

Catalyst handling and reactor services



> BUCHEN-ICS GmbH

BUCHEN-ICS specialises in unloading, cleaning, servicing and loading catalytic reactors – in both normal and nitrogen atmospheres

buchen-ics.com



Working with BUCHEN-ICS gives you access to its state-of-the-art technology and 40 years' experience of providing reactor services

Have us deliver your reactor services and leave nothing to chance

If industrial plants are to function effectively, it is essential that their reactors are serviced and cleaned and that the catalyst is replaced at regular intervals. The BUCHEN-ICS experts can carry out all the tasks needed here – professionally and efficiently.

In safe hands

It is impossible to become a reactor service and catalyst handling specialist overnight. We have been demonstrating our expertise in this field since 1979, taking part in a whole range of major projects at chemical businesses and refineries. And, of course, we are well aware that safety, quality and speed are top of the list of priorities when it comes to reactor work – which is why we always plan and carry out our tasks meticulously from start to finish. Make the most of our highly professional services.

A one-stop shop

We are not only able to clean and service your reactors, we can also take over all the other reactor services on your behalf, such as disposal and processing the catalyst. We either do all the tasks ourselves or commission a suitable service provider to carry out the work for you.

Expertise you can rely on

At our company, service also means providing our customers with expert advice. Which is why we make the very most of our experience to develop and implement bespoke solutions to suit the type of reactor you operate. And the results really are impressive. We document each and every stage of our work – from preparing the facility to recommissioning it – so you know exactly what's happening at all times.

Well prepared all the time

Our company is well known for its excellent staff qualifications. BUCHEN-ICS only works with people who are experts in their field, who know how to use the latest technology and who feel comfortable in all environments, no matter where they may be deployed. What's more, they regularly take part in further training courses and seminars to ensure they are always up to date. Our training centre in Voerde allows operatives to practise using their respiratory protective equipment (RPE) under realistic conditions – a truly unique facility in Europe able to do this.

Part of a high-performance network

BUCHEN-ICS not only has the expert knowledge needed to deliver reactor services, it also has access to the expertise of the global REMONDIS Group. BUCHEN and XERVON – and their 10,000+ employees – are responsible within the Group for providing all industrial services, with BUCHEN-ICS focusing on catalyst handling and reactor services. We benefit from working together with the other companies in the REMONDIS Group, especially when it comes to disposal and processing materials, and pass these advantages straight on to our own customers. BUCHEN-ICS' operations abroad are managed by the individual international subsidiaries.

We keep a very close eye on quality, health, safety and the environment:

BUCHEN-ICS has the certificates needed to show it meets all QHSE standards

Highly trained operatives from within the Group are deployed to help out during peak periods

> You benefit from

- 40 years' experience of major projects
- Certified safety and quality
- Shortest possible turnaround periods
- Highly trained staff
- Expert advice and a full range of services
- Innovative processes



The 14-metre-long simulator at our training centre allows operatives to practise using their RPE in a variety of environments



Practising to use respiratory protective equipment is a fundamental part of our staff training programme

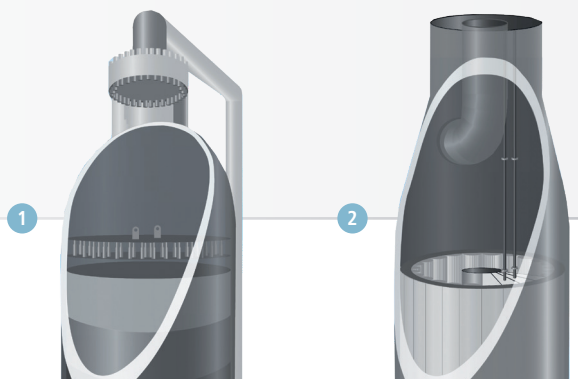
Only the very best for your reactors: Top quality services from BUCHEN-ICS

The greater the challenge, the greater the need for BUCHEN-ICS. Why? Because we are always able to find a suitable solution no matter how complex the situation. We are the partner of choice for many large industrial businesses – and handle all types of reactors and facilities at both refineries and chemical and petrochemical plants.



No job is too high for us: we also have the expertise needed to deal with large-scale reactors

If you wish, we can also supervise the changeout of your catalyst



At home in a whole range of processing plants

It's certainly good if you are an expert in your field. It's even better if you are an expert in all fields. We offer a full range of services for processing plants in both normal and nitrogen atmospheres. Not only do we unload, clean and reload different types of storage vessels (including setting up and removing any necessary installations), we also separate the fine material and inert ceramic balls from the catalyst. What's more, we also handle all the materials and parts that need replacing – such as the catalyst, molecular sieves, activated carbon and perlite – as well as all the maintenance work.

Modern technology protects the material when reactors are being unloaded and loaded

Anything but off-the-peg

Our goal is to provide a bespoke service for each individual type of reactor. We offer you our services to work out the best maintenance concept for your reactor. Why not get in touch?!

