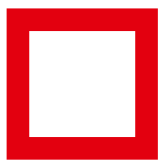




INDUSTRIAL SERVICE FOR CONVENTIONAL
POWER PLANTS AND **INCINERATORS**



ABOUT THE BUCHEN GROUP

The Buchen Group is an internationally active service provider, who sets standards in the industrial service, waste and decontamination markets. We invest our full effort every day at over 60 locations in Germany, Europe and the Middle East in order to offer our customers professional industrial service. We know that our 2,300 employees are the greatest capital of the Buchen Group. That is why we keep their technical knowledge and abilities up to date through regular training and education programs in our certified training centre. All areas of the Buchen Group are certified throughout Europe in regards to quality, safety, health and environment management. Furthermore, all locations in Germany in which we offer waste management services are certified as specialists. The companies from our Group combine basic values that help our customers become more successful and preserve the environment.

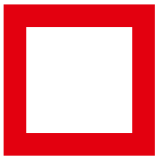
■ BUCHEN KRAFTWERKSERVICE – THE SPECIALIST FOR INDUSTRIAL SERVICE IN CONVENTIONAL POWER PLANTS AND INCINERATORS

Buchen KraftwerkService offers services to the operators of conventional power plants, thermal waste treatment plants and industrial incinerators and steam boiler plants throughout Europe, which range from consulting for the cleaning and decontamination of systems and system components up to waste management. We create individual service packages customized to your needs; this helps minimize your coordination and work expenses and simplifies your process procedures during revisions. For disruptions and emergencies, our 24-hour service is available day and night under the national hotline 0800-7177-111.



Where we work for you:

- Feed hoppers
- Container/steam generators
- Turbines
- Condensers
- Ash removal
- Primary air preheater (LUVO)
- Gas preheater (GAVO)
- Exhaust denitrification systems (DeNOx)
- Dust extraction plants (E-filter)
- DESOX plant (REA)
- Coolant systems and towers
- Piping and canals
- Tanks
- Instruments and containers
- Heat exchangers
- Chimneys
- And a lot more



BOILER CLEANING

In order to provide good technical availability and reliability, the operators count on competent partners for the on-time execution of required repairs and cleaning work. This is the only way that their delivery and acceptance obligations can be maintained. The basis for operation and maintenance is the constant cleaning of the system.

Waste incineration does not occur without residues. Due to the chemical and physical properties of the combustibles, caking, waste and incrustation form on the heating areas of the steam generator. These hinder the transfer of heat, lead to an increase in the system's power needs due to the increased flow resistance and in extreme cases, this may even result in total failure. For these reasons, regular cleaning of the system is indispensable.

Good planning and its implementation in combination with an operating team and external partners is the requirement for a quick cleaning and rapid restart of the system.

Our procedures:

- Sandblast procedure
- Dry ice blasting technique(CO₂- lasting)
- Vacuum stream procedure

Areas of application:

- Mechanical basic cleaning of all heating surfaces
- Removal of ramming mass
- Blooming of surfaces
- Descaling
- Removing rust
- Surface preparation for coating work
- Preparation of measuring points
- Fire damage restoration
- Turbine/machine cleaning

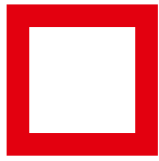
UNDERPRESSURIZATION/ SUCTION DRAFT REPLACEMENT

If the suction draft is out of order during a revision, we are able to provide for an adequate replacement with our mobile high-power vacuum dust extracting systems. Of course, we also offer this service for unplanned disruptions.

Your benefits at a glance:

- Extraction and filtering of dust in order to protect the direct environment from contamination
- Replacement of the facility's suction drafts if needed
- Depending on the requirements, provision of devices with different power classes and volume capacities
- Filtering either through a bag or cartridge filter
- Filling of the dust into the bunker or big-bags





EXTRACTION

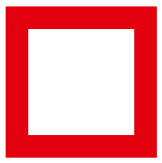


Our mobile suction vehicles and high-performance air conveyors are approved according to GGVS/TRbF and develop a suction power of up to 8,100 m³/h. This enormous amount of power and an operating radius of around 300 m without changing the location allows for the extraction of dusty, dry, pasty or liquid materials.

