

GF Piping Systems

+GF+

Application Solutions Made Easy

Chemical Process Industry



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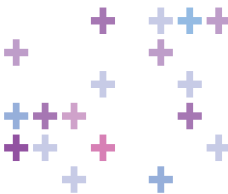
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Active Market Segments



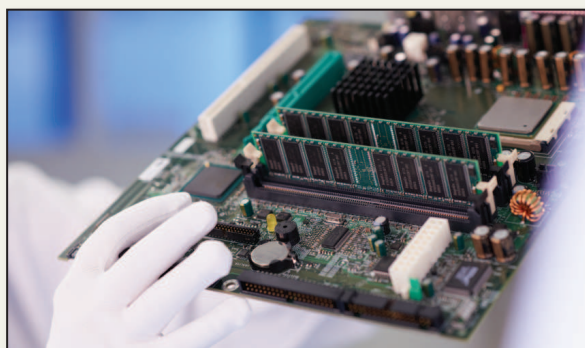
Building Technology



Water Treatment



Chemical Process Industry



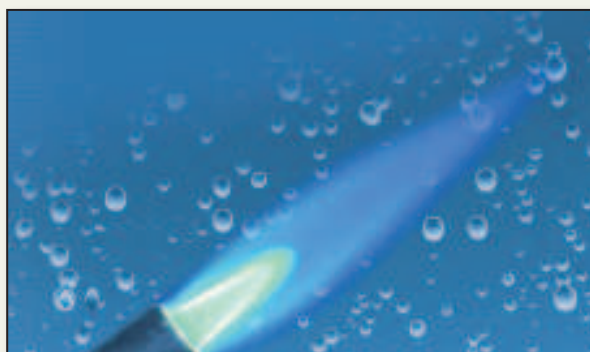
Microelectronics



Marine



Cooling



Water & Gas

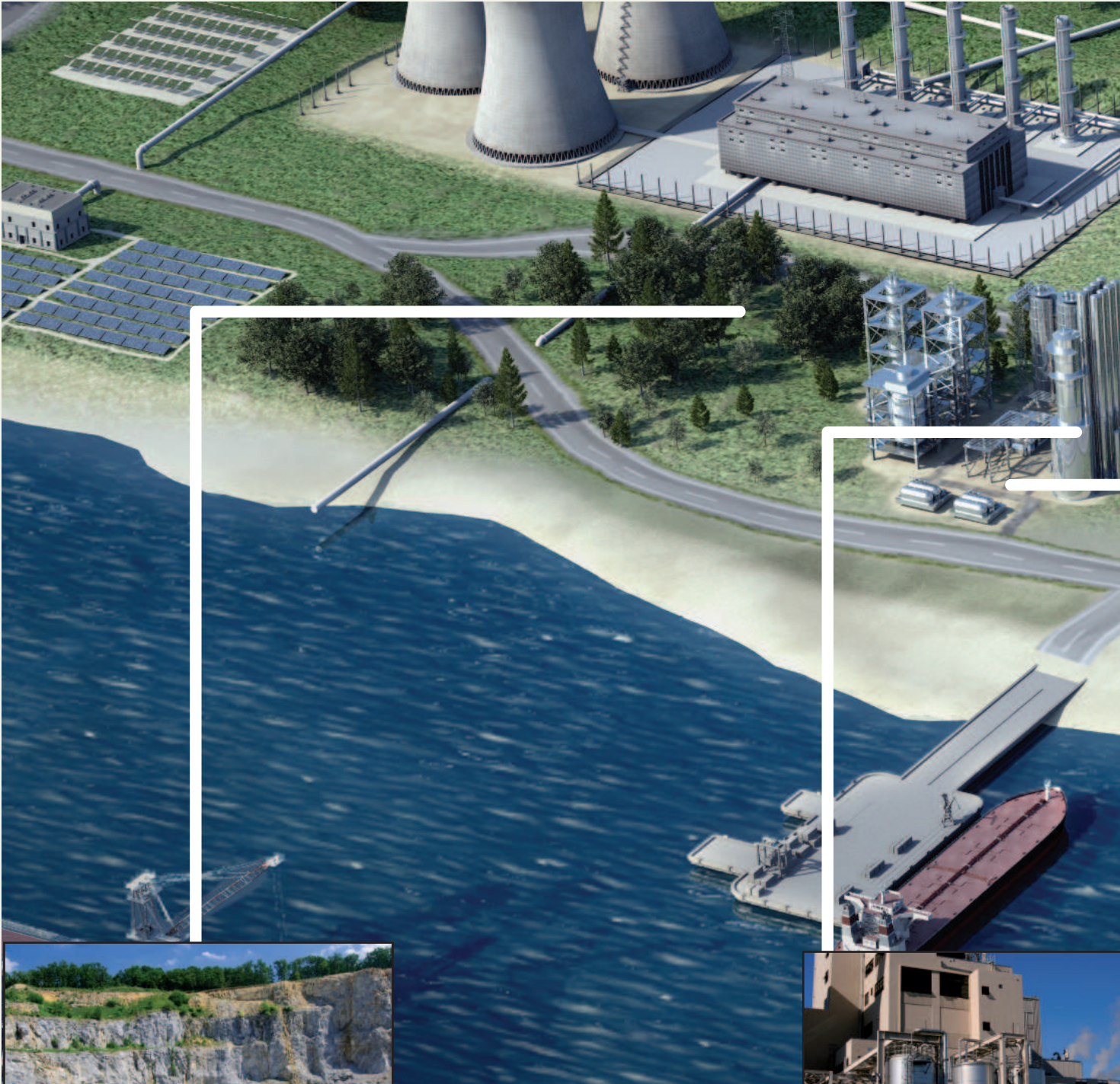


Energy



Market Segment

Chemical Process Industry

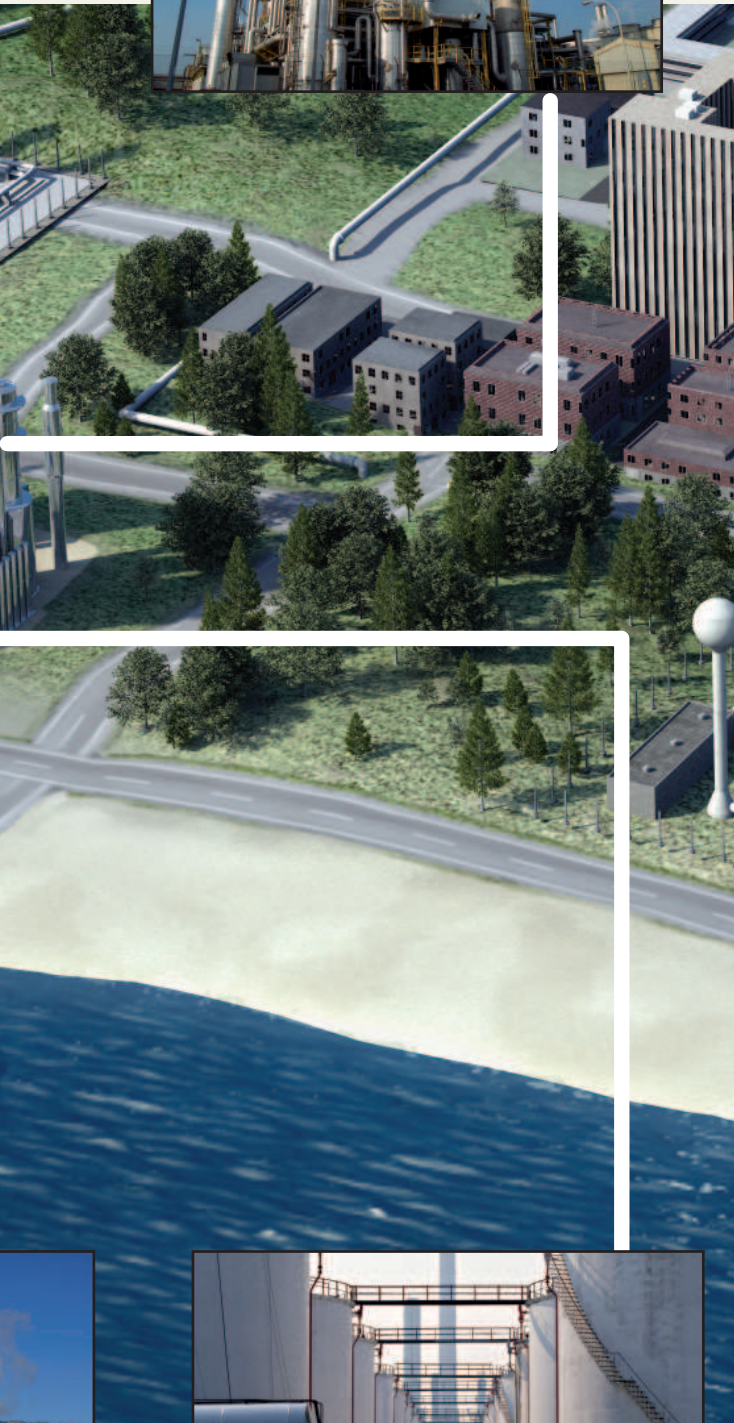


Mining



Metal and Surface Finishing

Chemical Production



Chemical Distribution

Overview

GF Piping Systems steps up to this challenge with a comprehensive system offering of pipes, fittings, valves as well as an optimally adapted selection of components for measurement and control technology. Our customer focus is on Chemical Production, Chemical Distribution, Surface Treatment and Mining. We continually set ourselves new goals on the path to perfect global customer service in a complex market.

We have a solution to meet your application needs.

Depending on the application area, our customers have to face different challenges in water treatment processes ranging from guaranteeing high water qualities, to providing reliable measurements to assuring stringent regulations. This is where GF products are positioned to accommodate the automation market by offering a wide range of valves, pipes, fittings, and measurement and control options to suit the most popular industrial applications.

GF offers product measurement solutions ranging from:

- Flow
- pH/ORP
- Conductivity/Resistivity
- Temperature
- Pressure
- Level
- Chlorine
- Turbidity
- Dissolved Oxygen

Application Areas

Mining

Products and applications from GF Piping Systems fulfill the highest expectations in the harsh environment of mining

Modern-day mining requires innovative products and solutions because of the degree of automation and mechanization and the rising pressure of costs. GF Piping Systems offers innovative and efficient solutions targeted to specific applications and for each application we have exactly the right jointing technology. Measurement and control devices for simple installations to networked control or pump systems round off our product offering. This significantly cuts down on installation and maintenance time.

Signet products and applications fulfill highest quality standards, successfully facing the aggressive and harsh environment of mining. Longevity, operating as well as economic efficiency and safe media conveyance can be guaranteed where traditional plastic solutions are failing due to chemical attack.



Cyanide Destruction - Two-Step

Cooling Tower

Bulk Transportation

Boilers

Chemical Injection



Application Areas

Chemical Production

Plastic piping systems from GF Piping systems afford the greatest possible degree of safety and efficiency

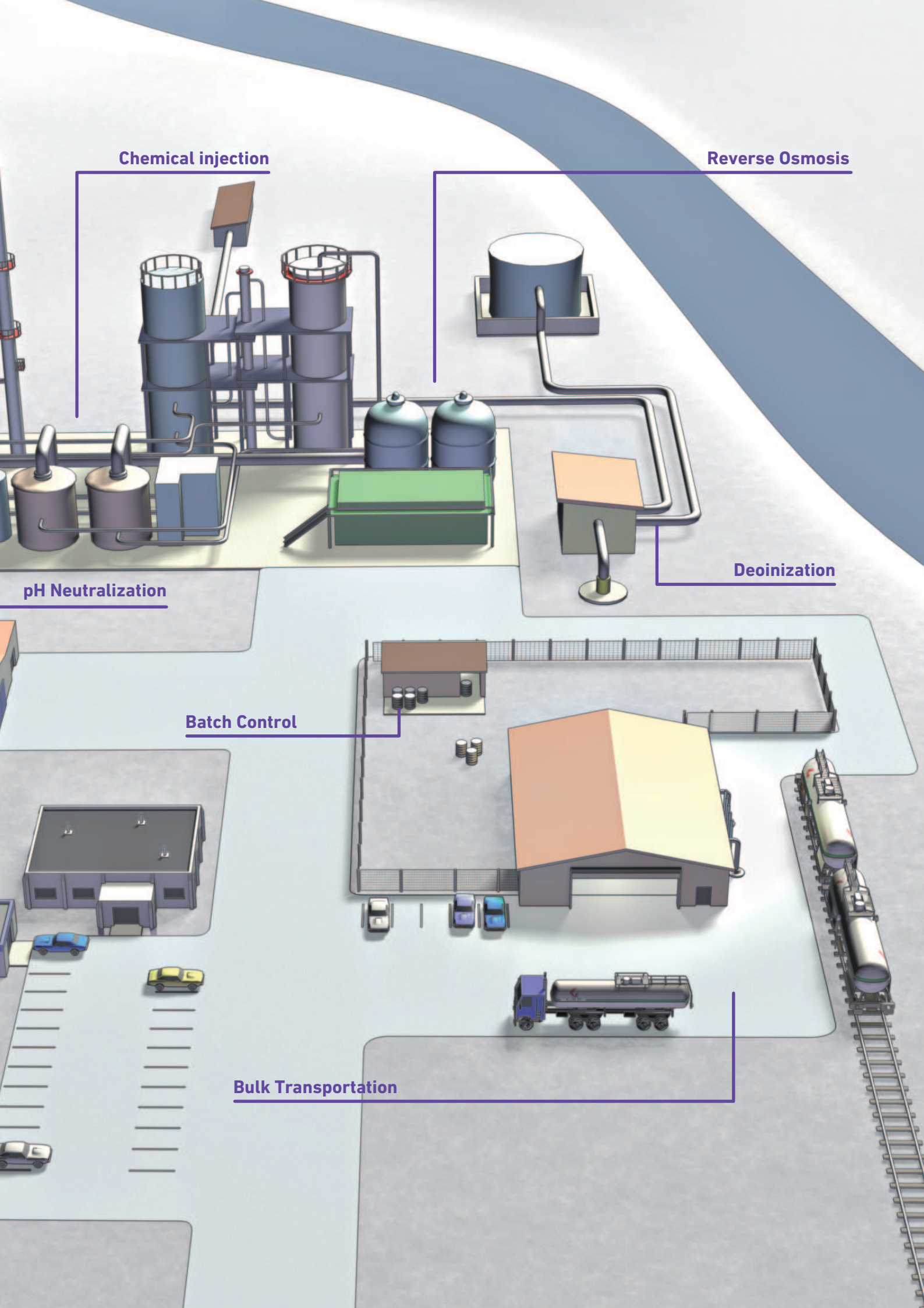
Many of the chemicals we use daily are manufactured with the help of Georg Fischer products. The production of chemicals contributes to and safeguards our comfortable lifestyle, our health and our nutrition.

The systems in chemical production are subjected to extreme conditions. Aggressive substances need to be transported and processed, which places high demands on the systems in regard to safety, efficiency and maintenance. Besides being very reliable, these need to afford safety and efficiency, as well as maximum corrosion protection. Georg Fischer offers Signet sensors and instrumentation to measure flow, pH, conductivity, as well as other parameters to ensure the quality of the chemical production processes. Using our measurement and control components assures our customers optimal control of production processes, a reduction of operating costs and less downtime.

Because GF products satisfy the most stringent criteria of legislators and the chemical industry in all the main application areas, GF Piping Systems makes a significant contribution to progress and securing the future globally. Customers are invited to consult with our specialists on site to determine where our products can best be used.

