



# PIGGING 101

Learn about HPS Advanced Liquid Product Recovery (Pigging) Technology - helping companies that process liquids increase yields, capacity, efficiency, and sustainability.

“An HPS pigging system is saving a beverage company roughly \$31,500 per changeover.”

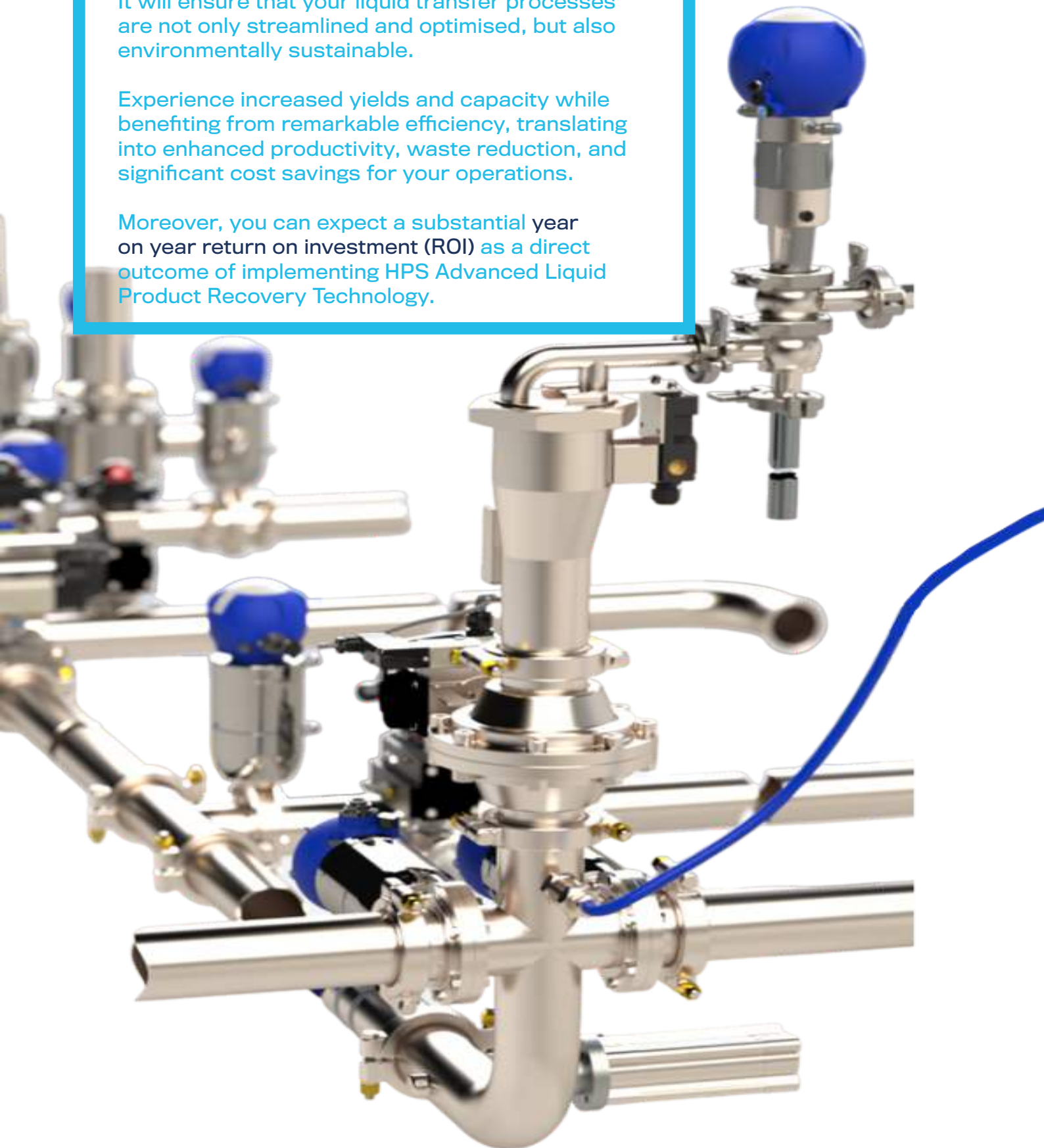
# PIGGING 101: AN INTRODUCTION

At the core of modern liquid processing industries, from food, beverages and paints resides a transformative process - HPS Advanced Liquid Product Recovery (Pigging) Technology.

