



Sodian Group was founded in Vorchdorf in 1981, and has become a leader in the field of high-pressure water technology across Europe. The company is among the very few competent providers of high-pressure water jet technology, coating removal, surface preparation, concrete repair and industrial cleaning services.

The Group aims to expand geographic coverage and stay a technological leader in the various segments.



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Removal of road markings

Our special wide-area surface cleaners are perfect for removing all kinds of road markings. In a single operation, our proprietary „waterjet beam“ technical solution can remove road marks 15 cm to 100 cm wide.

The marking vehicle uses an optical control system, developed in-house, to follow the lines automatically and accurately, and to measure the treated area for billing.

100% of the waste water and all removed materials (coatings, paints, colour remnants, etc.) are collected in a 10,000-litre recovery tank located on the vehicle and lawfully disposed of.

The special jet nozzles and their arrangement can be optimally adapted to the ground to avoid damaging surfaces and joint fillings.

Advantages

- The road surface is not roughened, as is the case with milling procedures
- The resulting waste water and removed markings are immediately absorbed
- No dust
- Sweeper not required

Application area

- Road markings
- Surface markers (airport)
- Colour stains on pavement
- Lane markings on concrete and tarmac roadways



Removal of colour lines



Removal of airport markings



Removal of paint residues on a tarmac road after the World Cycling Championship



Reference projects

- | | |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 460,000 linear metres | removal of colour marking from road surfaces in Turkey, Istanbul area, Ankara, Antalya |
| 350,000 linear metres | removal of cold plastic markings on porous tarmac in Italy A1, A1, A21 |
| 600,000 linear metres | removal of colour marking from the Italian A22 motorway from Brenner to Campogalliano |
| Various road marking removal projects on motorways and roads in Austria, Italy, Germany | |

Surface processing by shot and water blasting

Our special wide-area surface cleaners and shot blasting equipment are perfect for processing and preparing road surfaces to customer specifications. We will brighten up, roughen, or simply remove extensive contamination from tarmac and concrete road surfaces in the scope of our services for road operators. Our shot and high-pressure water blasting devices are each suitable for certain specialised application areas.

Shot blasting:

All dry, grease-free surfaces can be treated with this method, but processing is limited to horizontal areas. The advantage of shot blasting is the superficial opening of the grain structure, which brightens up the roadway. The procedure also significantly improves traction on all surfaces (optimising road grip at hazard sites is crucial to motorway operators). Other application areas include test and race tracks, where a homogeneous grip on the entire track is essential for comparison measurements.

Water blasting:

Our special wide-area, high-pressure surface cleaners are perfect for roughing concrete surfaces, as well as removing rubber skid marks and all types of road markings. The concrete or tarmac surface is treated with an operating pressure of up to 2600bar and a variable nozzle combination. Unlike shot blasting, this allows us to expose the coating's granular structure while removing any separating substances, so we also use it to prepare surfaces with optimal bonding properties before applying a new coating. Wet surfaces or working in the rain pose no problems for the high-pressure water blaster.

We guarantee that both methods meet the technical conditions of RVS 8B.07.1.



Surface processing by water blasting



Wide-area equipment for fast and efficient processing

Advantages

- Separating substances (concrete slurry, impurities, etc.) are entirely removed without damaging the surface
- Non-bearing old coatings are entirely or partially removed as required
- Worn materials are immediately sucked up where necessary
- Appropriately sized devices for small and large areas



Application area

- Increased roughness for highways and racetracks
- Brightening of pavements
- Homogeneous adhesion across the entire surface

Reference projects

Motorways, highways and race tracks in Austria, Germany, Italy, France, Scandinavia, etc. (for example: S16 Arlberg tunnel)

Surface processing by shot blasting

Shot blasting (or reinforcement shot blasting) is a blasting application regulated under DIN 8200, and a tried and proven method of surface preparation. The technology involves propelling small steel balls onto a surface by a high-speed impeller wheel with electric drive (approximately 300 km/h). The impact energy of the abrasive medium causes a solidification and elastic-plastic deformation of the treated surface.

The abrasive is returned to the reservoir through a rebound channel, and the lighter, dissolved components are passed into a waste container by the attached vacuum device.

