

I.S.T. MOLCHTECHNIK G.M.B.H.

The address for pigging technology



The principle of pig cleaning



Description of a typical pig cleared process flow system



I.S.T. Headquarters, Hamburg



I.S.T. provides the following services



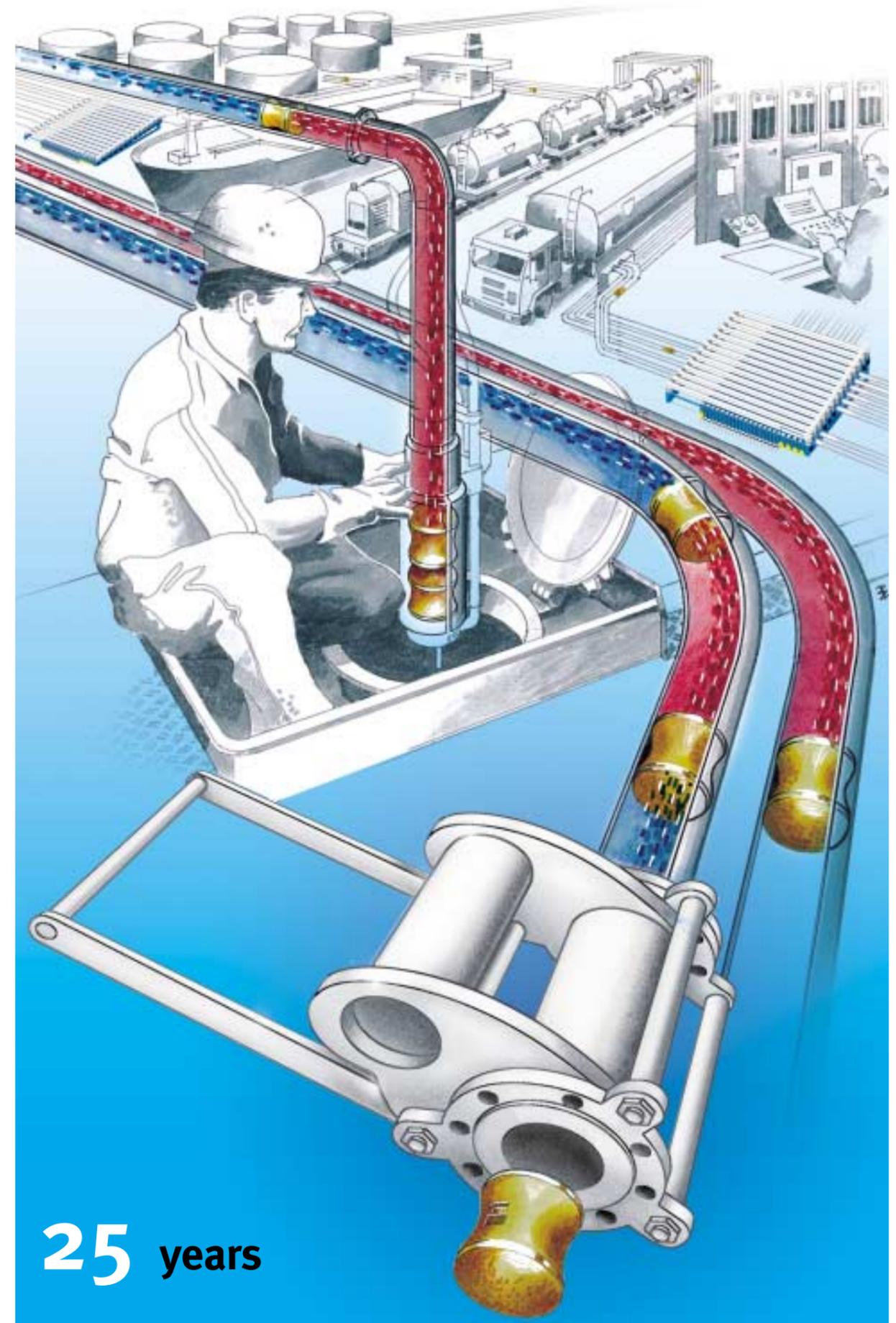
Product overview



Contacts



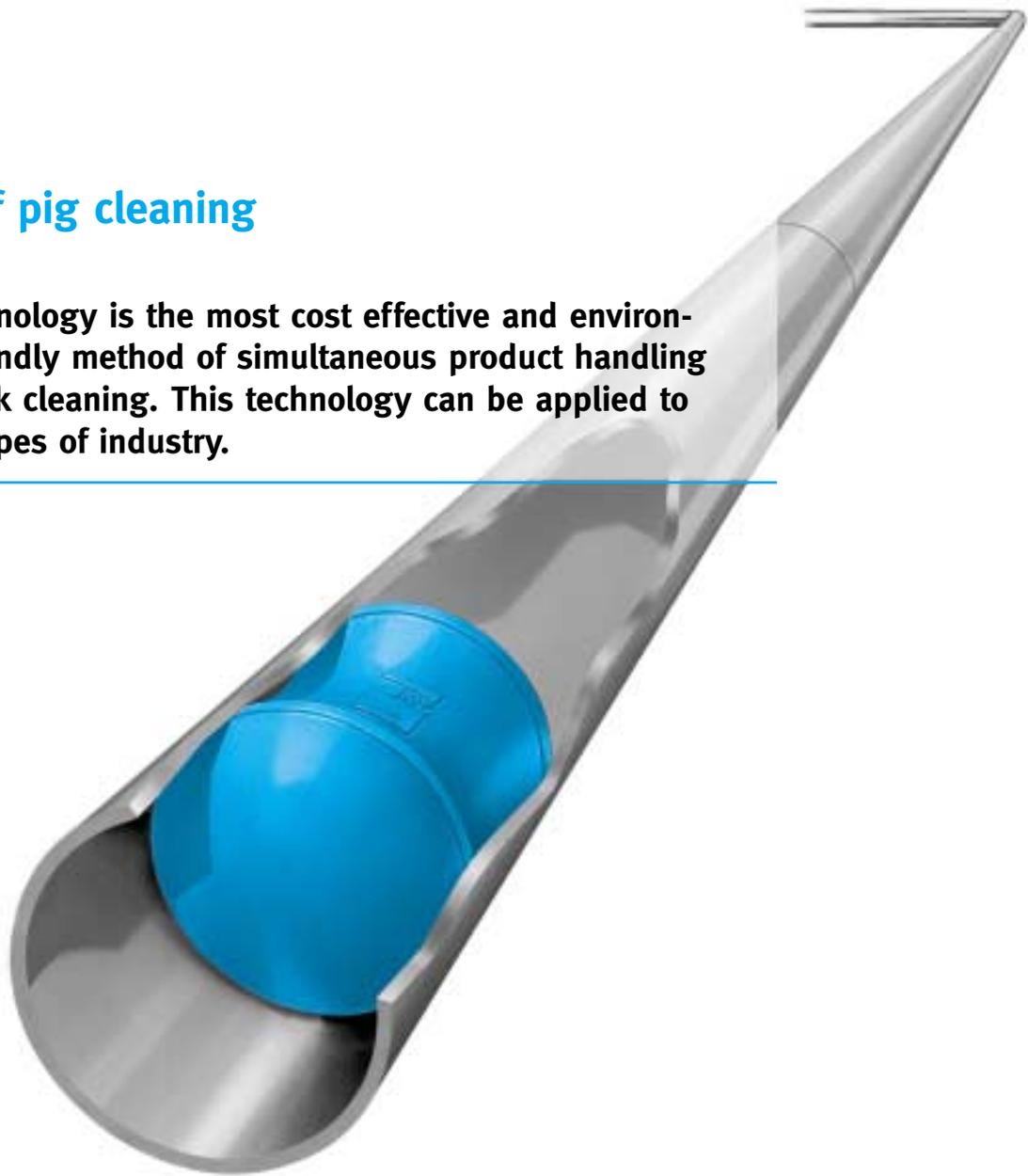
Experience in pigging technology for more than



25 years

The principle of pig cleaning

Pigging technology is the most cost effective and environmentally friendly method of simultaneous product handling and pipework cleaning. This technology can be applied to almost all types of industry.



The pipeline contents are recovered by a special contoured plug, the "pig", which is moved by a propellant. This method of batch separation is used in many industries on a wide variety of products. All I.S.T. pigs and fittings are manufactured to the highest possible standards, in order to ensure that the optimum pigging results are always achieved.