Fume Scrubbing

Water Treatment



Application Areas

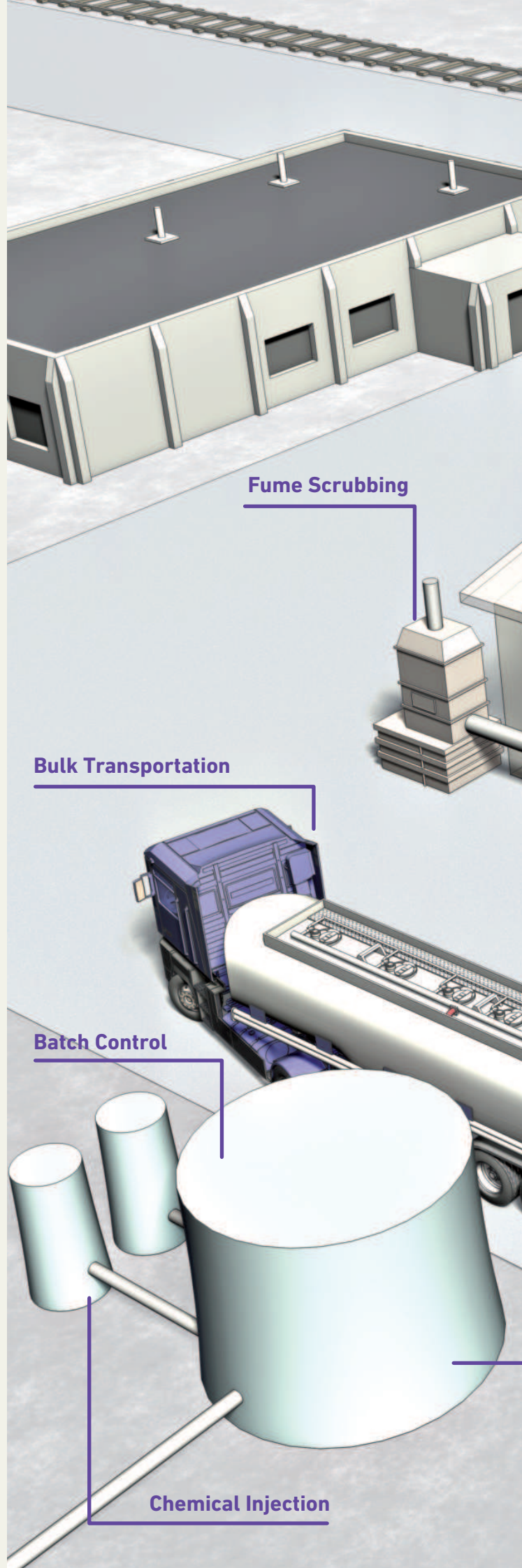
Chemical Distribution

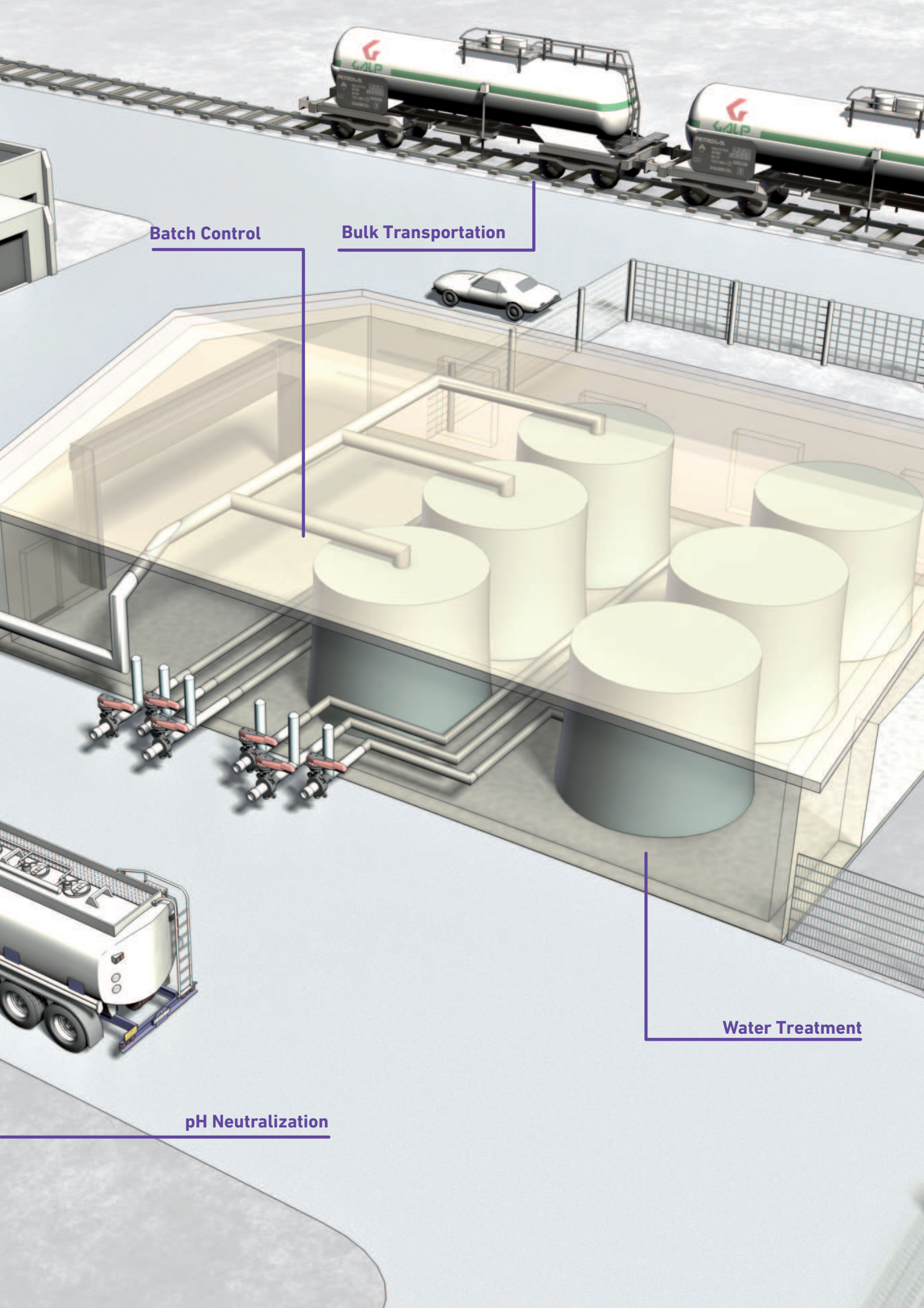
System solutions from GF Piping Systems comply with the highest safety standards worldwide

In the chemical distribution business, the highest product quality and a maximum of process reliability is an absolute must because chemical media are transported in diverse concentrations and dosages. Transporting chemicals from their storage place to the actual process application must be planned and carried out reliably and safely. This means the materials used in the piping system must be one hundred percent compatible with the properties of the chemicals.

Whether a manufacturing facility receives deliveries of large liquid supplies or distributes liquids to customers, the fluid is transported, in bulk, via large tanker trucks, railroad cars, drums, etc. These liquids are usually tightly controlled and filling or emptying the bulk container can be closely monitored using GF Signet flow sensors and instruments.

Choosing the most suitable piping system, including automation technology, allows us not only to increase productivity and reduce maintenance costs, but also to realize a significant improvement in product quality for our customers. The products supplied by GF Piping Systems meet these stringent specifications regarding chemical resistance, temperature, pressure, optimal quality and safety. GF Piping Systems is a reliable partner for safe and cost-efficient chemical distribution. By request our specialist teams will consult with our customers on site to find the best possible solution for the individual operation and setting.





Batch Control

Bulk Transportation

Water Treatment

pH Neutralization

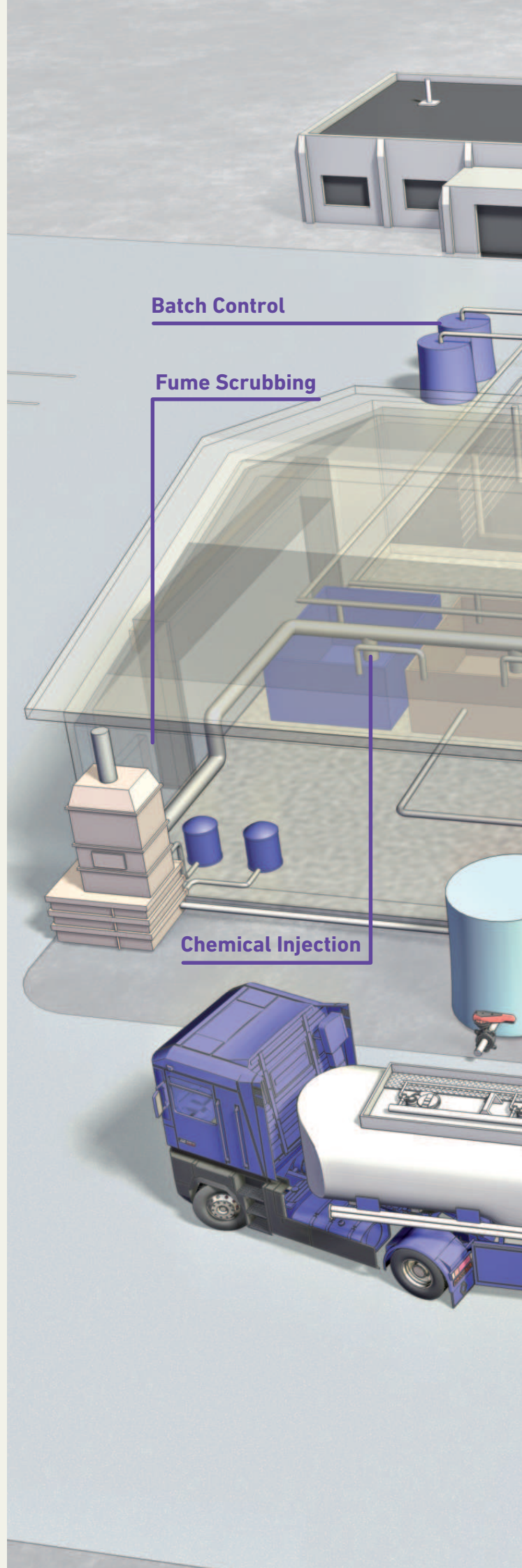
Application Areas

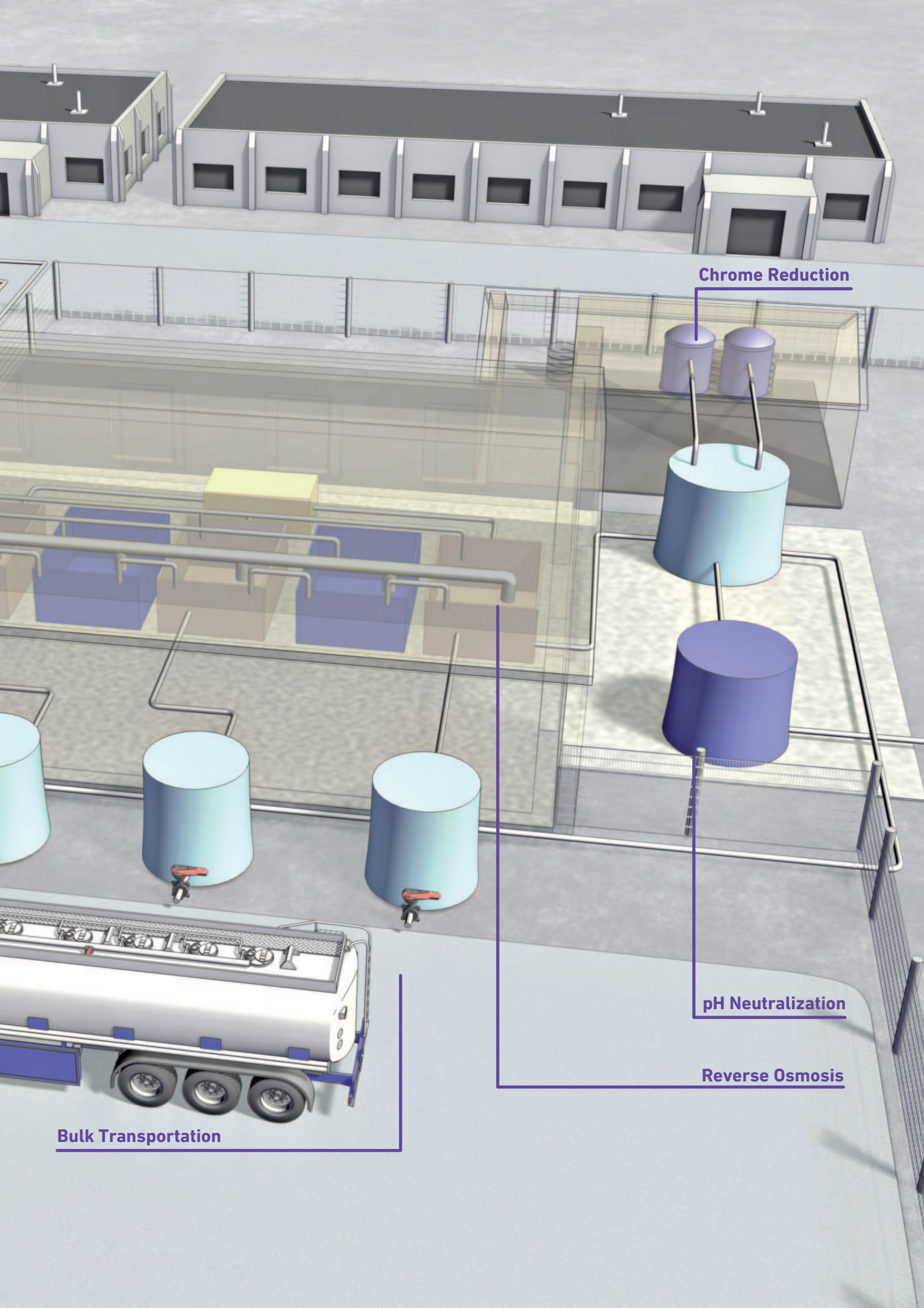
Metal and Surface Finishing

A discerning market that demands the highest level of quality and absolutely reliable products

The surface of an object is its interface to the environment and decisive for chemical, physical and corrosive resistance. To be completely certain that a product complies with their standards and requirements, a customer will often need to treat the surfaces of its products. The main techniques used in surface treatment are electroplating, strip coating and hot-dip galvanizing. Due to the fact that our products meet the most stringent requirements, GF Piping Systems is in a position to offer complete solutions for the surface treatment industry.

The use of measurement and control technology from GF Piping Systems enables our customers to improve quality, safety and profitability. Automating process control provides a maximum of operational safety without additional maintenance efforts. For example, by installing the respective sensors from GF Piping Systems, controlling the chemical feed lines during electroplating is no longer a problem.