All dry, grease-free surfaces can be treated with this method, but processing is limited to horizontal areas. The advantage of shot blasting is the superficial opening of the grain structure, which brightens up the roadway. The procedure also significantly improves traction on all surfaces (optimising road grip at hazard sites is crucial to motorway operators). Other application areas include test and race tracks, where a homogeneous grip on the entire track is essential for comparison measurements.

Advantages

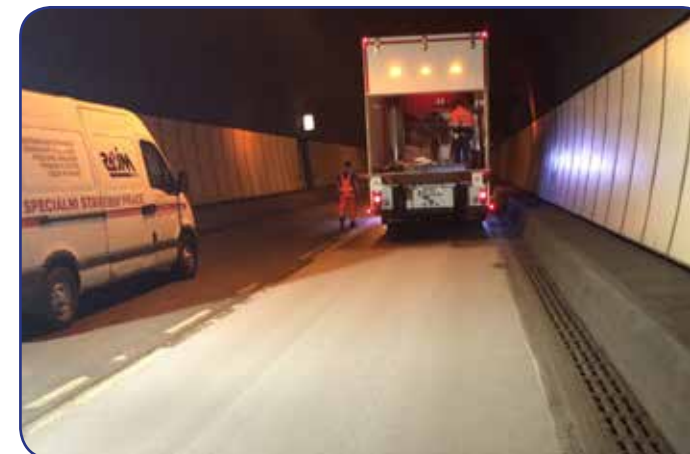
- Roadway remains dry
- Brightens tarmac due to superficial opening of grain structure
- The resulting waste water and removed markings are immediately sucked up
- No dust
- Sweeper not required

Application area

- Increased roughness for highways and racetracks
- Brightening of pavements
- Homogeneous adhesion across the entire surface



Grip improvement by shot blasting



Road brightening in tunnels



Reference projects

Grip improvement test track Mercedes Pappenburg

Grip improvement BMW test track Miramas

Grip improvement Volvo test track Hallered

Grip improvement for ASFINAG (A1, A7, A9, A25)

Grip improvement on various Roads in the Czech Republic and Slovakia Roadway

brightening in Prague tunnel

Roadway brightening various tunnels in Austria





Surface processing with water

Our special wide-area, high-pressure water blasters are perfect for roughing concrete surfaces, as well as removing rubber skid marks and all types of road markings. The concrete or tarmac surface is treated with an operating pressure of up to 2600bar and a variable nozzle combination.

Unlike shot blasting, this allows us to expose the coating's granular structure while removing any separating substances. This procedure is mainly used to remove rubber skid marks from taxiways and runways.

Advantages

- Improved grip
- Separating substances (rubber skid marks, impurities, etc.) are entirely removed without damaging the surface
- The resulting waste water and removed markings are immediately sucked up
- 10,000-litre suction tank
- No dust
- Sweeper not required

Application area

- Removing rubber skid marks and road markings
- Increasing roughness

Reference projects

- International airports such as Munich, Basel, Stuttgart, Salzburg, Bologna, Leipzig, Verona, Bergamo, Ancona
- Round tracks



Removing rubber skid marks from tarmac and concrete pavement



Surface processing by shot blasting

We can use our new shot blast system to improve friction value on tarmac and concrete, brighten roadways and remove road markings.

Unlike processing with water, in this method the impact of the steel balls roughens the surface of the grain, thus restoring the necessary grip while brightening the roadway or runway. This method is mainly used when taxiways and runways are only slightly contaminated with rubber skid marks.

Collecting the removed material in BigBags (FIBC) allows for easy disposal.

Advantages

- Roadway remains dry
- Brightens tarmac due to superficial opening of grain structure
- The accumulated waste water and removed markings are immediately sucked up
- No dust
- Sweeper not required

Application area

- Increasing roughness
- Brightening pavements
- Ensuring homogeneous adhesion across the entire surface

Reference projects

- International airports such as Stuttgart, Leipzig and Budweis



Friction improvement by shot blasting



Concrete removal

„Due to the geographical situation in central Europe, the density of road and rail tunnels is extremely high compared to other parts of the world. These bridges were mainly constructed with concrete building material in conjunction with reinforcing bars. Natural ageing („carbonation“) and environmental factors such as static overloading or salt spreading are primary sources of damage to the concrete and reinforcement. Ensuring the safety of the tunnel requires timely and professional concrete repairs. For this purpose, the old concrete is removed so that reinforcing rods can be exposed and cleaned. A new corrosion protection system can then be applied, followed by a new top layer of concrete and a special coating.“

The advantage of removing concrete with high-pressure water jets is that surfaces are treated gently and without vibrations, which prevents stress cracks. At the same time, the reinforcement is cleaned directly by the water jet and prepared for further processing steps.