This catalogue provides outline details for all I.S.T. components and should enable you to plan the initial configuration of the proposed pigging system. However, for detailed system design and planning we

recommend that you seek further advice from I.S.T.'s qualified project engineers and benefit from their many years experience in this specialised field.

A full list of all contact addresses can be found at the front of our catalogue.

We endeavour to provide a very high level of customer care and after sales service to all our clients. With this in mind we recommend that I.S.T. service engineers are utilised for start-up, commissioning and training works. This will ensure that the pigging system is installed correctly and operates to your total satisfaction.

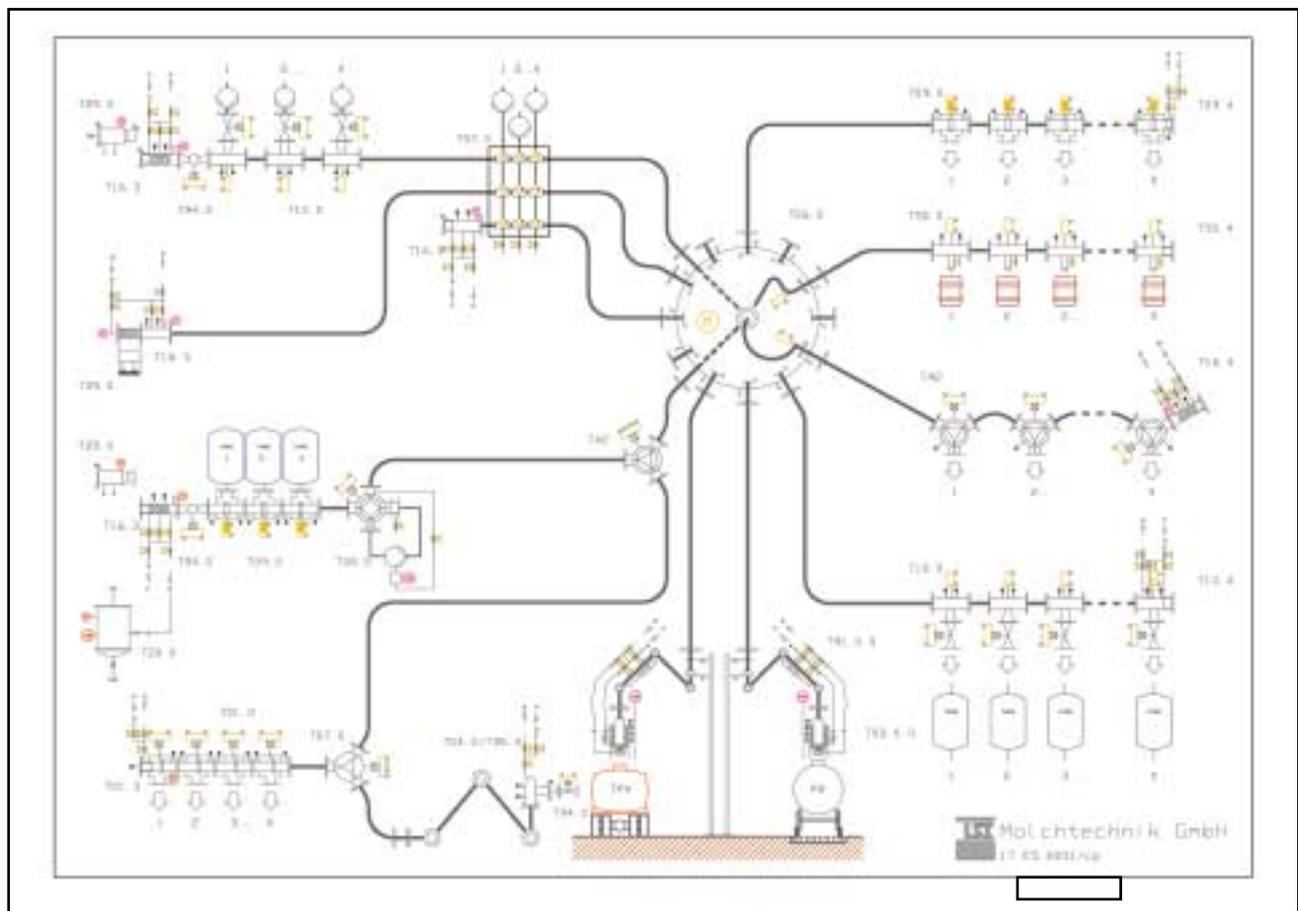
Description of a typical pig cleared process flow system.

This flow scheme gives an overview of how the range of equipment in the Catalogue could be connected together at a "typical" plant installation.

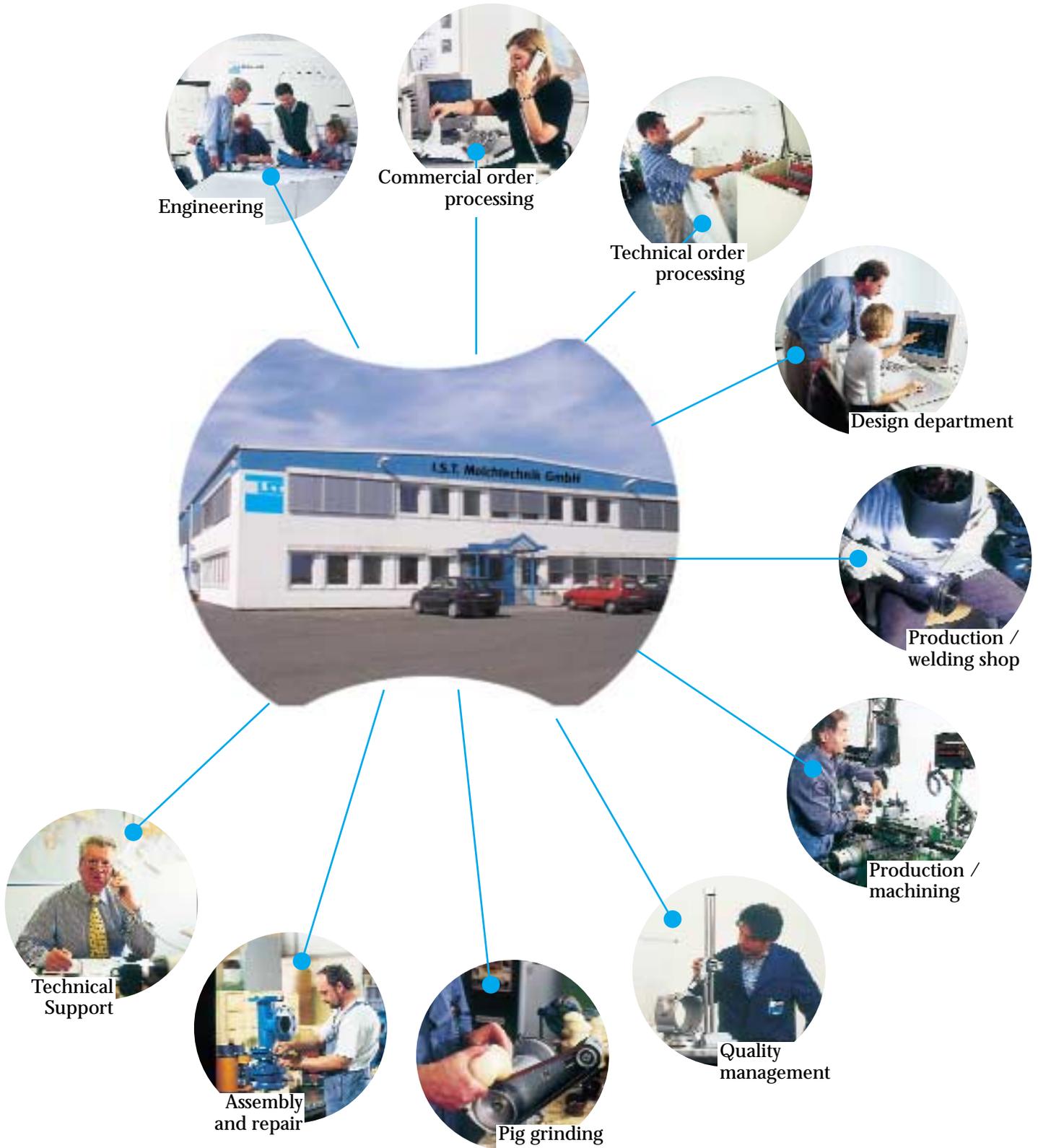
The pig loading and unloading stations (T 29 & T 39) are positioned at the pig launching stations. Tee-pieces (T 10), Tee-sleeve valves (T 01), Tee-ring valves (T 09), Three-way valves and different manifolds interconnect the product inlet points with the piggable distribution system.