This innovative approach, harnessing the latest pigging techniques, will transform your operations. It will ensure that your liquid transfer processes are not only streamlined and optimised, but also environmentally sustainable.

Experience increased yields and capacity while benefiting from remarkable efficiency, translating into enhanced productivity, waste reduction, and significant cost savings for your operations.

Moreover, you can expect a substantial year on year return on investment (ROI) as a direct outcome of implementing HPS Advanced Liquid Product Recovery Technology.



# WHAT IS PIGGING?

In modern liquid processing and manufacturing industries, Advanced Liquid Product Recovery (Pigging) Technology recovers residual liquid product from pipes. If it wasn't recovered by pigging, this liquid would go to waste.

The recovered product is perfectly useable so can be sold, stored, packed, or continue to be processed along with the rest of the batch, rather than being flushed down the drain.

So, if you work for a company that transfers liquids through pipelines during manufacture or processing, our state-of-the-art automatic pigging technology stands as a game-changer across a variety of industries:

- Food and Beverages
- Confectionery
- Personal Care and Cosmetics
- Homecare and Household Liquids
- Paint and Coatings
- Pet Food
- Chemicals
- Industrial Lubricants, plus much more

# HOW IT WORKS.

At its core, a pigging system involves a specialist projectile, known as the 'pig,' which is slightly larger than the pipeline it navigates. This pig is automatically introduced into the pipeline, and propelled through the pipe.

The process involves propelling the pig through the pipe by pressurizing the pipework behind it. This pressure can come from compressed air, carbon dioxide, nitrogen, clean water, or even the subsequent product, depending on the application.

Rather than disposing of the residual liquid by flushing it away, the pigging process recovers it. It pushes the product left in the pipe to a destination filler or tank or returns it to the source for further processing along with the rest of the product.

Pigging is fast, highly efficient, and easily implementable in both new and existing pipelines.

**“HPS pigging technology reduced our changeover times from around 3 hours to just a few minutes.”**

HPS PRODUCT RECOVERY SOLUTIONS

# EVERY PROCESS CAN BE IMPROVED.

Rapidly enhance your liquid processing by leveraging HPS's Advanced Liquid Product Recovery Technology. Our state-of-the-art pigging systems are designed to align with your unique needs, systems, and objectives. Understanding the distinct requirements of each customer, we tailor design every product recovery and pigging system we provide.

Our commitment goes beyond customisation; we make sure that our solutions not only align with your specifications but also optimise the efficiency and effectiveness of your processes.