For dangerous dusts, we have filters with the dust protection class "H". The removal occurs through dumping, filling in big bags or blowing – depending on the local circumstances.

The procedure is ideal for:

- Dusty goods
- Dry material
- Pasty products
- Liquid goods
- Hazardous goods



HIGH PRESSURE WATER CLEANING



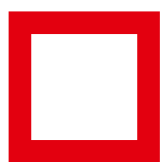
Residue is created in all production systems. Everywhere where a smooth work process depends on the optimal throughput in systems or pipes, our automated or manual water-jet high-pressure cleaning can be used. It is environment-friendly and conserves the materials.

Because the cleaning process does not occur with the help of chemicals, but rather purely mechanically – through pure water power. We have the required technical know-how and corresponding equipment for all areas of application:

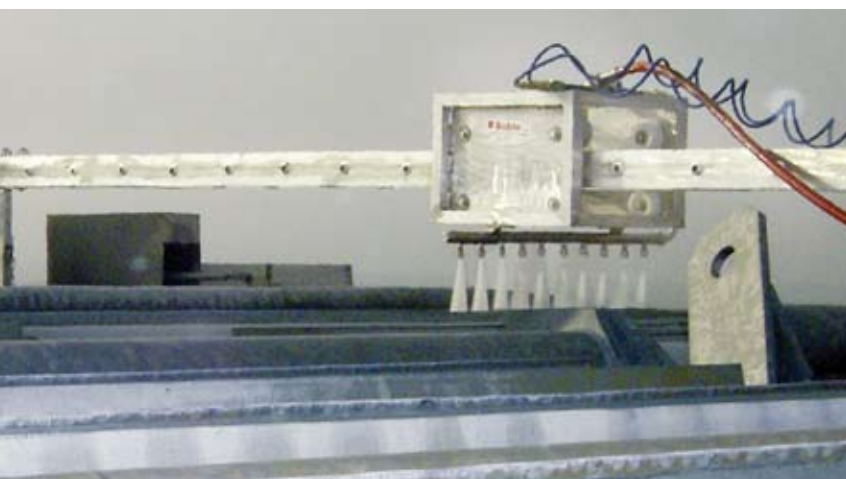
The drive powers of our high pressure pumps reach up to 600 kW. Depending on the degree of contamination, we use pressures of up to 2,500 bar.

We achieve optimal cleaning results for the following areas of application:

- Stubborn deposits on heat exchangers
- Algae and copper rust residues in the interior of cement and wood cooling towers
- Incrustation in pipes
- Removal of coating and lining
- Cleaning of tanks, containers and systems



AIR COOLER CLEANING



Air coolers and air condensers in power plants are subject to the recondensation of water that drives the turbines when it is in a steam form. These are heat exchangers with finned pipes for cooling the medium through exchanging heat with the surrounding atmosphere.

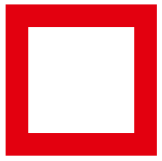
Through contamination and deposits, the heat exchange is lowered in the air cooler, the condensation process is hindered and the efficiency of the power plant decreases.

Buchen KraftwerkService developed an automated high pressure cleaning procedure specializing on the properties of air coolers and air condensers in order to clean these sensitive systems in a preserving and efficient manner. With a combined ladder and slide system, it is possible to clean large surfaces of the air cooler in a short amount of time.

The semi-automated procedure is used for fine work where the cleaning sleds are controlled by qualified specialists by remote control.

