



# Steel Pipe Systems for Snowmaking

Cost efficient, quick installation and  
maximum service life





# More snow for less costs

**Alvenius FlowMax® piping systems have all the properties you need for the most economic snowmaking.**

**Light weight, extremely low flow resistance, ease of installation and long service life are built into every metre.**

## **Alvenius FlowMax® saves money**

FlowMax® pipes have several advantages, for example a large internal diameter and a CorroFlo® (thermoplastic) coating that gives low flow resistance and reduced pressure losses.

You can therefore use smaller or fewer pumps in the system – or pipes with a smaller diameter. And make real cost savings in both investment and operation.

## **It's the inner diameter that counts!**

Thanks to the high quality of the steel and Alvenius' unique manufacturing process using spiral welding, the pipes can be made thin walled and light while preserving profile stability.

The result is pipes of larger inner diameter without increasing the outer dimension. And that saves costs in transport, handling and installation.

## **Installation is a walk in the park**

Regardless if you are building a snowmaking system for alpine slopes or crosscountry skiing FlowMax® has a complete system of pipes and fittings, sized to maximize the performance of your pumps and snow guns.

The obvious low weight makes FlowMax® easy to handle during installation, and all connections are made with quick-couplings that even allow for angular deflection.

No welding is needed, saving time and money.

## **Long service life**

Alvenius FlowMax® pipes are made of high-quality Swedish steel, with a minimum tensile strength of 420 MPa and pressure ratio up to 80 bar. All pipes are pressure tested with water in the production process, and comply with PED 2014/68/EU.

High-quality steel and anti-corrosion protection, thanks to hot-dip galvanizing or CorroFlo® thermoplastic coating, give FlowMax® pipes an unbeatable service life.

For extra resistance to wear and tear the pipes outsides can be covered with RocShield® on top of the CorroFlo® coating.





## Quick couplings for quickest possible installation

One of the many advantages of Alvenius FlowMax® pipe systems is how quickly and easily they can be installed with the restrained quick couplings.

No welding. No special tools. No time-consuming training and no hot works at all.

### Couplings

Available as rigid or flexible couplings with a wide range of rubber gaskets, depending on the application and system build-up.

- Dimensions DN80-500
- Pressure rating up to 80 bar (DN300/12") and up to 40 bar (DN500/20")
- Rigid or flexible couplings, both restrained
- A wide range of rubber gaskets, depending on the application and the pipe system conditions
- Self-sealing gasket
- Also suitable for vacuum under certain circumstances
- Insensitive to vibrations
- Absorbs axial movement, for example heat generation, thanks to axial play in the coupling

### Ten times faster assembly

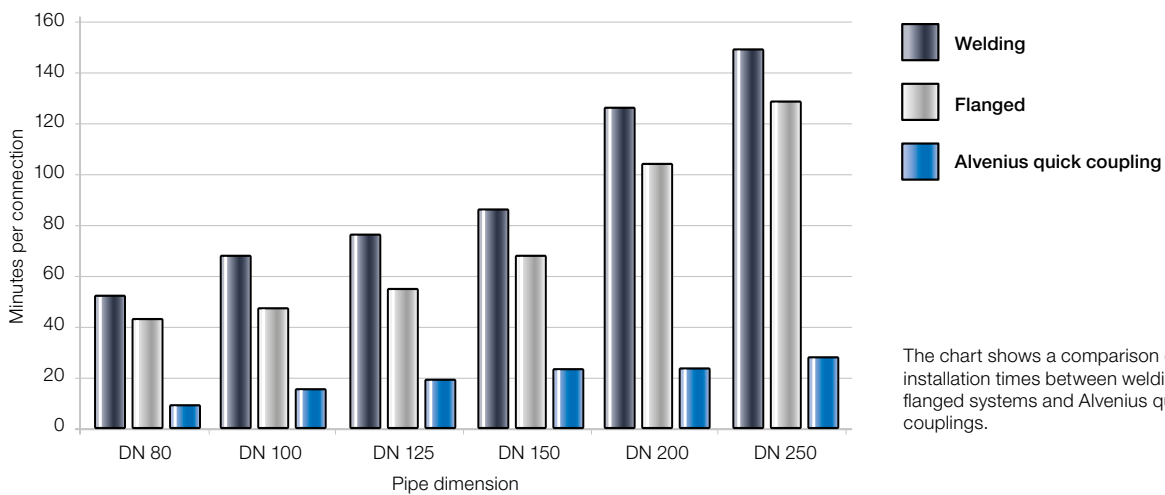
Forget about how you normally assemble pipes. Forget about time consuming methods and time spent on training.

