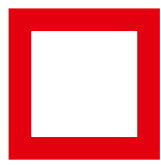




AMINE RECYCLING – SERVICE FOR FOUNDRIES



AMINE RECYCLING – MATERIAL RECOVERY IN PRACTICE

The finite availability of resources and increasing global concern about environmental aspects of industrial production processes have triggered a more responsible approach to reclaimable materials and made a „throw-away“ mentality untenable.

Product responsibility is one of the fundamental obligations under Germany’s Recycling Management Act. Products are to be manufactured and distributed in such

a way that, after use, they can be returned to the material cycle or utilised in an environmentally friendly way.

One example of how valuable resources can be recovered is provided by amines.

Buchen UmweltService, an expert partner to the foundry industry, has been operating a closed recycling system for amines at its Voerde facility for over 20 years.

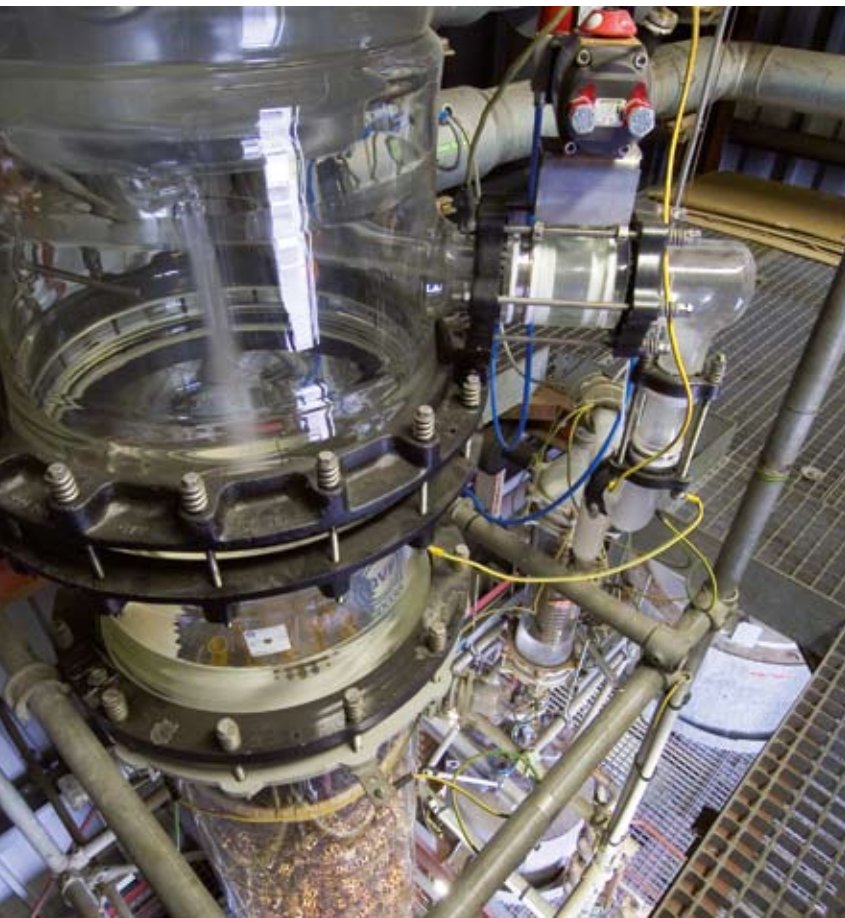
CIRCULATION SYSTEM FOR AMINES



Our service package comprises:

- Supply of wash concentrate K 103 (sulphuric acid)
- Provision of skeleton containers (IBC)
- Acceptance of loaded wash concentrate (LWC or amine sulphate)
- Compiling of all required documents for all waste management-relevant processes in accordance with recycling and waste management law
- Offer of an eANV – Complete module for participants in the electronic verification process through REGISTA® software and hardware components
- Notification of the cross-border import of waste in accordance with EU Ordinance No. 1013/2006
- Logistics and analytical support
- Distillation of the amines (e.g. DMEA, DMIPA, DMPA)
- Provision of the recovered amines to the foundry supply industry

■ ... TO THE RECOVERY OF THE AMINES



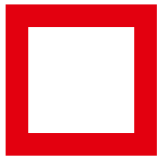
In the amine recycling plant this process takes place in the reactor. The amine released is cleaned by column rectification and transformed into a usable condition with a high degree of purity. The resultant amine is then filled into containers approved for this purpose and returned to use through the foundry supply industry.

In this way, we at Buchen UmweltService GmbH offer our customers a closed product cycle at our Voerde facility, including the necessary logistics.