The discharge of the products can then take place through barrel filling valves (T 50), Tee-ring valves, Three-way valves, Tee-pieces and Loading arms (T 91) with a piggable filling head (T 02). Individually, all these units can also be used as Pig launching and receiving stations.

The choice of the correct piece of piggable equipment depends on several factors. Examples of this are the characteristics of the products to be transferred, plus the required cleanliness / minimal contamination aspects of the finished pipework. Experienced Engineers from I.S.T. are available with advice as required. This will ensure that the optimum selection of equipment, on both a cost and suitability basis for your application, is chosen.



I.S.T. Headquarters, Hamburg



I.S.T. provides the following services:

- ▶ **Planning and conception of complete systems**
- ▶ **Retrofitting and modification of existing systems**
- ▶ **Piggable fittings and manifold systems**
- ▶ **Pipework**
- ▶ **Control systems**
- ▶ **Accessories**
- ▶ **Technical support**
- ▶ **After sales service – commissioning, training, etc.**

I.S.T. manufactures a wide range of both welded and cast fittings, providing a very flexible product range.

- Welded fittings can be manufactured according to individual customer requirement.
- Cast fittings are available in many different designs to suit various functions. All fittings are proven designs and provide reliable operation and long service life for all parts (incl. seals).

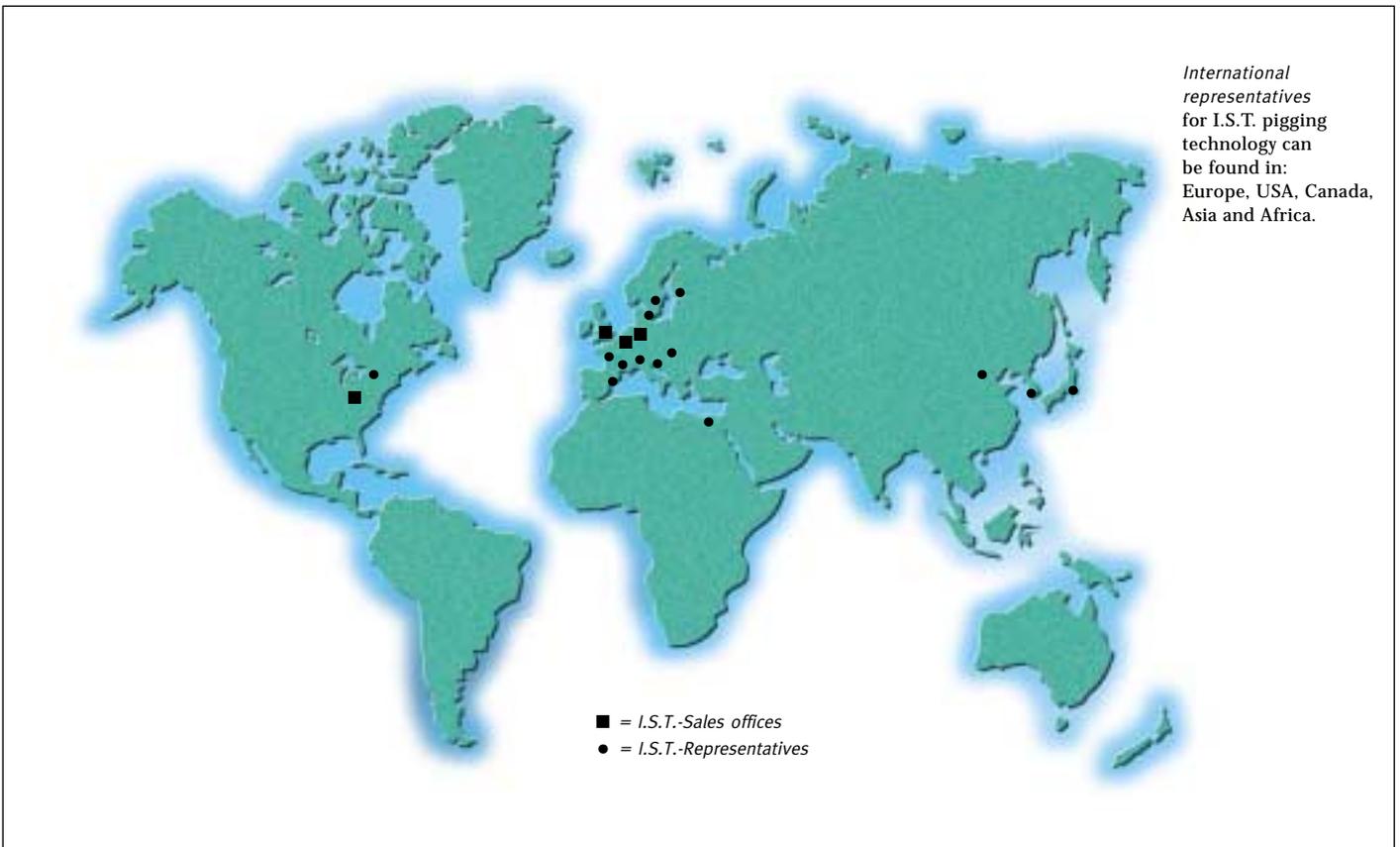
Technical data for standard product range:

Available diameters:	DN 25 / 1" up to DN 250 / 10" (other sizes on request)
Flanges:	DIN or ANSI
Pressure:	PN 16 / 150 lbs (other pressure stages on request)
Temperature:	up to 80°C (higher temperatures on request)
Materials:	carbon steel and stainless steel
Seals:	NBR, FKM, PTFE, AU (other materials on request)

In this catalogue you will find a résumé of all fittings, pigs, accessories and services available from I.S.T

Contents

Product group	Type no.	Description	Section
Station, T-Shape	01	T-Sleeve valve	AT 1
Station, T-Shape	09	T-Ring valve	AT 1
Station, T-Shape	10	T-piece	AT 2
Station, T-Shape	10.3/4	T-piece as launching and receiving station	AT 2
Station, T-Shape	26	Filter as launching and receiving station	AT 3
Station, T-Shape	35	Pig launching and receiving station	AT 3
Station, T-Shape	43	Plunger valve	AT 3
Filling station	02	Loading lance for tank trucks and tank wagons	AB 1
Filling station	91	Loading arm	AB 1
Filling station	50	Loading valve	AB 1
Fitting, straight form	14	Pig receiving station with pig catcher ring	AG 1
Fitting, straight form	16	Pig launching and receiving station	AG 1
Fitting, straight form	17	Pig trap	AG 1
Fitting, straight form	29	Pig loading and unloading station	AG 2
Fitting, straight form	39	Pig loading and unloading station, swivelling	AG 2
Three way valve	41	Three way valve, cylinder	AW 1
Three way valve	42	Three way valve, ball	AW 1
Manifold	06	Rotary manifolds 1 to 6, 12 or 18 and 2 to 12 or 18	VT 1
Manifold	06	Plug in manifolds	VT 1
Manifold	08	2/2 way valve	VT 2
Manifold	51	1 to 4 manifold	VT 2
Manifold	54	Modular multi direction manifold	VT 3
Manifold	57	Full system manifold	VT 4
Pigs	19	DUO-pig	M 1
Pigs	19	DUO-Lip pig	M 1
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Pigs	19	Jet pig	M 2
Pigs	19	Special pigs	M 2
Connecting element	99	Product hose	VE 1
Connecting element	04	Swivel arm	VE 1
Accessories	20	Pressure relief vessel	Z 1
Accessories	27	Sliding coupling	Z 1
Accessories	31	Pig sensor/Manual pig locator	Z 2
Accessories	32	Pig stop/Pig retainer	Z 3
Accessories	33	Swivel joint	Z 3
Accessories	34	Welding rings	Z 3
Accessories	45	Inline Blender	Z 4
Accessories	48	Control units	Z 5
Accessories	59	Pipeline and pipe bends	Z 5
Accessories	92	Measuring instruments	Z 6
Accessories	97	Air pressure booster	Z 6
Service		Engineering	S 1
Service		Site supervision	S 1
Service		Test pigging	S 1
Service		Commissioning	S 1
Service		Training	S 2
Service		Repair and maintenance	S 2
Service		Technical support	S 2



Whether you require partial retrofitting or a completely new system, I.S.T. pigging technology will suit your needs:

System planning

Design

Partial and complete solutions,

i.e. pigging fittings, pipe laying and control systems, pigging fittings and test pigging

Installation

Maintenance

... all from one supplier.



