



Mall environmental systems for protecting water and soil





Mall – the specialists in rainwater, wastewater and renewable energies

Over five decades, the Mall Group has become one of the most important specialist providers, with process-engineering expertise for small wastewater treatment plants, separators and rainwater management with its comprehensive range of environmental systems.

For almost ten years, Mall has been promoting renewable energies, producing pellet storage units and woodchip containers in different sizes. The “New Energies” business unit, founded in 2009, now bundles all solar thermal, biomass / pellets, geothermal and biogas products.

In addition, the Mall Group has established itself as a competent manufacturer and supplier of specialist products for street and road design and burial chamber systems.

The Mall Group has six production sites. These are in Donaueschingen, Ettlingen-Oberweier, Coswig/Anhalt, Haslach and Nottuln in Germany, and in Szentendre near Budapest, Hungary.

For many years, Mall GmbH has purchased NaturEnergie Silber electricity for all its production sites in Germany. With the purchase of around 1,517 megawatt hours of clean electricity every year, Mall avoids emitting around 822 tonnes of harmful carbon dioxide, and in so doing also makes a contribution to environmental protection in this field.

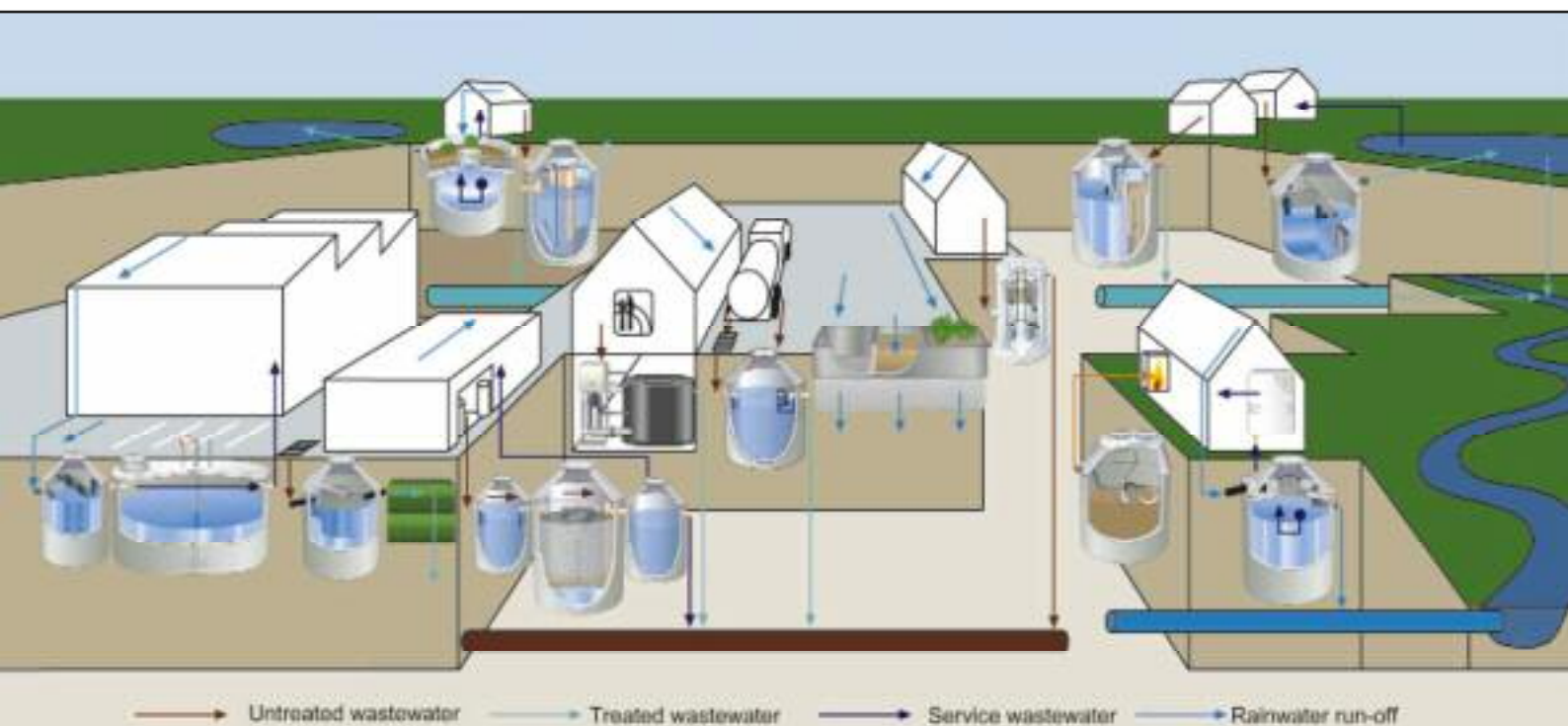


Furthermore, all printed documents are printed in an environmentally neutral way, preventing an increase in carbon dioxide in the atmosphere. The CO₂ output of the printed products is calculated precisely and the emissions which result are compensated at First Climate by purchasing certificates which finance regenerative energy projects. With the aid of this certificate trading, Mall offsets the unavoidable CO₂ emission from the print production, making it climate neutral.



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High performances thanks to process-engineering expertise and modern concrete technology



All our employees are involved in environmental technology and construction. The process engineers and specialists in the areas of water and wastewater work hand-in-hand with civil engineers and concrete specialists. Working as a team, we develop new solutions to problems and are involved in projects from site analysis, laboratory tests and manufacturing right through to installation and final inspection. Thanks to consultants who are renowned in their field and to development work in partnership with third-level institutes, Mall technology is always state of the art.

