipe ends. The flanges are available in ANSI and DIN standards with different pressure classes.

- Strong due to better impact resistance.
- High safety factor against pressure fluctuations, water hammer and outside impacts.





A coated pipe is a reliable pipe Recommended for Fire Protection

Effective surface coating enhances the performance dramatically. Especially in environments where corrosion can be an issue.

That's why the FlowMax® piping system from Alvenius is completely covered and coated with highly effective CorroFlo®.

CorroFlo® overall facts

- Very good adhesion – no risk for cracking or flaking
- High chemical resistance against acids and alkalis
- Proven outdoor properties – UV resistant, flexible down to -40°
- Working temperature in air – continuously up to +65°
- Very good corrosion resistance
- Electrical insulating
- Eco-friendly
- C5-Meaning extreme protection against corrosion in environments with high salinity
- Very low pipe losses – Absolute Roughness Coefficient – $k \approx 0.05$
- 500 µm thickness
- Bisphenol-A free
- Elongation at break 800 %

CorroFlo® - inside

- Improved economy – extremely low flow resistance means lower energy consumption and lower cost-in-use
- Excellent chemical resistance
- Excellent corrosion resistance

CorroFlo® - outside

- Completely sealed with CorroFlo®, meaning no outer influences can affect the pipes
- Long service life – third party tests show long service life, even in aggressive surroundings
- Perfect in aggressive environments as the coating is very resistant to chemicals such as acids and alkalis
- Excellent corrosion resistance

Additional coating solutions

– when needed

No matter what media you pump in your piping system, a surface coating enhances the performance dramatically.

Different situations and applications requires its tailor-made coating solution.

Alvenius provides what you need!

RocShield®

For additional durability and resistance to abrasion and impacts, the exterior of FlowMax® pipes can be coated with RocShield® = 500 µm LDPE on top of the CorroFlo® coating.

RocShield® produces a stronger, harder surface with greater resistance to weather and chemicals, with many advantages:

- Simpler, safer pipe handling with good grip as the structure (surface) is coarser
- Very high resistance to wear and mechanical impact
- Very high impact resistance

HDG

HDG (hot-dip galvanisation) is ideal for pipes that are fitted and subsequently removed thanks to the very robust coating.

The deep protection makes HDG pipes more impact-resistant and more resistant to wind and weather than untreated pipes. The zinc layer also has a unique 'self-healing' property if the surface layer becomes damaged.





World-leading steel. Made in Sweden.

It's not a coincidence that Alvenius pipes are of the highest quality on the market. They are made of steel from the Swedish company SSAB, optimised for our specific requirements.

High strength, smooth surface, good flatness and extremely narrow thickness tolerances are typical properties of the steel grades.

For Alvenius, this means steel that is light, strong and durable.

Alvenius is certified according to the quality standard ISO 9001, the environmental standard ISO 14001 and the welding quality standard ISO 3834-2.

The pipes are dimensioned according to the SS-EN 13480 series. Tolerances are according to SS-EN 10217-1.

This means FlowMax[®] pipes are of the highest possible quality.

Low CO₂ footprint

SSAB is also committed to continuous environmental work aimed at minimising the adverse environmental impact of its operations. SSAB is one of the best in the world in iron ore-based steel-making when it comes to CO₂ efficiency – 7% better than the European average.

And this is totally in line with Alvenius' dedication to green production.

Swedish steel - nothing comes close

Steel qualities				
SSAB	Yield strength, ReH [MPa]	Tensile strength, Rm [MPa]	Elongation on failure [%]	EN 10149-2 equivalent
Domex 240 YP	240	360 – 460	28	S235
Docol 260 LA	260	350 – 430	16	N/A
Domex 420 MC	420	490 – 620	20	S420 MC

Available pressure classes							
Pipe size			Working pressure, bar				
ISO DN	Inch	DY (mm)	16	25	40	63	80
80	3	88.9	x	x	x	x	x
100	4	114.3	x	x	x	x	x
125	5	139.7	x	x	x	x	x
150	6	168.3	x	x	x	x	x
200	8	219.1	x	x	x	x	x
250	10	273.0	x	x	x	x	x
300	12	323.9	x	x	x	x	x
400	16	406.4	x	x	x		
500	20	508.0	x	x			



Complete steel pipe system

Alvenius FlowMax® pipe systems contain all that is needed for all types of installation – pipes, couplings, valves, bends, T-pieces, transition pieces, threaded sockets, etc.