Your benefits at a glance:

- Clear increase in efficiency
- Optimal degree of cleaning
- Shortened cleaning time
- Directed beam control
- Increase in the degree of efficiency
- Material-preserving
- The large number of jets allows for the simultaneous cleaning of a larger area
- Increased work safety



LUVO CLEANING

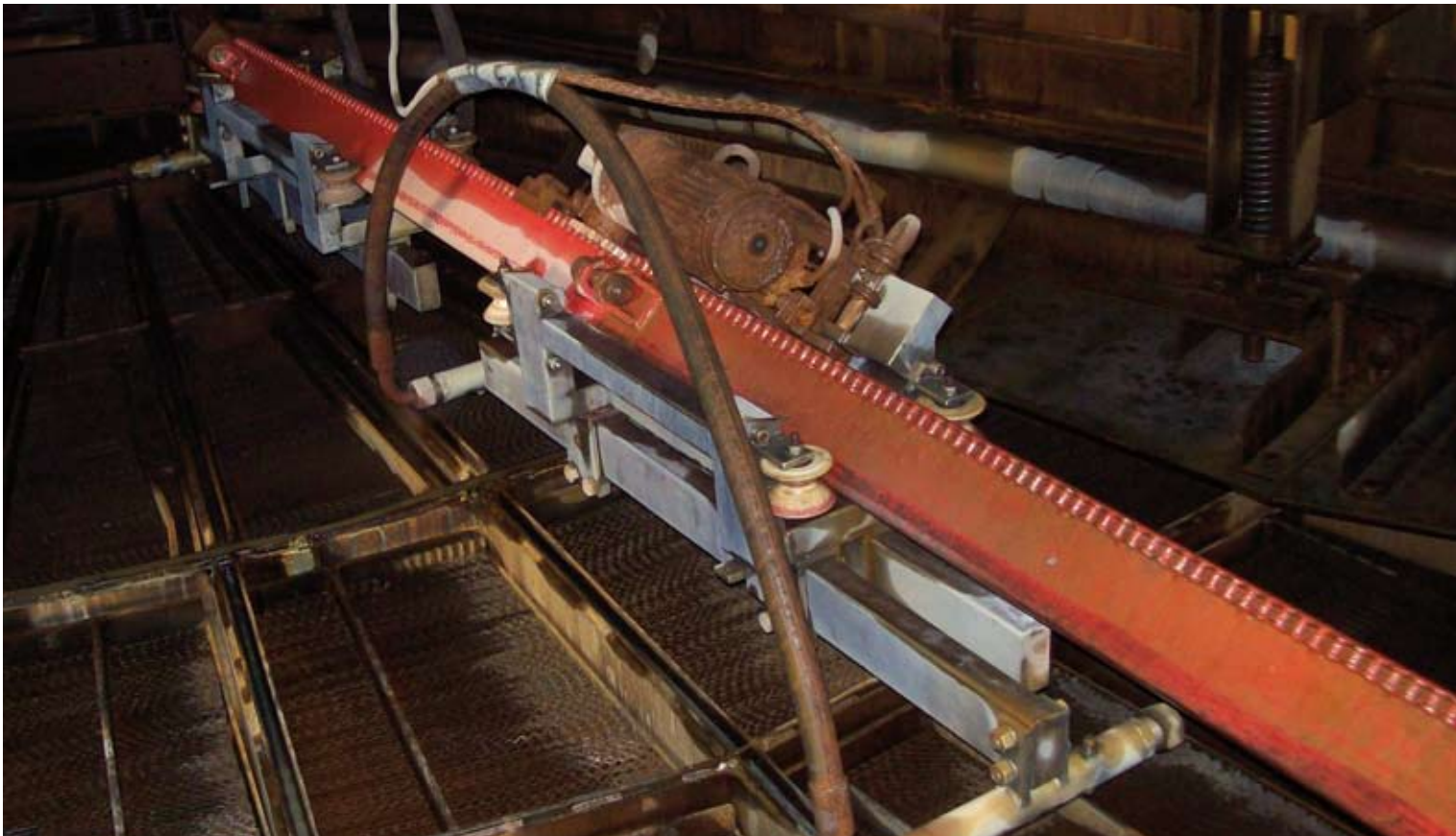
Contaminations on the heating surfaces of primary air preheaters lead to problems during operation. The heat transfer is dramatically reduced through this and the back-pressure in the system increases. The consequences: Forced draft fans and suction draft fans are hindered. The efficiency of the system decreases considerably.