Furthermore, in conjunction with partners of many years' standing, we offer our customers for their cold box exhaust air cleaning plants an additional service comprising:

- Technical advice
- Plant maintenance (as a specialist business according to § 19 WHG (Water Resources Law))
- Spare parts service





VOLUNTARY RECIRCULATION OF WASTE (§ 25 SUBSECTION 3 KRW-/ABFG)



With its combined system of supplying wash concentrate K 103 (sulphuric acid) and taking back the loaded wash concentrate (LWC or amine sulphate), Buchen Umwelt-Service GmbH meets the objectives of recycling according to statutory requirements.

This results in the following advantages for operators of cold box exhaust air cleaning plants:

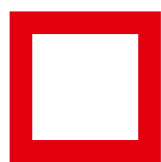
- Release from the otherwise obligatory participation in the approval process for dangerous waste with approval of the authorities per waste type and origin of waste
- Release from the obligation of carrying an electronic approval for dangerous waste / no participation offered in the electronic approval procedure for this type of waste material
- High degree of flexibility in the use of logistics companies, even in the area of packaged goods through release from the transportation approval ordinance (TgV)

CERTIFICATIONS

- Quality management ISO 9001
- Environmental management ISO 14001
- Safety management SCC**
- Waste disposal specialist in accordance with Art. 52 KrW- /AbfG (waste disposal specialist act)
- German quality mark RAL-997 for industrial plant service

The expenses and costs associated with the processing, documentation and administration of otherwise common approvals and supporting documents in the area of waste management are thereby reduced to a minimum. As approval for the whereabouts of the waste recycled by us, only an official acquisition form, which we provide to you for each transport, is required.

The registration requirement to be heeded by the creator of the waste can be completed using a normal spreadsheet program installed on one's own PC.



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 almost 70 locations in Germany, Europe and the Middle East in order to offer our customers professional industrial service. We know that our 2.500 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.

TURNAROUND MANAGEMENT

Cleaning, maintenance and servicing work during periodical shutdown of plants or plant components are a core service provided by the Buchen Group. Our service package includes all project phases. In this way, the decommissioning is conceptualised, organized and entirely planned in advance. We will coordinate all necessary individual steps and ensure that the involved service companies cooperate efficiently as well as with the same high level of quality.

TANK SERVICE

Depending on the type and size of the tank as well as the consistency of the residue to be removed, we employ different automated, closed tank cleaning processes. Short cleaning times and a high level of security for employees – since no personal entrance into the tank is necessary (non-man entry system) – are further advantages of the automated cleaning systems. Economic advantages are the high crude oil recovery rates and the related lower waste management costs as well as the shortened cleaning time.

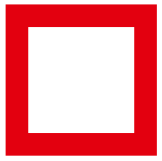
POWER PLANT SERVICE

The Buchen Group offers operators of conventional power plants, thermal waste processing plants as well as industrial incineration and steam generation plants across Europe special services related to cleaning, waste management and retrofitting. Individual service packages based on the requirements of our customers minimise their coordination and work-related effort and simplify audits and process steps.

MOBILE SLUDGE DEWATERING

At the core of this service is the preparation of industrial sludge through solid-liquid separation. Products such as caustic substances, acids or oils are filtered and oil/water/solids decanted. Depending on the requirements,





FURTHER SPECIAL SERVICES OF THE BUCHEN GROUP

individual concepts are developed. For the efficient processing of the dewatering requirements, technically mature equipment (decanter, centrifuges or chamber filter presses) is used.

■ **REACTOR SERVICE**

The reactor service includes all work surrounding catalyst-relevant process plants such as hydrocracker, FCC reactors, UOP-CCR reformers etc. The catalyst handling includes the unloading of used catalyst mass, the screening of the material and if possible, re-uses the catalyst, as well as the reloading by means of Dense or Sock Loading processes. The regeneration, passivation or re-use of the catalyst mass are additional specialities in the multifaceted services offered by BUCHEN-ICS.

■ **EMERGENCY MANAGEMENT**

Our emergency management ensures to provide companies that manufacture, process, transport or store dangerous goods or materials with rapid support in case of an emergency. Immediately upon notification of an occurrence, we will initiate all necessary activities in order to limit and remove the damages.

24-hour emergency hotline: 0800 - 0 07 17 70

■ **ADDITIONAL SPECIALITY SERVICES**

- Chemical cleaning process
- Plate heat exchange service
- Cold cutting
- Corrosion protection
- Drain service
- and many more





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