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.

Short installation time means considerable cost savings and a system that can be up and running faster.

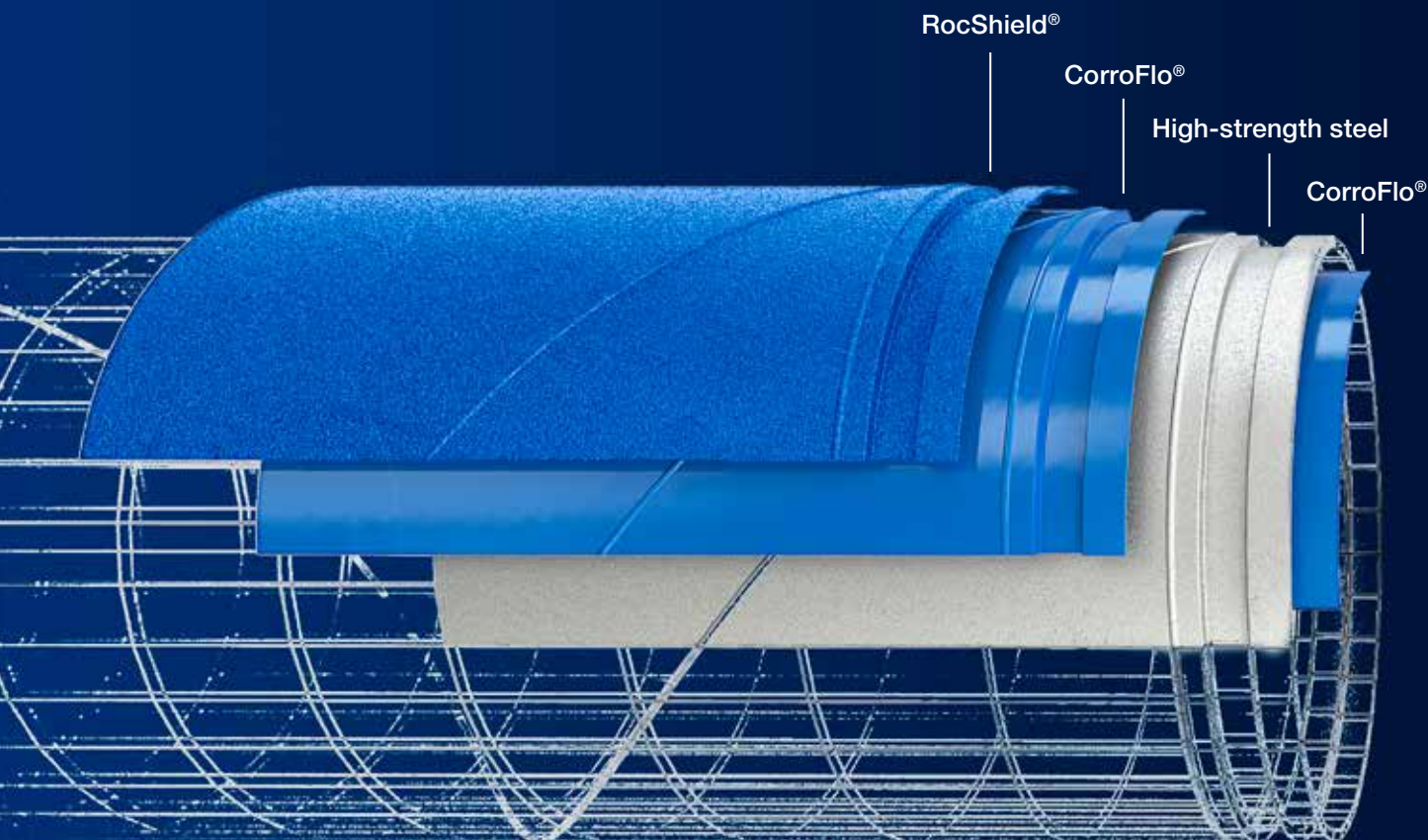


Quick coupling compared



The chart shows a comparison of installation times between welding, flanged systems and Alvenius quick couplings.





# Surface coatings for all conditions and needs

Demanding conditions, aggressive or abrasive media, strict hygiene requirements, the need for a cost-effective pipe system. No problem. Alvenius offers surface coatings to meet all needs and requirements and we guide you to the right solution.