This is aided by new ideas gained when participating in standards committees and specialist bodies such as the Association for Rainwater Harvesting and Water Utilisation (Fachvereinigung Betriebs- und Regenwassernutzung e.V., fbr) and the NAW V4 Water Practice Standards Committee. The overlapping areas of activity within the Mall Group and dialogue between these areas mean that our employees are quick to identify the big picture and formulate design solutions. In times of continuously changing technology and environmental factors, this is a priceless asset that is the envy of others.

There is no better construction material

Concrete, the ultimate building material, is actually nothing more than a mixture of the naturally available materials sand, gravel or grit, together with cement and water. Cement, the binding substance, is itself simply ground and fired limestone, marl and clay. Concrete is now synonymous with our built living environment and with construction in general. Concrete is innocuous for animals, plants, water and the soil, has an extremely long service life, and can be subjected to high static loads. The properties of concrete can also be modified to match the application in question.

High-precision manufacturing

One of Mall's core competences is comprehensive technical expertise in production and application of reinforced concrete – in particular, in seamless container construction. All our sites are equipped with the most modern, computer-controlled metering, mixing, casting and reinforcement equipment. High-quality concrete grades guarantee impermeability and absolute structural stability. As most systems are delivered ready for installation, the process specialists and concrete experts work hand-in-hand.

DIN-tested quality

Reinforced concrete containers and concrete components from Mall are not subject to quality fluctuations. Additives, reinforcement steels and binding agents are selected in accordance with the exacting requirements of the latest generation of standards – DIN EN 206 and DIN 1045, parts 1 to 4. Concrete production is subject to systematic factory production monitoring in Mall's concrete laboratory and to continuous quality control by the Institute for Materials Testing (Materialprüfanstalt) at the University of Karlsruhe, a recognised testing and certification body.

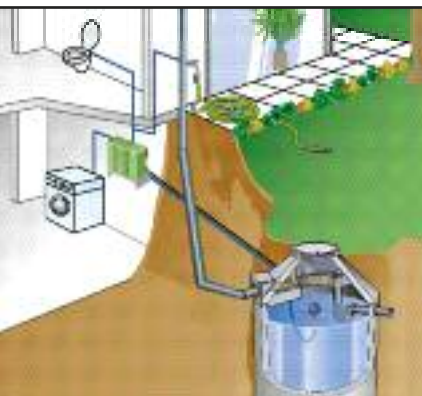
The latest system technology

Mall systems are characterised by extremely high efficiencies. Decentralised wastewater treatment using the SanoClean treatment system delivers perfect water treatment results, while at the same time fulfilling the minimum requirements of the authorities.

Delivery and installation using Mall's special-purpose vehicles

Mall has a fleet of special crane vehicles with a lifting capacity of up to 8 t for lifting containers into place on site. The reinforced concrete containers or complete systems are delivered all over Germany and can be installed quickly.





Proven units and systems for rainwater use



Rainwater use has become an established element in building services for houses, especially since the publication of the DIN 1989 series of standards, parts 1 to 4.

The fact that groundwater reserves are permanently under threat and that sewage treatment plants and sewage systems can't keep up with precipitation levels has led to increased recognition of the importance of rainwater management.

Experience and expertise you can depend on

As early as 1979, we began carrying out pioneering environmental and commercial work with the monolithic Mall rainwater storage tank made of concrete. Since then, we have been working intensively on decentralised solutions for the use, percolation, treatment and retention of rainwater.

Rainwater storage tanks for every application

Mall rainwater storage tanks are available in solid concrete in capacities of 1,000 to 22,400 litres, and in plastics in sizes of 1,000 to 12,000 litres. No other material is as well-suited to underground construction as concrete is. Concrete is unparalleled in terms of robustness, stability under static loading, and resistance against frost and aggressive materials in the ground. Mall rainwater storage tanks represent perfection in concrete technology. Seamless reinforced steel containers are produced in one piece and reinforced around their circumference, making them watertight and structurally stable. Mall rainwater storage tanks made of robust, high-quality polyethylene are also masterpieces of technology. They are also delivered ready for installation and come complete with filters and connections. With their low weight, these smaller containers are also suitable for do-it-yourself installation.

Delivery range

- Rainwater storage tanks made of reinforced concrete of 1 – 1000 m³
- Rainwater storage tanks made of PE of 1 – 12 m³
- Large-scale rainwater systems
- Monsun rainwater centre for domestic water use
- Fontana draw-off unit for watering gardens





Rainwater use for engineering, commercial and industrial premises

Commercial and industrial companies generally have large water needs and large roof surfaces too. If this is the case, the prerequisites are in place to use rainwater in the company.