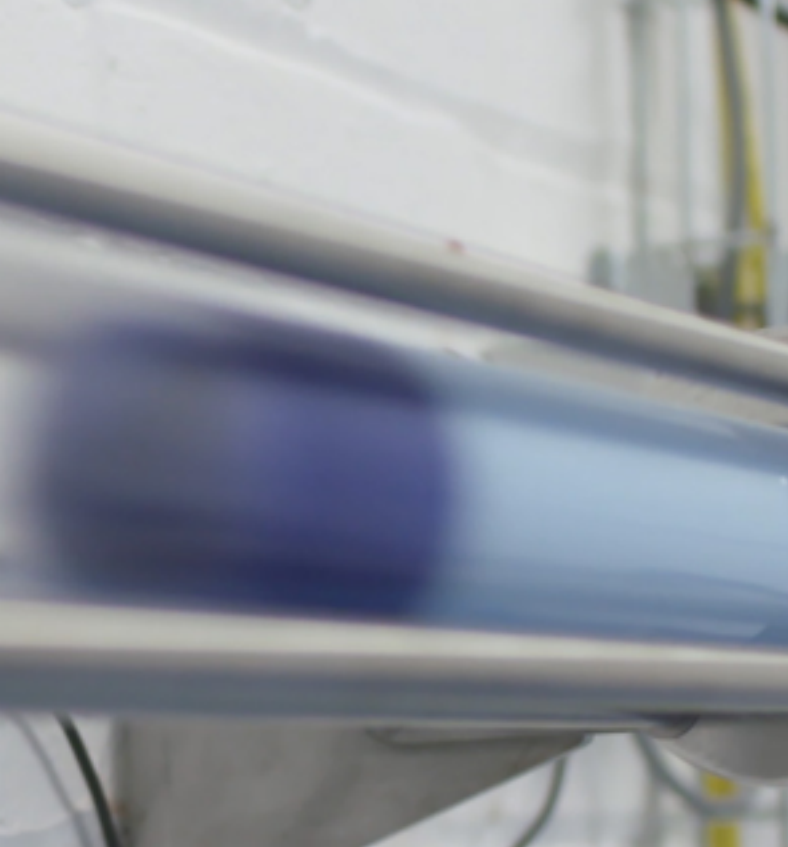


## HPS ADVANCED LIQUID PRODUCT RECOVERY DELIVERS:

- High Return on Investment (ROI)
- Increased Yields and Better Margins
- Reduced Waste and Less Downtime
- Increased Plant Capacity
- Streamlined Changeovers
- Lower Water and Energy Consumption
- Minimised Cross-Contamination Risks
- Reduced Effluent and Associated Costs
- Improved Productivity and Efficiency
- Improved Environmental Sustainability







## BENEFITS OF PIGGING

# WHY YOU SHOULD CONSIDER PIGGING TECHNOLOGY!

HPS proven pigging technology delivers efficiency, cost savings and transformative benefits to many different process industry sectors - from food and beverages to paints, coatings, cosmetics, and industrial applications.

### HIGH ROI

If you choose an advanced pigging system by HPS, your savings will usually pay back the initial cost of the system in just a few months. After that, it will provide a high ROI year on year.

### REDUCED WASTE AND DOWNTIME

Our high-tech, modern pigging solutions massively reduce waste, as well as saving cleaning agents and water. In addition, pigging streamlines cleaning and changeovers, so you have less downtime.

### INCREASED YIELDS AND MARGINS

Because pigging reclaims nearly all residual product in pipelines instead of it being wasted, it significantly increases your product yields. And as a direct result of this, you'll increase your margins.

### STREAMLINED CHANGEOVERS

Pigging's efficiency in minimising water flush and CIP requirements accelerates processes, resulting in faster, less labour-intensive changeovers. This contributes to enhanced operational productivity.

## PREVENTION OF AERATION, FOAMING AND DISSOLVED OXYGEN

Some liquids tend to foam; others must not come in to contact with air (such as wine). Specialist 'double-pig' systems prevent aeration, foaming, dissolved oxygen and contamination.

## REDUCED WATER USAGE

Pigging technology aids in water conservation by improving cleaning processes. Its efficient removal of product residues from pipelines reduces the need for prolonged flushing, thereby decreasing overall water consumption.

## IMPROVED CAPACITY

Due to the exceptional recovery efficiency of the HPS pig, it allows for the utilisation of a single line for multiple products. This significantly enhances operational capacity and flexibility, while maximising the efficiency of operations.

## ENERGY SAVINGS

Pigging systems contribute to energy savings by minimising pumping requirements, speeding up changeovers, and streamlining processes. Additionally, they accelerate hot water flushes, enhancing overall efficiency and reducing energy consumption significantly.

## MINIMISED CONTAMINATION AND CROSS-CONTAMINATION RISKS

Pigging significantly reduces bacterial contamination and product cross-contamination risks. This not only ensures adherence to stringent quality and safety standards but also reinforces overall product integrity.

## LOWER LABOUR COSTS

By efficiently recovering product residue from pipelines, advanced pigging systems reduce the need for extensive cleaning and labour efforts. This streamlined approach translates to considerable savings in cleaning expenses and labour.

## BOOSTED EFFICIENCY

HPS state-of-the-art automatic pigging technology improves efficiency through higher yields, increased capacity, faster changeovers, reduced flushing and chemical washouts, and less waste.

## IMPROVED SUSTAINABILITY

Pigging reduces waste, decreases water usage, minimises chemicals and related transport and disposal costs. So, the environmental advantages of pigging are substantial.



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The HPS systems resulted in a clear increase in product yields, equating to 48,000 extra cans per week.