**Typical applications for pipe systems from Alvenius include:**

- Mining industry and mineral processing
- Tunnelling applications
- Chemical industry
- Municipal water & wastewater
- Pulp and paper industry
- Food industry
- Offshore
- Construction and civil engineering
- District cooling
- Artificial snowmaking
- Fire protection
- Automotive industry



## HDG

HDG (Hot-Dip Galvanized) is an ideal surface coating for pipes that may need to be dismantled and reassembled as it provides a highly robust surface layer.

Such pipes are highly resistant to impact, wear and harsh weather conditions. What's more, the zinc layer "heals" if damaged.



## CorroFlo®

Alvenius FlowMax® pipes are coated both internally and externally with CorroFlo®. These pipes are ideal for environments and applications where, for example, acidic water and aggressive chemicals are a problem.

Tests show that CorroFlo® meets the requirements for the extremely demanding corrosion class SS-EN ISO 12944, which applies to marine environments (C5-M) and underground (Im3).

Independent tests show that pipes coated with CorroFlo® offer a service life of more than 50 years.



## RocShield®

For extra-durable wear and impact protection, the external surface of the pipes can be treated with RocShield® on top of the CorroFlo® coating.

RocShield® is a 500 µm LDPE layer that offers extreme resistance, making it suitable for pipes used in exposed environments.

The surface structure with its good gripping properties also offers easier and safer handling.



### Internal surface coating advantages

- Improved life cycle cost – extremely low flow resistance means lower energy consumption and lower overall costs
- Very good resistance to corrosion and chemicals
- Optimal hygiene properties – the smooth coating prevents the build-up of deposits inside the pipes
- Free from Bisphenol A

### External surface coating advantages

- Resistance to external impact on the pipes
- Superior service life – proven by independent tests in extreme environments
- Ideal in aggressive environments thanks to the high resistance to acidic and alkaline liquids
- Very good resistance to corrosion
- The surface coating has an elongation at failure of up to 800%
- Flexible and easy to repair if damaged







# Made in Sweden!

Alvenius FlowMax® pipes are spirally welded with unique pressure-vessel-class steel. This means that the pipes can be made thin-walled yet strong. And the spiral welding means that they stay straight.

FlowMax® pipes have a number of unique advantages as a result of the steel qualities. No other manufacturer offers a combination of material strength, a very smooth surface and extremely thin walls without any loss of strength.

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

The FlowMax® pipes are designed and manufactured according to the pressure equipment directive PED 2014/68/EU and SS-EN 13480 series. Tolerances according to SS-EN 10217-1. This means FlowMax® pipes are of the highest possible quality.