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If you are interested in a no commitment quotation, and would like further information about the benefits of this kind of system, perhaps including detailed comparisons with other systems, please do call us. We will be pleased to send you more detailed information, or to give you advice at a more personal level:

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1.1 T-shape (incl. pig launching and receiving stations)

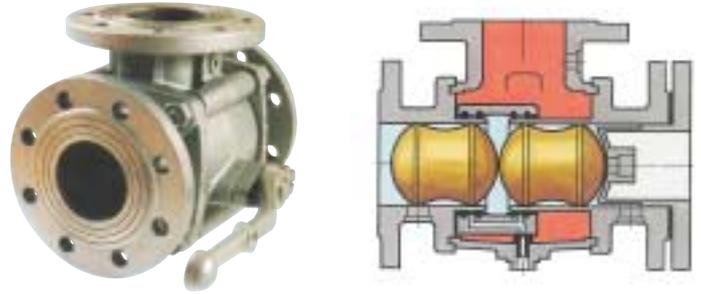
T-sleeve valve T 01

The T-sleeve valve is a highly versatile fitting. It serves as a piggable T-piece, an interlock device and as a pig launching and receiving station. This patented valve is available both as manual (with hand lever) and automatic version (with actuator).

The T-branch can be locked with a sliding sleeve and the straight passage can be pigged pocket-free. The sliding sleeve is simple in operation and the seals are designed to have a long service life.

The T-sleeve valve functions as a pig launching and receiving station when a pig stop insert is installed. This station can be equipped with contamination control and other accessories (pig locators, pig sensors, pressure relief etc.).

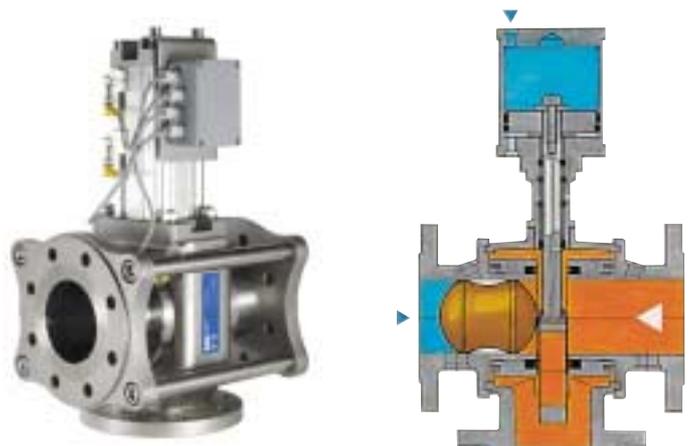
Available diameters: DN 80 - DN 100 (3" - 4")



T-ring valve T 09

The T-ring valve has three functions: Piggable T-piece, product isolation valve and pig stop. It is possible to use it as a single fitting or as a part of a manifold assembly. The T-ring valve is operated automatically. Its straight through passage can be pigged pocket free when the valve is closed. The T-branch is opened by the sliding ring that also serves as pig catcher. Moreover, contamination is avoided by a spring-balanced seal design.

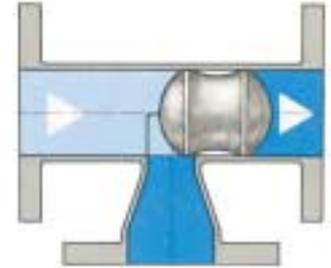
Available diameters: DN 50 - DN 150 (2" - 6")



1.1 T-shape (incl. pig launching and receiving stations)

T-piece T 10

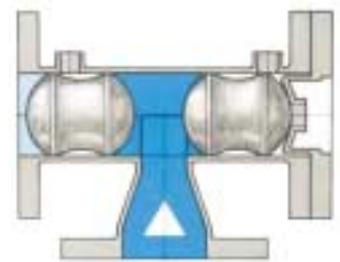
The T-piece is piggable in the straight passage. During the pigging process the special T-branch is completely sealed by the lips of the pig. The fitting can also be equipped with a pig stop that serves as a buffer for one and two pig systems. The T-piece is a welded fitting, especially suitable for non standard designs, inner diameters, heating jackets etc.



Available diameters: DN 25 - DN 300 (1" - 12")

T-piece as pig launching and receiving station T 10.3

This pig station is applicable for one and two pig systems. It can be operated both manually or automatically. It is equipped with a pig stop insert that catches the pig. This insert can be removed for pig change. Sockets for propellant as well as electrical and manual pig sensing can be installed individually. In order to avoid the pig being pulled out of its position due to product turbulence a pig retainer can be mounted.



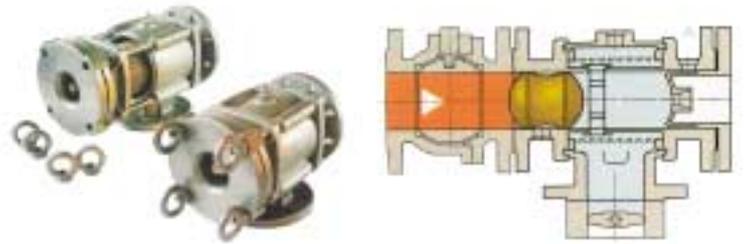
Available diameters: DN 25 - DN 300 (1"-12")

1.1 T-shape (incl. pig launching and receiving stations)

Filter with pig launching and receiving station T 26

This fitting combines the functions of a filter, a piggable T-piece and a pig launching and receiving station. Pigging is possible up to the filter insert. The filter is a reversible-flow filter that can be changed quickly. Moreover, it is available in various mesh sizes.

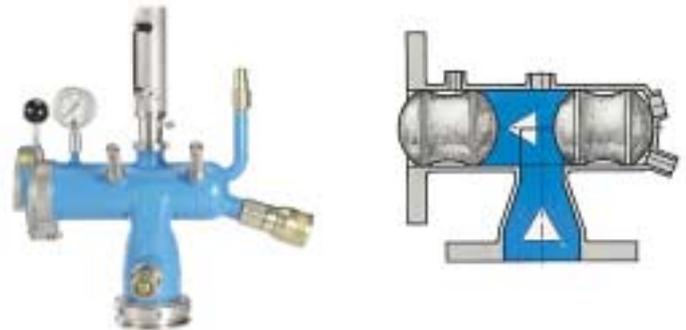
Available diameters: DN 80 - DN 100 (3" - 4")



Pig launching and receiving station T 35 with 90° branch

In principle, this station has the same function as the T 10.3. The difference is that the T 35 has no removable pig stop insert and therefore the station cannot be opened. This has the effect of reduced unpigged volumes. The risk of contamination is reduced. The station has a relatively low weight. This station is often used for hose connections where unloading of the pig is not necessary.

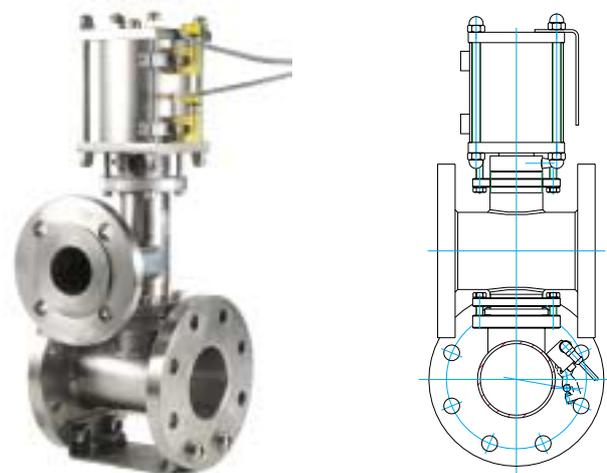
Available diameters: DN 25 - DN 300 (1" - 12")



Plunger valve T 43

The Plunger valve T 43 can dose single product components into the piggable line. The flow in the branch is controlled by a piston. In the closed position the piston closes exactly to the pipe's inner wall and thus leaves a pocket free passage for the pig. The Plunger valve has a double acting pneumatic actuator with spring return so that in case of emergency an immediate closing of the station is guaranteed. The non-piggable branch can easily be cleaned by special rinsing connections.