Besides providing reactor services, we also clean silos. See page 7



> Our areas of expertise

Refining

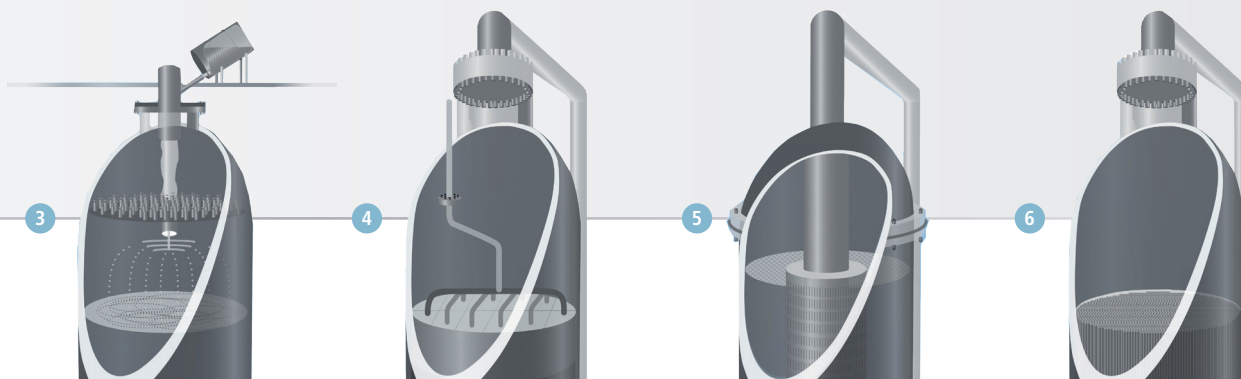
- Hydrocracking 1
- FCC
- Reforming / CCR 2
- Desulphurisation / Claus / hydrofining / hydrotreating
- Filters (activated carbon, absorbers)
- Isomerisation / Penex™ 3
- CHD
- Sulfren
- Prime-G
- Unifining
- Parex™ / Molex™ 4

(Petro) Chemicals

- Olefins
- Aromatics
- Ammonia synthesis converters 5
- Tubular reactors 6 (EO, PO, GTL, acrylic acid, methacrylic acid)
- Styrene (polymerisation)

Other areas

- Steam reformers / primary reformers
- Cold boxes
- Sulphuric acid converters
- PSA
- LT/HT shift converters
- Flue gas desulphurisation (DeNOx, SNOx, SO₂ converters)
- CD-tech (catalyst modules)
- Silos
- Coal bunkers
- Storage vessels



Ahead of the competition – also when it comes to innovations

We not only use standard technologies (such as industrial vacuum cleaners and material-friendly catalyst screening equipment) but also processes which we have developed ourselves to make our work even safer and more efficient. A few examples can be found below.



We always find the right solution, no matter how complex the challenge

Life support system

Our CE-certified life support system (LSS) meets the highest safety standards and is deployed when operatives carry out tasks in a nitrogen atmosphere. This system has a number of advantages: video surveillance is available at all times (also in the LSS control centre itself) and the infrared technology enables the lower explosive limit to be continuously monitored at the worker's level, even under nitrogen conditions. It also uses 'anti-panic helmets', which have two completely separate oxygen supplies, and an integrated communications system. What's more, the system is extremely flexible as it can be transported in many different ways (trailer, bus, flight case etc).

Wet dumping

Wet dumping is a method used to empty reactors. When this process is deployed, the catalyst is unloaded or vacuumed out using a liquid. The big advantage here is that the operatives do not normally have to enter the nitrogen atmosphere, guaranteeing the highest possible levels of safety.

Dense phase conveying system

Dust-free catalyst handling

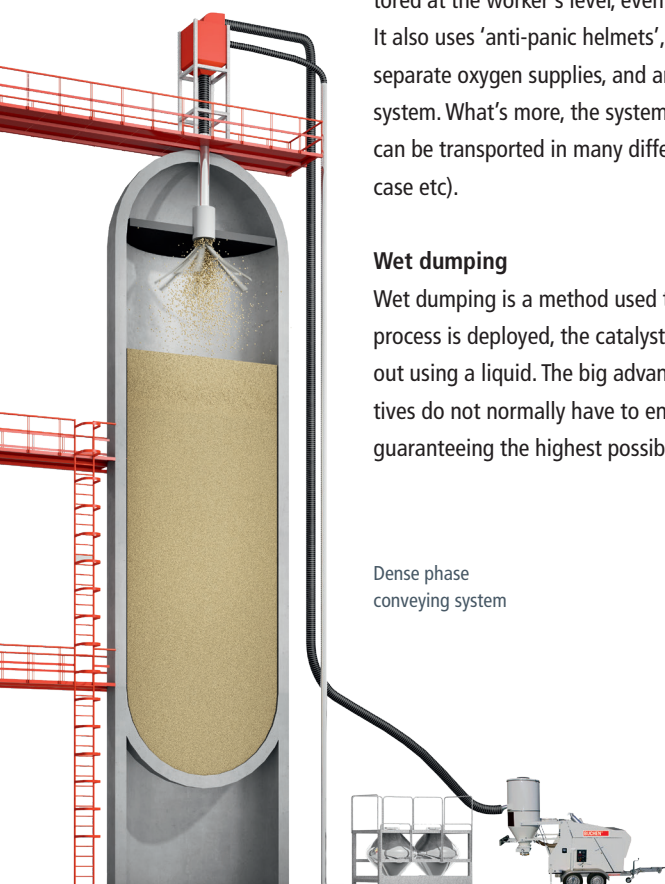
The systems we use (run using either compressed air or nitrogen) fill the catalyst into 200l drums – a process that takes, on average, just 15 seconds per drum. A sliding valve automatically closes each time to prevent a spill and a sensor in the lid stops the drums from being overfilled.