*Coca-Cola*



MORE INFORMATION

# KEY COMPONENTS OF A PIGGING SYSTEM

A pigging system is made up of a variety of different parts and components. These include pig launchers, receivers, detectors, storage, housings, propellant sources, PLCs, HMIs, control software, and various valves, supports and fittings.

However, the most important component is the pig itself.

## PIPELINE PIG

The most important component of a pigging system is the pig. This is a specialist projectile that has a diameter slightly larger than the pipeline that it is pigging. As the pig travels through the pipeline, it reclaims the product, optimising recovery within the system.

## PIGGING CONTROL SOFTWARE

HPS modern closed-loop systems are fully automatic, requiring no manual intervention during normal operation. The control software or PLCs, with either HMI or SCADA systems, can either be supplied as standalone or can be integrated into your existing setup.

## PIG HOUSING

When the pig is not in use, it resides in a special housing. The HPS pig housing, slightly larger than the pig, allows easy and safe removal for maintenance and inspection. It also ensures there's enough room for water and cleaning fluids to flow around the pig for thorough cleaning and CIP.

## PIG DETECTOR

The HPS AccuTect pig detector provides state-of-the-art pig detection. An essential component of HPS pigging systems, it determines the presence or non-presence of an HPS pig when it's in close proximity.

## RECEIVE AND LAUNCH STATION

Pig receive and launch stations, often referred to simply as pig stations, serve a crucial role in safely introducing the pig into the product line, propelling the pig between source and destination. If required, they provide storage when the pig is not in use.

“

HPS was able to help us customize our design based upon our processes. They worked hand in hand with us to help us understand the trade-offs of the different design elements.”

Tyson Richart, KIK Custom Products



## VALVES, SUPPORTS AND FITTINGS

Other important components of HPS advanced pigging technology are the valves, supports, and fittings. While valve types may differ across solutions, they collectively serve a common purpose: facilitating the smooth and efficient routing of both the product and pig within the system.

## PIPEWORK

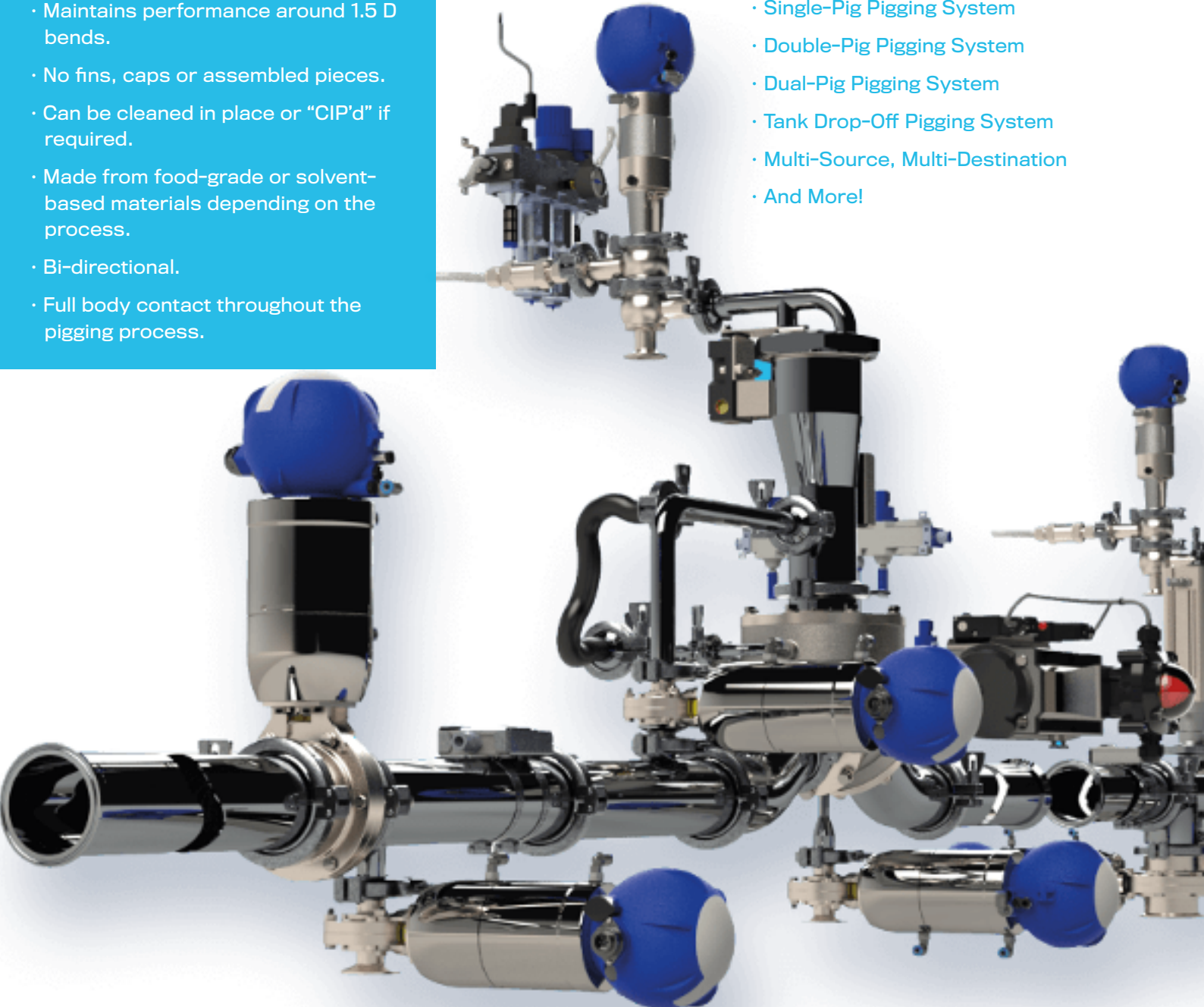
A key part of any pigging system is the pipework. HPS work with a wide variety of pipe codes and standards, including ASME, ANSI, ASTM, AGA, API, AWWA, BS, ISO, DIN, plus more. Importantly, the pipework needs to be in good condition and free from dents and damage along the length of the pipe you are intending to pig. Please talk to one of our team if you need more information.

