Pigging technology
Solutions for multiproduct transfers and cleaning of pipelines
30 year's expertise
More than 4000 components installed

ABB propose the pigging technology for the industries of paints and varnishes, lubricants and greases, paper, resins, specialty chemicals, perfumes, ... at every process step, for the transfer of raw materials (unloading of tank trucks), semifinished products (transfer from tank to tank) and finished products (transfer to filling units or bulk dispatch).

Application
The pigging technology consists in moving a plug called “pig” inside a pipe in order to:
• completely empty the line,
• clean the line,
• separate the sequential transfer of two different fluids.

Innovative solutions
• Reduction of space requirement for manifolds (using H valves).
• Piggable collector with mass flow meter for accurate dosing of products.
• Recycling of cleaning or propelling media.
• Decontamination chamber for pigs.

Know-how
• Utilisation of valves without retention area to minimise the contamination between products.
• Cleaning cycle according to the compatibility of products.
• Matrix installations for multiple inlets and outlets (piggable manifold).
• Interconnection of lines with different diameters.
• Bidirectional pigging with one or two pigs.
• Controlled propelling of pigs and line depressurising.
• Patented components in compliance with ATEX and EC standards.
• Pipes from DN25 to DN150.

The many benefits of pigged lines to boost your productivity:

- Exceptional material recovery: 100% of transferred product is used.
- Maximum flexibility: hidden time and just-in-time operations.
- Safety of liquid transfers due to closed system.
- Easy layout of equipment and workshops.
- Modularity of units.
- Simplified piping network and reduced space requirement.
- Minimised quantity of cleaning liquid.
- Reduction and recovery of waste.
- No connections with flexible pipes.
References

**Paints and specialty chemicals**
- AKZO NOBEL
- ASIAN PAINT
- AVENTIS
- BAYER
- BLANCHON SYNTILO
- CHRYSO
- CIBA GEIGY
- COGNIS
- CRAY VALLEY
- CYTEC
- DSM
- DYRUP
- ELF ATOCHEM
- FIRMENICH
- GIVAUDAN
- GRACE
- HERMES VITEX
- HEXION
- ICI
- J.W. OSTENDORF
- KUNSUL
- LA SEIGNEURIE
- OWENS CORNING
- PEUGEOT PSA
- PINTUCO
- PPG INDUSTRIES
- PPO
- PROSPA
- RHODIA
- STOMIX
- TIKKURILA PAINTS
- TOA
- TOLLENS
- UCB
- VALLSPAR
- VERNIS CLAESSENS
- ZOLPAN

**Lubricants**
- ACPA
- AMOC
- BLENDCOR
- BP CASTROL
- CHEVRON
- COPEC
- ENOC
- EXXON MOBIL
- FINA IBERICA
- FUCHS LABO
- GALP
- GAOQIAO
- KLOC
- KSJC
- KUO HORNG
- LUBRICIANTS DE TUNISIE
- LUBRIZOL
- MISR PETROLEUM
- PETROLUBE
- PETROMIN
- PETROSAM
- PETROSER
- PERTAMINA
- PSO
- Q8 PETROLEUM
- REPSOL
- SHELL
- SINOPEC
- TOTAL
- YEMEN AIMTCO

**Paper**
- ARJO WIGGINS
- GUERIMAND
- INTERNATIONAL PAPER
- NORSCANTECH
- PT RIAU ANDALAN
- SARRIOPAPEL
- SMURFIT CONDAT
Transfer from one way... to six and more

Depending on the number of inlet and outlet points, ABB offer a range of patented components enabling the design of an installation adapted to every project and budget. Of sturdy construction and designed without retention zones, the piggable components require easy and minimum maintenance.

Pigs
Of flexible design, the pig fits exactly the internal surface of the piping and play a major role in the quality of pigging. Pigs ensure the cleaning of pipes by a mechanical effect (movement of one or two pigs) and possibly by chemical effect (transfer of cleaning product between two pigs).

Consisting of one or several pieces, ABB pigs are moulded or machined using the following materials: Nitrile, Viton, EPDM, Polyurethane, Nylon, PTFE, Aluminium (body). A magnetic core enables the detection of the pig in the line.

Pig with moulded body and replaceable lips

Piping
The pigged installations require the use of pipes and fittings for which tolerances have been controlled to enable perfect transfer and pigging conditions.