Chrome Reduction

pH Neutralization

Reverse Osmosis

Bulk Transportation

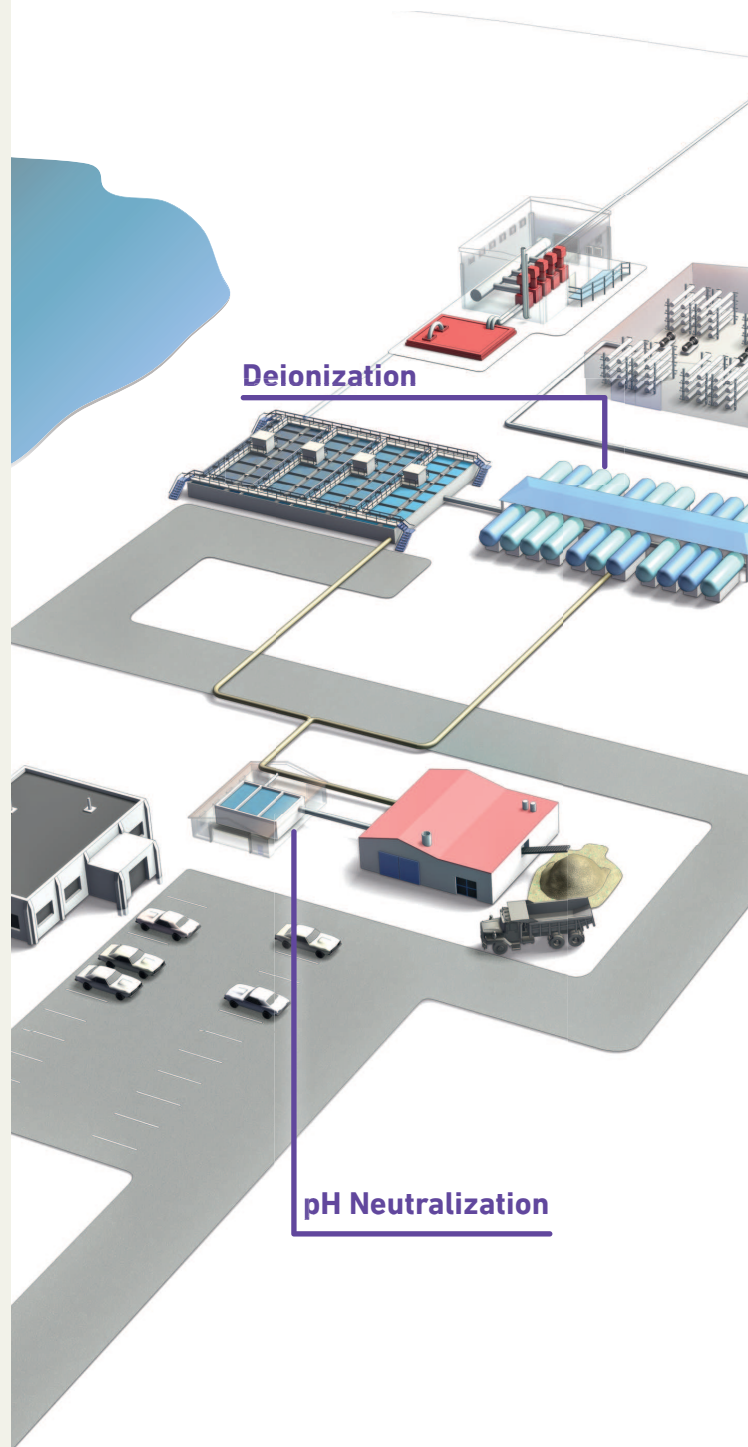
Application Areas

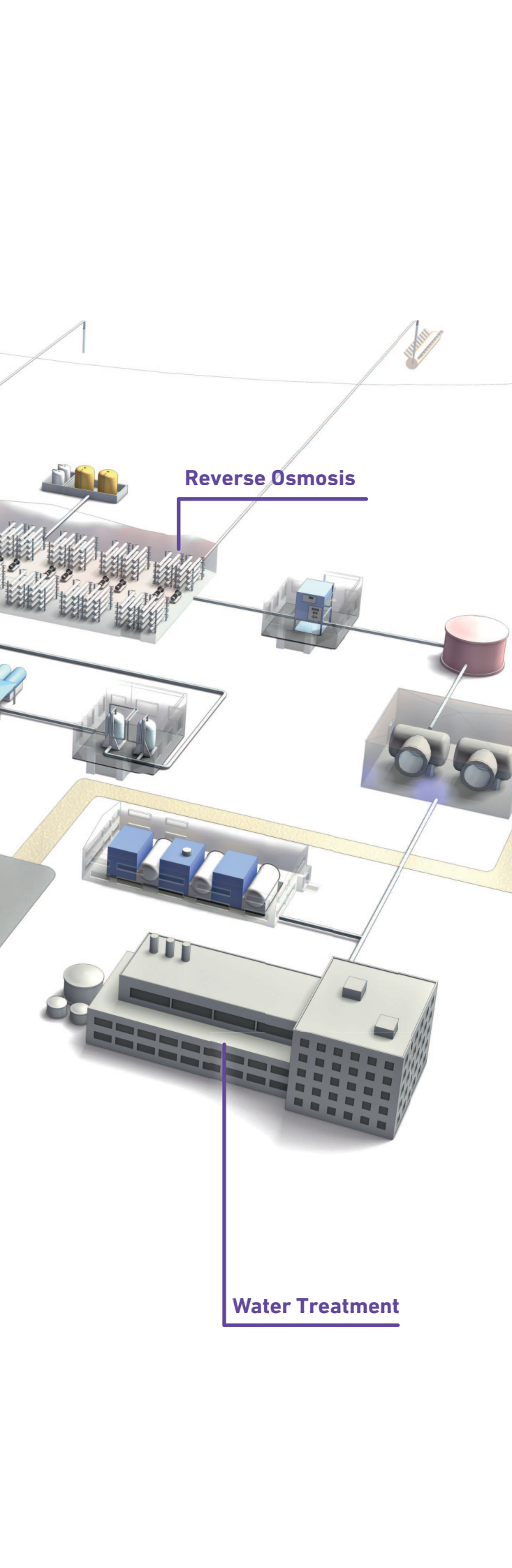
Industrial Process Water

Long lasting solutions with a focus on high water quality and purity

Water is an essential and indispensable element in nearly all industrial processes. In sectors such as food and beverage or pharmaceutical production, water is either used as a primary product or in the area of cooling, steam generation or boiler feed systems. Using water in the industrial environment requires consistently high water quality, namely precisely defined physical parameters like ion purity, acidity or conductivity.

High water quality in terms of purity for feed boilers, production processes and cooling systems is the key requirement and an absolute necessity for industry today. Avoiding any form of contamination, scale formation and corrosion is achieved through applications such as deionization, electrodialysis and new membrane-based solutions. The plastic products and additional technologies provided by GF Piping Systems Signet product line, supports the industry in designing an efficient, reliable and cost effective water treatment system. Signet instrumentation technologies warrant a long service life, regardless of how challenging the specific needs for pure industrial process water may be.





Application Areas

Industrial Wastewater Treatment

Cost effective solutions from GF Piping systems for safety conveying corrosive fluids even at elevated temperatures

Power plants, petrochemical complexes, steel mills, or processing facilities and many other water intensive industries are increasingly forced by authorities to clean their wastewater before disposal into rivers and lakes.

Wastewater treatment plans for inorganic caustics and acids are small chemical plants themselves. Corrosion resistance and staff safety are the top priority issues for waste containing piping systems. GF Piping Systems' philosophy for safe transport of liquids and gases meets these advanced process needs. GF products are designed for a maximum of uptime reliability and maintenance simplicity and a minimum of energy consumption during operation.

Batch Control

Production batch control includes combining specific volumes of one, two, or more injection liquids into a batch tank where a chemical reaction occurs. This reaction can be measured and controlled by pH. Once a final pH value has been reached in the batch tank, the finished product can continue to the next stage of production. A good understanding of the batch liquids, chemical reactions, flow rates into the tank, volumes added and pH control is critical in understanding how to best serve the needs of the batch process.

For instance, plating baths operate at various pH levels. The acid, caustic or ammonia concentration could be automatically controlled bath using an online pH system. Adjustments are made based on the current pH, the volume of the tank, and the strength of the reagent to bring the tank back to its nominal operating concentration. Using a batch control instrument with each injection liquid tank will enable users to add the appropriate amount of liquid to make the correct adjustments to the batch tank.

Signet Measurement and control products offer ideal solutions in Batch Applications:

1. Track the volume of batching liquids being used. Measure the volume of final product being dispensed from the batch tank.
2. Adjust and control pH levels in the batch tanks.



Instruments

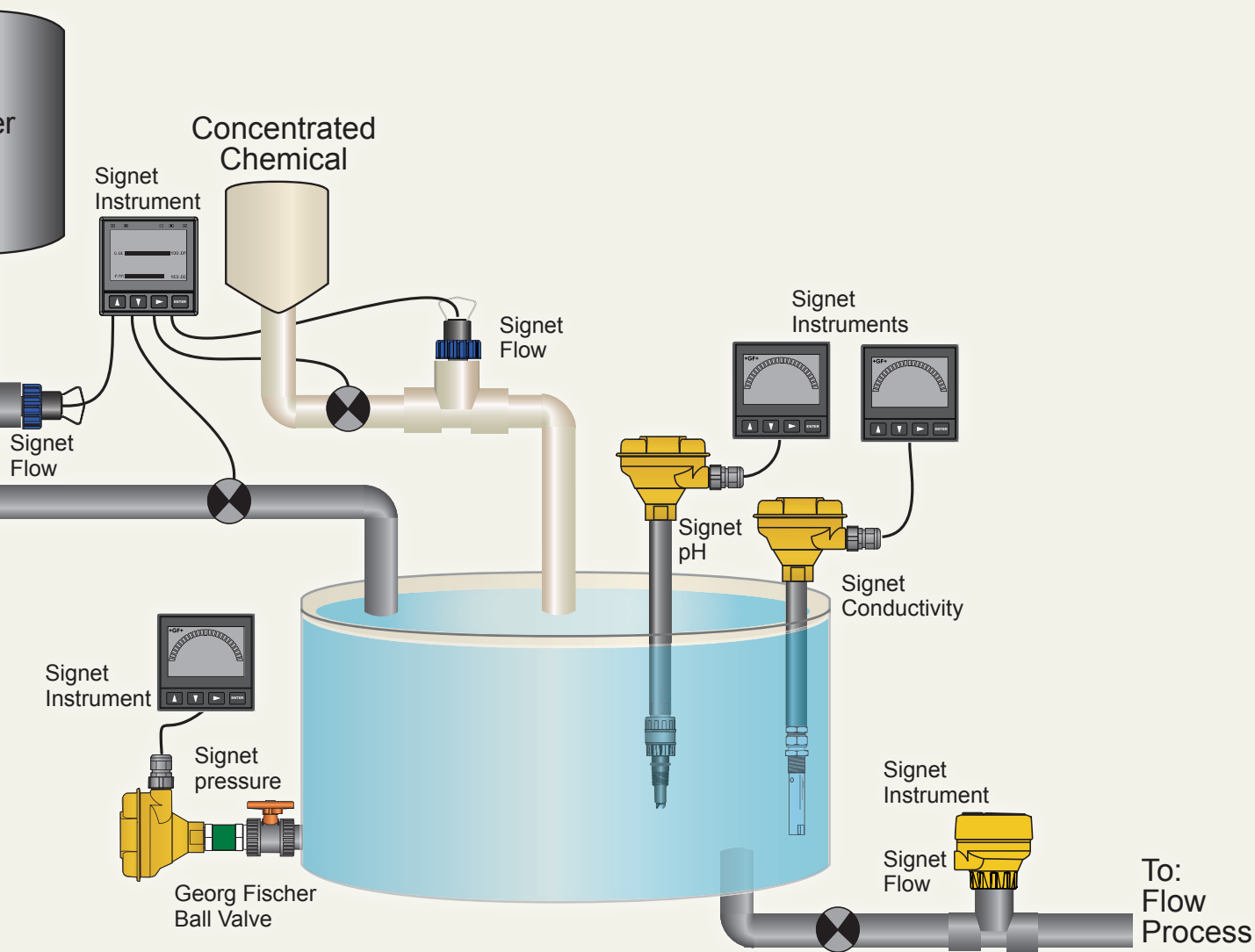
- + 8900
- + 9900
- + 9900-1BC
- + 9950



Flow

- + 515
- + 2536
- + 2551





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pH

- + 2724-2726
- + 2734-2736
- + 2774-2776
- + 2750/2751



Conductivity

- + 2818-2823
- + 2839-2842



Pressure/Level

- + 2250
- + 2450



Boilers

Boilers are used to create steam. Steam is used for many processes such as heating for buildings, temperature control of process solutions, creating electricity. In some applications boilers are used for multiple purposes such as at cogeneration plants where the steam is used for processes within the organization and a portion of the steam is used to create electricity for the facility.

Boiler feed water treatment can employ both reverse osmosis (RO) and deionization (DI) systems. Some users may have experienced some challenges with energy costs, heat exchanger fouling due to scale build up, boiler tube failure due to corrosion and condensate contamination due to process leaks

Signet measurement and control products provide efficient solutions to fully automated processes.

1. Conductivity monitoring of boiler blowdown to prevent scale buildup.
2. pH Monitoring of dearator feed water to reduce corrosion.
3. pH and or Conductivity monitoring of returned condensate detects condensate leaks and contamination, increases energy efficiency, and reduces water use.
4. Feed water flow is monitored to proportion Chemicals into the system reducing overall chemical costs.

Instruments

- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 525



Heat



Signet Instrument

Signet Flow



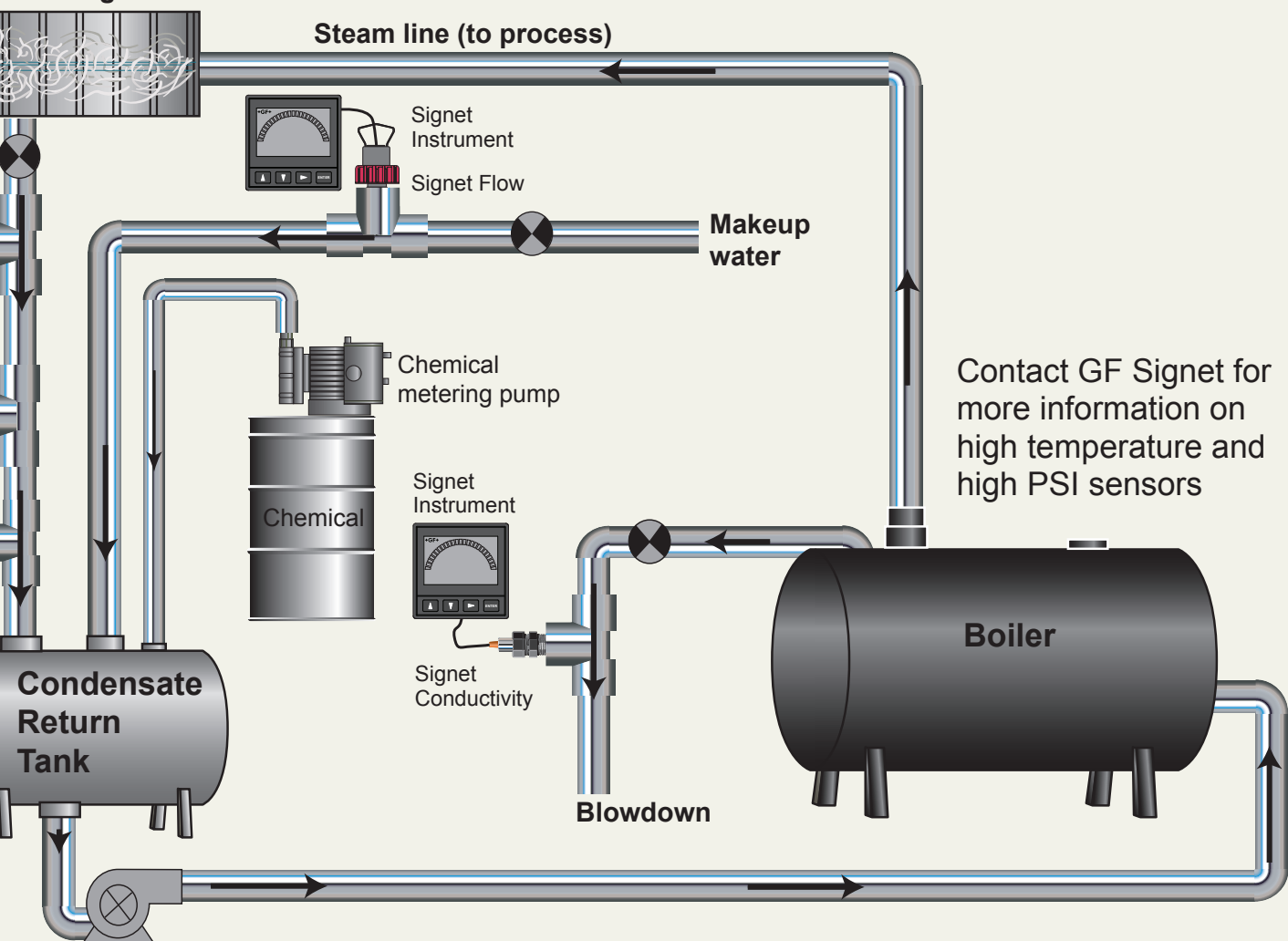
Signet Instrument

Signet Resistivity

Signet pH



Exchange



Contact GF Signet for more information on high temperature and high PSI sensors

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pH

- + 2724-2726
- + 2774-2776
- + 2750/2751



Conductivity

- + 2818-2821
- + 2839-2841
- + 2850



Bulk Transportation

Whether a manufacturing facility receives deliveries of large liquid supplies or distributes liquids to customers, the fluid is transported, in bulk, via large tanker trucks, railroad cars, drums, etc. These liquids are usually tightly controlled and filling or emptying the bulk container can be closely monitored via a flow sensor, an instrument or computer to indicate volume.