Available diameters: DN 25 - DN 80 (1" - 3")



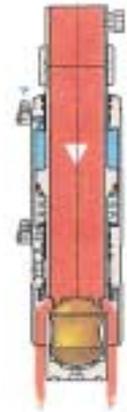
Straight shape

Loading lance T 02 and loading arm T 91

The loading lance is a fitting for application in piggable filling plants. It is mounted at the end of a loading arm and allows pipeline pigging through the complete loading arm. The pig can transport the product into the loading lance or back into the initial source tank.

The fitting is equipped with a level control switch. This enables the product to be transported back to the tank after loading and overfilling of tank trucks or wagons etc. is avoided. Due to the fact that the loading arm is fully piggable, it is possible to fill several different products through the same loading arm. Product flow is controlled by a sliding sleeve installed in the loading lance. This sleeve is operated by instrument air (positions open/closed/throttle). In case of emergency air failure, the loading lance is closed automatically by spring.

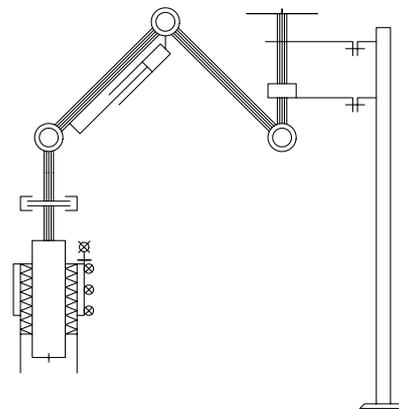
The loading lance achieves optimum function together with the piggable Loading arm t 91. (below)



Piggable Loading arm T 91.

With the loading arm T 91 pigging through the arm into the filling valve is possible. It has large positioning possibilities that can be adapted individually. Special constructions for top level and bottom level filling are possible, as well as a suction device for the filling process. The loading arms are available with mechanical or pneumatic level balancing.

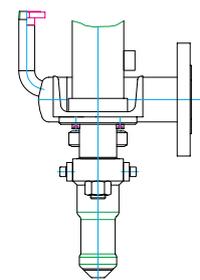
Available diameters: DN 80 - DN 100 (3" - 4")



Loading valve T 50

The loading valve is designed for filling of drums and other containers with a bunghole > 60 mm. The pig pushes the product directly into the filling station. Thus the contents of the non-piggable area are fully drained. The loading valve can handle various filling operations such as top level, bottom level and bottom bunghole filling. This valve design allows a fully automated piggable filling plant to be achieved.

Available diameters: DN 50 - DN 100 (2" - 4")



Straight shape

Pig launching and receiving station T 14

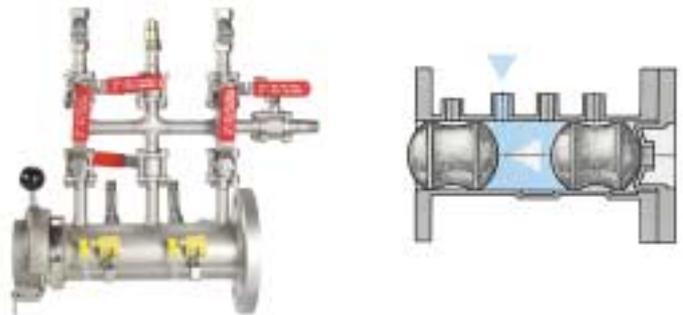
The product can flow straight through this fitting whilst the pig is retained by the internal pig stop ring. It can be applied to both one and two pig systems. In order to rinse the pig the station can be equipped with internal and external bypasses. Thus, it is possible to clean the pig as well as the non piggable area. After the filling and cleaning process the pig is propelled back into the launching station.



Available diameters: DN 25 - DN 300 (1" - 12")

Pig launching and receiving station T 16

This station can also be used for both one and two pig systems. It is equipped with a pig stop insert. Internal and external bypasses can be fitted to allow rinsing/drying of pigs at the end of the pigging sequence. With help of the I.S.T. sliding coupling it is easy to connect the T 16 to the pig loading and unloading station T 29.

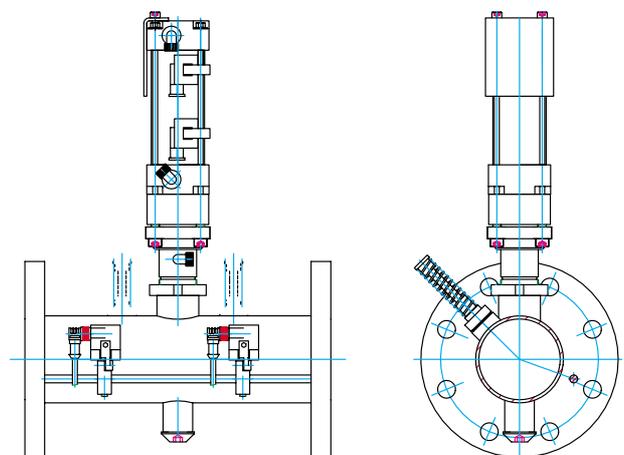


Available diameters: DN 25 - DN 300 (1" - 12")

Pig trap T 17

The pig trap is designed to catch the pig within the pipeline. With this simple fitting the pig can be stopped at any desired position. Thus, it is also possible to pig only parts of the pipeline. It can be applied to both one and two pig systems. It can be operated manually (hand lever), or automatically.

Available diameters: DN 25 - DN 300 (1" - 12")

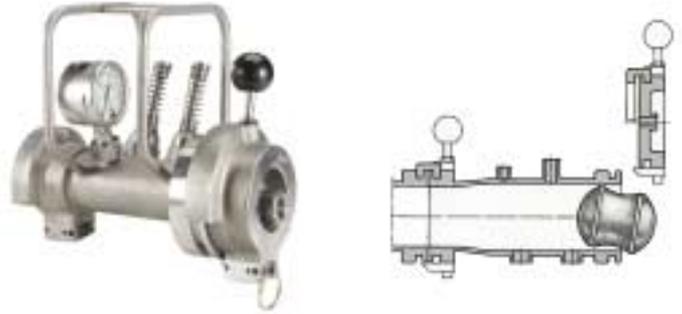


Pig loading and unloading stations

Pig loading and unloading station T 29

This station ensures safe loading and unloading of the pigs. On the loading/unloading side it is equipped with I.S.T. sliding couplings (male and female part) that facilitate a quick and safe unloading. After opening the pig can easily be removed from the oversize section of the station. In order to avoid an unauthorised opening of the station it can be locked mechanically or pneumatically. With special accessories it can be secured by a safety control. The pipeline side can be equipped either with a flange or a female sliding coupling. For safety reasons I.S.T. recommends the use of this station.

Available diameters: DN 25 - DN 300 (1" - 12")

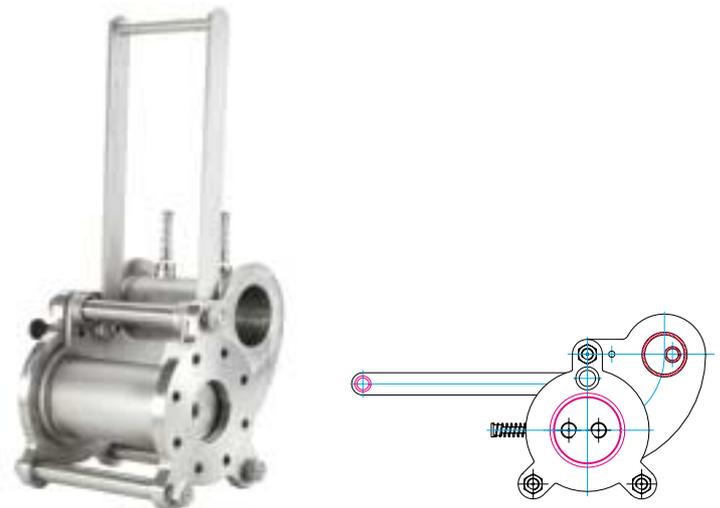


Pig loading and unloading station T 39

With this station the loading and unloading of the pig from a pipe system is also easy, fast and safe. A part of the station can be swivelled out of the pipeline. Thus, a pressure free loading or unloading of the pig is ensured. So the process of pig exchange is made easier and operational errors are avoided.

The pipeline side can be equipped with a flange. For safety reasons I.S.T. recommends the use of this station.