Damaged concrete is partially removed with a water jet at up to 3000bar and 400 litres per minute; this is done by special removal robots, or manually by way of hand lances.

Tunnel robots remove concrete across all tunnel side walls



Advantages

- No secondary damage, such as new microcracks
- High-pressure water blasting is vibration-free, which prevents stress cracks and structure-borne noise
- The remaining surface is rough, and ideal for good adhesion of new concrete
- Worn concrete is particularly removed due to its diminished compressive strength. This permits selective removal
- Full preservation of existing reinforcement
- Effective cleaning of corroded reinforcing steel
- High-pressure water blaster dissolves chloride
- Improved adhesive properties

Application area

- Vertical and soffit concrete removal
- Work can be performed in varying degrees, from “roughening“ to “complete removal“
- Introduction of slits into tunnel side walls
- Concrete removal in recesses



Soffit removal by robots from a wagon



Removal for a certain radius by robot



Concrete removal by pilgrim-step method

Reference projects

9,000 m ³	concrete removal Autostrada del Brennero A22 (Italy)
40,000 m ²	concrete removal Arlberg railway tunnel
22,000 m ²	concrete removal and stripping railway tunnel at Kaunas (Lithuania)
6,000 m ²	concrete removal S16 Arlberg tunnel
3,000 m ²	concrete removal and surface preparation S10 tunnel at Neumarkt

Surface processing in the tunnel

When refurbishing a tunnel, it is not typically necessary to renew the concrete base—removing and reapplying the tunnel wall coating is usually enough.

Before each new surface coating, the relevant area (concrete, steel, floor, etc.) must be prepared in accordance with the respectively required standards and renovation guidelines. Optimal adhesion properties of the surface and coating material are the most important prerequisite for a long-lasting, professional recoating in compliance with the warranty.

We will find an optimal solution for any project by using special robots and vehicles to ensure coating is removed gently and without vibration.

We have experience with road tunnels of all kinds, and have already completed several special construction projects for railway tunnels to permit stripping during ongoing rail traffic (by using one set of rails while the opposite direction is being processed).