We can also supply feed pipes in different dimensions. This is a good example of special solutions that we can develop uniquely for each project.

Dimensions

89 – 508 mm

Lengths

6,000 mm

Pressure class

SS-EN 13480

Steel quality

SSAB Domex 240 YPD-ALV, 420 MCD-ALV

Precision-lathed rings for welding on.

Surface coating

CorroFlo®

Accessories/ fittings

Complete system with pipes. Fittings, couplings, etc.

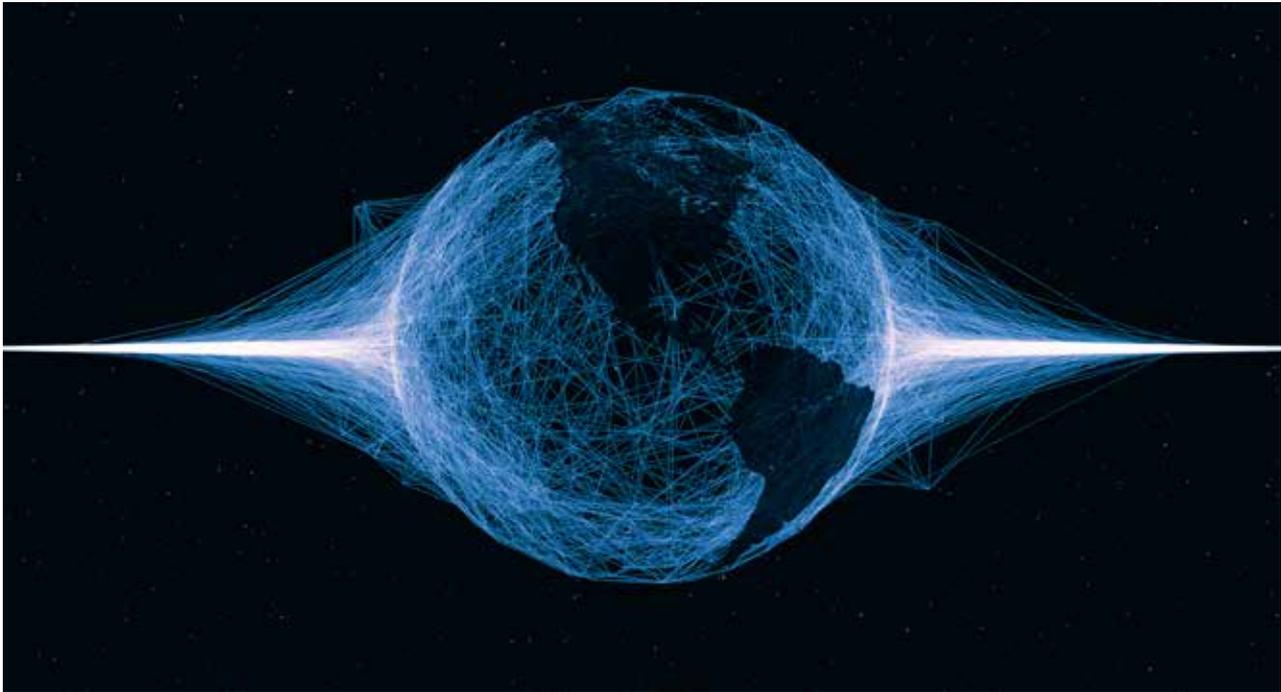
Weight savings

Up to 40% compared with standard pipes.

Installation times

Up to 10 times faster than using traditional methods.





Alvenius was founded in 1951 and ever since we have focused on supplying the global market with high-quality quick coupling steel pipe systems.

Today, Alvenius focuses its expertise on the segments tunnels, mines, industry, fire protection and extinguishing, water and wastewater systems and artificial snow making.

We have a presence in Asia, Africa, the Middle East, North and South America, Europe and, of course, our domestic market Sweden.

Our international approach offers many advantages.

Above all else, it means that we understand the conditions and demands of your particular market – wherever that may be.



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