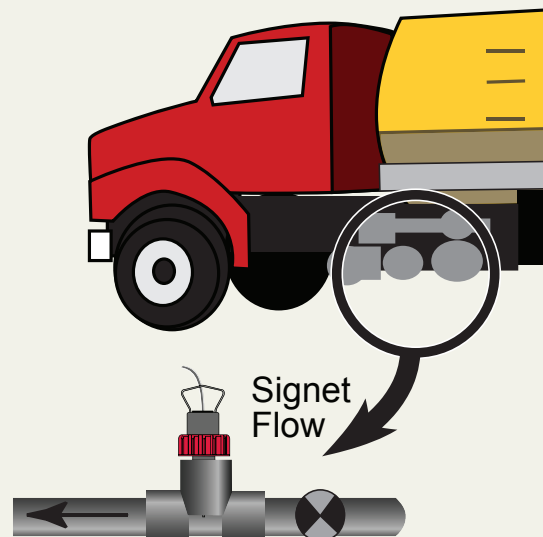
For instance, bulk chemical plants rely on controllers and flow sensors to accurately measure the “batch” in predefined volumes. The specified volume can then be conveyed into cans, drums, bulk containers or trucks. Signet provides a reliable batch controller which enables accurate dosing of any required quantity, and is available with a 4 to 20 mA output and relay to enable tighter control of the operation.

Similarly, many product facilities use large amounts of a liquid that is pumped out of the bulk containers and into large holding tanks. With Signet flow equipment, volume measurement is fast, easy and reliable. Tank level measurements can be made using Signet’s hydrostatic level sensors, and combined with an instrument, the tank geometry can be easily accommodated. The hydrostatic systems indicate level and can control it in the process using automatic valves. To avoid chemical overflow, a high level alarm can be connected and can close an automatic valve.

Signet measurements in Bulk Transportation applications:

1. Careful monitoring of the pumped volume is critical to verify quantity and to assist in cost analysis.
2. A pressure sensor (acting as a hydrostatic level sensor) may be used to monitor the level of the chemical tanks.

Truck Filling/Offloading



Instruments

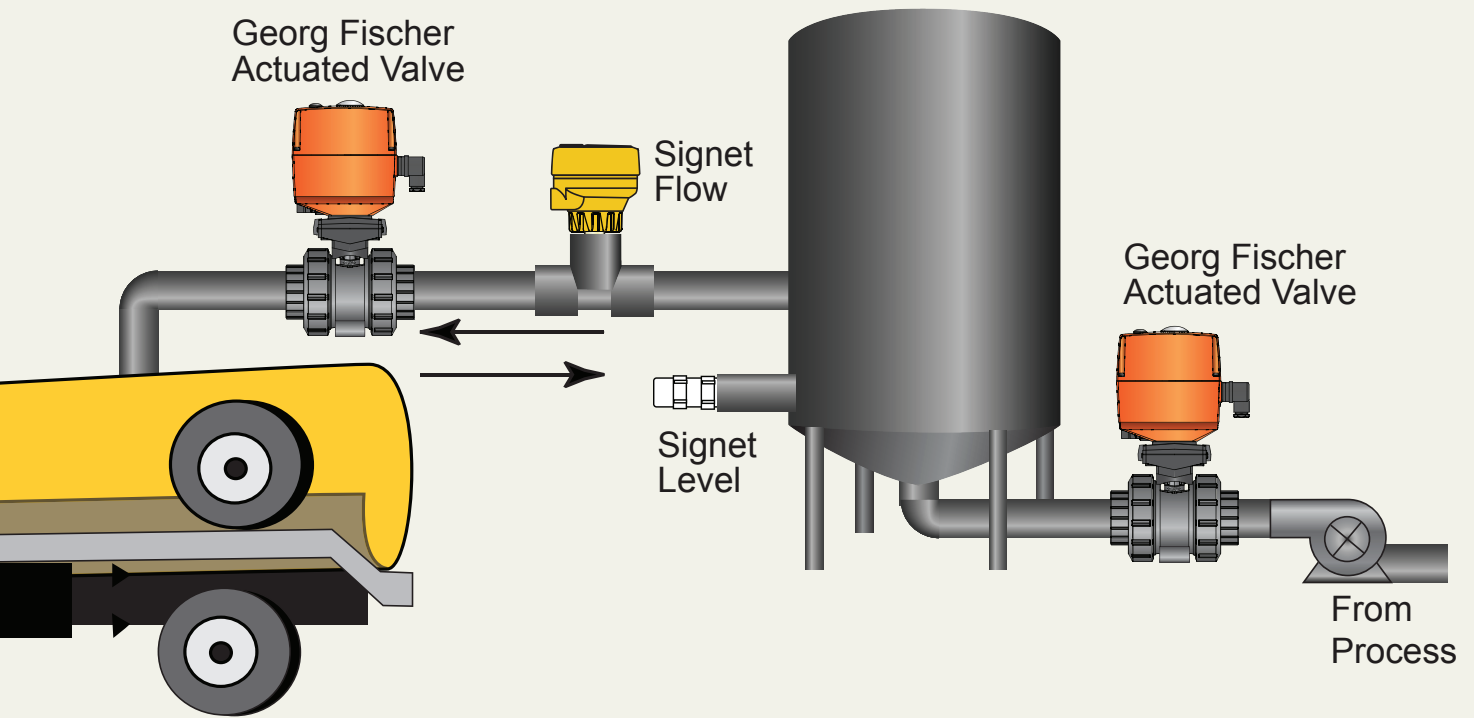
- + 9900
- + 9900-1BC



Flow

- + 515
- + 2536
- + 2551





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Pressure/level

- + 2250
- + 2450



Valves

- + 180-182 Ball Valve

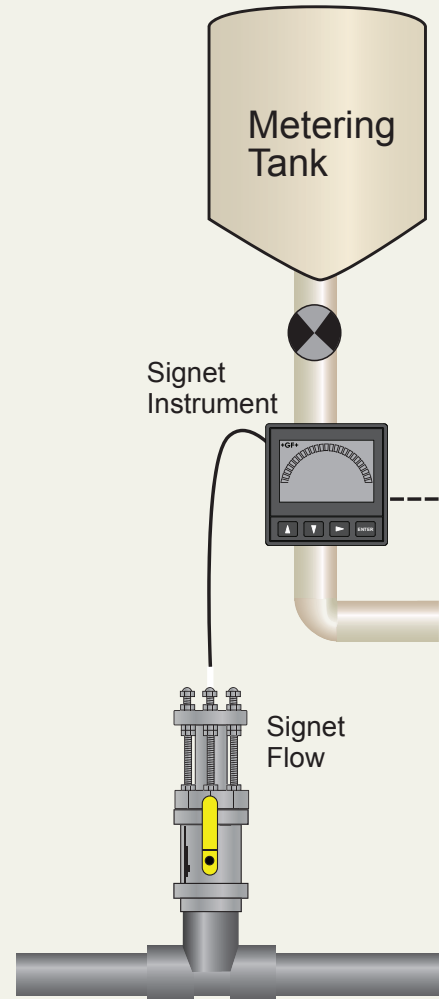


Chemical Injection

The chemical industry manufactures over 10,000 products by mixing a variety of elements and water to produce a product that may be used to manufacture additional products or help in a final process in other industries such as food and beverage, metal and plastic manufacturing, or pool and spa maintenance. Many process variables can affect the final product during the mixing process. The control of a specific and critical variable in the process is necessary to ensure the production of a product is repeatable. These variables can include flow, pH, ORP, pressure and conductivity.

Signet products offer reliable measurement solutions to monitor a chemical injection application.

1. Careful monitoring of the influent water volume is critical when the output of the flow controller is feeding a pulse signal to a precision chemical dosing pump.
2. Monitoring the pH of the mixture may be the best way to ensure that the proper amount of chemicals are being introduced. Adjustments to the pH can be made when required. Alternatively, ORP or conductivity may be used and is dependent upon the applications specifications.
3. During chemical injection of a catalyst, the solution mixture may expand, causing a pressure increase. Monitoring pressure increases can indicate the improper mixture.
4. A pressure sensor (acting as a hydrostatic level sensor) may be used to monitor the level of the chemical tanks.
5. Chemical concentration levels can be monitored using a conductivity sensor. This measurement helps maintain proper introduction of chemicals into the process. Alternatively, pH or ORP may be used depending upon the application.



Instruments

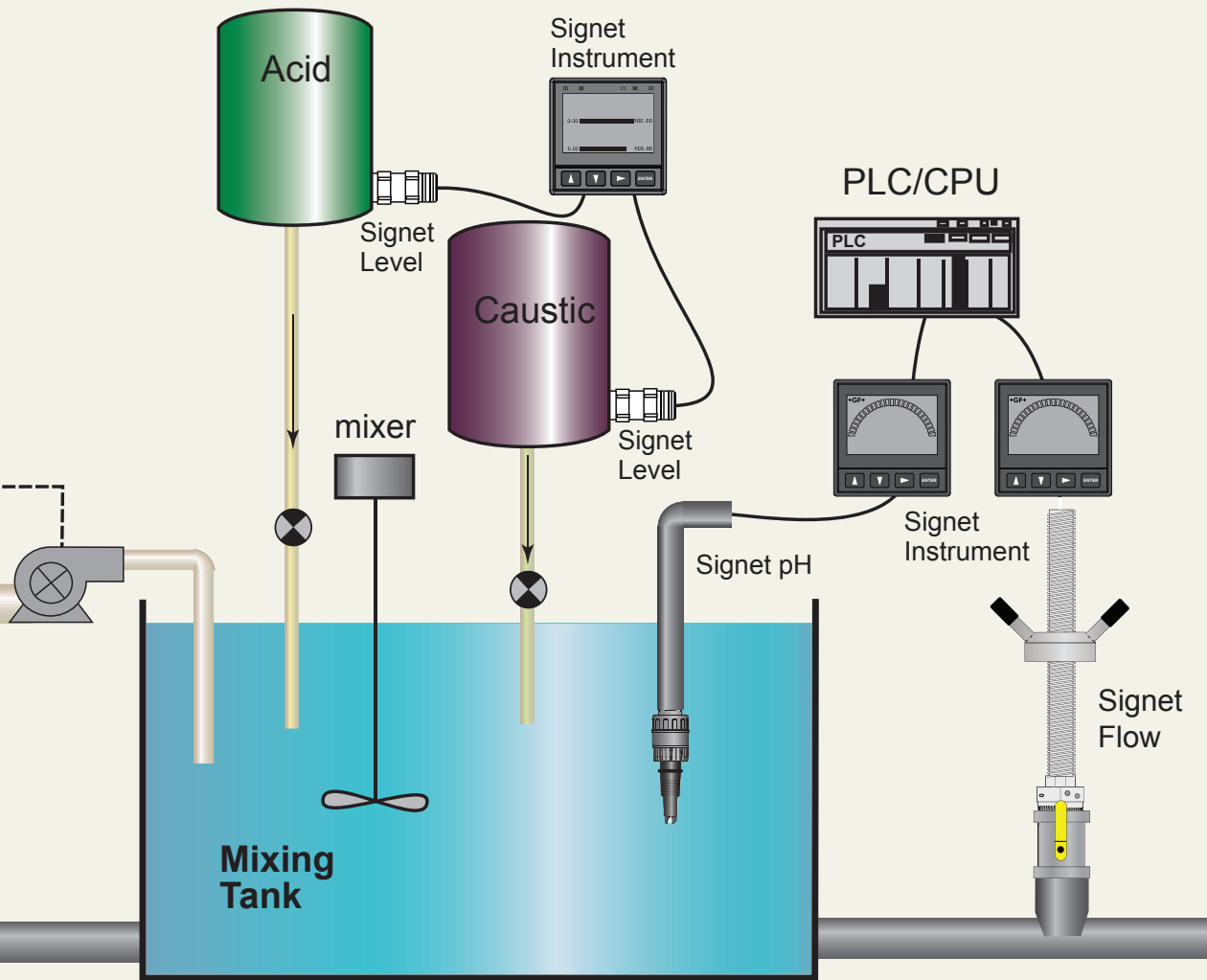
- + 8900
- + 9900
- + 9900-1BC
- + 9950



Flow

- + 515
- + 2536
- + 2540
- + 2551
- + 2552





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pH/ORP

- + 2724-2726
- + 2774-2777
- + 2750/2751



Conductivity/resistivity

- + 2818-2823
- + 2839-2842
- + 2850



Pressure/level

- + 2450



Chrome Reduction

The chrome reduction process is used as a pretreatment for the standard metal hydroxide precipitation process.

In the plating of chrome or chromium, traditional processes use chromium in the hexavalent state (1,000 times more toxic than trivalent chromium, does not form a hydroxide precipitate that can be settled and filtered out). There are strictly controlled discharge limits for hexavalent chrome.

In the chromium reduction process, hexavalent, (+6 charged chromium ion) is reduced to trivalent, (+3 charged ion) state. The reduction is completed in a single stage operation. The pH is lowered to approximately 2.5, followed by the addition of a reducing agent (i.e., sulfur dioxide, sodium sulfite, or sodium metabisulfite).

Controlling chemical costs to ensure chrome is reduced to a safe level to discharge is imperative to the application. Accurate pH and ORP reduction to ensure proper chemical dosing.

The Signet pH and ORP products offer many solutions to the chrome reduction process.