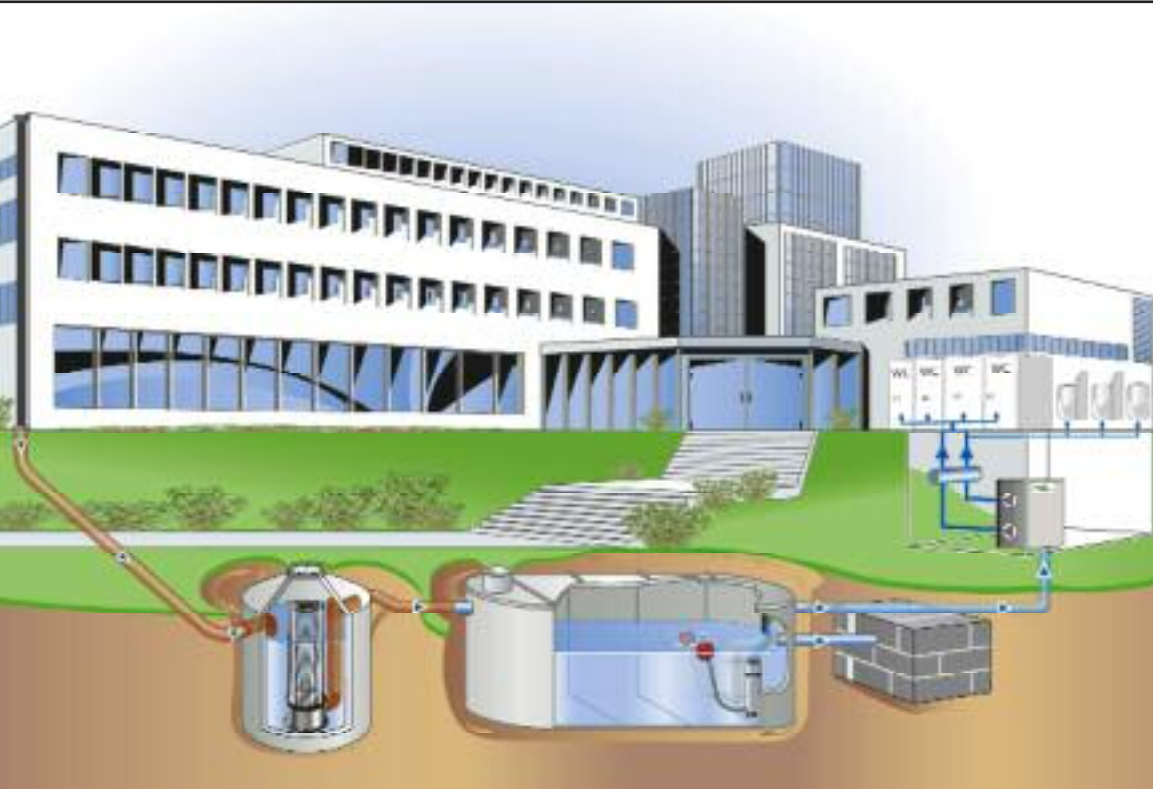
Wide range of applications for rainwater

Alongside use in production, rainwater can also be used as service water in other areas. This leads to significant savings on drinking water and wastewater rates, which are rising all the time. This is particularly true where

additional precipitation charges are applied based on the amount of paved or sealed surface area.

Individual sizing and manufacture

Small rainwater storage tanks and large-scale containers can be made into tailored systems by adapting them to suit site conditions and specific water requirements. Individual unit heights for various container types can be easily implemented. Reinforced concrete containers are manufactured in accordance with EN 206 / DIN 1045 1-4.





Use, percolation and retention of rainwater



Mall Reto rainwater storage tank

Rainwater tanks not only store water for use, they also retain rainwater which would otherwise burden the sewage system with undesirable peak volumes. Not enough attention is generally paid to this retention effect in private use. This behaviour is altered

with Mall Reto rainwater tank, an ingenious system which combines usage with retention. In the same manner as public rainwater retention basins, this tank repeatedly provides free retention capacity for the next precipitation. Its function in providing for rainwater use is unaffected.



Mall Terra rainwater storage tank (patented)

With Mall Terra rainwater storage tank, the combined usage and percolation of water is not only easy, but also attractive, as this system is equipped with an integrated biological soil zone. In most cases, the system fulfils the criteria which mean that an operating licence is not required.

The rainwater is cleaned by the soil filter which consists of a special substrate. The substrate allows for robust planting, is not sensitive to blockages and prevents the water from discolouring. The filtered water is collected in a submerged drainage system, and passes through irrigation openings into the storage space.



Mall Sico rainwater storage tank (patented)

The Mall Sico rainwater storage tank system ensures that excess rainwater lands in the right place: in the ground. Simple and clever at the same time. Run-off rainwater is filtered and collected in a concrete cistern under the ground.

The stored water is used as service water in the house or for watering the garden. Excess water is routed to the surrounding gravel areas and percolates from there into the ground or into the groundwater (it may be necessary find out about permission requirements).



Cavi infiltration chamber

This shallow rainwater infiltration and retention system is suitable for any infiltration or retention volume in private, commercial and public applications. It stands out for its high load capacity and easy installation, can be used

flexibly, and has a storage coefficient of up to 85 %. The infiltration chambers can be used as ditches or basin-ditches for rainwater infiltration.

Treatment of rainwater



Mall sedimentation units

They consist of a reinforced-concrete container, a central pipe and a guide baffle in the inlet. The incoming water is directed by the guide baffle to form a circular stream which flows tangentially to the container; a rotating body of water forms in the annular gap between the container's outer wall and the central pipe. Coarse dirt particles and any heavy metal ions settle at the bottom. Light, floating substances are retained in the upper area.

An additional containment area is provided for light liquids if accidents occur.