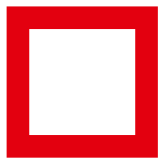
Buchen KraftwerkService has developed a fully automated, computer-controlled system for water high-pressure cleaning of primary air and gas preheaters. This mature procedure is mobile, works in a self-sufficient manner and only requires electricity and water.

It allows you to clean heating surfaces of primary air preheaters with a very high degree of cleaning using the water high pressure procedure – faster and more efficient than ever.

Your benefits at a glance:

- Highest degree of cleaning
- Shortened cleaning times
- Longer system availability
- Shortening of downtime
- Considerably improved heat transfer
- Considerable reduction of the Δp (differential pressure)
- Directed beam control
- Either electrical or diesel operation
- Optional: Takeover of sewage management





CHEMICAL CLEANING

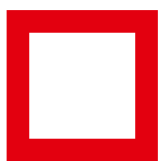


With chemical cleaning, we can remove stubborn attachments on and in system parts. Here we determine the selection and dosing of the solvent individually for each case. We use this procedure wherever the constellation of material and contamination makes it necessary or if we can obtain better cleaning results with this procedure.

For example, in hard to reach system areas. We professionally treat and minimize the accrued residue. On request, we can also take care of the disposal.

We achieve optimal cleaning results for the following areas of application:

- Combustion chambers
- Heat exchangers
- Superheaters
- Convection zones
- Primary air preheaters
- Containers
- Pipes
- Fixtures



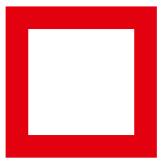
CLEANING IN PLACE (CIP)



The object of chemical circulation cleaning in fluid systems is to restore bare, metallic surfaces in heat exchangers, condensers and coolers. Coatings of scale, iron, magnetite or biofilm are removed from pipes. Losses during heat transfer are reduced in the devices, energy costs decrease and the life cycle of a system or of the system parts is extended dramatically.

Your benefits at a glance:

- Saving of assembly times (dis- and reassembly)
- Cost benefits: No scaffolding and lifting equipment required
- Decrease in energy costs
- Restoration of the performance values to a new device level
- Extension of the system run times



DETONATION CLEANING

For the removal of dust, dirt and product deposits in combustion chambers from giant boilers and in modern fluidised bed boilers or in downstream systems for exhaust gas treatment, detonation cleaning is used within the scope of planned downtime in the offline procedure and during the running operation in the online procedure. While cleaning the deactivated systems, the first safety cleaning through detonation cleaning can occur during the cooling phase and large amounts of deposits can be quickly reduced to conveyable, small pieces. We use industrial climbers for hard to reach areas. Detonation cleaning technologies can be combined with conventional cleaning procedures.

Your benefits at a glance:

- Reduction of the planned downtime
- Decrease in costs through savings on equipment
- High personal safety during the preparatory work for the downtime

For cleaning while in operation, the system safety is guaranteed by maintaining the temperature of the load under 70 °C. The increase in the operating times, high personal safety, saving of equipment and avoidance of residues from conventional cleaning materials are all important benefits of detonation cleaning. A special camera guarantees the visual state detection before and after the cleaning is done in the system.