## PIG CHECKLIST:

- Typical recovery efficiency of up to 99.5% of product.
- No solid magnets but fully detectable.
- Long life expectancy.
- Maintains performance around 1.5 D bends.
- No fins, caps or assembled pieces.
- Can be cleaned in place or "CIP'd" if required.
- Made from food-grade or solvent-based materials depending on the process.
- Bi-directional.
- Full body contact throughout the pigging process.

## DIFFERENT TYPES OF PIGGING SYSTEM:

- Single-Pig Pigging System
- Double-Pig Pigging System
- Dual-Pig Pigging System
- Tank Drop-Off Pigging System
- Multi-Source, Multi-Destination
- And More!







PROCESS LIQUIDS?

# INDUSTRIES BENEFITING FROM PIGGING

Our state-of-the-art automatic pigging technology helps companies in a wide variety of industries improve their productivity, profits, efficiency, and environmental sustainability.

We have a saying at HPS: "If You Can Pump It, We Can Pig It!"

## FOOD

Our proven pigging solutions are helping food manufacturers increase product yields, cut waste, speed up changeovers, save water, reduce contamination, and improve the competitiveness of food processing operations.

## CONFECTIONERY

Our pigging systems are used worldwide in the manufacture of chocolate and confectionery. They deliver ongoing ROI and improve the bottom line through reduced waste, faster changeovers and cleaning, improved lot control, decreased cross-contamination, and more.

## PET FOOD

HPS has a wealth of expertise in pet food processing and production. Our advanced liquid product recovery systems for pet food help improve processing speed, cut waste, minimise cross-contamination and improve efficiency.

## PAINT, COATINGS AND CHEMICALS

HPS' modern pigging solutions are helping leading brands to quickly transfer raw product into mixing tanks, avoid cross-contamination after changeovers, speed up processing, and recover significant amounts of usable product.

## BEVERAGES

We have a proven track record of delivering modern, high-tech solutions that help beverage processors improve the efficiency, flexibility, productivity, sustainability, and profitability of their plants and processes.

## BEAUTY AND PERSONAL CARE

From creams to lotions, shampoo to cosmetics, we have extensive experience in providing automated pigging systems that deliver a great ROI through product recovery, waste reduction, quicker changeovers, and improved environmental performance.

## HEMOCARE & HOUSEHOLD

From detergents to washing-up liquid, we've helped a wide range of manufacturers increase product yields, improve cleaning, and enhance process efficiency through pigging and liquid product recovery solutions.