Technical data

- Classification as per information sheet DWA-M 153, August 2007
- Connectable reduced area of 260 to 8200 m²
- Permitted throughput 3.9 – 620 l/s
- Optional: bypass with flow-dividing structure, i.e. significant increase of the connectable area
- Optional: emergency gate valve in outlet pipe



Mall lamella clarifiers

The design of the lamella clarifier makes it possible to use components with smaller dimensions compared to sedimentation units. Plastic pipes in lamella cores enhance the settling effect, particularly for small particles; this increases the effective area of the basin. The inclination of the lamellas causes particles to slide to the bottom of the container (sludge settlement). Particles with a size of around 0.1 mm will be separated.

Technical data

- Classification as per information sheet DWA-M 153, August 2007
- Connectable reduced area of 1060 to 30200 m²
- Surface loading 18 m/h (D = 0.35) and 9 m/h (D = 0.2 m)
- Permitted throughput 8 – 453 l/s
- Optional: bypass with flow-dividing structure, i.e. significant increase of the connectable area
- Optional: emergency gate valve in outlet pipe



Mall filtration units for metal roofs

Regardless of how they are designed, roofs and roof drainage will always feed back into the natural water cycle. According to the DWA-M 153 information sheet, run-off water from uncoated roof coverings made of copper, zinc or lead is categorised as heavily contaminated and thus requires special treatment. Overground percolation of this water is tolerated, but often cannot be implemented because of the large amount of surface area required.

Technical data

- Design approval according to § 41 BayWG (Bavarian Water Act), and of the Bavarian Environment Agency
- Purification efficiency > 97 % based on the metal content
- Connectable roof surfaces 70 – 650 m²
- Infiltration and design rainfall intensity in accordance with DWA-A 138
- In the case of discharge into the sewage system, higher metal concentrations or larger roof areas are possible





Separation technology is an ecological imperative



Rainwater and wastewater that have been contaminated by light mineral liquids such as motor vehicle fuels, diesel, heating oils or filter oils must not be allowed to seep into the groundwater or be discharged into the sewage system or other bodies of water. The discharge of lubricants of any kind is also not permitted.

For this reason, rainwater and wastewater that could be contaminated with pollutants must pass through separators before being discharged. Commercial wastewater containing animal or vegetable fats and oils must also be pre-treated before being discharged into the sewage system. Wastewater treatment using NEUTRA separation technology offers the solution to this problem.

Separation systems in accordance with EN 858 1-2 / DIN 1999-100+101 class I and class II in the nominal sizes NS 3 – 100.

Fat and oil separation systems in accordance with EN 1825 1-2 / DIN 4040-100 in the nominal sizes NS 2 - 30. Units for underground installation and free-standing installation in buildings. Larger systems can be built as special cases.

NEUTRA separation technology for light mineral liquids

NEUTRA oil, coalescence and gasoline separators (classes I and II)

These separation systems are used in all applications where light mineral liquids are filled or may escape during the operation, servicing and repair of engines. They consist of the following functional areas: sludge trap, petrol separator, coalescence separator and Sample-removal facility.

Process technology

Depending on requirements, the functional components are housed in one or several structures made of seamless reinforced concrete. Solid particles such as sand and sludge are separated in the sludge trap. Light mineral components are separated from water and rise to the surface in the oil and petrol separator. This floating layer must be removed properly and disposed of. The sample-removal manhole is used for taking monitoring samples of the discharged water.

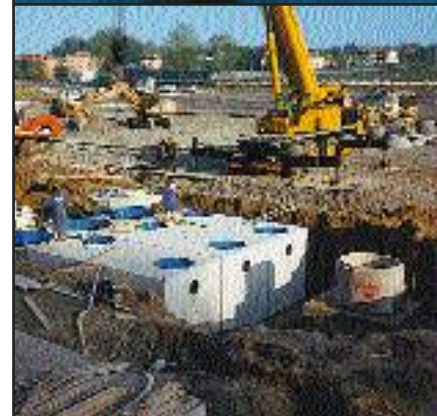
The coalescence separator is very effective, even with the smallest droplets

In this unit, small droplets of light liquid contained in the wastewater flow to the coalescence insert. They are collected here and coalesce, i.e. they join up and become bigger. They then separate from the coalescence material and form an oil film on the surface of the water. An automatic closing mechanism prevents the light liquid from discharging into the sewer.

Advantages

In terms of technology and functioning, NEUTRA separation systems are high-quality, proven products offering significant advantages:

- Corrosion-proof stainless steel components
- Float switch mounted in a protective cage
- The coalescence insert is easy to take out and put back in place without emptying the container
- Non-wearing coalescence material
- Easy to clean with a hose
- High-quality materials – seamless reinforced concrete, at least C 35/45
- Sealing gaskets that are resistant to mineral oils
- Watertight, flexible pipe connections
- Effective and cost-effective systems
- Tested type structure
- Inner coating in accordance with the relevant standards, high-quality PE/HD liner available as an option
- Quality tested in accordance with GET guidelines



Systems for surface water treatment – indispensable



An area equivalent to that of 130 football pitches is paved and sealed every day in Germany – for example, for the construction of commercial premises, industrial buildings and traffic facilities such as roads, car parks and depots. The rainwater run-off from these areas can pose problems because of their quantity and contents.

The possible consequences include overloading of wastewater systems and a build-up of suspended matter in receiving bodies of water.

For this reason, systems for retaining and treating precipitation water are increasingly being installed as part of the construction of projects of this type. This water is treated before being discharged in a controlled manner into a body of water or allowed to percolate into the ground. An alternative approach is based on the collection of the first flush with its accumulation of particles, after which the subsequent water, which is less contaminated, can be safely discharged into the drain.