1. Controlling the pH in the range of 2.0 to 2.5 keeps the chrome reduction reaction at its optimum rate. The reaction rate slows significantly as the pH rises to 3.0, and becomes very slow at a pH of 4.0. Operation at the lower pH setting can also help correct for insufficient detention time in the reaction tank. An absolute minimum detention time of 15 minutes is required for most chrome reduction processes. Lowering the pH further may lead to hazardous sulfur dioxide gas being released into the atmosphere.
2. ORP is used to control the addition of the reducing agent. A set point of -300 mV (-400 mV max.) is generally adequate for most installations at pH 2.0 (processes vary). Decreasing the ORP set point (increasing in negative value) will increase the amount of reducing agent in solution, and should increase the rate of reaction. Raising the ORP set point (moving towards 0 or into the positive ORP range) will slow the reaction, but also result in less reagent used and a subsequent cost savings.



Instruments

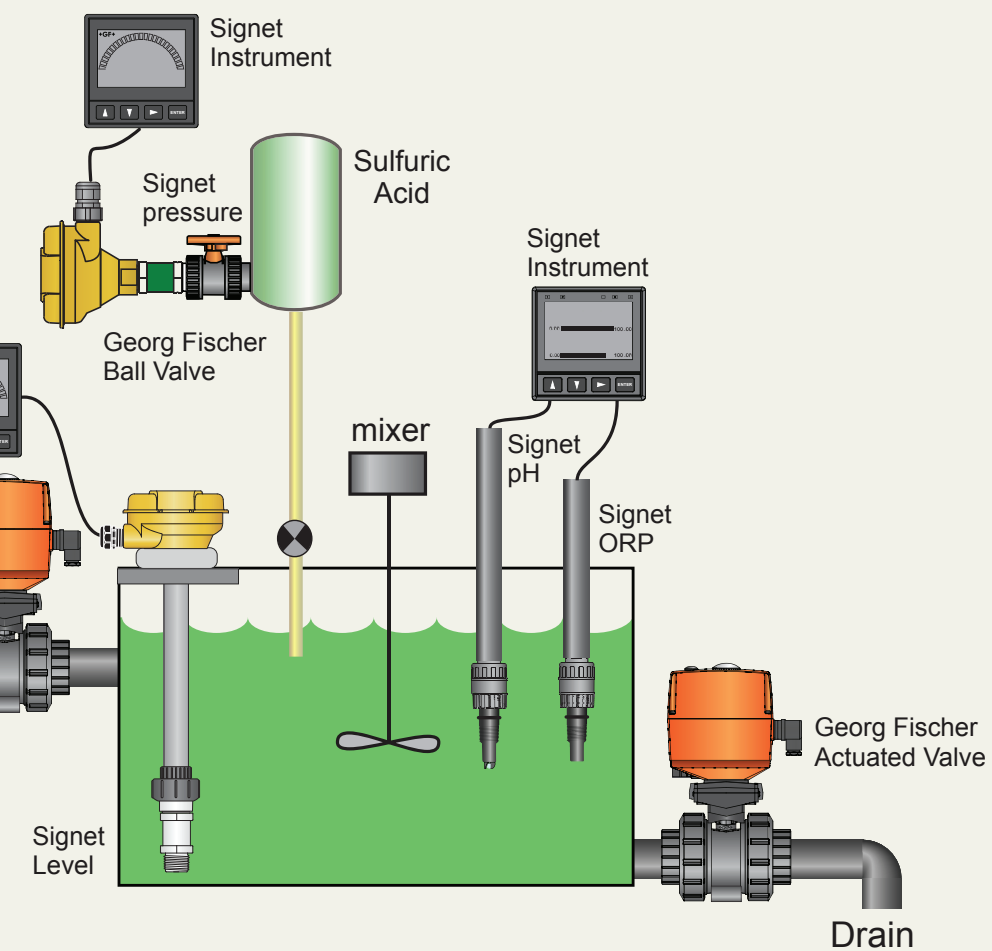
- + 8900
- + 9900
- + 9950



pH/ORP

- + 2764-2767
- + 2774-2777





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Preamplifiers

+ 2750/2751



Valves

+ 546 Ball Valve



Pressure/Level

+ 2250

+ 2450



Cooling Tower

Cooling towers are used to dissipate heat through the cooling of a water stream as it passes through the cooling tower. Most cooling towers remove the heat through the evaporation of water in the tower. Dry cooling towers use heat exchangers to transfer the heat from the water to the air.

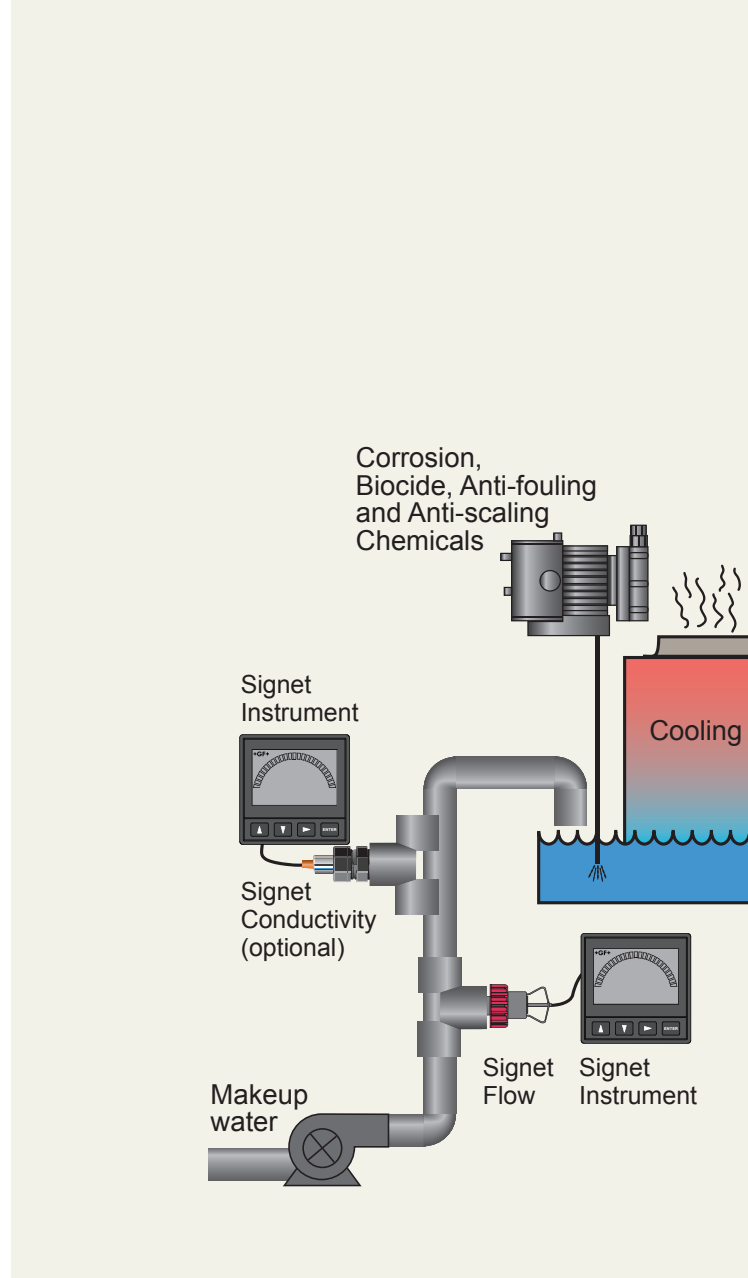
Common applications include cooling of processes within chemical, food processing, and manufacturing plants, power plant cooling, refrigerated warehouse cooling, and building HVAC systems.

Here are a few common challenges when dealing with a cooling tower application. The importance of protecting heat exchangers from the build up of scale, corrosion reduction in metal components of the cooling system, pipes, heat exchangers, and pumps is critical for an efficient system. Reducing the danger of Legionella, and increasing efficiency of the cooling system and reducing water and chemical consumption are additional factors as well.

Operators may face some challenges relating to acid cleaning to reduce scale build up, and heat exchanger failure due to corrosion and possible environmental and legal issues due to Legionella exposure to the public, chemical and water expense as well as sewer charges.

Signet products offer reliable measurement solutions to monitor a cooling tower application.

1. Maintain proper pH range to reduce corrosion, scaling, and to maximize chemical treatment program efficiency.
2. Maintain biocide levels, through ORP control or the use of a 4630-XX ampormetric chlorine system, to prevent Legionella and biological fouling in the system.
3. Maintain proper conductivity levels to reduce water usage and control scaling tendencies.
4. Calculate water evaporation by monitoring water make up and water bleed off for sewer charge credit.
5. Control chemical feed based on make up water addition for corrosion protection and scaling potential reduction.
6. Monitor closed loop pH and conductivity levels to detect leakage or heat exchanger failures.



Instruments

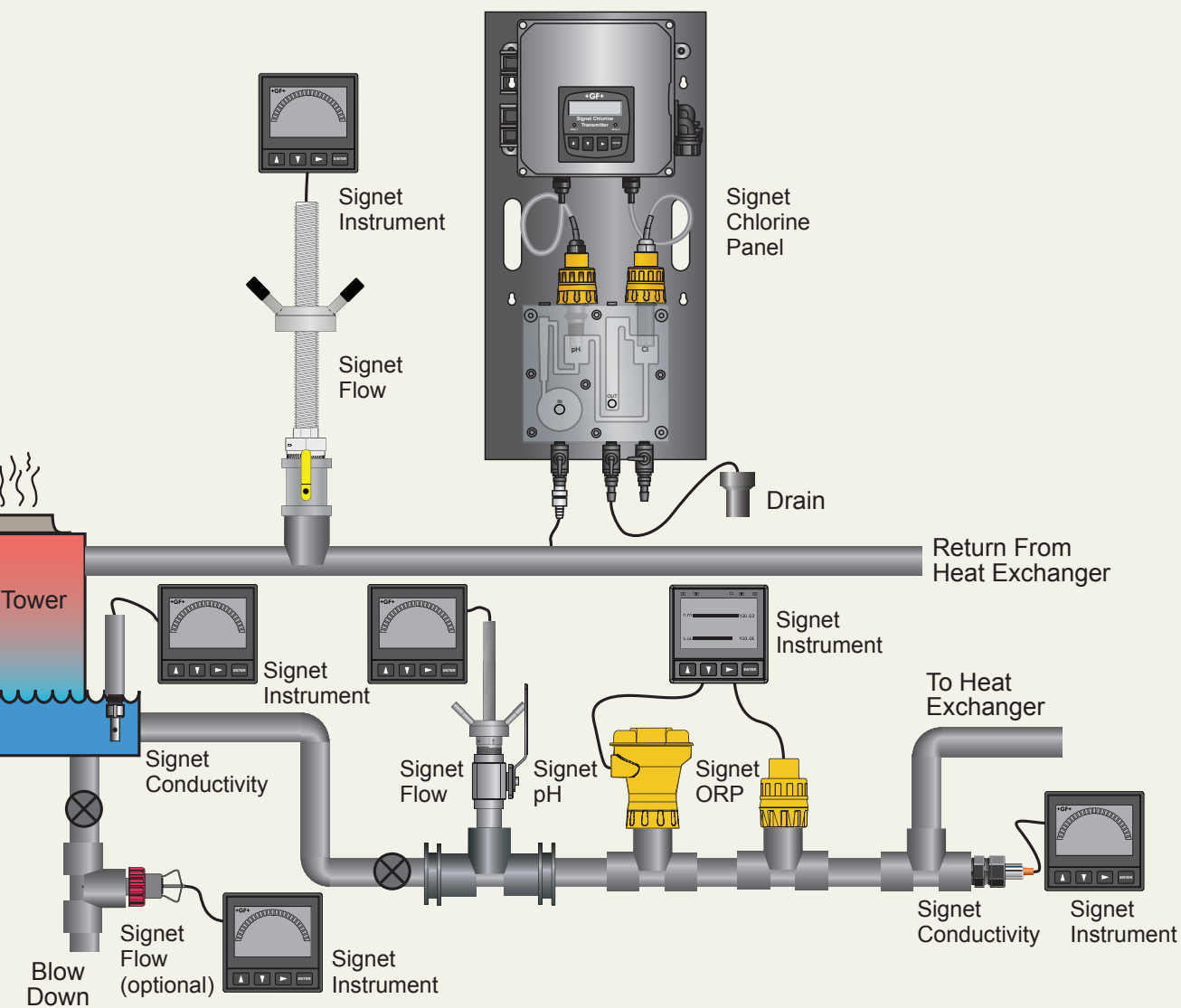
- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 2551
- + 2552





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pH/ORP

- + 2724-2726
- + 2734-2736
- + 2764-2766
- + 2774-2777
- + 2750/2751



Conductivity

- + 2818-2821
- + 2839-2841
- + 2850



Chlorine

- + 4630



Cyanide Destruction

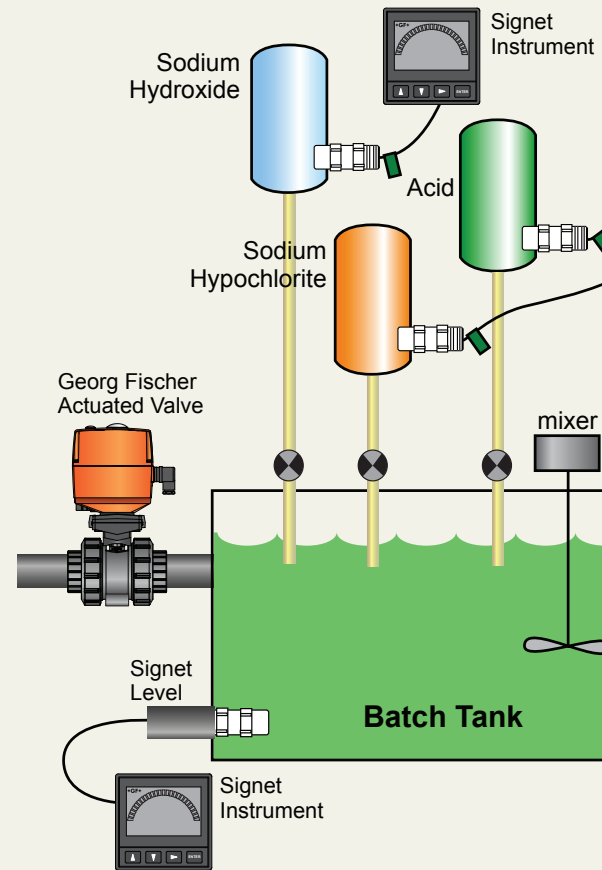
Batch

Batch cyanide destruction treatment uses the same procedures as the 2 stage cyanide destruct method with the exceptions that the process is completed in one tank. The first stage of the process requires the pH to be raised to 11.5 using sodium hydroxide and then chlorine is added until the ORP's mV is +450. At this time small adjustments of sodium hydroxide is added to maintain the proper pH of 11.5. This first stage procedure converts cyanide to cyanate. After the proper amount of contact time, the solution is neutralized using acid and a small amount of chlorine to convert the cyanite to carbonate. The solution can be left in the batch tank to settle out particles, then transferred to drain, or the solution can be transferred to a separate setting tank for a period of time then discharged.

NOTE: During the batch process, the acid injection must be manually locked out to prevent the pH from dropping below pH 11, if the pH is adjusted below pH 11 this will not allow the proper amount of oxidation to break down the cyanite to cyanate.

Signet products offer reliable measurement solutions to monitor a cyanide destruction applications.

