



# JANSEN shark

Smart technology inspired by bionic research  
for pressure pipes, geothermal & HVAC piping



**JANSEN**



# JANSEN shark:

## A scientific breakthrough for your benefit

A patented surface inside the pipe is especially beneficial to the hydraulic resistance of fluid-carrying pipes.

### Pump capacity reduction

Head loss can be reduced by up to 7% compared with conventional plain tubes. This has an immediate impact on the required pump capacity and power consumption of feed pumps or circulation pumps. Systems applying JANSEN shark technology can save between 10% and 15% of electricity depending on the pump's efficiency curve.

### Familiar thermal design

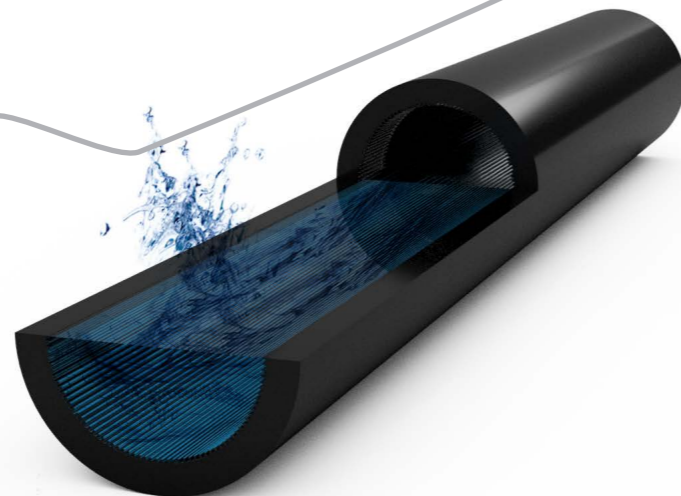
The enlarged heat exchanger surface in the interior of the pipe leads to an excellent heat flow, even with pipes of high pressure levels and thus naturally thick pipe walls. Therefore, the planning phase of heat exchange pipe systems (e.g. geothermal loops) works out safely and smoothly with conventional design values.

### Familiar handling

The dimensions of the pipes using the JANSEN shark technology correspond to the commonly available pipe types. Our high quality in dimensional accuracy and the highest quality raw material used allow easy installation and safe connection, e.g. with electrofusion fittings in the context of geothermal or pressure piping made of PE 100 RC or press fittings in the case of HVAC piping.