HIGH TEMPERATURE CAMERA

It is often the case that contamination cannot be precisely located in large combustion plants. Even if a deviation from the normal values is determined through the system sensors, this says nothing about the size and quality of the cause. For effective cleaning and the determination of the ideal cleaning process, it is important to precisely determine the type, scope and position of the contamination or disruption. We use a high tem-

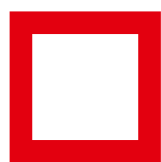
perature camera for this purpose, which allows us to execute a boiler or system inspection during operation.

The situation in the system can be precisely analyzed through a monitor. The conditions found have a direct influence on the planning of the most effective way to take care of the disruption. Thus, for example, with an intended explosive cleaning, the detonation process and required dosing can be calculated in advance. The recordings can also be documented on video.

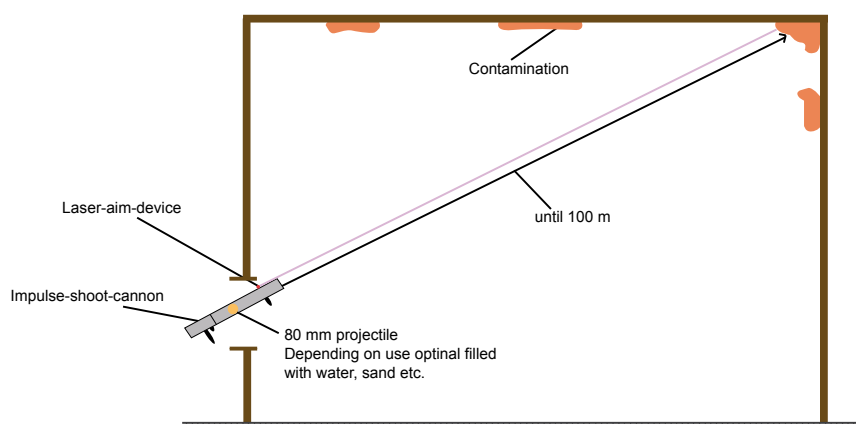
The camera can be used for the localization and evaluation of:

- Damaged areas (rips in the pipes, etc.)
- Caking (which hinders an optimal operating state)
- Leaks (heating surfaces, pipes, canals, etc.)
- Flame patterns
- Flow conditions



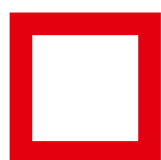


INDUSTRIAL CANON



Strong adhesive contaminations, also on hard to reach areas of the respective system parts, can be removed effectively with the industrial canon aimed directly at the problem. With the manually operated industrial canon, you shoot plastic balls filled with water at high speeds against the walls in the boiler or industrial systems, which are encrusted with deposits. The energy released upon impact causes the immediate dissipation, removal and breaking of deposits. You can also use plastic balls filled with sand or metal scrap.

The accuracy of the industrial canon is 1 square meter with a range of 100 meters. Due to the good accessibility of nearly inaccessible areas, potential safety hazards in systems caused by deposits can already be repaired from a safe distance, before entering the facility.



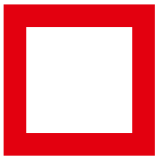
STUD WELDING/STUD REMOVAL



A functional fire-proof system is an important factor for efficient incineration in a lot of combustion plants. Connectors between the boiler tube and fire-proof coating are metallic anchoring elements (studs). These are primarily attached through the stud welding process.

Your benefits at a glance:

- Removal of old studs, for example, boiler boats, well anchors, plate holders
- Face grinding of old anchoring elements
- Delivery and proper welding of different anchor types according to individual customer requests
- Consulting services about material qualities and anchor types



ELEVATED WORK

At hard to reach areas, conventional scaffolding meets its technical and economical limits. This is where the rope-supported elevated work is used for cleaning, testing and inspecting and for maintenance work.

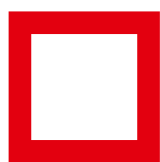
Specialized elevated workers provide for proper and efficient operation.