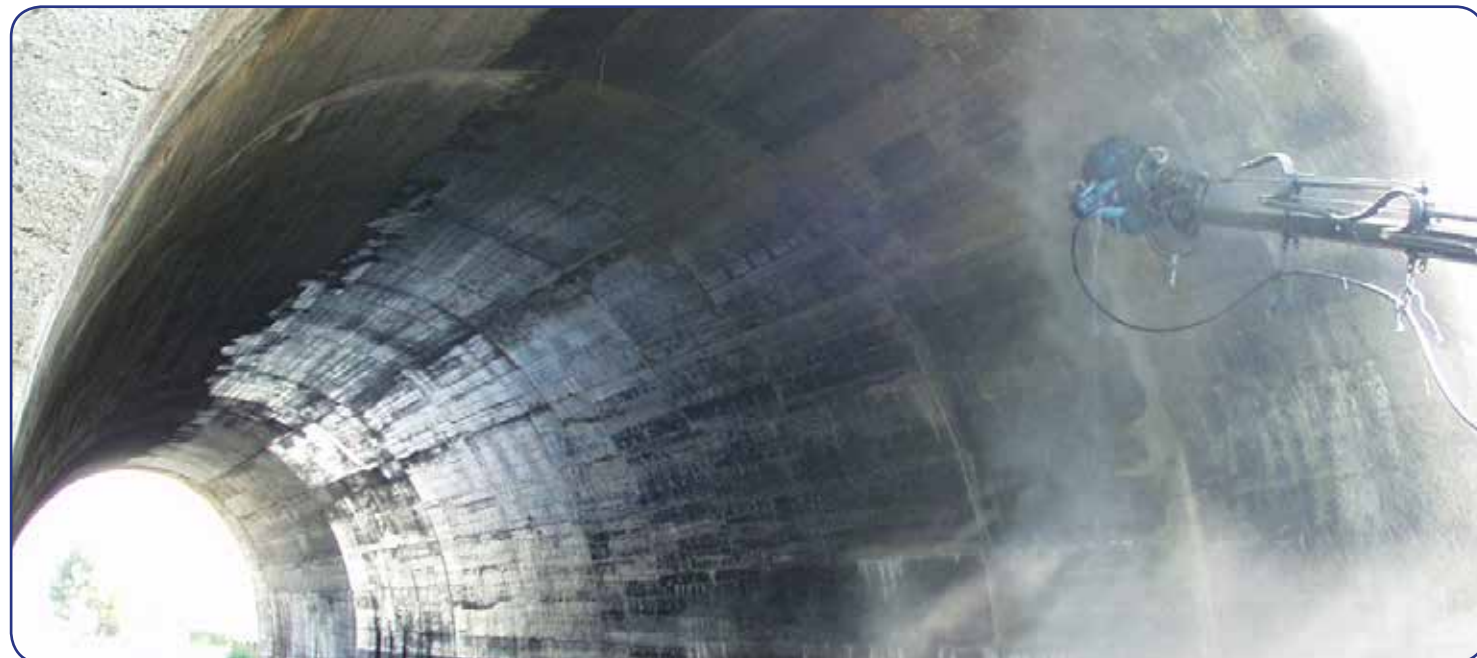
Advantages

- Separating substances (concrete slurry, impurities, etc.) are gently and entirely removed
- Non-bearing old coatings are completely or partially removed as required
- The removed material is immediately sucked up as required
- Suitable equipment for small and large areas

Application area

- Removing concrete slurry
- Removing coatings
- Removing fillings
- Opening cavities
- Making surfaces rougher

Tunnel work using a crane and washing disc at up to 2600bar



Stripping a rail tunnel without interrupting traffic



Coating removal



Gallery – processing by hand lance



Enclosure – working with a crane

Reference projects

- | | |
|------------|-------------------------------------------------------------------|
| 100,000 m² | surface preparation S10 tunnels |
| 100,000 m² | surface preparation S16 Arlbergtunnel |
| 22,000 m² | concrete removal and stripping railway tunnel at Kaunas Lithuania |
| 20,000 m² | surface preparation tunnel at Grenzstraße in Cologne |
| 6,000 m² | surface preparation railway tunnel at Rekawinkel |

Concrete removal

As transport routes have become optimised and the road network expanded, the number of bridges in Central Europe has become particularly high due to regional geographical conditions. These bridges were mainly constructed with concrete building material in conjunction with reinforcing bars. Natural ageing („carbonation“) and environmental factors such as static overloading or salt spreading are primary sources of damage to the concrete and reinforcement. Ensuring the safety of the tunnel requires timely and professional concrete repairs.

For this purpose, the old concrete is removed so that reinforcing rods can be exposed and cleaned. A new corrosion protection system can then be applied, followed by a new top layer of concrete and a special coating.

The advantage of removing concrete with high-pressure water jets is that surfaces are treated gently and without vibrations, which prevents stress cracks. At the same time, the reinforcement is cleaned directly by the water jet and prepared for further processing steps.

Damaged concrete is partially removed with a water jet at up to 3000bar and 400 litres per minute; this is done by special removal robots, or manually by way of hand lances.

Advantages

- No secondary damage, such as new microcracks
- High-pressure water blasting is vibration-free, which prevents stress cracks and structure-borne noise
- The remaining surface is rough, and ideal for good adhesion of new concrete
- Worn concrete is particularly removed due to its diminished compressive strength. This permits selective removal
- Full preservation of existing reinforcement
- Effective cleaning of corroded reinforcing steel
- High-pressure water blaster dissolves chloride
- Improved adhesive properties

Application area

- Concrete removal on surfaces, vertical surfaces and soffits, pillars, cantilevers, etc.
- Work can be performed in varying degrees, from “roughening“ to “complete removal“
- Introduction of slits for additional reinforcement



Concrete removal from bridge pillars by hand lances



Concrete removal from the soffit



Cantilever after concrete removal



Cantilever during processing



Reference projects

9,000 m³	concrete removal Autostrada del Brennero A22
2,600 m³	concrete removal Agnello 1 + 2 Klausen (Italy)
500 m³	concrete removal airport underpass at Salzburg
450 m³	concrete removal A23 south-east tangent
400 m³	concrete removal A12 Mölz buildings 07–10
300 m³	concrete removal A3 at Mühlbachthal (Germany)

Achieving roughness and increasing adhesive properties

When renovating bridges, the roadway structure must often be resealed to prevent damage to the concrete superstructure. Sealing is required to prevent damage to the concrete superstructure. Without sealing, water may infiltrate defects, damage the reinforcement (e.g. due to salt ingress) and jeopardise the bridge's stability.