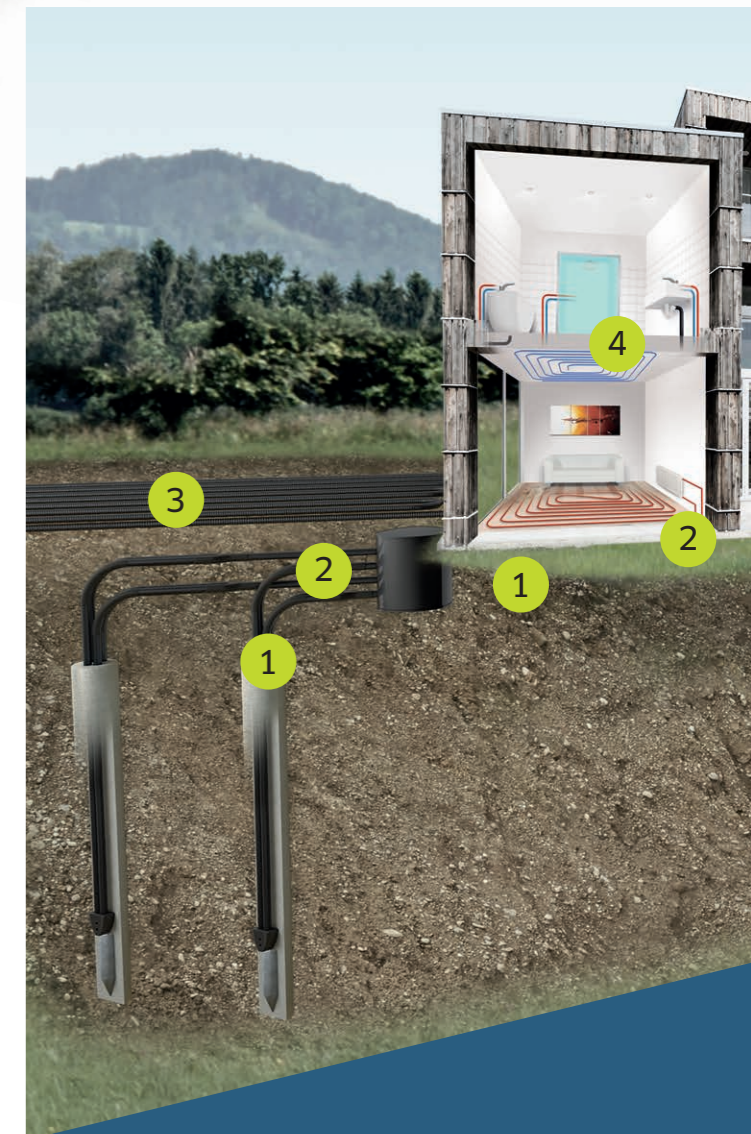
### Filling up more economical

The changed inner surface leads to a lower filling volume compared to conventional plain pipes. Therefore, a total of less heat transfer medium is required. Both time and glycol are expensive; therefore, filling JANSEN shark pipes is about 4% more economical.



## Applications

- 1 Borehole heat exchangers**  
 Geothermal probes of any depth benefit from a lower pressure drop, increasing the efficiency of the circulation pump and lowering the operating costs. However, the JANSEN shark effect can also be used in another way: smaller pipe dimensions can be used, as the JANSEN shark technology compensates for part of the head loss. The lower price and the simplified installation of smaller dimensions have a positive effect on the overall investment costs.
- 2 Supply and connection lines**  
 Any kind of pressure pipe can benefit from a reduced hydraulic resistance. For example, pipes used to connect geothermal loops can make up to one-third of the total system head loss. Such pipes can also be equipped with the JANSEN shark technology to significantly improve the overall system efficiency. The operating costs are minimized, the payback period is shortened.
- 3 Horizontal geothermal collectors**  
 Benefitting from a lower head loss, too, with JANSEN shark collector pipes longer brine circuits are possible. This leads to a simplified installation and a smaller and therefore more cost-effective manifold system.
- 4 HVAC piping**  
 Piping networks, such as rising mains or TABS (Thermally Activated Building Systems), can be operated with a higher flow velocity. To that effect, longer hydraulic circuits can be planned. Accordingly, e.g. underfloor heating systems for large spaces need fewer lines and manifold systems are smaller, less expensive, and require less space.





# Our Quality. Your Peace of Mind.

## Technical data

Highly qualified personnel and state-of-the-art production technologies guarantee first-class quality and durable products. Our products and manufacturing processes are certified, monitored, and documented according to the latest quality and safety

standards as well as environmental policies. For any questions about the application options, as well as assistance with design and planning, please contact our technical support staff.