1. Monitor and maintain the first stage and second stage bath solutions at 9.5 pH.
2. Monitor and maintain the first stage and second stage bath oxidation level at 450 mV during the cyanide destruct stage.
3. Maintain and monitor the level of sodium hypochlorite and acid in the storage tanks. Monitor and maintain the fluid level in the treatment tanks(s).



Instruments

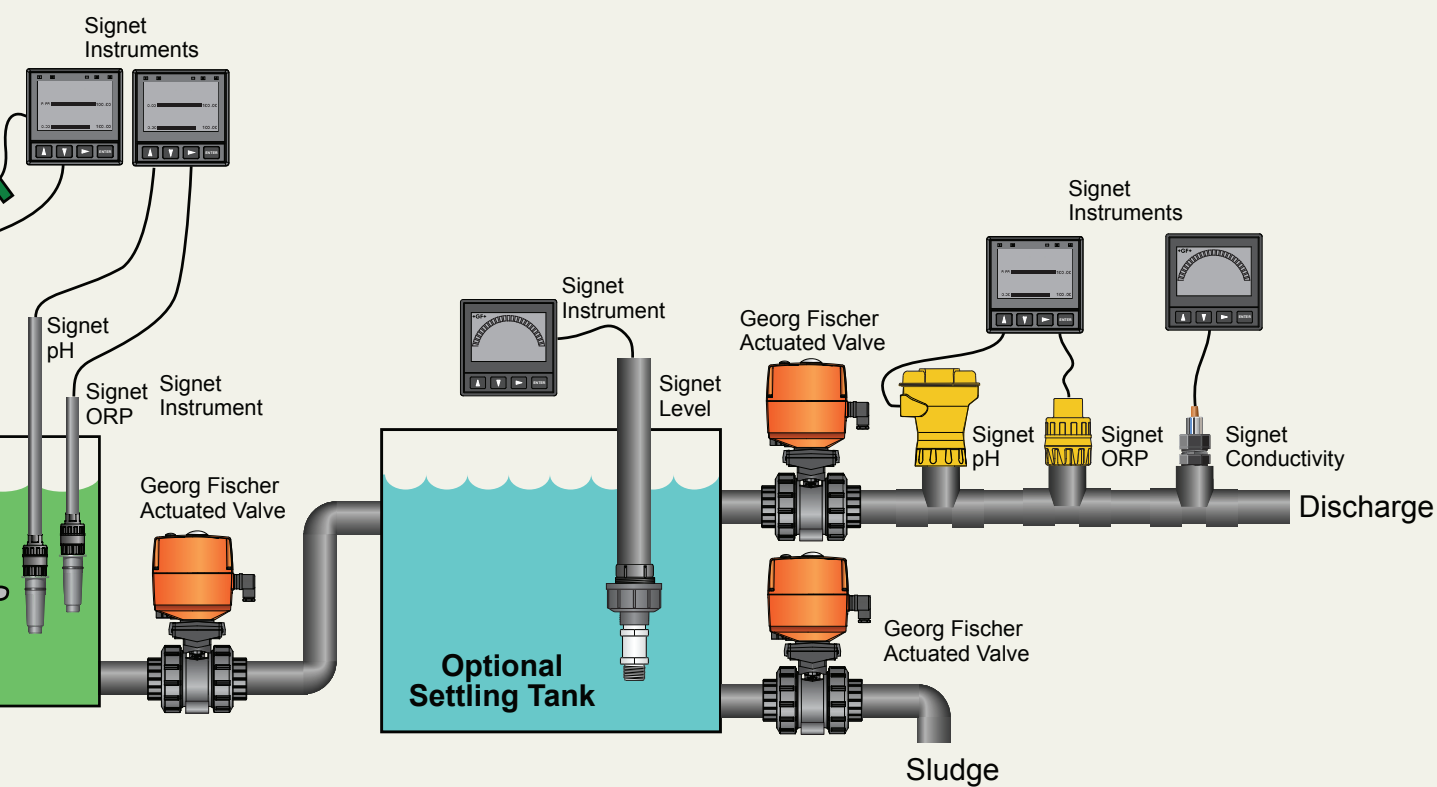
- + 8900
- + 9900
- + 9900-1BC
- + 9950



pH/ORP

- + 2724, 2725
- + 2764-2767
- + 2774, 2777
- + 2750/2751





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Conductivity

- + 2818-2821
- + 2839-2842
- + 2850



Chlorine

- + 4630



Pressure/Level

- + 2250
- + 2450



Valves

- + 127 Ball Valve



Cyanide Destruction

Two-Step

Cyanide is an important complexing agent for many plating processes and is an extremely toxic chemical.

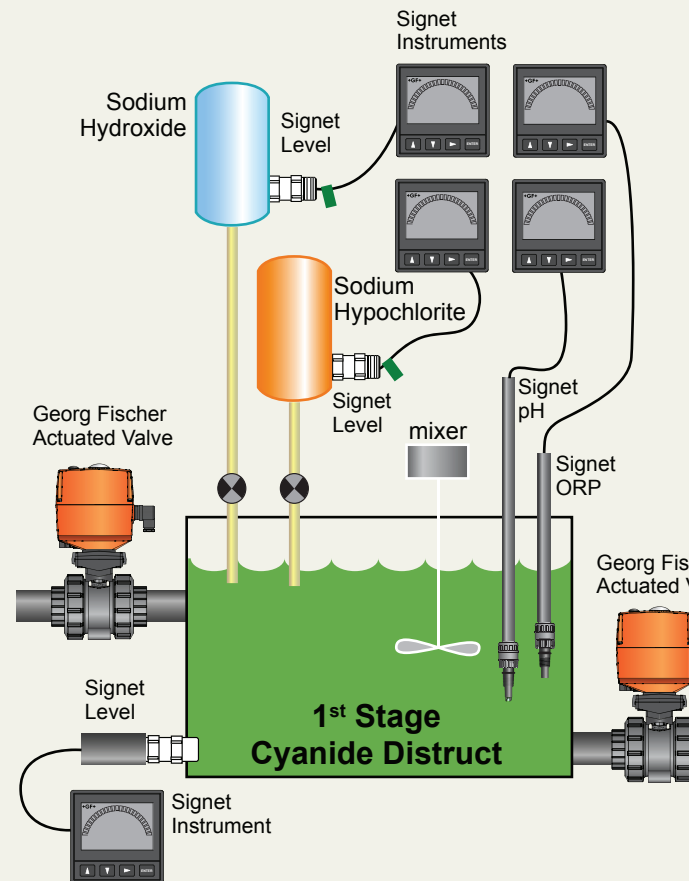
Cyanide oxidation is normally carried out in two stages. The first stage converts cyanide to a less toxic cyanate. The second stage then converts the cyanate to carbonate and nitrogen gas. The national trend is to require a two stage treatment, but in some areas the second stage treatment may not be required.

In the first stage, both pH and ORP control are essential. The pH is adjusted to rapidly convert the cyanide to cyanate without the risk of releasing extremely toxic cyanogen chloride gas. Then ORP control for oxidizer addition is started. Each installation must determine the optimum pH and ORP set points based on their loading rate and detention time. A proper system should be able to achieve oxidation to a level of less than 0.1 ppm.

The second stage also uses both pH and ORP control. The pH is lowered with sulfuric acid. ORP controls the addition of the oxidizer. The rate required is determined by the loading of the system and the detention time. Modern systems are often designed with as much as a four hour detention time.

Plating processes using Cyanide destruction include copper, brass, gold, and zinc. Other metal finishing operations that may require cyanide waste treatment include: conversion coatings, chemical milling, barrel finishing, burnishing, heat treating and electrochemical machining.

1. Monitor and maintain the first stage and second stage bath solutions at 9.5 pH.
2. Monitor and maintain the first stage and second stage bath oxidation level at 450 mV during the cyanide destruct stage.
3. Maintain and monitor the level of sodium hypochlorite and acid in the storage tanks. Monitor and maintain the fluid level in the treatment tanks(s).



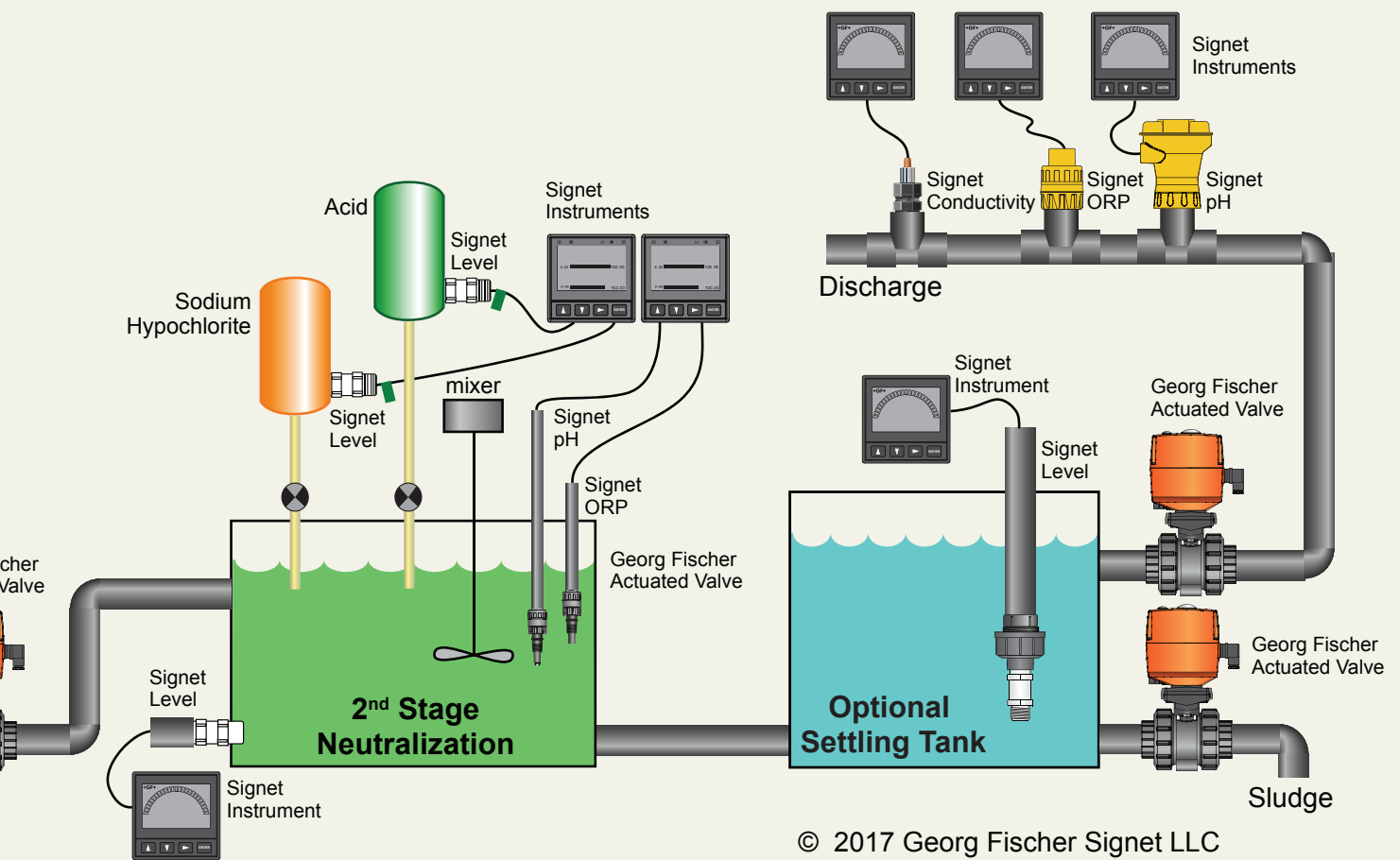
Instruments

- + 8900
- + 9900
- + 9900-1BC
- + 9950

pH/ORP

- + 2724, 2725
- + 2764-2767
- + 2774, 2777
- + 2750/2751





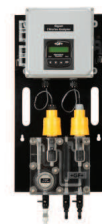
Conductivity

- + 2820, 2821
- + 2850



Chlorine

- + 4630



Pressure/Level

- + 2250
- + 2450



Valves

- + 180-182 Ball Valve



Deionization

Mixed Bed Twin Bed Ultra-Pure Water

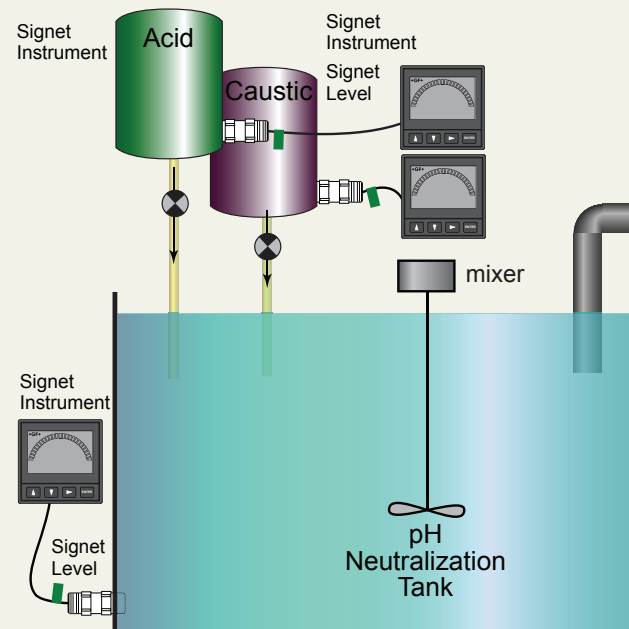
Deionization is the process of removing minerals from water to produce pure water, which has a very low and/or nominal mineral content, or ultra-pure water which is virtually mineral free. This process typically passes processed water through two separate beds, cation and anion, followed by a mixed bed.

The production of Ultra-Pure Water (UPW) for use in an industrial, pharmaceutical or laboratory environment must meet the strictest standards to ensure high purity and guarantee minimal contaminants. GF Signets line of industrial sensors and metering systems provides an accurate real time information to monitor the complete process from the influent line to the product water feeding the application and waste water to the drain.

Depending on the specific application and the water quality needed, the Ion exchange systems can contain several banks of twin bed ion tanks, each tank would be filled with either a cation or anion resin bead that feed a single or bank of mixed bed which sometimes referred to as a "polishing tank", and is usually in line after a double pass RO system or a two bed deionizer system. The cation and anion resins in one tank allows the hydrogen and hydroxyls ions to combine immediately to produce high quality pure water.

See how Signet products offer reliable measurement solutions in various desalination applications.

1. Monitor flow in the amount of feed water being cycled into the resin tanks.
2. Monitor the use of the product water being used in the application.
3. Monitor and control the pH Neutralization process. Monitor the pH after the optional degasser has stripped out the CO₂.
4. Monitor conductivity in the influent water quality a two tank or mixed bed system. This allows the operator to verify the quality of the feed water or RO product water.
5. Resistivity using a Conductivity sensor, monitors the water quality of the product water to the application or to the mix bed system.
6. Level using a Pressure sensor, monitors levels in various tanks.