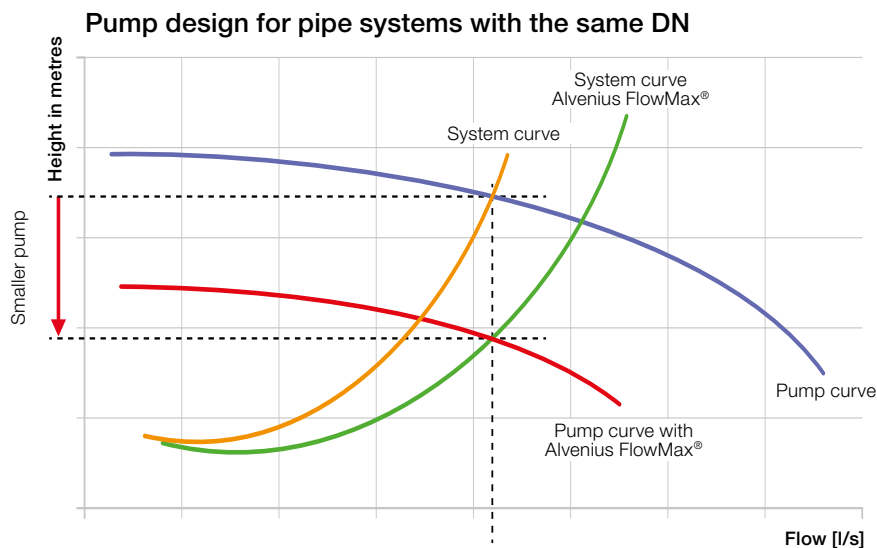
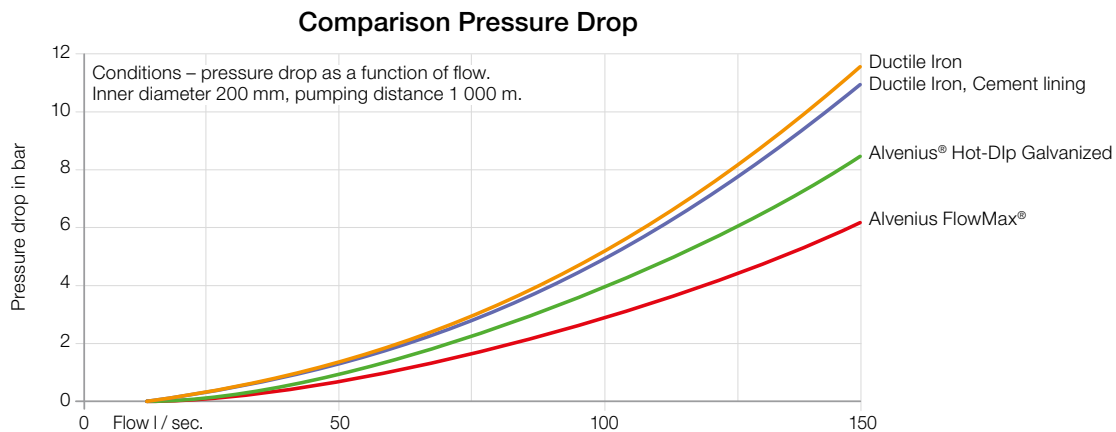
| Steel qualities |                           |                            |                         |                       |
|-----------------|---------------------------|----------------------------|-------------------------|-----------------------|
| SSAB            | Yield strength, ReH [MPa] | Tensile strength, Rm [MPa] | Elongation at break [%] | EN 10149-2 equivalent |
| Domex 240 YP    | 240                       | 360 – 460                  | 28                      | S235                  |
| 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  |
| 350                        | 14   | 355.0   | x                     | x  | x  |    |    |
| 400                        | 16   | 406.4   | x                     | x  | x  |    |    |
| 450                        | 18   | 457.0   | x                     | x  | x  |    |    |
| 500                        | 20   | 508.0   | x                     | x  | x  |    |    |

# Alvenius FlowMax®

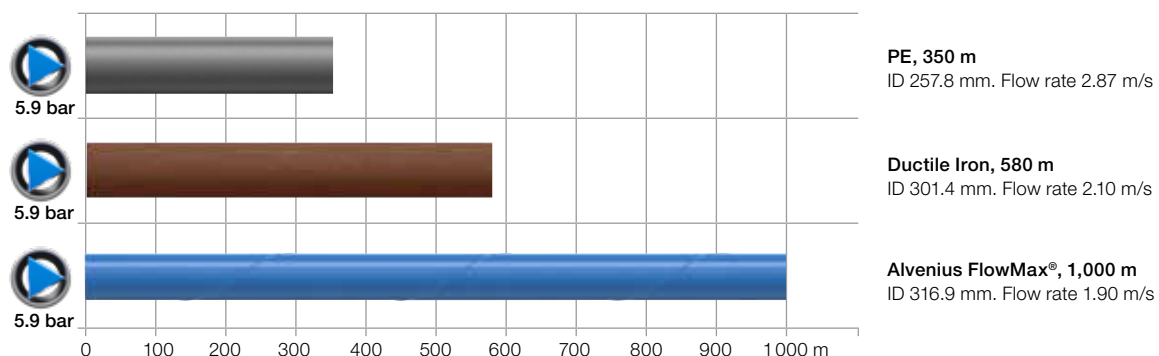
## - unbeatable performance

Alvenius FlowMax® pipes deliver performance that cannot be matched by any alternative, and their combination of advantages makes them unbeatably cost-efficient. Light, strong, corrosion-proof and extremely low flow resistance all means minimum life-cycle costs.



### Pump over a longer distance with the same pump pressure

Assumptions: Pump pressure 5.9 bar. Defined final pressure 5 bar. Flow required 150 l/s. DN 300.