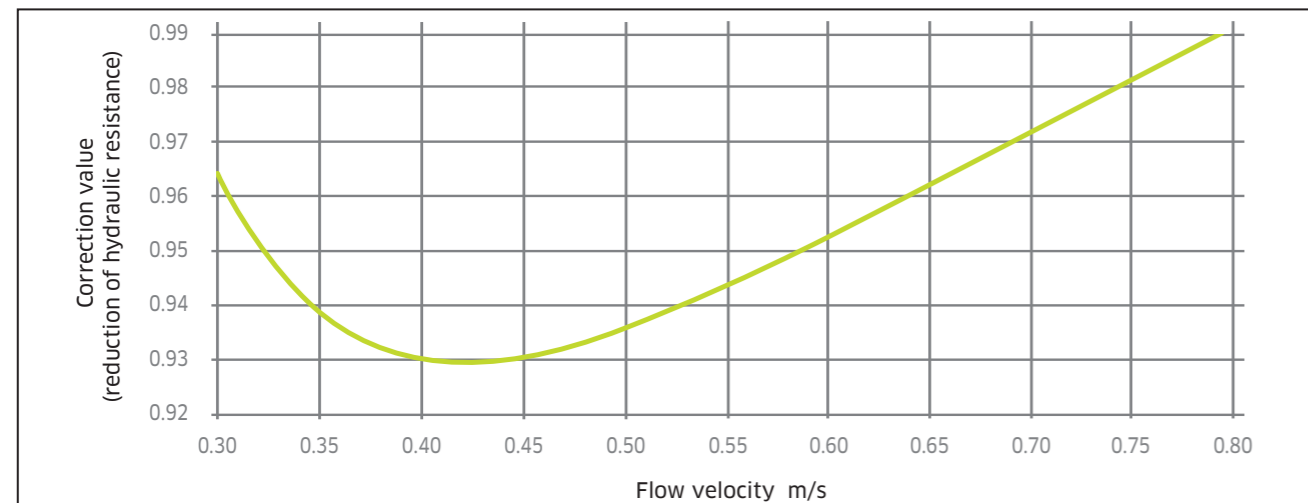
### Dimensions

Application	Raw materials	Dimensions
Geothermal heating & cooling Supply and connection piping	PE 100 RC (resistant to crack) PERT (raised temperature)	32 mm, 40 mm, 50 mm as PN16, PN20, PN35 (JANSEN hipress)
HVAC piping	PERT (raised temperature)	16 mm, 20 mm as single-layer, multi-layer (EVOH), or aluminium composite pipe

Further materials and dimensions on request. Our engineering team also optimally implements your ideas.

### Correction value for JANSEN shark

This graph helps to determine the head loss reduction using the JANSEN shark technology. Simply multiply the hydraulic resistance of a correspondent standard smooth pipe with the correction value at the relevant velocity.



# Intelligent pipe technology: symbiosis of nature and engineering

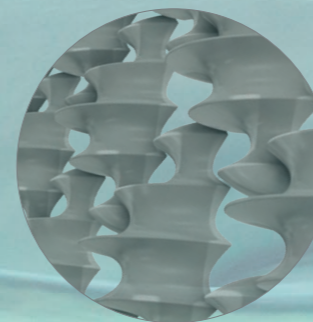
With more than 60 years of experience in the development and manufacture of innovative plastic pipe systems, Jansen, as a Swiss industrial business, stands for both the highest precision and pioneering high-tech solutions. Thanks to intensive research in the area of fluid mechanics, Jansen has increased the efficiency of ground source heat systems and HVAC piping to a new level.

Giving credit to a brilliant phenomenon in creation, the Jansen R&D engineers have been inspired by the king of the ocean: the shark. Sharks are amongst the fastest animals in the oceans. Particularly their speed is the reason why they are so feared as predators.

The shark's scales are covered with sharp riblets that steer the flow of the water alongside the body. The fine longitudinal grooves on the shark's skin prevent lateral movements in the water flow. Combined with its hydrodynamic shape, the shark therefore glides through the water - almost without resistance.

In co-operation with specialists from the Institute for Energy Technology at the University of Rapperswil «IET/HSR» and their colleagues from the University of Applied Sciences of Buchs, as well as with researchers from the renowned «bionic surface technologies» lab, Jansen has developed a plastic pipe that imitates this resistance-reducing effect: the JANSEN shark technology. The inner structure of the pipe is optimally adapted to the flow behaviour typical for certain pipe applications, and in this way significantly reduces the hydraulic resistance.

Related technologies are already successfully in use in aircraft construction, in wind turbines and in ship building. Nature shows what measurements confirm: the JANSEN shark technology, as a new pipe generation, surpasses the efficiency of previously known piping systems.





Jansen AG

**Plastic Solutions**  
Industriestrasse 34  
9463 Oberriet  
Switzerland  
[jansen.com/shark](http://jansen.com/shark)  
[geothermie@jansen.com](mailto:geothermie@jansen.com)  
[haustechnik@jansen.com](mailto:haustechnik@jansen.com)

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