Contribution to the quality of bodies of water and groundwater protection

Our interdisciplinary team of engineers and technicians deliver system solutions, particularly in the case of unusual applications and problems.

NEUTRARist separation systems

The particles contained in water runoff from roads contaminate the soil, groundwater and the overall water cycle. For this reason, systems for retaining pollutants, and in particular light mineral liquids, in water catchment areas is stipulated by regulations (German guidelines for construction measures along roads in water catchment areas, RiStWag).

Mall stormwater settling basins

In contrast to the situation in sedimentation systems, the water flow through a stormwater settling basin is always limited by a throttling device. The inlet rate is limited to the so-called critical rainfall which lies between 15 and 45 l/(sec · ha) (ATV-M 153), depending on the amount of protection necessary for the drain.

Mall dirt trap

Every time precipitation occurs, the first flush of a defined height (e.g. 1 mm) is fed into a collection basin. A flow-dividing structure sends clean water into the drain and, after the rain has stopped, triggers the pumping of the first flush into the water treatment system.





NEUTRA grease separators extend the service life of pipelines

Grease separators are part of the wastewater treatment process necessary for certain commercial operations. The animal or vegetable fats and oils contained in wastewater must be treated before they are discharged into the sewage system. This is the only way that deposits on pipe walls, which lead to reductions in available cross-sectional area of the pipe and to blockages of sewage pipes, can be prevented in the long term.

Prevention of blockages and deposits in pipelines

Separation systems for animal and vegetable substances consist of several functional components: sludge trap, grease separator and sample-removal manhole. Depending on requirements, these functional components can be installed in one or several structures.

Heavier matter will settle in the sludge trap, while fats and oils rise to the surface. The layer of fat must be removed and disposed of. The sample-removal manhole is used in monitoring the discharged wastewater.

Grease separator for underground installation

- Covers suitable for traffic – installation location remains available for use
- Excellent access for maintenance and disposal
- Long-lasting seals and flexible pipe connections
- The separator is available with internal coating to the relevant standard or with plastic lining (PE/HD)

Free-standing, frost-protected

- The system remains mobile
- Narrow shape, low weight, passes through narrow doors
- No earthworks required for installation
- Viewing glass to monitor the layer of fat
- Tested, guaranteed quality



NEUTRAclear treatment system for water cycles

Annex 49 of the German wastewater ordinance stipulates the recycling of wash water. This not only eases the burden on the environment, but also helps to lower the operating costs significantly – for example, in the cases of car washes. The treatment process provided by Mall functions entirely without chemical additives.

NEUTRAclear treats the contaminated wash water using a mechanical / biological treatment system. A filter that is supplied with compressed air treats the wastewater using a complex interaction of bio-film processes, filtration, adsorption and flotation. The oxygen added is reliable in preventing the formation of odours.

System design and flow path

The system consists of an optimised pre-treatment basin which retains settling and floating solids, a biological cleaning stage with adsorption filter and counter-current aeration, and a reservoir for service water. The components are designed to match each other and are operated as a continuous system. The wash water flows under gravity through the whole system, ending with the discharge of the excess water into the sewage system. Evaporation and other water losses may be made up using rainwater or fresh water.

Areas of application

- Drive-through washing facilities
- Washing facilities for commercial vehicles
- Continuous washing facilities

Advantages

- Particularly low maintenance and reliable operation
- No chemical additives required
- No odour nuisance
- Saves space as all treatment basins are installed underground
- Reduction of surfactants and phosphates
- Reduction of COD and BOD
- Simple control system
- Options such as conductivity measurement, flowmeter, sludge dewatering and use of rainwater
- Additional savings possible by using rainwater
- **General technical approval in Germany for NEUTRAclear Z-83.4-6**





Systems and processes for centralised and decentralised wastewater purification

Centralised or decentralised? Planning officers and local authorities are confronted with this question regularly. The answer can only be provided by considering the overall situation, taking financial, technical, organisational and ecological considerations into account. If the costs for sewage connections, cleaning and wastewater charges are included, then connection to a centralised sewage treatment plant becomes the more expensive solution in rural areas with lower population densities. Smaller, decentralised water treatment units made from precast concrete are generally a more economic alternative. Natural, ecological treatment processes which, after a short start-up phase, are almost self-regulating and purify the wastewater biologically are particularly economical and environmentally friendly. Mall treatment systems provide a perfect treatment result. The SanoClean Sequencing Batch Reactor (SBR) treatment system is especially effective; it uses modern treatment technology as a basic module to meet the minimum statutory requirements and, with additional components, can also be used in particularly demanding applications.

Mall wastewater treatment systems at a glance

System type	Mall-SanoClean	Mall-SanoFix	Mall-SanoKom easyline	Mall-SanoKom	Mall-VarioKom
Sizes	4-200 residents	4 - 50 residents	200 - 1000 residents	100 - 1000 residents	100 - 500 residents
	Modern, aerated SBR treatment system	Aerated SBR Plus wastewater treatment plant	SBR systems for commercial premises, hotels, restaurants and industry	Small, municipal wastewater treatment plants	Proven biological filter system for small communities

Wastewater treatment can be this easy



Nowadays, wastewater treatment systems can be installed in sensitive protected areas such as water protection zones, which until recently required the installation of expensive and – from an ecological point of view – not very sensible solutions.