Your benefits at a glance:

- Safe services at hard to reach areas
- Rope-supported industrial climbers
- Safety cleaning
- Tests and inspections
- Flexible and fastest possible use
- No or low downtime through dis- and assembly times
- Cost benefits through no scaffolding and lifting equipment

Innovative rope-guided and supported industrial cleaning through dry and wet blasting processes as well as welding work and wall thickness gauging have proven to be economical alternatives in many projects.





FURTHER SPECIAL SERVICES



■ WALL THICKNESS GAUGING

A test of the pipe wall thicknesses is frequently executed after the cleaning of boiler systems from fossil-fuel power plants or waste burning plants. We use the newest measuring technology to measure the wall thickness.

The measuring devices have a high performance probe so that it is possible to perform optimal measurements, even at higher object temperatures... The recording occurs through an integrated measurement data memory, which supports grid formats and is designed for up to 50,000 values. Furthermore, min. and max. values and alarms and differential measurements can be executed in order to allow for an immediate comparison between the measured and nominal wall thicknesses. The files are transported to a PC through a Mini USB Com Port and then imported in Microsoft Excel.

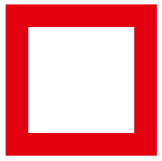
■ CANAL-TV-INSPECTION

With the most modern camera systems, we inspect systems, pipes and canals. Here, we cover all uses in non-accessible and accessible areas up to ex-areas. The inspection vehicles used for the TV canal inspections are state-of-the-art.



■ CANAL CLEANING

We reliably clean canals and lines up to DN 2,000 with combined suction and cleaning vehicles, which are used to extract and transport the residues. All vehicles are approved according to GGVSE/TRbF.



FURTHER SPECIAL SERVICES

■ **SLUDGE TREATMENT**

We treat sludge and suspensions and drain them so that the amounts of waste are reduced. We use powerful decanters, centrifuges or chamber filter presses for this. We would be happy to dispose of the residue on request.

■ **MANUAL CLEANING**

Despite all mechanical equipment and progressive automation, manual work is still indispensable in certain areas. Our trained personnel execute this quickly and professionally.

■ **DECONTAMINATION**

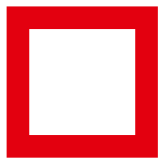
In regards to decontamination, we execute decommissioning, dismantling and decontamination projects. Here we use our know-how from our different areas of expertise and bundle it with individual complete packages from one source. The concentrations here are in the decontamination of contaminated land and buildings and system dismantling.

■ **WASTE MANAGEMENT**

Cleaning work is normally connected with waste tasks. On the basis of legal regulations, we work on integrated concepts for the management and removal of waste. Our offer reaches from the collection to the storage, classification and declaration up to the transportation and treatment of all types of waste in our own waste management facilities.

**Now it's your turn:
What can we do for you?**





OUR EMPLOYEES



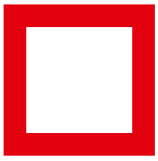
The abilities of our employees are the basis for our success. Continual training and education guarantee a wide standard of qualifications among our skilled workers.

KraftwerkService skilled workers

- DEKRA-certified basic training "skilled workers for sandblast work"
- Systematic guarantee of general and activity-related instructions (SAP-monitoring)*
- Medical screening according to G 1.4 / 2 / 8 / 20 / 25 / 26.3 / 30 / 32 / 40 / 41
- Confident knowledge of German

- Training as a breathing apparatus wearer
- HD-training (theoretical and practice)
- SCC training and test
- Trained fork lift operators (50%), first aid workers (30 %) and
- Safety officers (15 %)
- Own safety officers
- Own breathing protection apparatus workshops

* Safety instructions are documented in the safety pass



OUR CERTIFICATES



Quality management ISO 9001



Safety management SCC**



Specialist Company in accordance with German Water Act § 19 I WHG

Our qualifications

- Personnel qualification for activities as an industrial cleaner
- HD-cleaning specialist
- HD-machine operator



VGB SeSaM Qualifikation



DEKRA evidence of conformity



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