Dense loading

In some cases, it is extremely important for the catalyst to be distributed evenly in a reactor while it is being loaded. This is where the dense loading technology comes into play. One of the dense loading systems (see photo) has a series of rotor blades that regulate the way the material falls into the reactor. We offer all conventional dense loading systems.

Dense phase conveying system

This unique system allows reactors and storage vessels to be filled in windy and adverse weather conditions. The material is first stored in weatherproof tanks to keep it dry and then transported safely to the reactor via hose lines – cranes are not needed here at all.





> SILO CLEANING WORK

Systems for cleaning silos and storage vessels

Gone are the times when staff had to climb into the silos to clean them – a time-consuming and dangerous process. Thanks to our mobile systems, deposits and build-ups of material can be removed from silos up to 45 metres deep without operatives having to enter them at any stage. This not only prevents the material from becoming contaminated, it also reduces the risk of a work accident to an absolute minimum.

1 BinWhip® – our bin cleanout system

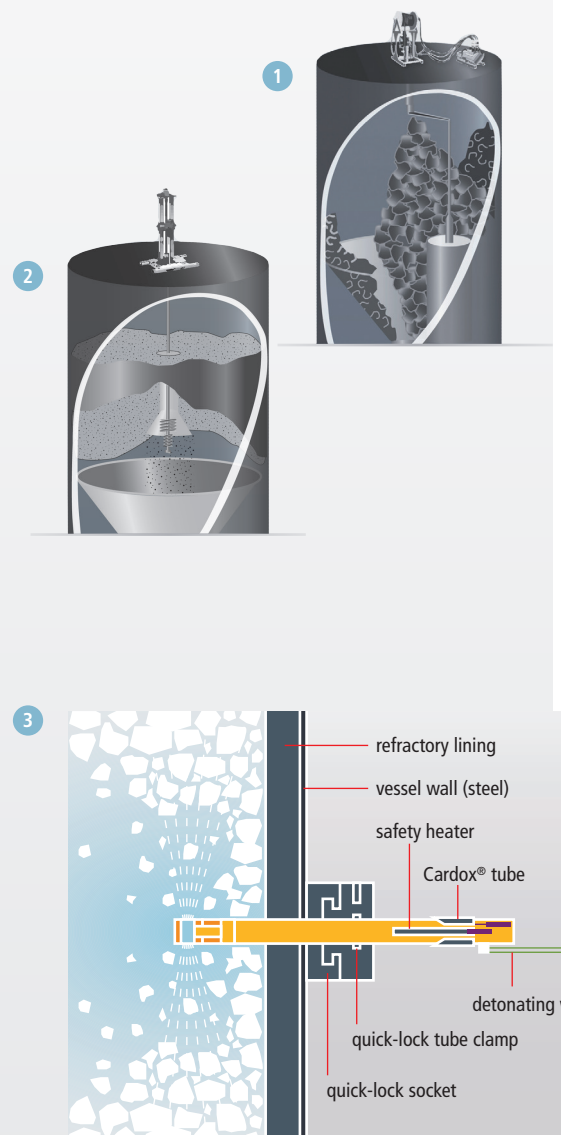
The BinWhip® system consists of hydraulically controlled telescopic arms with knuckle whips attached to them – a particularly effective method for removing deposits as the system creates such a strong rotational force. We use either UHMW whips, spark-proof bronze chains or specially produced steel chains to carry out the work depending on the type of material that needs to be removed.

2 BinDrill® – our bridge breaking system

The BinDrill® system is ideal for clearing material when a silo is completely bridged or the discharge section has become clogged up. We are able to deal with the toughest of material as this system is powered by high-torque industrial hydraulic motors and we are able to choose from a variety of different drills.

3 Cardox® – our blockage clearing system

The Cardox® system breaks up compacted material in storage vessels by suddenly releasing liquid carbon dioxide. This method uses high strength, reusable steel tubes filled with liquid carbon dioxide (CO₂). This is activated by a small electric charge causing it to expand and create a powerful force of up to 3,000 bar. Several tonnes of material can be detached with a single detonation. The Cardox® system can even be used whilst production continues as normal if the vessels have been fitted out with permanent tube sockets.



BUCHEN®

WORKING FOR THE FUTURE

BUCHEN-ICS is part of the REMONDIS group, one of the world's largest recycling, service and water companies. The company group has branches and associated businesses in more than 30 countries across Europe, Africa, Asia and Australia. With over 30,000 employees, the group serves around 30 million people as well as many thousands of companies. The highest levels of quality. Working for the future.

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A company of the REMONDIS Group