- Rolled welded pipes with smoothed weld or seamless drawn pipes, internal roughness < 3.2 μ.
- Material: carbon steel (petroleum and lubricants), stainless steel (paint, chemicals, food, cosmetics).
- Long radius elbows with low ovalisation tolerances.
- Connection with flanges (welding neck flanges with centered gasket), with sleeves or orbital welding.

Strict procedures are required during installation to avoid any misalignment of flanges, deformation or foreign body inside.

Launching and receiving stations
They are installed at each end of a pigged line to:

- support the valves controlling the utilities (water, air, nitrogen etc.) required to propel the pigs,
- ensure an inlet or outlet point for the transferred product with minimal retention,
- are delivered with two magnetic detectors to indicate the presence of the pigs.
The pig launching and receiving station can be fitted with a removable pig introduction or extraction system which maintains the operator safety and enables significant cost reductions on projects where several pigged lines are installed.

Compact pig receiving station

The automatic pig loading system can be added on the launching station. It is supplied with a secured intermediate chamber allowing not only the introduction or extraction of the pigs but also their bacteriological decontamination during a cleaning sequence with appropriate liquid.

Pig loading station with pig cleaning chamber

**Distribution valves**

They allow the inlet or outlet of the product at an intermediate point of the pigged line:

- in closed position, the line is perfectly piggable without retention area,
- in open position, the valve plug is used as pig stopping device, enabling the complete emptying of the line.

With a one-way distribution valve, only one pig is needed to empty the line. With a two-way distribution valve, two pigs are needed to empty the line. The three-way valve or diverter enables shorter pipe lines. It is available in two or three position.

**Interconnection valves**

Installed at the intersection of two lines, the cross valve enables the interconnection of two pigged lines which can be of different diameters.

The interconnected lines can operate separately. In closed position, the line is perfectly piggable without retention area. In open position, the product is transferred from one line to the other, the plug is used as pig stopping device enabling the complete emptying of the line. Two pigs are necessary to empty the line.

**Assembly of three H-valves**

Being the combination of two cross valves, the H-valve enables the interconnection of one dedicated line and two pigged lines or three pigged lines.

**Twin valves**

Twin valves enable two outlet/inlet points on the same piece of equipment.

Two versions exist: in-line version with pig stopper or end of line version which also acts as a pig receiving station.

**2-Way valve in stainless steel for paint industry**

Twin valve for the lubricants industry
In 40 years, pigging technology has evolved from a maintenance to a real process tool.

**Piggable collector**
The piggable collector meets the challenge of connecting multiple dedicated lines to a pigged line. It consists of a compact set of several piggable stainless steel or carbon steel elements, each one corresponding to one to three product inlets with a minimum retention. Associated with a mass flow meter, it enables the successive dosing and transfer of a large number of products into a mixing tank using a piggable twoway distribution valve.

This technology is currently used in resin, solvent and speciality chemical dosing stations and enables waste generation and the consumption of rinsing products to be minimised.

**Piggable manifold**
Several cross or H-valves assembled in the form of a matrix constitute a manifold interconnecting several inlet and outlet points. Each crossing of a horizontal line with a vertical one is a possible connection between the pipes.

The advantages of a piggable manifold are:
- Optimised compactness with H-valves.
- Modularity (connections between dedicated or pigged lines).
- Possibility of connection between lines of different diameters.
- Closed system: increased safety, minimised risk of leakage and toxic emanation.
- Sturdiness (tested design).
- Minimal maintenance (few parts in movement).
Automation and control
An automated production is composed of workshops performing different sequences of fabrication such as dispersion, finishing or packaging. The transfers have a great impact on the organization of the production, hence pigging is an efficient way to increase the reactivity between the workshops.

To reduce the production time, the transfers between different workshops must naturally follow each other without the intervention of the operator.

Pigging is easy to be automated and is composed of 4 phases:
- configuration of the line with the positioning of valves and pigs,
- transfer of the product,
- pigging of the product,
- return to the initial configuration of the line.

The status of the lines and the transfers in process can be displayed in real time on the mimic screens of local terminals or in the control room. This graphical representation of the lines informs in real time the operator of the position of valves and pigs.

Engineering and services
- Audits of existing plants and technical-economic study.
- Pilot line for tests.
- Basic engineering and general mechanical and electrical studies.
- Automation and control system.
- Fabrication, preassembly and quality control.
- Installation on site and erection of turn-key plants.
- Commissioning, start-up and training.
- Maintenance and spare parts.
Additional information
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