## LUBRICANTS

From industrial lubricants, to automotive, agriculture, commercial and others, HPS technology increases yields and capacity in lubricant production while cutting waste, lowering re-work costs, and improving environmental sustainability.

# OUR CLIENTS

HPS' advanced pigging technology is trusted throughout the world. We have hundreds of customers, including multinational, multi-site blue-chip companies, as well as smaller independents.

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L'ORÉAL



Unilever



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## WHAT DO OUR CLIENTS HAVE TO SAY ABOUT US?

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The solution was simple to use. The HMI was customisable to suit our needs and everyone we dealt with from sales to parts to installation and programming was fantastic to work with.

Jeff Green, Log House Foods

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HPS provided a great product and a great service. We're extremely satisfied with our experience with HPS and recommend them to others.

Stan Pintar, KIK Custom Products



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The systems work extremely well. They are more or less self-sufficient, very easy to use and need very little maintenance from us, occasionally checking the pigs and replacing them if they're worn, which isn't that often!



# PLANNING A PIGGING SYSTEM

HPS pigging systems seamlessly integrate into existing pipeline processes, as well as new plants, and the majority of solutions delivered by HPS pay for themselves extremely quickly.

Here are key considerations to bear in mind when planning a pigging system:

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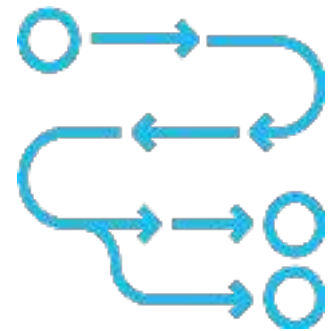
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## HOW TO CHOOSE A PIGGING SYSTEM

Due to the diverse range of applications and objectives, pigging systems come in various designs and specifications. This means there's no one-size-fits-all 'off-the-shelf' product recovery system available.

At HPS, we tailor each system to meet your specific requirements and infrastructure. Our experts guide you in selecting the most suitable system, and we'll design it for you. The most important thing is that we will provide a solution that not only works but provides outstanding results.

Different products have different requirements. While a single-pig system suits many applications, if your product tends to foam or must avoid contact with air, a double-pig system is likely the recommended solution. Moreover, if your priority lies in achieving precise cleaning and reducing the water content in your product, the dual-pig system may be the ideal solution.



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## PIG CONSIDERATIONS



There are different types of pigs available for sanitary and hygienic applications.

While the market offers a wide array of pigs, optimal performance often aligns with certain characteristics. The most efficient pigs are typically bi-directional, with a one-piece flexible design and contain no solid magnets (instead containing a flexible magnetic core). They exhibit the capability to navigate around 1.5 D bends without compromising full product recovery rates.

Generally, these pigs don't have fins or intricate shape profiles. This is because fins or protrusions can rip or tear, and sometimes product can build up behind the fins or where there's a sudden change in profile of the pig.

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## EXISTING SERVICES

Pigs are typically propelled using compressed air, nitrogen, or carbon dioxide. Water or the next product in line can also serve as propellants.

Utilising existing services is preferable, so it's vital to note their availability and specifications, including ratings when planning a pigging system.



# EXTENSIVE SAFETY FEATURES

It's crucial to partner with a pigging system provider that takes safety seriously. At HPS our pigging systems are equipped with extensive safety features. These include:

- One-piece pig with no solid magnets
- Full automation and interlocks
- No manual intervention
- Pig detection, automatic venting and depressurisation
- Pig stays off-line until needed
- Physical barriers



## AUTOMATION

HPS Advanced Liquid Product Recovery Systems are fully automated.



Automated pigging systems are more efficient, reliable, easier to run and safer than manual systems. You may have your own PLC, SCADA or HMI system specialists that will be able to set up programming and control for you. In this case we will supply you with a Functional Design Specification (FDS).

Alternatively, if you choose HPS, you can call on the extensive experience of HPS pigging system automation specialists.

## CHOOSE THE EXPERTS

When it comes to pigging systems, not all are created equal. That's why, when considering a pigging system for your organisation, it's crucial to partner with a provider offering high-tech, modern technology.