Our special wide-area surface cleaners can be used to roughen concrete surfaces. After milling off the tarmac and partially milling the underlying concrete, the concrete surface is roughed to a depth of up to 3 mm, using a working pressure of 2400bar and a special nozzle combination.

It is much easier to produce tensile adhesion on old or new concrete: The adhesive force of 1.5 N/mm², which is required for insulation works, is reached at a working pressure of up to 1000 bar. For this purpose, cement is removed from the cement slurry on the surface using the wide-area cleaner or a handheld device, and a roughness of around 0.1–0.3 mm is achieved.

Advantages

- No secondary damage, such as new microcracks
- Optimal combination of “old” and “new” materials
- No mechanical damage to the reinforcement
- Surface immediately ready for further processing
- Efficient and fast

Application area

- Bridge renovation
- Structural joints
- Surface sealing

Surface preparation of the bridge deck for sealing or grout topping



Measuring surface roughness using the sand patch method



Surface preparation on pillars



Wide-area cleaner: Improving roughness by using high-pressure water

Reference projects

Bridges on
 - Motorways,
 - Federal roads and
 - Railways in Austria, Germany, Italy, France

Power plant channels KW Isarkanal

Power plant channels KW Kleinmuenchen

Building renovations

The favourite material of the past century, concrete, is by now used in just about all buildings in conjunction with reinforcing bars. Natural ageing ("carbonation") and environmental factors such as static overloading or salt spreading are primary sources of damage to the concrete and reinforcement. Ensuring the safety of the building requires timely and professional concrete repairs.

For this purpose, the old concrete is removed so that reinforcing rods can be exposed and cleaned. A new corrosion protection system can then be applied, followed by a new top layer of concrete and a special coating.

The advantage of removing concrete with high-pressure water jets is that surfaces are treated gently and without vibrations, which prevents stress cracks. At the same time, the reinforcement is cleaned directly by the water jet and prepared for further processing steps.

Damaged concrete is partially removed with a water jet at up to 3000bar and 400 litres per minute; this is done by special removal robots, or manually by way of hand lances.

Advantages

- No secondary damage, such as new microcracks
- High-pressure water blasting is vibration-free, which prevents stress cracks and structure-borne noise
- The remaining surface is rough, and ideal for good adhesion of new concrete
- Worn concrete is particularly removed due to its diminished compressive strength. This permits selective removal
- Full preservation of existing reinforcement
- Effective cleaning of corroded reinforcing steel
- High-pressure water blaster dissolves chloride
- Improved adhesive properties

Application area

- Concrete removal on surfaces, vertical surfaces as well as soffits, particularly on ceilings, foundation plates, underground car parks, walls, supports, etc.
- Work can be performed in varying degrees, from "roughening" to "complete removal" of the slab thickness



Concrete removal on vertical surfaces such as retaining walls, pillars, walls



Work on pillars in an underground car park



Concrete removal in an underground car park

Reference projects

Underground car park renovation works in:

- Germany
- Austria
- Italy

Foundation restoration at VAI Jubail (Saudi Arabia)

2,500 m³ concrete removal Kokskranbahn Voest Linz

300 m³ Mount Coffee power plant (Liberia)



Power plant maintenance

Refurbishing power plants and their parts is similar to tasks found in other civil engineering projects. However, this does entail special requirements, particularly due to the sometimes exposed situation of hydroelectric power plants or long supply channels, for example.

In the light of increased safety and reliability requirements for clients operating in power plant construction and refurbishment, we have built a reputation as a competent and reliable partner in this niche market.

Most renovations require several aspects of our range of services (e.g. removing concrete from damaged surfaces, cleaning turbines or other critical parts, and cleaning pressurised pipes, particularly in hydroelectric power plants).

Thanks to the large number of pumps and machine units at our disposal, we are a reliable partner who can support our customers' projects around the globe without relying on the availability of specific devices.