SanoClean

The modern SanoClean SBR plant works in 2 stages. One stage is the mechanical pre-treatment. At the same time, this chamber collects the wastewater from your house. This buffer function means that the system can adjust itself to your behaviour over the course of the day. The bacteria in the second chamber, the activated sludge chamber, receive a fixed amount of water, specified by us, from the buffer. Since we are able to estimate accurately the amount of contamination, we can also adjust the aeration to achieve the desired purification result. This will also optimise your domestic running costs.

Calm after the storm

Once main purification is complete, an idling phase follows where the bacteria settle on the base of the activated sludge chamber. Only treated water is allowed to leave the system. For your convenience, we also feed the excess bacteria back into the sludge storage tank.

Easy to operate – low follow-on costs

The control system with d-pac automatically controls the fully biological wastewater treatment process. If necessary, it switches your system to holiday or savings mode, monitors it for faults and documents the operation – with an external storage device, if desired. SanoClean knows when it is needed.



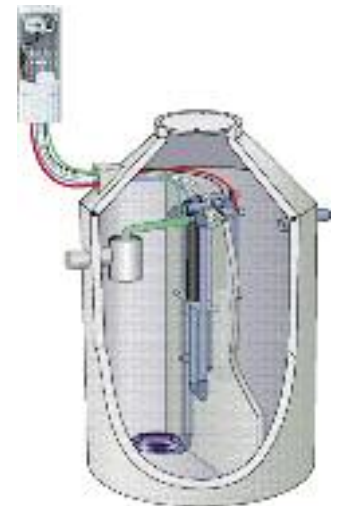
SanoFix SBR and fluidised bed

The SBR Plus method in the form of the SanoFix product series helps you with special purification tasks with strongly fluctuating loads. In addition to the tried and tested portion-by-portion treatment of the wastewater, SanoFix offers an immobilised biomass. This is protected against load fluctuations and toxic impacts. The extracellular polymer substance (EPS) is used for this purpose.

SanoClean – SanoFix

Delivered fully assembled and ready to be plugged in, the Mall small wastewater treatment plants are available in four equipment packages:

- SanoClean **easyline** – the low cost solution
- SanoClean **classicline** – the elegant solution
- SanoClean **activeline** – energy-optimised and environmentally friendly right from the beginning
- SanoFix with fixed biomass



**Approved by the German Institute
of Construction Engineering
(Deutsches Institut für Bautechnik, DIBt)
for various purification requirements**

The right approval



Approved technology

SanoClean SBR systems represent safe and tested technology. The inspection completed in line with the new European standards for small wastewater treatment systems will form the basis for approval in the future. SanoClean fulfils all requirements relating to the handling of domestic wastewater in Germany. This also holds for use in sensitive areas with high demands on water quality.

Approvals obtained

SanoClean S

Z-55.31-233 concrete

Z-55.31-287 PE

Z-55.3-285 concrete upgrade

for the minimum requirements of the authorities

Run-off class C

as per DIBt: COD < 150 mg/l
BOD₅ < 40 mg/l

SanoClean M

Z-55.31-232 concrete

Z-55.31-286 PE

Z-55.3-284 concrete upgrade

with nitrification

Run-off class N

as per DIBt: COD < 90 mg/l
BOD₅ < 20 mg/l
NH₄-N < 10 mg/l

SanoClean L

Z-55.31-231 concrete

Z-55.3-283 concrete upgrade

with nitrification and denitrification

Run-off class D

as per DIBt: COD < 90 mg/l
BOD₅ < 20 mg/l
NH₄-N < 10 mg/l
N inorg. < 25 mg/l

SanoClean XL

Z-55.3-118 concrete

with phosphate removal Run-off classes D+P

as per DIBt: P total < 2 mg/l

SanoClean SBR systems are safe and tested against every applicable requirement.

Mall SanoKom and Mall VarioKom for 100 to 500 residents

SanoKom – the process

In the SBR process, all the treatment steps that are carried out in physically separate locations in a conventional activated sludge system are combined in one tank. The purification stages operate in succession with a cycle of filling, mixing and aeration phases. After sedimentation of the biomass and removal of the purified water and excess sludge, the SBR basin is available for the next cycle. A special program controls the gradual build-up of contaminants in the water. The reactor serves as a nitrification basin, denitrification basin and post-treatment basin in turn.

Mall SanoKom Easyline

- For commercial premises, hotels, holiday camps and restaurants
- Standardised system components
- Easy to handle and install
- Low investment costs

Mall SanoKom Profiline

- For small municipalities
- Special features of the wastewater can be individually taken into account (infiltration water, inflow of separation and mixed water)
- Adaptable technology
- Professional equipment
- Individual dimensioning

VarioKom – the process

After pre-treatment, the wastewater is subjected to biological purification in the biological filter. The biological filter consists of a filling of open-pored ash (substrate for aerobic microorganisms). On its surface, aerobic bacteria and microorganisms form a “biological lawn” in the case of uniform wastewater and oxygen addition (“counter-current principle”). Using the oxygen in the air, this “lawn” converts the contaminants in the wastewater into water, carbon dioxide and minerals that settle out. The wastewater that is freed of materials that consume oxygen is fed through a recirculation shaft into the post-treatment basin. The pump in the recirculation shaft compensates for load fluctuations and also flushes the biological filter.