HPS stands out as the forefront leaders in Advanced Liquid Product Recovery (Pigging) Technology.



# PIGGING SYSTEM FREQUENTLY ASKED QUESTIONS (FAQS)

Here are some of the more common questions regularly asked about HPS Advanced Liquid Product Recovery (Pigging) Technology.

Please get in touch if you have any more questions.

## HOW MUCH DOES A PIGGING SYSTEM COST?

Because there are many different variables involved in working out costings, it is not possible to provide standard pricing. Contact HPS if you would like us to provide a budget quotation and expected ROI. Our expert team will gladly assist you in assessing your specific needs and determining the most cost-effective solution for your organisation.

## HOW LONG DO PIGGING SYSTEMS LAST?

If properly maintained, HPS pigging systems will last an extremely long time. In fact, some of our very first systems are still in use after nearly thirty years.

## CAN PIGS TRAVEL THROUGH PIPE BENDS AND BE STEAM CLEANED?

Yes. The flexible nature of HPS pigs enables them to travel through 1.5 D – 90° bends and still maintain full recovery rates. They can withstand temperatures up to 250 °C or 482 °F without degradation. This means you can steam clean them if required.

## ARE HPS PIGGING SYSTEMS COMPATIBLE WITH CIP?

HPS Pigging Systems and Clean In Place (CIP) solutions are fully compatible. Because HPS pigs recover nearly all product within a pipe, CIP is much easier, less time consuming, uses less water and CIP chemicals, and is less labour-intensive.



## **DO I NEED TO MANUALLY LOAD OR REMOVE THE PIG?**

No. As HPS pigging systems operate fully automatically, the need for manual pig removal or loading by operators is eliminated. Usually the only time you'll need to manually access a pig is for inspection and maintenance.

## **WHAT PROPELS THE PIG THROUGH A PIPE?**

Pigs don't propel themselves. Instead, they are pushed along pipes by liquids or gases. Industrial process pigging utilises various propellants such as water, filtered air, nitrogen, carbon dioxide, and other specialised products to facilitate their movement along the pipeline.

## **WHAT DOES 'ADVANCED PRODUCT RECOVERY' MEAN?**

HPS leads the industry in Advanced Liquid Product Recovery Technology, showcasing an innovative approach at the forefront of industry advancements. Its distinctive features include the unique design of the pig with no solid metal magnets, full automation with no manual intervention, extensive safety features plus more innovative pigging techniques.

## **AT WHAT STAGE IN A PROCESS IS PIGGING USED?**

It depends on the process. Typically, an operator or automatic control system will send a pig through a pipe to recover product whenever required. This can occur, for instance, after a holding tank has been emptied by a pump, before the CIP procedure, during a transition between products, or upon the completion of a specific batch run.

## **HOW FAST DO PIGS TRAVEL THROUGH THE PIPELINE?**

The HPS pig travels extremely quickly through the pipe, although its exact speed depends on several factors, including the product, pressure, process, pipe diameter, and so on. Typically, most pigging operations last just a few seconds. This rapid pace ensures minimal disruption to operations, making the pigging process extremely efficient.

## **ARE ALL PIGGING SYSTEMS AUTOMATED?**

Yes, nearly all pigging systems designed by HPS are fully automated. Automatic pigging solutions, controlled by PLCs with either HMI or SCADA systems, offer a wide range of benefits. These include increasing process speed, productivity, and overall efficiency, as well as reducing the chances of human error.

# PROCESS PERFECTED

HPS Advanced Liquid Product Recovery (Pigging) Technology will deliver transformational results to your company. Contact HPS to find out more.

## UK

From our Nottingham head office, we provide a range of pigging products and solutions to businesses throughout the UK and the rest of the world.

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info@hps-pigging.com

## USA

HPS work with organisations throughout the USA that pump liquids during the manufacturing process, ranging from major household names to smaller independents.

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usa@hps-pigging.com

## AUSTRALIA & NEW ZEALAND

HPS Australasia provides liquid product recovery and transfer technology to companies that process liquids throughout Australia, New Zealand, and neighbouring countries

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We also have official representatives based in:

Brazil  
India  
Mexico  
Singapore  
China

Thailand  
Malaysia & Indonesia  
The Netherlands  
Belgium