Instruments

- + 8900
- + 9900
- + 9950

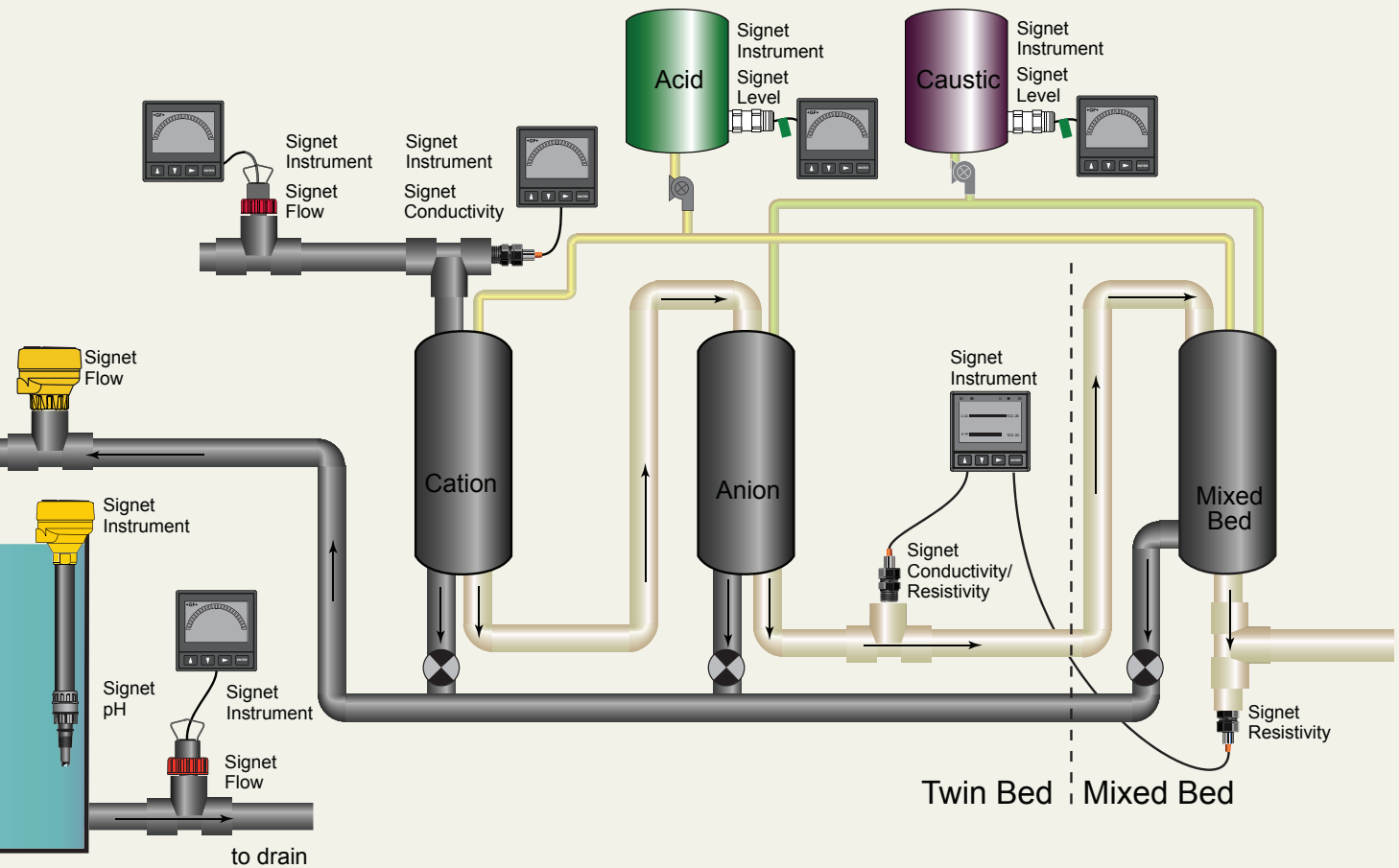


Flow

- + 515
- + 2536



Chemical Regeneration



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pH/ORP

- + 2724-2726
- + 2734-2736
- + 2774-2777
- + 2750/2751



Conductivity

- + 2818-2821
- + 2839-2841
- + 2850



Pressure/Level

- + 2250
- + 2450



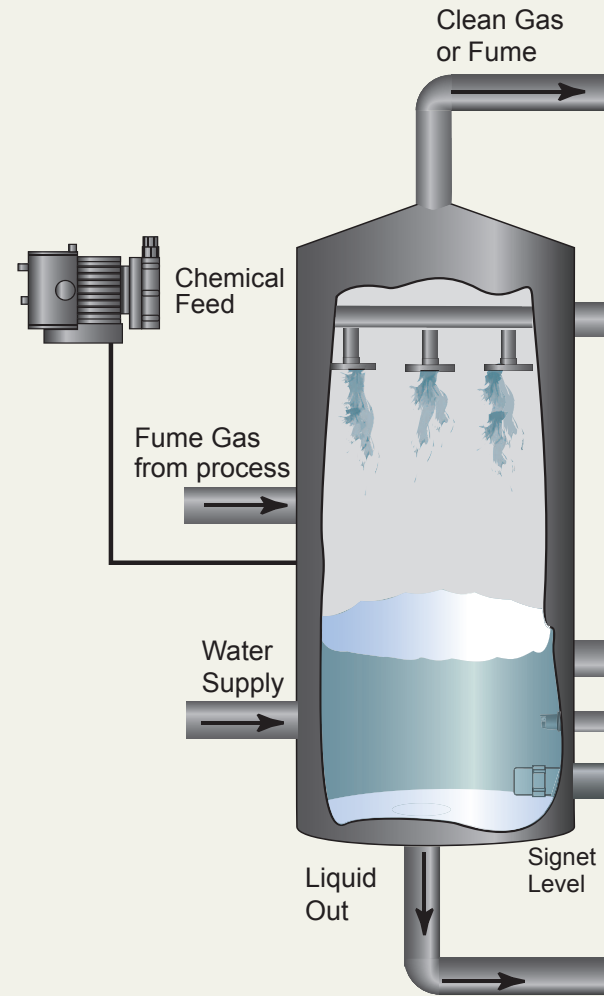
Fume Scrubbing

Chemical scrubbing is the removal of odor-causing chemicals from air and liquid streams. Basically, a process gas or liquid stream flows counter-current past a liquid chemical which removes the undesirable component of the gas (or liquid). It is important in waste treatment as well as industrial processes, and it is the most common method for odor control. The process of chemical scrubbing requires the addition of large amounts of caustic and dangerous chemicals.

GF Signet offers a complete range of measurement products to help users solve common issues such as maintaining proper flow rate or maintaining proper chemical concentration associated with fume scrubbing applications.

Signet measurement products offer a complete system solution to help monitor harmful substances.

1. Flow: Monitoring water flow of the makeup water.
2. Ensuring the flow through the sprinkler heads are at correct flow rate.
3. pH: Recycle water through misters: If pH of the water recycled through the misters (droplets) exceed the process requirements the scrubbing become inefficient. Once the pH exceeds the predetermined level the scrubbing solution is discharged and replaced.
4. ORP: Recycle water through misters: If ORP values (either oxidation or reductions values) of the water recycled through the misters is not at the proper level the air scrubbing process becomes inefficient. Once the ORP exceeds or falls below the predetermined level additional chemicals are added.
5. pH: Make up water: pH of the makeup solution is critical to ensure an effective scrubbing process.
6. Conductivity/TDS: monitors water quality of the makeup water before any pH adjustment required for the process.
7. Flow to drain: Monitors levels of waste water being discharged into the sewer system.



Instruments

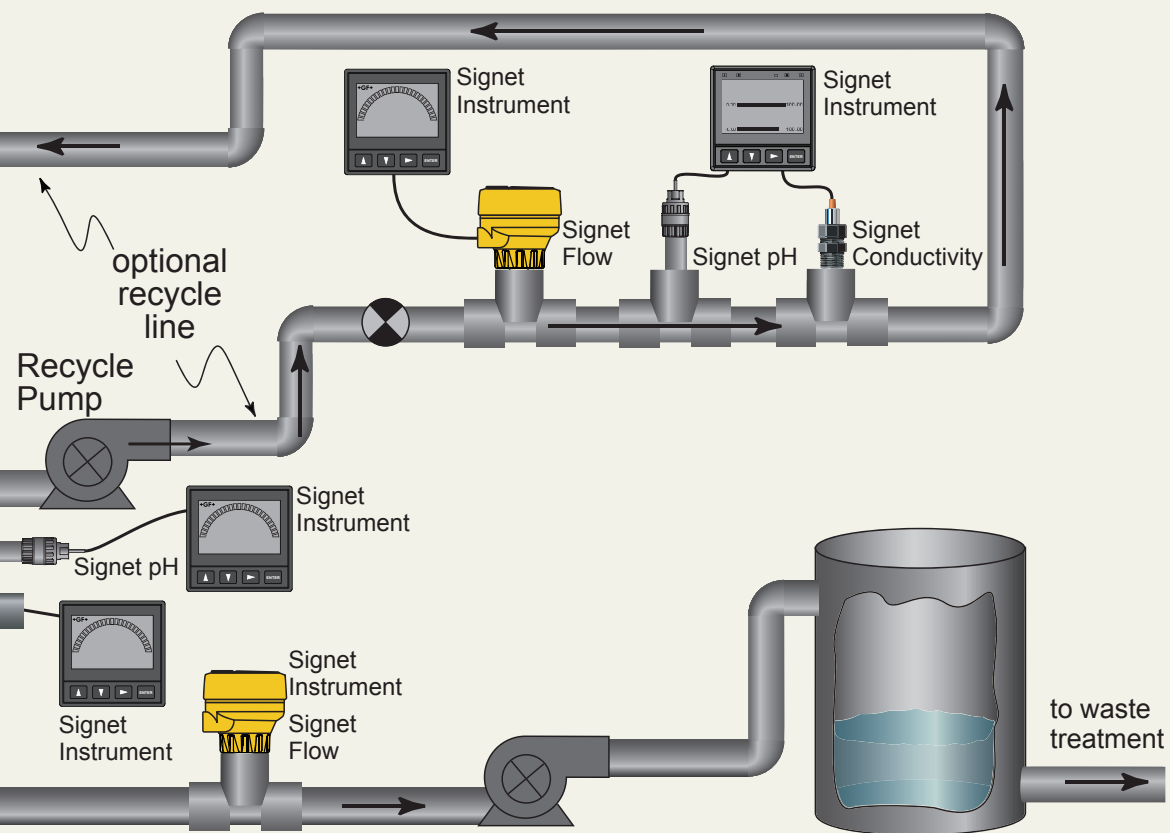
- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 2551
- + 2552





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pH/ORP

- + 2724-2726
- + 2734-2736
- + 2764-2766
- + 2774-2777
- + 2750/2751



Pressure/Level

- + 2450



Conductivity

- + 2818-2823
- + 2839-2842
- + 2850



Reverse Osmosis

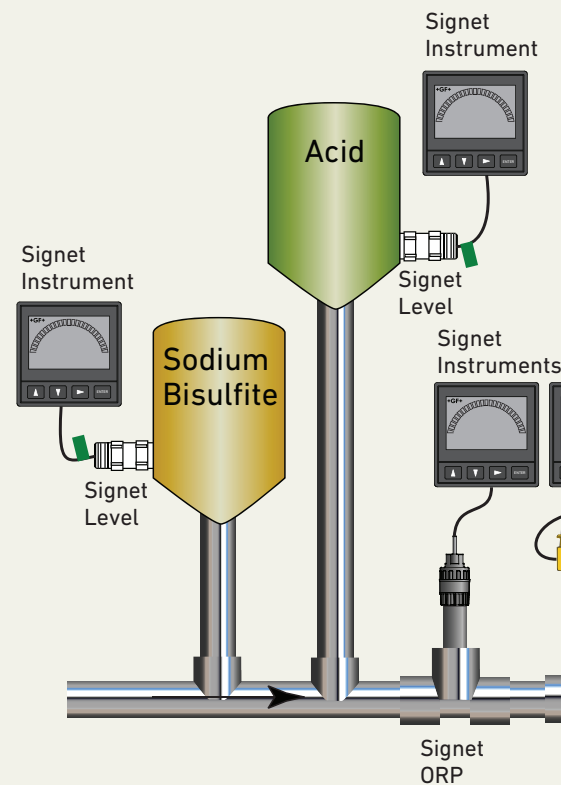
Membrane Technology

Membrane technology is increasingly being implemented to harvest drinking water and process water from surface water, seawater and reverse osmosis. It is an ideal application for GF's Signet product range, which offers a vast range of plastic instrumentation components for your system solution. Complete solutions from GF Piping Systems, offer a maximum of security and profitability for efficient processes, for instance by eliminating maintenance costs caused by rust and deposits.

Reverse osmosis is a physical process for separation of dissolved substances, some key challenges users may face, are maintaining unit performance to design parameters and maximizing service life. Minimizing fouling, prevention of scaling and minimizing chemical attack is crucial for the reverse osmosis process. Customers may have experienced service life or premature breakthrough; thru-put or pressure drop, back-flush automation or leak detection.

See how GF Signet's measurement and control products can be used in a reverse osmosis application.

1. Monitor flow, pH, conductivity, temperature and pressure.
2. Control of key parameters, pressure and flow rates.
3. Monitoring of process efficiency:
 - a. Reject ratios: Multi-channel controllers leveraging conductivity sensors
 - b. Process efficiencies: Leak detection via flow monitoring
4. Automation of bypass and safety operations
 - relays and valves to divert bad feed-water, automate purge functions, and divert output during process excursions (membrane failures).