Advantages

- Environmental impact significantly reduced by using water and its retreatment during processing operations
- Filtering of collected substances
- Reduction in safety measures and associated costs
- Significantly lower disposal costs due to highly concentrated waste
- Reduced working time
- Shorter operational stoppages
- Minimised economic disadvantages
- Work performed under consideration of SHE (safety, health and environmental protection)

Application area

- Power plant operators



Concrete removal at PP Mount Coffee/Liberia



Concrete removal by robot



Surface preparation of power plant channel for renovation

Reference projects

- | | |
|---------|----------------------------------------------------------------------------------------------------------|
| 300 m³ | Concrete removal from generator base, spillway and draft tube remediation at Mount Coffee plant, Liberia |
| 400 m | Abrasive cutting of girders backfilled with concrete at Mount Coffee power plant, Liberia |
| 250 m³ | Concrete removal in the suction pipe and spiral bevel at Dionysen power plant |
| 4.000 m | Cleaning of relief wells at Laas-Martelin power plant, Italy |

Concrete removal in the power plants Altenwörth, Gössendorf, Hallein, Hieflau, Jochenstein, Karmmern, Offensee, ...

General contractor for a range of renovation works to pressure pipes



Penstock stripping

In 2006, Sodian Group entered the business field (among others) of using high-pressure water blasting to strip penstocks which are subjected to water exposure (e.g., pressure pipes and tanks).

Steel surfaces exposed to water (pressure lines) must be protected from corrosion every 40 to 50 years. In the past, this often meant using paints containing hazardous substances such as asbestos, PCBs (polychlorinated biphenyls), PCP (pentachlorophenol) or PAHs (polycyclic hydrocarbons).

A proprietary method specially developed by Sodian Group ensures that surface layers and any primers down to the underlying steel surface are completely removed in a single pass without any residues.

The recycled water and any solids (rust, primer and top coats) are delivered into a mobile water-treatment plant, where process water and solids are continually separated using a multi-chamber filter system and pelletisation device. The liquid content of the pellets is very low.

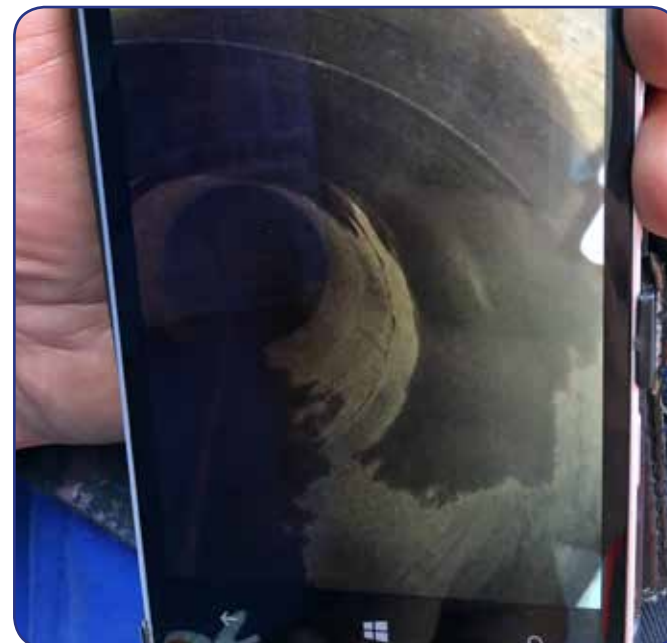
This method is not just revolutionary in ecological terms – stripping automatically by using specially developed robots keeps our employees safe, since no manual labour is carried out in the pipe.

Advantages

- Environmental impact significantly reduced
- Reduction in safety measures and associated costs
- Significantly lower disposal costs due to highly concentrated waste
- Reduced working time
- Shorter operational stoppages
- Minimised economic disadvantages
- Work performed under consideration of SHE (safety, health and environmental protection)

Application area

- Renovating Hydroelectric power plants



Digital surveillance outside the pipe

Reference projects

Stripping various primers in pipes.
A total of 30 km of pipes were de-coated by the company in the past 10 years.

- 100,000 m² sprayed zinc coating
- 80,000 m² zinc primer (some multi-layer)
- 20,000 m² of other coatings



Water Processing

Finding an environmentally sustainable solution for treating contaminated water is central to our work. We have endeavoured to do so for quite some time, and are proud of the options we can offer our customers.

The procedures developed by Sodian Group use high-pressure water blasting technology, filter out all solids, and reprocess the jet water.