The wastewater settles in the post-treatment basin and the sludge falls to the bottom. A pump at the point of the funnel pumps the excess sludge back to the sludge storage tank or buffer. This closes the wastewater cycle.

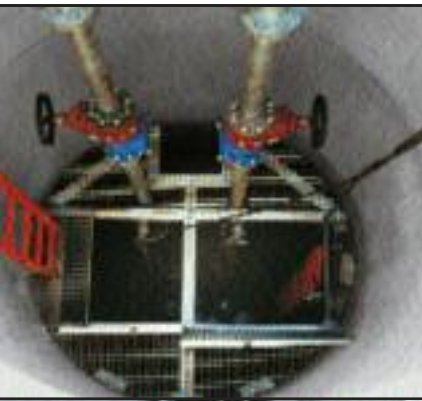
Purification performance (standard)

Design for 100 – 500 residents:
COD = 110 mg/l
BOD₅ = 25 mg/l

Advantages

- Very low operating costs
- Simple design
- Single or parallel layout
- Gradual commissioning and extensions are easy to carry out
- High purification performance
- Robust operation, even with fluctuating loading





Pump stations for pumped disposal in domestic and municipal applications



If there is an insufficient slope, if the groundwater level is high or if there are other unfavourable topographical conditions, then the discharge wastewater with faecal matter and rainwater using gravity drainage becomes either impossible or too expensive. An economic solution is offered by the Mall pump station.

Variable dimensioning

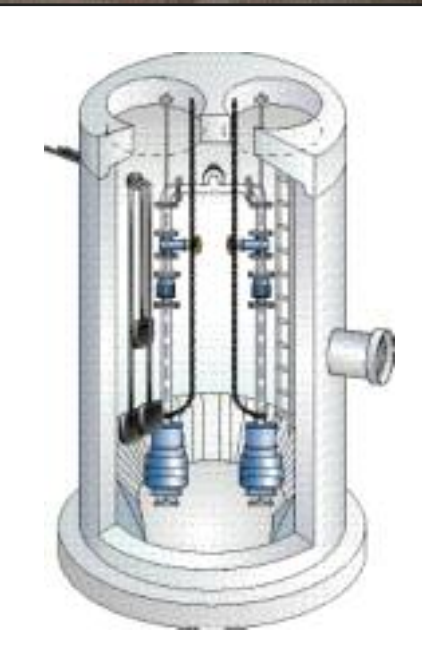
The pump manholes are monolithic round containers made from high-quality reinforced concrete, and have a height of up to 3.25 m. For manholes of larger depth, manhole extensions with a height of up to 3 m are available. In addition to our standard range, we also supply large-format rectangular structures made of reinforced concrete which have a wet and dry chamber cell.

Pre-assembled and ready for installation

All pump stations are dimensioned individually. All system components of the pump stations are supplied ready for installation, including the electric control system, and are generally delivered pre-assembled.

Advantages

- Individual solutions thanks to flexible components and dimensioning
- Ready for installation and pre-assembled at the factory, resulting in quick installation and low costs
- Mall takes care of planning, manufacture, delivery and installation
- Fixed price means no cost uncertainty
- Reliable operation with proven, brand-name pumps
- Tough, high-quality and waterproof reinforced concrete with seamless construction



Valve manholes

Mall valve manholes are the right choice wherever pressure pipes are equipped with fittings. These units are delivered ready to install, and factory assembly ensures fast installation and high quality. Mall only uses high-quality, corrosion-free materials for piping and fittings, working in close cooperation with the project planner.

Wastewater applications

- Aeration and deaeration manholes for pressure pipes with gravity-flow sections
- Sliding gate shaft, with manual gate or electrical drive
- Cleaning manhole for pressure pipes
- Valve manhole after a pump station
- Compressor manhole
- Measurement manhole – e.g. for flowrate measurement devices

Drinking water applications

- Water meter manhole
- Cleaning manhole for pressure pipes
- Distribution manhole for main and branch pipes

Only high-quality fittings are used in the installation of our systems

- Shut-off flaps
- Sliding gates
- Hydraulic gates
- Drives
- Waste weirs
- Change-over flaps with stem and locking lever
- Tooth profiles with clamp straps as per DIN 19558 in aluminium or stainless steel
- Submerged baffles
- Dam sluices
- Check flaps
- Tipping troughs
- Manhole ladders as per DIN 18799 made of stainless steel, galvanised steel or reinforced plastics
- Climbing systems with fall protection for climbing heights of over 5 m (stipulated by German accident prevention regulations, UVV)
- Entry aids for increased safety
- Manhole covers made of stainless steel / moulded concrete / mouldings as per required load class

Other equipment and installation parts

A large proportion of the equipment and installation parts for Mall products is produced in our own manufacturing facilities.





Reinforced-concrete containers for a range of applications



Mall reinforced-concrete containers are used everywhere that liquids are collected, stored or purified. They are suitable for storing very diverse media.

Individual construction heights for various types of containers can be easily implemented. Inlets and outlets in the form of core drillings, unfinished recesses or ready-to-connect seals can be integrated during production. Reinforced-concrete containers are manufactured in accordance with DIN EN 206 and the new series of standards for concrete DIN 1045-1 to 1045-4.

Made from high-quality concrete, precise tolerances, robust and watertight

Mall reinforced-concrete containers are made from high-quality reinforced concrete, are seamless, and have a smooth surface. Underground installation is quick and easy, and also saves space. They can be driven over by 60-tonne vehicular traffic (German SLW 60 standard), and can be individually adapted in terms of shape and volume to suit a wide range of application areas. To increase the volume, it is also possible to connect several containers together, extend them by using U-shaped connector pieces, or to install them on top of each other.