# Lower pressure drop, improved operating economy

FlowMax® pipes give you a number of operating advantages:

- You choose pipes with smaller dimensions with the same pump capacity
- You can choose smaller or fewer pumps in the system
- In the future, you can increase the pump capacity with the same pipe dimensions
- You get both lower investment and lower operating costs

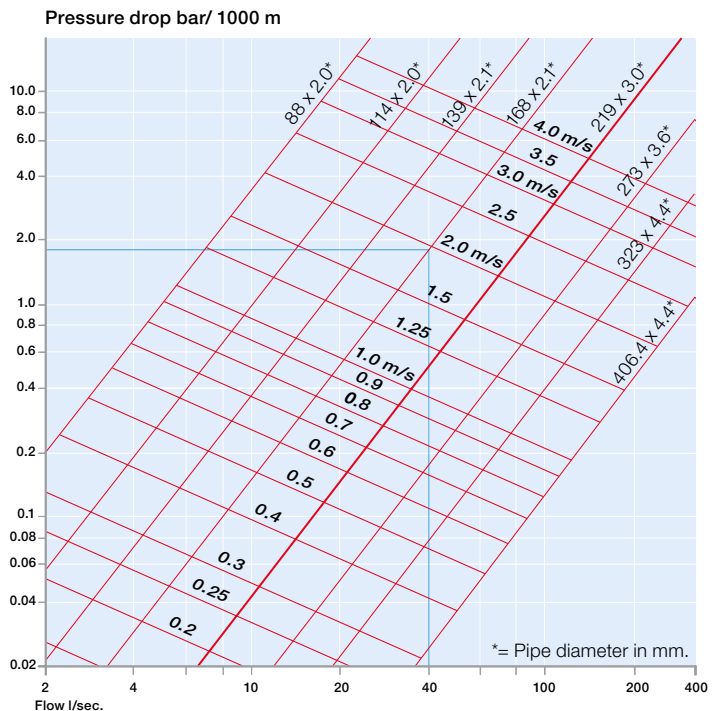
## Proven low pressure drop, in detail

Comparison of maximum flow rate at a water speed of 2.5 m/s

| Pipe type    | Dim.      | Flow l/s | Flow m³/h | Pressure drop bar/1000m |
|--------------|-----------|----------|-----------|-------------------------|
| Alvenius     | 89 x 2.2  | 14       | 50        | 6.4                     |
| Ductile Iron | DN80      | 12       | 43        | 7.0                     |
| Alvenius     | 114 x 2.7 | 23       | 83        | 4.7                     |
| Ductile Iron | DN100     | 20       | 72        | 5.5                     |
| Alvenius     | 139 x 3.3 | 35       | 126       | 3.7                     |
| Ductile Iron | DN125     | 30       | 108       | 5.0                     |
| Alvenius     | 168 x 2.8 | 52       | 187       | 2.9                     |
| Ductile Iron | DN150     | 44       | 158       | 4.0                     |
| Alvenius     | 219 x 3.6 | 88       | 317       | 2.1                     |
| Ductile Iron | DN200     | 79       | 158       | 2.9                     |
| Alvenius     | 273 x 3.6 | 139      | 500       | 1.6                     |
| Ductile Iron | DN250     | 124      | 446       | 2.2                     |
| Alvenius     | 323 x 5.7 | 192      | 691       | 1.3                     |
| Ductile Iron | DN300     | 178      | 641       | 1.8                     |