Available diameters: DN 25 - DN 300 (2" - 12")



Three way valves

Three way valve T 41 (cylinder)

This three way valve allows either two or three pipeline routes to be connected. The internal cylinder rotates and locks the desired connection. Due to its shape the valve is almost pocket-free and is therefore successfully used in the chemical and in the paint industry. The T 41 can be operated manually (hand lever), or automatically. In combination with a pig stop insert and a pig sensor the T 41 can also be used for launching and receiving of a pig. Thus the pig can be reversed into another pipeline or driven back into its home station.

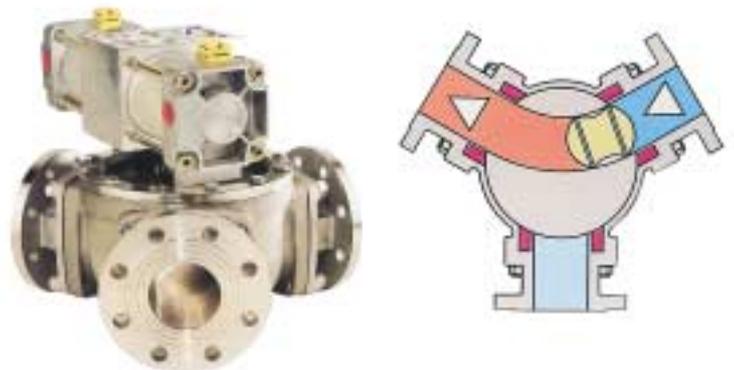
Available diameters: DN 50 - DN 150 (2" - 6")



Three way valve T 42

The three way valve T 42 has the same switching functions as the T 41. The large bend radius through the ball provides an optimum sealing with a small torque for switching. The T 42 can be operated with a lever or by a pneumatic actuator for two or three positions. In combination with a pig stop insert and a pig sensor the T 42 can also be used for launching and receiving of a pig. Thus, the pig can be reversed into another pipeline or driven back into its home station.

Available diameters: DN 50 - DN 100 (2" - 4")



Distribution / Manifolds

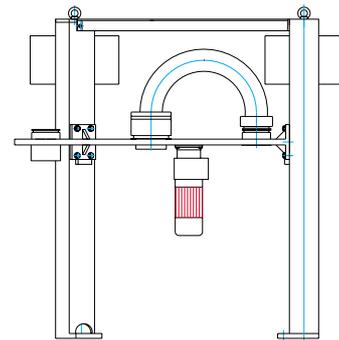
Rotary manifold T 06

The I.S.T. rotary manifold T 06 connects one or two supplies with up to 18 outlets. Thus, for example tank groups, mixers etc, can be interconnected to 1 or 2 filling devices. The fully piggable version of the T 06 allows a pigging process from the tank up to the filling device. The manifold is also available with dry break couplings. These couplings shut both sides of the line after disconnection of the couplings.

The I.S.T. rotary manifolds are available in the following designs:

Connection	Version
1 to 6	manual
1 to 12 or 18	manual / automatic
2 to 12 or 18	automatic

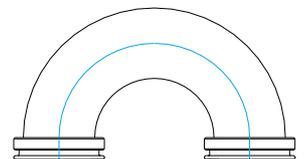
Available diameters: DN 50 - DN 100 (2" - 4")



I.S.T. plug-in manifolds

Plug-in manifold concept, using piggable elbows to connect pipelines together. The connections are made by the patented I.S.T. sliding coupling – uniquely safe and easy to operate.

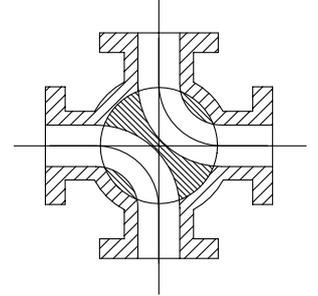
Available diameters: DN 50 - DN 100 (2" - 4")



Distribution / Manifolds

Two / two way valve T 08

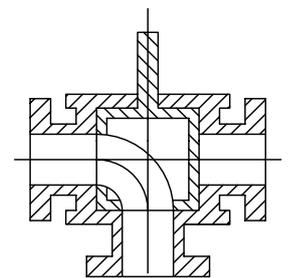
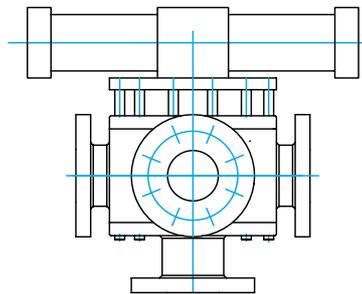
This valve facilitates the diversion of product flows in two directions simultaneously. Thus, different pipelines can be switched and pigged. This fitting can also be used as a piggable pump bypass. In this case the product flow is connected with the pump. After conveying the pig-gable pump bypass is switched on. Its integrated cylinder is pocket free due to the optimum sealing design. Therefore it can especially be used for products that allow no or only minimum contamination. The valve can be switched either manually (with hand lever) or automatically (with actuator). There is no overlapping of ports while switching since all outlets are blocked. In combination with a pig stop insert and a pig sensor the T 08 can also be used for launching and receiving of a pig. Thus, the pig can be reversed into another pipeline.



Available diameters: DN 50 - DN 100 (2" - 4")

1 to 4 manifold T 51

This manifold is suitable for smaller distributions. 4 supplies which are arranged radially can be connected to a central outlet. Thus an easy and cost effective distribution is facilitated. This manifold is based on the sealing principle of the T 41 (cylindrical form). Due to the fully pig-gable and pocket free design the possibility of contamination is virtually eliminated. A pneumatic four position actuator rotates the valve to any of the desired connections.



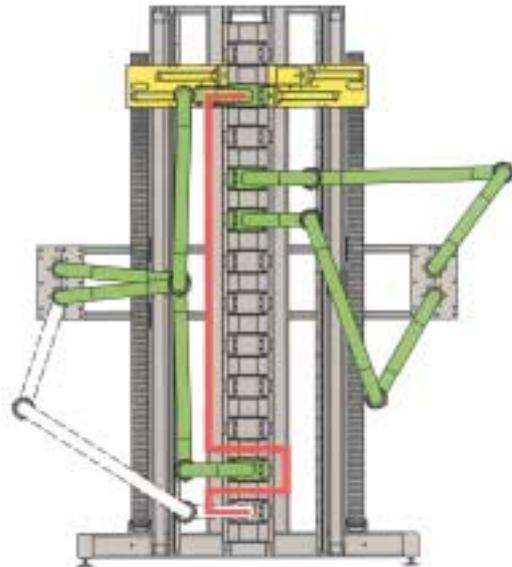
Available diameters: DN 50 - DN 80 (2" - 3")

Distribution / Manifolds

Modular multi direction manifold T 54

This piggable pipeline manifold connects 12 inlets to max. 4 outlets. 4 products can be conveyed simultaneously and completely through the manifold. All coupled connections are equipped with safety devices. The distribution is done with 4 movable joint arms that are connected to 12 fixed pipeline connections. The jointed arm is picked up by a slide and is then driven to the desired position. Integrity of coupling and uncoupling is ensured by the use of pneumatic cylinders. All connections are coupled in parallel and are equipped with safety devices. The manifold is of modular construction and thus facilitates various options of installation. For safety reasons unused pipeline inlets are locked with a blind coupling. Thus, an unwanted product or pig escape is avoided. The manifold is designed for automatic operation and the control system is an integral part of our supply. With a special coding system the position of the jointed arms is continually monitored by the control system. The operation of the manifold is done via keyboard and monitor. This programme can control the manifold as well as the fully automated pigging system. A structured menu facilitates an easy operation. It is also possible to integrate a local hand control for start up and maintenance purposes.

