



The smarter
way to keep
pipes clean

Equipment, service and expertise



What is Ice Pigging?

Ice Pigging is a highly effective pipe cleaning technique in which ice slurry is used to remove unwanted material, sediment, or product residues from the pipe.

Ice Pigging is capable of navigating complex pipework which may incorporate changes in pipe diameter, bends, valve systems, and other obstructions without becoming stuck.

The ice slurry is composed of fine ice crystals and an additive used to control the structure of the slurry and to prevent it from forming large crystals.

Using an additive keeps the ice in a mobile state, allowing for navigation through complex pipework.

Ice Pigging is highly flexible, making it suited to a range of products and industries:



Personal care
and cosmetics



Pharmaceutical



Industrial

“Ice Pigging has proved to be a game changer for us. Ice Pigging has now been adopted for other production sites.”



About Nivalis

The Nivalis team are responsible for developing the concept of Ice Pigging from its origin. We still work closely with Professor Joe Quarini who invented the process.

In recent years, we have concentrated on and successfully implemented Ice Pigging into several diverse sectors. Many of our customers carry out niche, high value manufacturing, and Ice Pigging can be a game changer in terms of time saved and production efficiency.

We continue to learn as a team and use Ice Pigging and our transferable knowledge in new areas, establishing Ice Pigging as a standard operation.

What are the benefits?

Ice Pigging is fast, effective, and achieves enhanced cleaning.

Time saving

Time saving resulting in increased platform availability.

Low risk

Exceptionally low risk — if ever the ice gets stuck, it will simply melt.

Cleans and clears

Enhanced cleaning of complex pipework systems clearing problem contaminants and materials, expelling them from pipework.

Cost

Overall costs can be significantly reduced as a result of time savings and cleaning efficiency.

No dismantling

Removes materials and residues that have built up over time and may otherwise be impossible to remove without disassembling pipework.

Environmental benefits

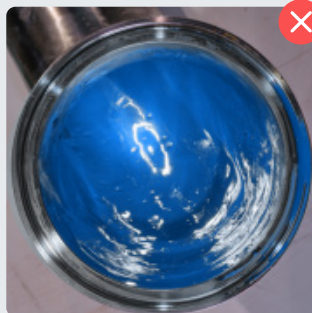
Minimal volumes of water are involved compared with conventional cleaning and no harmful chemicals are used. Significant reduction in waste volumes.

How does Ice Pigging compare to water flushing?

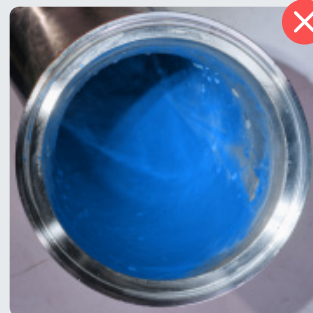
Compare Ice Pigging with a cold water flush and a hot water flush for a viscous liquid (PVA glue with dye):



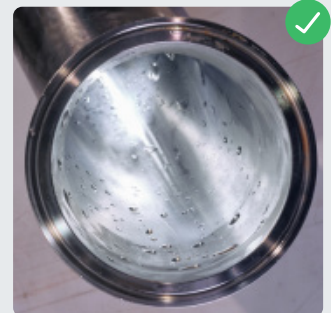
Start:
PVA glue with dye



Method 1:
Cold water flush



Method 2:
Hot water flush



Method 3:
Ice Pigging

It is easy to see the difference between water flushing and Ice Pigging. It is extremely effective at removing viscous material. The quality of clean with Ice Pigging is proven to be significantly higher than water flushing alone.

How does Ice Pigging work?

Preparation

The Ice Pigging flow path is setup. This may be an automated process for a factory installation or, for a routine maintenance operation, a manual process of fitting hoses to the inlet and outlet and changing valves in the system.

Ice Production

A Nivalis ice production machine will automatically produce ice to the ideal consistency for Ice Pigging using an additive specified to suit the application. The machine will manage the whole process of freezing, agitating and conditioning the ice slurry.

Ice Pigging

The required quantity of ice is pumped into the pipeline at a predetermined pressure by the Ice Pigging machine. Once the Ice Pig has formed (anything from 10% to 100% of the pipe volume depending on the application) it is pushed through the line using an external pressurised water supply.

Post Ice Pigging

The pipeline outlet is monitored to detect the arrival of ice. Ice is diverted to waste containment at the outlet and the water flush continues to remove any additive residue. The system can then be drained and put back into operation or prepared for further cleaning or sterilisation. For cleaning operations the condition of the ice is assessed at the outlet to determine cleaning performance and if repeat operations are required.

Nivalis Ice Pigging delivered as a service

Nivalis have an extensive range of equipment and an experienced team capable of delivering on-site Ice Pigging services.

We work with our customers to design and implement an Ice Pigging solution to suit their specific application requirements.

Initial feasibility assessment

- Customer specific study of cleaning need and benefits
- Assessment of the systems to be Ice Pigged
- Understanding line processes and current cleaning methods
- Selection of suitable Ice Pig additive



Ice Pigging methodology

- Design of Ice Pigging flow paths
- Specification of ice volumes
- Determining equipment requirements

Preparation

- Equipment clean and test
- Equipment shipped to site

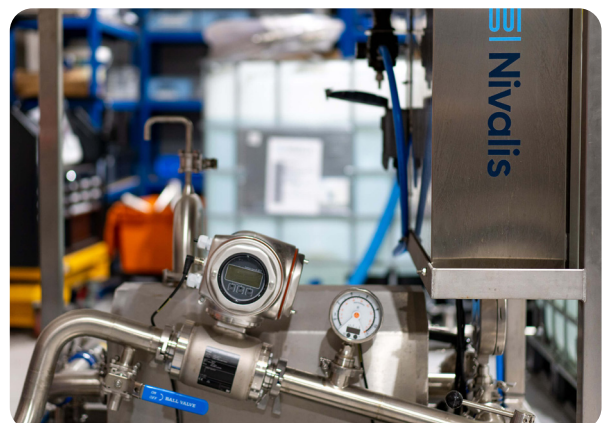


Installation of equipment on site

- Line bypasses and inlet /outlet adapters fitted
- Ice Pigging equipment delivered and commissioned
- Hoses installed to deliver ice and remove waste

Ice Pigging implementation

- Systems tested for integrity and flow
- Ice Pig distribution to required lines
- Lines flushed and reinstated
- Results analysed, technical report issued





Ice Pigging equipment supply

For applications where customers require Ice Pigging routinely, Nivalis supply specially designed equipment.

This equipment ranges from fully automated factory based combined ice production and delivery systems such as our smaller 500 litre machine to large scale depot based ice production systems with separate ice delivery road takers suitable for volumes of 2,000 - 15,000 litres.

Nivalis design and build Ice Pigging equipment which is used all over the world. The equipment varies in size depending on the application, but will always be suited to cleaning complex pipe geometries helping customers save programme time and ensure superior cleaning, therefore improving resilience.

In addition to ice production and delivery equipment Nivalis provide ancillary equipment including flow analysis systems for use at the outlet of Ice Pigging operations used to measure and validate operational outcomes and pressure boosting systems for pushing ice through systems at higher pressures.

All our equipment is:

- CE marked
- Constructed of stainless steel
- Provided with full user manuals
- Tested and commissioned before shipping

Contact Nivalis to find out how we can help you with your process cleaning needs.



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To find out more about Nivalis, scan the QR code or visit our website at www.nivalis-tech.com.