Instruments

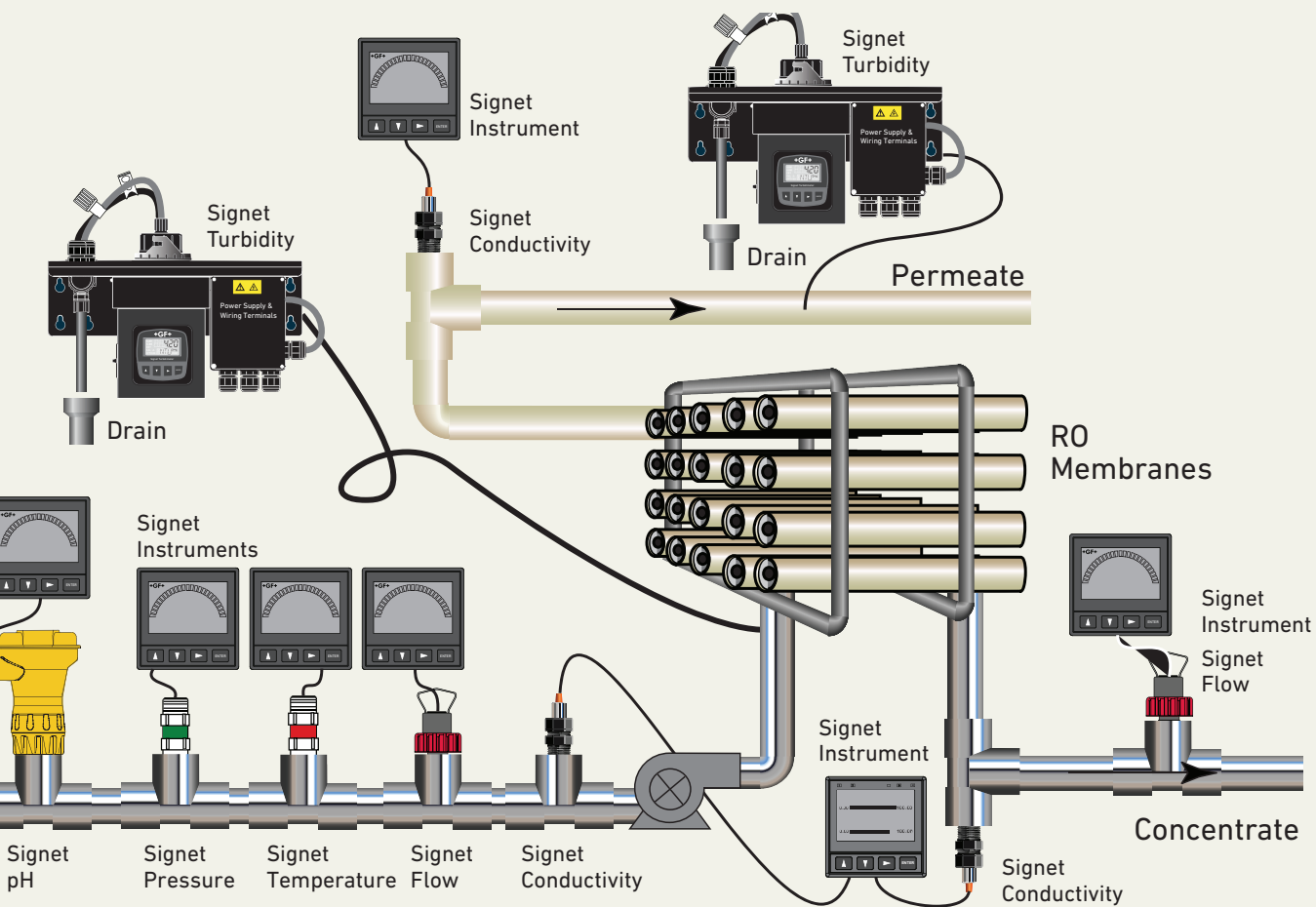
- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 2551





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pH/ORP

- + 2724-2726
- + 2734-2736
- + 2774-2777
- + 2750/2751



Conductivity

- + 2818-2823
- + 2839-2841
- + 2850



Temperature/Pressure/Level

- + 2350
- + 2450



Turbidity

- + 4150



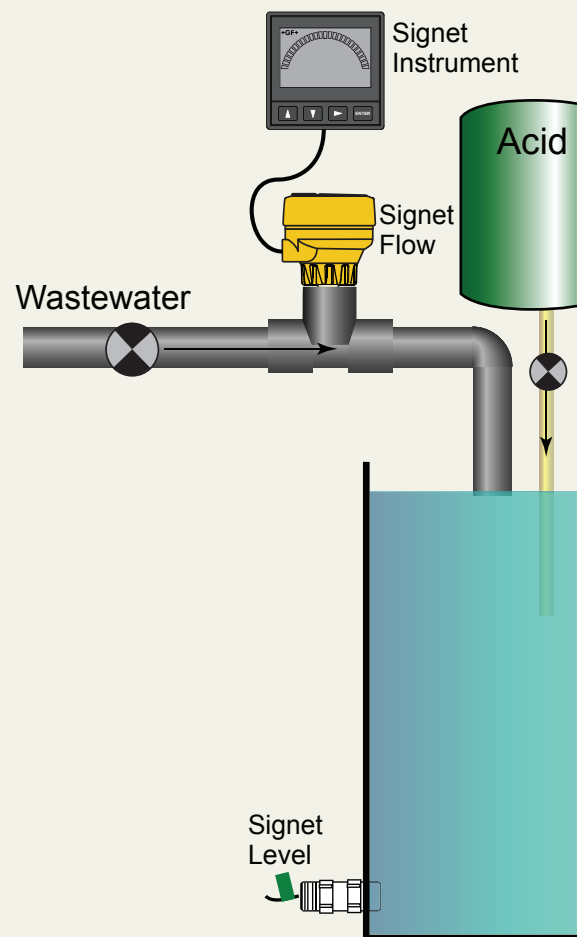
pH Neutralization

Local water authorities require the neutralization of industrial wastewater discharge to protect the ecological systems in the surrounding lakes, rivers, and oceans, or to protect the local sewer networks and treatment plant. It is more efficient to perform the neutralization process in tanks rather than making the adjustments in a flowing piping system.

The neutralization process can be complex and is different for each industrial location. Operators must meet environmental health and safety requirements in order to prevent fines and penalties. Reporting effluent discharge is important to the process.

Signet measurement and control products provide efficient solutions to fully automated processes.

1. Flow is used to measure influent flow and Volume to internal process. Monitor daily generation of wastewater to be treated – can determine a inefficiency in the manufacturing process by:
 - Monitoring the amount of waste being transported to the neutralization tanks.
 - Monitoring and controlling chemical injection.
 - Monitoring and recording effluent discharge to the sewer per local regulations.
 - Calculating volumetric totals of daily waste generation or production consumption.
2. Level monitors chemical inventory in the tanks, as well as monitoring the level of wastewater being stored prior to processing.
3. pH sensors and instruments measure the pH of wastewater for control of the neutralization process, as well as monitors the pH of water being discharged into the sewer.
4. ORP sensors - (Applicable for oxidizer neutralization) measures the ORP of the wastewater for control of the neutralization process. User can also monitor the ORP of the water being recycled into process or the environment.
5. Conductivity monitors salt discharge levels that are set by the plant authority.



Instruments

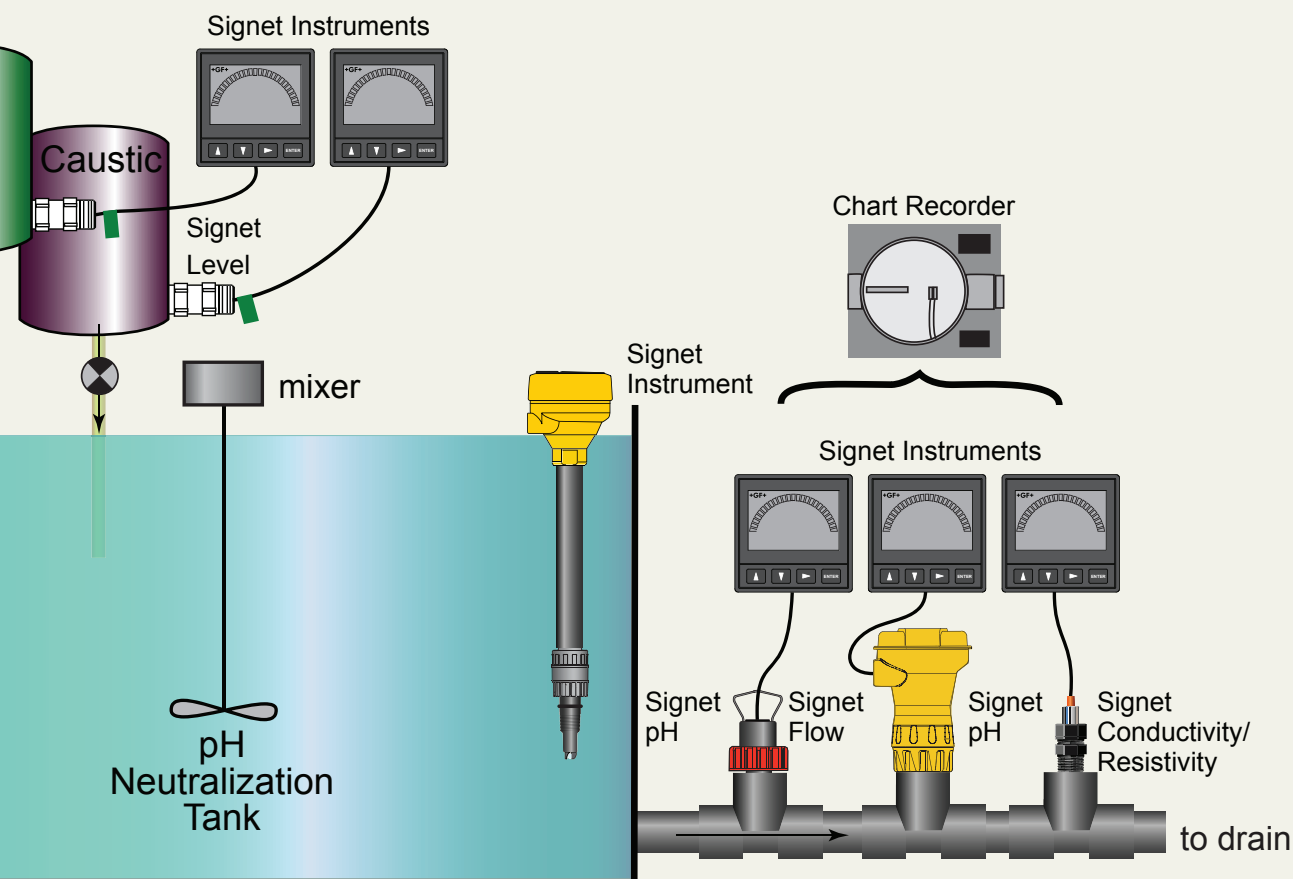
- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 2551





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ORP

- + 2724-2726
- + 2734-2736
- + 2764-2766
- + 2774-2776
- + 2750/2751
- + 2760



Conductivity

- + 2818-2823
- + 2839-2841
- + 2850



Pressure/Level

- + 2250
- + 2450



Water Treatment

Industrial Wastewater

Local water authorities require industrial wastewater discharge neutralization to protect the ecological systems in the surrounding lakes, rivers, and oceans or to protect the local sewer networks and treatment plant.

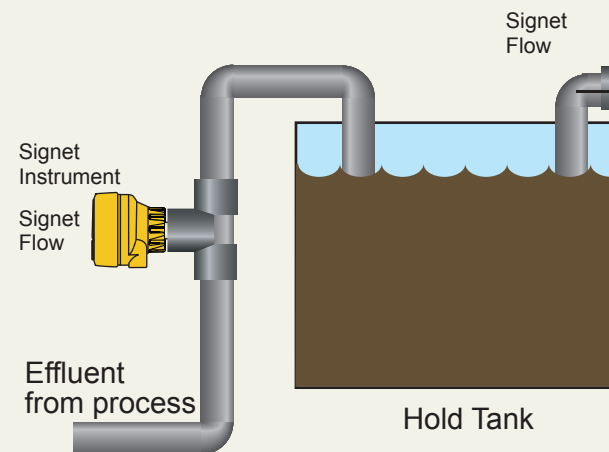
The neutralization process can be complex and is different for each industrial location. It is most effective to perform the neutralization process in a tank rather than in a pipe to the final process or discharge.

The neutralization tank construction should include a pH sensor, mounted in a position that will allow the easy removal of the sensor for periodic maintenance and calibration, a mixing motor, and chemical injection pumps located opposite of the pH sensor.

Sensors that measure pH are crucial in the neutralization process, however, all pH sensors are not the same. Many neutralization processes contain materials or chemicals that can cause premature sensor failure by contamination of the internal reference solution. In these cases, a more rugged sensor such as one with a differential reference, will extend the life of the sensor.

Signet offers measurements and control solutions for Industrial Wastewater Treatment Applications:

1. Track the amount of process effluent water being treated Record the amount of process waste water being discharges to the sewer.
2. Adjust and control pH levels in the neutralization tanks as well as throughout the process. Monitor and adjust the pH levels being discharged into the sewer system.
3. Monitor the disinfectant ability of the chlorine injection.
4. May be used to monitor and adjust conductivity levels being discharged to the sewer to prevent high salt solution.
5. A turbidimeter detects the presence of undissolved matter and suspended solids in water. These impurities make water opaque to light.



Instruments

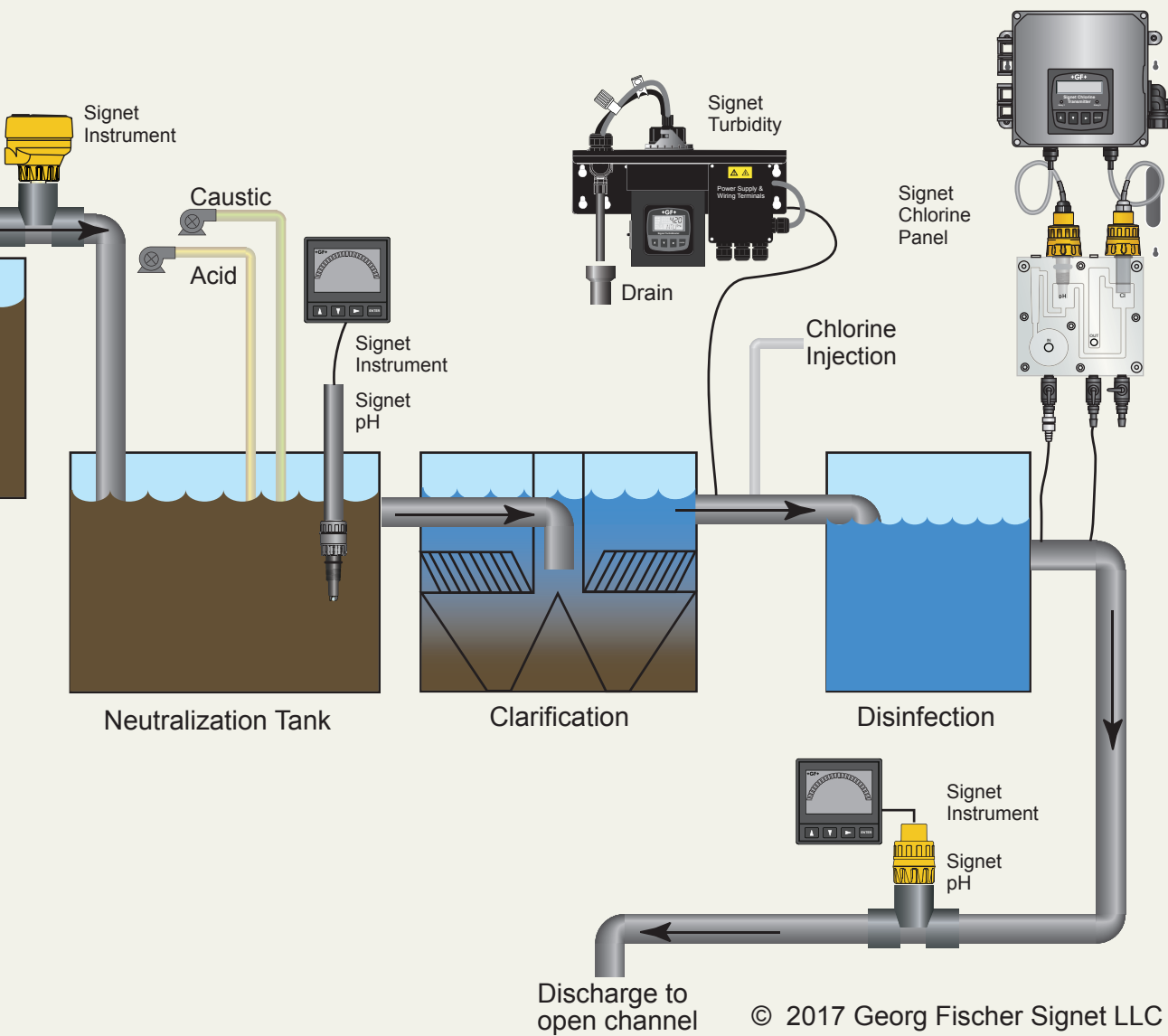
- + 8900
- + 9900
- + 9950



Flow

- + 515
- + 2536
- + 2551





ORP

- + 2724-2726
- + 2734-2736
- + 2764-2766
- + 2774-2776
- + 2750/2751
- + 2760



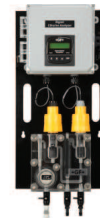
Turbidity

- + 4150



Chlorine

- + 4630



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