Available diameters : DN 50 - DN 100 (2" - 4")

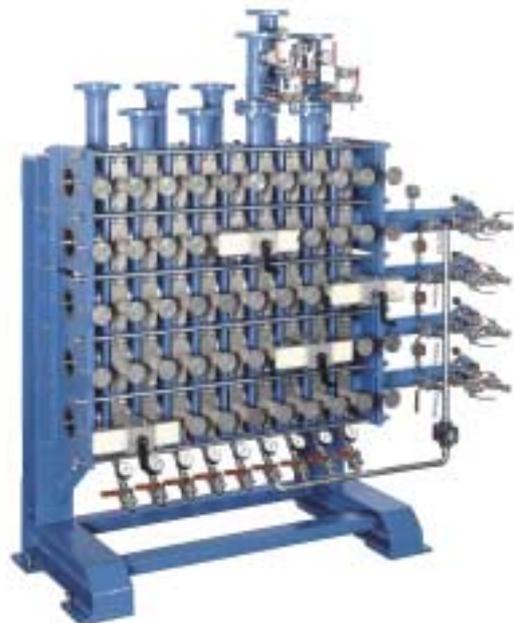
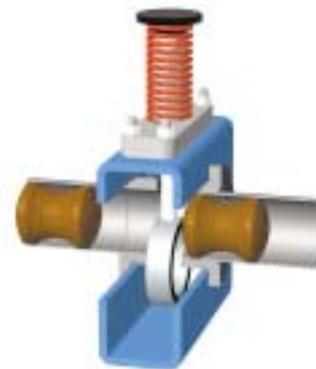


Distribution / Manifolds

I.S.T. Full system manifold T 57

This is the first manifold which allows pipelines of different nominal diameters to be combined in a single design (DN 50, 80 and 100). The system is closed and piggable on one side. The full system section consists of non-piggable rectangular ducts for product feed. At right angles to these ducts are the piggable pipelines which are connected at the intersection by means of a ring valve principle. This ring valve opens the connection from the product feed duct to the piggable part of the manifold. The valve also acts as a pig receiving station. The respective ring valves are opened by a manual or pneumatic actuating unit. The actuating unit moves in a direction parallel to the piggable pipeline, and is stopped at the ring valve to be opened. This means that only one actuating unit per piggable pipeline is required. Cost effective software and interlocking devices are thus reduced to a minimum. The small shut-off unit makes the manifold very compact. All dynamic seals are exchangeable within minutes. The T 57 makes it possible to connect and distribute up to 50 feed pipelines to as many as 20 pigging pipelines in a single module. All filling and pigging processes are effected in parallel. The manifold can open and close the connections independently of each other. Transfer pumping from tank to tank or from pigging line into pigging line is also possible with the corresponding switch processes. This unique manifold design provides a very compact and low cost solution with minimal maintenance.

Available diameters: DN 50 - DN 100 (2" - 4")
(others on request)



Pigs

I.S.T. has more than 25 years experience in the design and development of pigs for pipeline cleaning. I.S.T. pigs are manufactured in various designs and materials to suit individual customer requirements. In principle, if a product can be pumped then it can also be pigged: Lube oils, aggressive chemicals, toiletries, cosmetics, pastes and foodstuffs. In special cases even granulates, powders etc., can also be pigged. Outlined below are the various pig designs available from I.S.T.



I.S.T. Duo-pig

The I.S.T. Duo-pig is used universally due to its form and the wide variety of elastomers. It can be made from AU, FKM, EPDM, NBR etc. It is robust and simple to handle. With the design of certain pig launch/receive stations, the pig itself can be rinsed in place. Pig removal is not required for this cleaning function. The pig can be detected in the stations or in the pipeline due to its integrated magnet. For manual systems the Duo-pig can also be supplied without a magnet. In this case it would be detected with manual pig locators.



Available diameters: DN 25 - DN 150 (1" - 6")
On request also up to DN 300 (12")

I.S.T. Duo lip pig

Due to its flexible sealing lips the I.S.T. Duo lip pig ensures optimum sealing. Even with inferior quality pipelines it provides excellent operational characteristics. It is also available with or without magnet. The body of this pig is manufactured from polyurethane (AU) - foamed or solid and the seal lips are non-abrasive solid polyurethane.

Available diameters: DN 50 - DN 200 (2" - 8")



Pigs

I.S.T. Duo lip pig with replaceable lips

The I.S.T. Duo lip pig with replaceable lips is a special type of Duo lip pig that has been designed especially for handling aggressive media. The advantage of this pig is that the seal lips can be replaced separately. The body of this pig is manufactured from a chemical resistant thermoplast such as PA 6 or PVDF. The replaceable sealing lips are typically manufactured from non-abrasive polyurethane or FKM (Viton). In most cases the Duo lip pig with replaceable lips is supplied with integrated magnet.

Available diameters: DN 50 - DN 300 (2" - 12")



I.S.T. jet pig

The I.S.T. jet pig is used for pigging granulates and powders. Used regularly it prevents the formation of residual material. The body of this pig is manufactured from polyurethane (AU) - foamed or solid and the seal lips are non-abrasive solid polyurethane. The jet pig is available with or without integrated magnet.

Available diameters: DN 25 - DN 150 (1" - 6")

On request also up to DN 300 (12")



I.S.T. special pigs

In addition to the above pigs I.S.T. also designs pigs for special applications (e. g. brush pigs, pigs with more sealing lips or pig forms designed for systems outside our standard product range).

Available diameters: on request



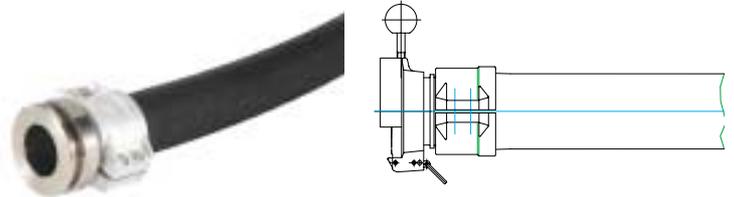
I.S.T. pigs are only sold together with our pigging systems

Connection elements

Piggable hoses T 99

Piggable hoses are available in different materials for different products as lubeoils, chemicals, food etc. The professional mounting of the steel/stainless steel coupling flanges or swivel joints ensures the highest flexibility and safety. Examples of the use of piggable hoses are distribution to different connecting points and changing distances and flexible connections into tank trucks etc.

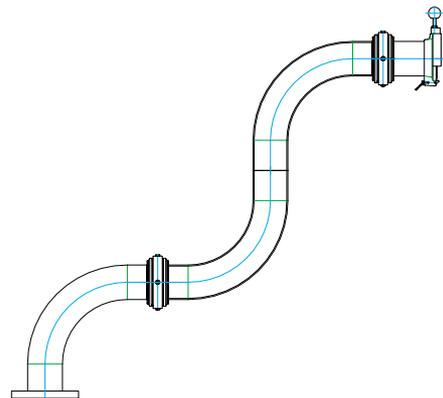
Available diameters: DN 50 - DN 100 (2" - 4")



Swivel arm T 04

With the I.S.T. swivel arm variable piggable connections can be produced. With matching couplings, connections between pipeline connections and tank trucks or movable tanks etc. are possible.

Available diameters: DN 50 - DN 100 (2" - 4")

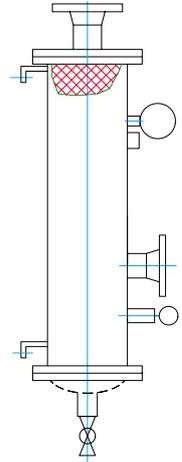


Accessories

Pressure relief vessel T 20

The pressure relief vessel is used for the safe venting and filtering of pig propellant (compressed air, nitrogen etc.) and collection of residual contaminate. The T 20 is equipped with a demister that separates contaminates and pig propellant. The volume of the residual contaminate is monitored by a level control switch allowing it to be disposed of as required.

The pressure relief vessel is available with a volume of 60 and 100 litres with optional heating-jacket.

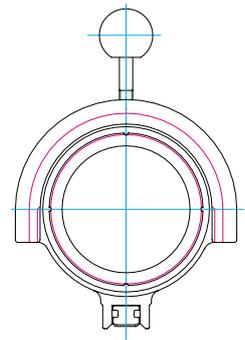


I.S.T. Sliding coupling T 27

With the piggable I.S.T. sliding coupling the coupling of hoses or pipeline connections is made easier. Two coupling halves slide on each other until they are locked. Both coupling parts are sealed by an O-ring that lies in a special groove. The protected locking device ensures a safe closure of the coupled halves.

The coupling system can be built with an integral coding system. Thus each coupled connection can be monitored by a control unit so that operational errors are avoided.

Available diameters: DN 50 - DN 100 (2" - 4")



Accessories

Pig sensor, manual pig locator T 31

In order to locate the pigs in the pipeline or in the pigging stations I.S.T. has developed various special pig sensors. In automated systems the pig is equipped with an integrated magnet. The field of this magnet is sensed by a special magnetic field switch. For welded stainless steel stations these sensors are fixed to an externally mounted rod with a special clamp. This allows the sensor to detect the pig through the pipe wall. In cast fittings other sensors are screwed into a housing. I.S.T. also offers electromechanic devices for location of pig without magnet.