The recycled water and any solids (rust, primer and top coats) are delivered into a mobile water-treatment plant, where process water and solids are continually separated using a multi-chamber filter system and pelletisation device. The liquid content of the pellets amounts to a maximum of 10%. The recycled water is clean and free of suspended matter and may be resupplied to the high-pressure pump or fed to the drains.

Purifying the water to <1 micron allows our high-pressure pumps to reuse the treated water, which provides a water circuit to minimise the water we need to perform our work.

Advantages

- Environmental impact is significantly reduced
- Safety measures and associated costs are reduced
- Required water is minimised
- Disposal costs are reduced by using compressed, highly concentrated pellets



Application areas

Road construction

The remediation of process water for recirculation is essential in areas with strict ecological requirements or limited drinking water resources.

Tunnel and bridge renovation

Tunnels and bridges are often located at sites with limited availability of process water for renovation works. In addition, the environmental requirements for these areas are comparatively higher than in urban areas.

Power plant renovation

When removing critical materials such as asbestos, PCBs (polychlorinated biphenyls), PCP (pentachlorophenol) or PAHs (polycyclic hydrocarbons), the use of water and the associated binding of hazardous materials helps prevent their release into the environment, and thus contamination. The water treatment minimises the volume of contaminated material, thus drastically reducing the burden on the environment.

Building renovations

In urban areas, renovation works in building construction are rarely conducted without a waste water treatment concept – especially when it comes to underground car parks. Solutions that do not involve circulating process water are increasingly encountering not only ecological but economic challenges



Water treatment



Equipment used



Industrial cleaning

Over the past 35 years, high-pressure water jet technology has become an indispensable part of industrial cleaning. SODIAN industrial cleaning has been active in this segment since its inception, and is now one of the most experienced and best-performing companies in the sector.

We offer a pure, efficient cleaning solution without using chemicals, and have always regarded technical expertise and customer focus as our core values.

- Shutdown service
- Tank cleaning
- Heat exchanger cleaning
- Pipe cleaning
- Crew cleaning

SODIAN Industrial cleaning is safety-certified (SCC**) and has implemented quality management pursuant to ISO 9001:2008!

Advantages

- Non-destructive cleaning procedures
- No chemical additives
- 24/7 availability
- Fleet of over 60 units for major shutdowns

Application area

- Paper and pulp industry
- Chemical and pharmaceutical industries
- Petrochemical industry
- Food producers
- Power plant operators
- Steelworks



Clogged pipes



Pipe after high-pressure water cleaning



Heat exchanger cleaning



Reference projects

Lenzing AG
Smurfit Kappa Nettingsdorf
Papierfabrik Steyermühl
Sappi Austria
Energie AG
Danisco Sweeteners
Laakirchen Papier AG
Voest Alpine
Zellstoff Pöls AG





Dry-ice blasting

The dry ice pellets are fired at the contaminated surfaces at high speed. Upon impact, they vaporise into carbon dioxide and inflate to 700 times their original volume.

This process shock-freezes the impurities so that they become brittle and detach from the surface.

Dry-ice cleaning is an innovative new technology that was developed as an environmentally friendly, safe, inexpensive and fast alternative to traditional cleaning with brushes and spatulas.

Advantages

- Environmentally friendly
- For applications where water or sand cannot be used (electrically controlled machines)
- Compact and portable
- Saves time and money (no disassembly of the cleaning equipment required)
- Non-abrasive

Application area

- Paper and pulp industry
- Chemical and pharmaceutical industries
- Petrochemical industry
- Food producers
- Power plant operators
- Steelworks



Abrasive cutting

With the abrasive waterjet cutting procedure, cutting metal precisely is no problem even in hazardous areas.

The cutting jet (injector jet) consists of air, water, and an abrasive agent.

This combination of high-pressure water (up to 2500bar) and the abrasive material can cut through an object several centimetres thick.

Application area

- Dismantling of industrial equipment of all kinds
- Linear cuts in containers and tanks
- Cutting of tubes, pipes, pipelines, etc.
- Cutting of heat exchangers and jackets



Advantages

- Almost any material can be cut (e.g., steel, glass, stone, wood)
- High environmental compatibility, since no thermal reaction products are brought about
- No thermal influence on the cutting edge
- Narrow and clean kerf
- Cutting of solid materials
- Low cutting and reaction forces
- No sparks





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