### Reference figures

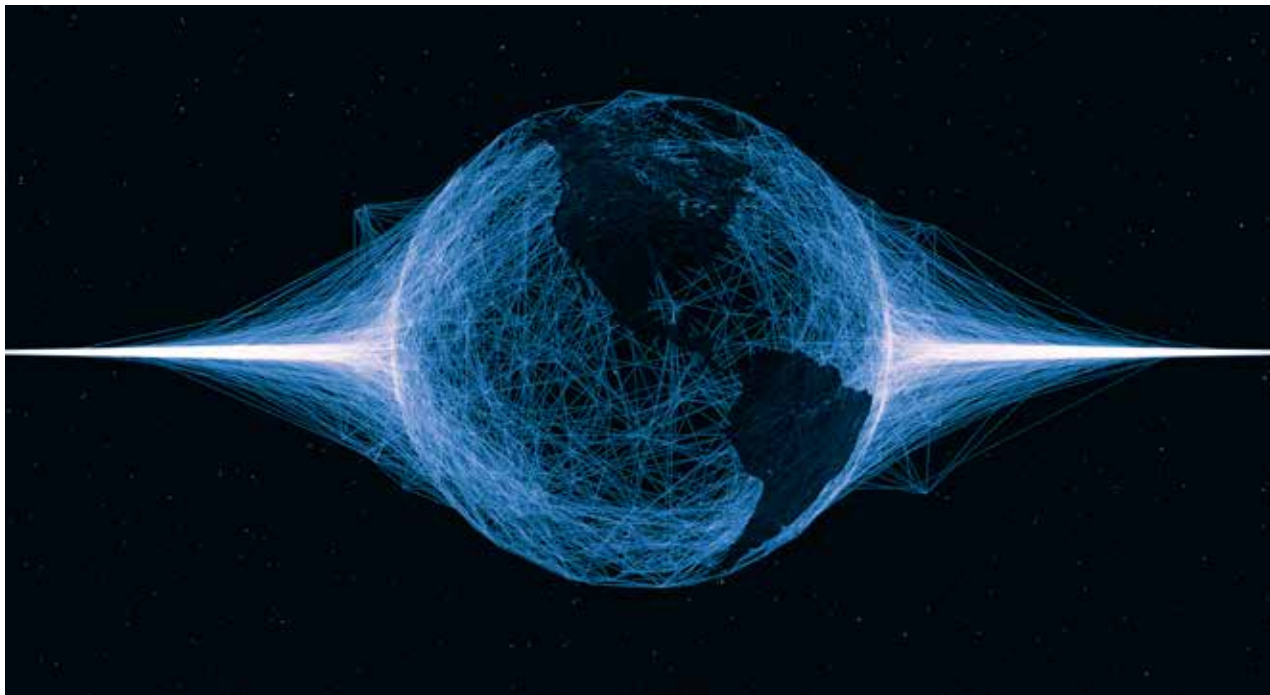
Pump 40 l/sec in a FlowMax® pipe, with 168.3 mm inner diameter. The pressure drop is as low as 2 bar/1000 m pipe length, achieving a water velocity of 1.9 m/sec.



## Overall comparison Alvenius® pipes and ductile iron pipes

Quite simply you need fewer tractors and less trailer capacity, which is great for your wallet and the environment.

| Pipe type    | Size Inch | Inner DN mm | Outside Ø mm | Inside difference mm | Weight kg/m | Weight kg/pipe | Pipes on Trailer Max 24000 kg | Total weight |
|--------------|-----------|-------------|--------------|----------------------|-------------|----------------|-------------------------------|--------------|
| Alvenius     | 3         | 84.5        | 88.9         | 5.1                  | 4.8         | 28             | 736 pipes                     | 21 344 kg    |
| Ductile Iron | 3         | 79.4        | 98.0         |                      | 15.5        | 93             | 258 pipes                     | 23 994 kg    |
| Alvenius     | 4         | 108.9       | 114.3        | 12.3                 | 7.8         | 45             | 521 pipes                     | 23 996 kg    |
| Ductile Iron | 4         | 96.6        | 118.0        |                      | 21.5        | 129            | 186 pipes                     | 23 994 kg    |
| Alvenius     | 5         | 133.1       | 139.7        | 11.1                 | 11.6        | 67             | 352 pipes                     | 23 584 kg    |
| Ductile Iron | 5         | 122.0       | 144.0        |                      | 27.5        | 165            | 145 pipes                     | 23 925 kg    |
| Alvenius     | 6         | 162.7       | 168.3        | 15.3                 | 12.1        | 70             | 280 pipes                     | 19 600 kg    |
| Ductile Iron | 6         | 147.4       | 170.0        |                      | 33.5        | 201            | 119 pipes                     | 23 919 kg    |
| Alvenius     | 8         | 211.9       | 219.1        | 12.7                 | 20.0        | 116            | 160 pipes                     | 18 560 kg    |
| Ductile Iron | 8         | 199.2       | 222.0        |                      | 47.5        | 285            | 84 pipes                      | 23 940 kg    |
| Alvenius     | 10        | 264.2       | 273.0        | 15.2                 | 24.1        | 140            | 96 pipes                      | 16 896 kg    |
| Ductile Iron | 10        | 249.0       | 274.0        |                      | 63.0        | 378            | 63 pipes                      | 23 814 kg    |
| Alvenius     | 12        | 311.6       | 323.0        | 11.8                 | 46.0        | 267            | 70 pipes                      | 18 690 kg    |
| Ductile Iron | 12        | 299.8       | 326.0        |                      | 80.5        | 483            | 49 pipes                      | 23 667 kg    |



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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