For high temperature areas special sensors are also available.

All pig sensors are available for EX and NON-EX areas.

Pigging stations can also be equipped with manual pig locators. With this type of device a tapet is manually pressed into the station to check for the presence of the pig. A spring ensures the locator returns and does not protrude into the pipe when it is released.

I.S.T. also offers a mobile pen shaped magnetic field detector which allows the pig to be detected throughout the pipeline. This method is only applicable for stainless steel pipelines.



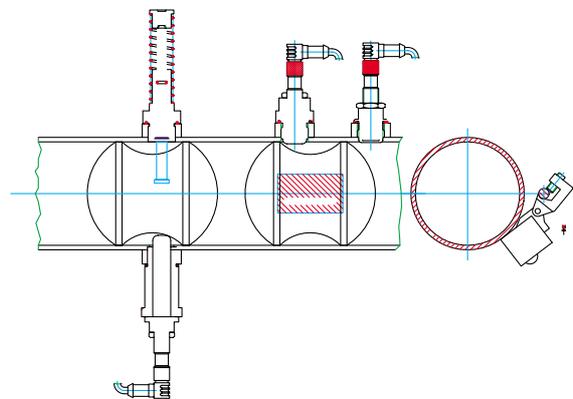
electromagnetic

electromagnetic



electromechanic

mechanic



mobile pig sensor

Accessories

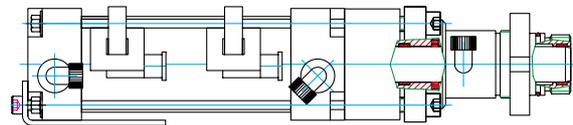
Pig stop and pig retainer T 32

The pig stop catches the pig in the T-stations. This allows the pig to be used as a closure device.

The pig retainer is designed to hold the pig in the launching or receiving station. It prevents the pig from being pulled out of its home position and into the pipeline.

The operation of the pig stop and the pig retainer can be done manually (with hand lever up to DN 100 / 4") or automatically (with actuator).

Available for diameters: DN 25 - DN 300 (1" - 12")



Swivel joint T 33

The piggable swivel joint T 33 is a component that allows axial rotations into a piping system and thus facilitates a greater flexibility. Swivel joints can make the handling of piggable hoses easier.

Available diameters: DN 50 - DN 100 (2" - 4")



Welding ring T 34

Piggable pipelines have to be installed without any misalignment. To ensure correct alignment of a pipeline, I.S.T. recommend the use of welding rings. These rings provide an externally welded sleeve joint which eliminates the need for a full penetration weld and keeps the internal surface of the pipeline weld free.

Available diameters: DN 50 - DN 300 (2" - 12")



Accessories

Inline Blender T45

This dynamic multicomponent blender has been designed for the continuous mixing of 2-9 components. In the standard version it is possible to achieve a flow rate of 60 m³/h with a blending chamber volume of 60 l. Its special construction allows the direct mounting of standard dosing valves to ensure a simultaneous supply of all components. The locking cones of the dosing valves open into the interior of the blending chamber, and when closed are a flush fit with the inside surface of the blender. Control of the volume of the various mixing products is usually done through flow meters with pulse transmitters in connection with pneumatically operated control valves. The blending proportions are done through the control unit. The combination of I.S.T. Inline Blender and automatic control guarantees an accurate and consistent mixing result. Despite the varied flowpath of the components in the blending chamber the quality of the final blend is unaffected. Even products with very high and very low viscosity can be mixed together into a homogeneous product. Although the mixing time in the blender is relatively short, the mixed product is to exact specification from beginning to end of the operation. The liquid/liquid blending operation of the I.S.T. Inline Blender is an answer to the requirement of a continuous process operation which is easier controlled and automated than conventional batch blending operation.

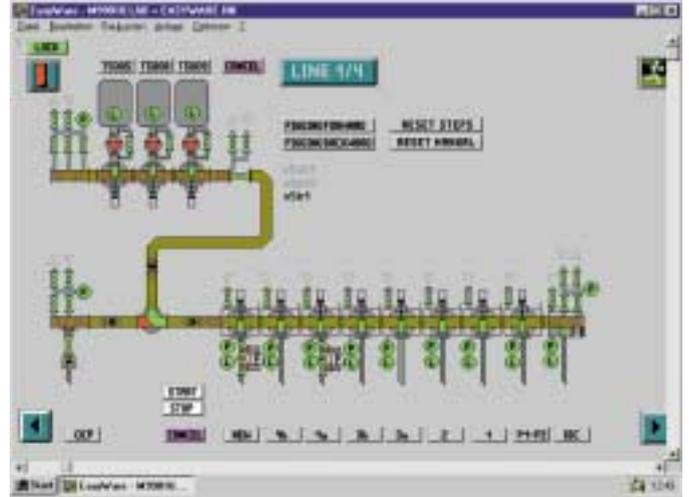
The excellent blending results show the effect of this unique technology.



Accessories

Control system T 48

Automated pigging systems need a control system for the control of the various steps of the pigging operation. This is effected by an "SPS" (stored programme system), which is often known to as a PLC controlled system. The status of all stations and the position of the pigs can be controlled throughout the whole plant operational process/procedure. The single elements of the pigging system can be connected to the control unit either conventionally or via a bus system. When programming the control system the knowledge of the programmers is most important in order to ensure a smooth pigging process. I.S.T. has more than 25 years experience in the development of automated process control.



Piggable pipes and elbows

I.S.T. applies strict standards with regard to the production of piggable pipes and elbows since the quality of these parts has a high influence on the pigging result. Pipe tolerances, ovality, surface quality, material thickness and the quality of the welded seams are the most important parameters. Piggable elbows are produced by a special method so that the roundness discrepancies are kept within small tolerances. For the different applications I.S.T. offers a wide range of pipes and elbows. All parts are available for the application in the chemical industry according to DIN 2430.



Available diameters: DN 25 - 300 (1" - 12")

Accessories

Measuring instruments T 92

For the control of pressure, filling level of liquids, volume flow etc. I.S.T. offers a wide range of special measuring instruments for pigging systems



Air pressure booster T 97

For all pneumatically actuated piggable fittings a certain compressed air supply is necessary. If this pressure is not available the air pressure booster can be used. This pump works with a pressure multiplication of 1 : 2 and is supplied completely with a pressure tank.



I.S.T. Service

The supply of individual components alone will not guarantee the correct function of a pigging system. For optimum results it is very important to utilise the experienced engineering support and services which I.S.T. staff can provide.

Engineering

In the planning phase for a pigging system experience, co-operation and innovation are highly important factors for a successful end result. I.S.T. offers a complete planning and project engineering service for pigging systems from conception to final design.



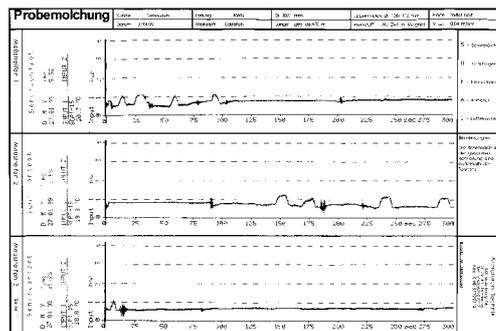
Site supervision service

Experienced engineering support during installation, commissioning and final hand-over is a critical factor. I.S.T. offers multi-disciplined engineering services to cover all aspects of a project.



Test pigging

Test pigging allows new and existing lines to be tested to confirm suitability for pigging. All pipe joints, elbows, welded seams are tested to identify any problem areas.



I.S.T. Service

Training

To ensure optimal understanding of design concepts, operational requirements, maintenance and safety issues, I.S.T. recommend that all personnel are trained accordingly. Centres are offered by I.S.T. for this purpose either at customer's premises or at Hamburg Head Office.



Repair and maintenance

All I.S.T. pigging components are made from long wearing materials. However, certain maintenance work will obviously be necessary. For exchange of seals and any other elements our experienced technicians are at your disposal; either for an exchange at I.S.T. in Hamburg or at your premises. Regular maintenance by I.S.T. personnel will ensure a continuous operation and avoids downtimes. Should there, however, be any "emergency" the flexible I.S.T. team will always be at your disposal to solve any problems at site.



Technical support

For any questions regarding pigging systems you can benefit from our technical support – by phone or personally. Be it for a planned or an existing pigging system, our experts will support you in word and deed.