Mall concrete containers are used in the areas of wastewater purification and sewage treatment – for example: in wastewater collection pits, decentralised treatment plants and pump stations. They are used in rainwater management as rainwater storage, stormwater basins and to store service water in businesses and industry. Further areas of application include tanks for fire-extinguishing purposes and cooling water storage.

Overview of range

Round-shaped reinforced-concrete containers

Internal \varnothing : 800 – 3000 mm
Height: 750 – 3250 mm
Capacity: 1 – 23 m³

Rectangular-shaped reinforced-concrete containers

Length: max. 6000 mm
Width: max. 3300 mm
Height: max. 3400 mm
Capacity: 20 – 50 m³

Multi-component reinforced-concrete containers

Internal \varnothing : 4000 or 5600 mm
Height: 1500 – 3250 mm
Length: from 6000 mm
Capacity: 25 – 1000 m³

Reinforced-concrete containers made of rectangular components

Length: from 6000 mm
Width: 4050 mm
Height: 2850 mm
Capacity: 24 – 100 m³





Underground storage systems for wood pellets



Wood pellets are small pressed forms made from woodchips and sawdust. They are a cost-effective and environmentally-friendly alternative to the fossil fuels oil and gas.

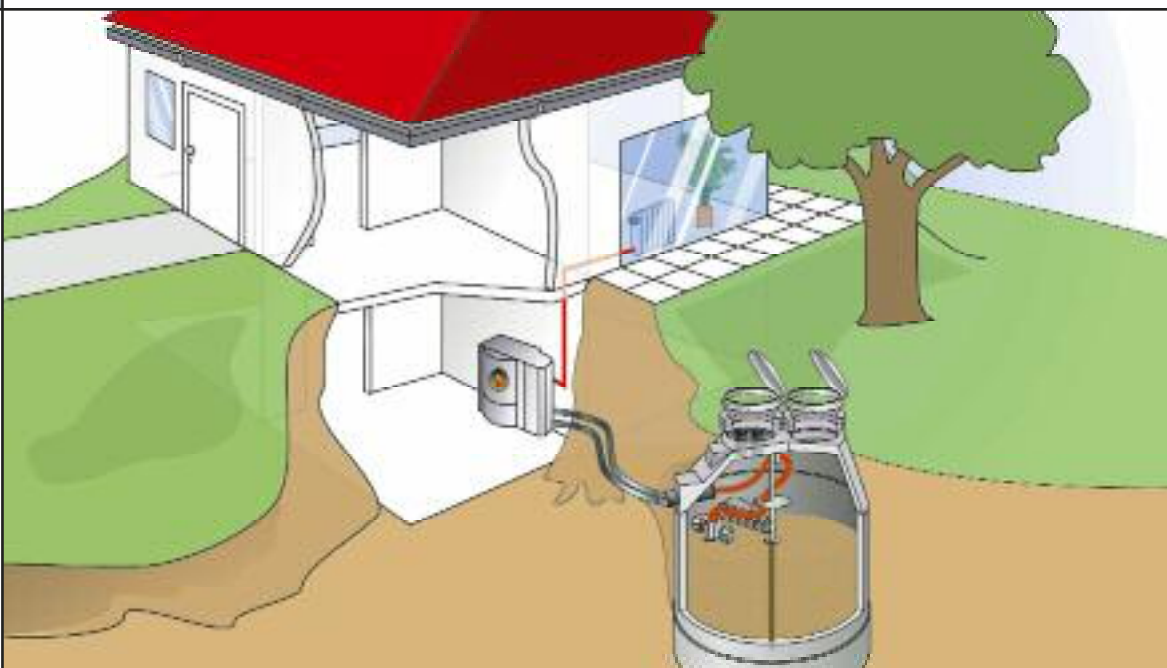


Save valuable space in the basement

The Mall pellet storage unit provides a storage solution for these wood pellets. It consists of a round-shaped reinforced-concrete container that is installed underground beside the house or building in question. This saves space in the basement and helps avoid dirt and dust around the house.

Advantages

- Dry storage underground
- Cost savings compared to storage in a bunker
- Saves space in the basement
- Avoids dust and odours in the house
- Ideal fire protection
- Compatible with standard heating systems, see compatibility list
- Complete unit
- Optionally with a cover that can be driven over or walked on
- The ground above the storage unit can be used for greenery or as an access route
- High-quality reinforced concrete C 35/45
- Concrete is chemically neutral in the ground, sturdy in demanding construction applications, and is not affected by buoyancy effects if the groundwater is high
- Easy access for filling
- Easy to maintain



Mall pellet storage units with suction 'mole' 2500 – 3000 – 6000



Pneumatic, flexible, visible – the ideal removal system

The suction 'mole' is a pneumatic removal system – i.e. the pellets are sucked out to the heating system in the basement. The system stays on top of the pile of pellets, and can thus be seen when the cover is opened. It can be pulled up slightly when the storage unit is being filled. The mole moves over the pellets during the removal process. This avoids the formation of funnel shapes, gaps or bridges. Less than 10 % of the stored amount remains in the storage unit. The removal of pellets from the top of the pile in the storage unit offers the advantage that the finer particles present do not all gather at the bottom and cause faults in the burner later on when using the material at the bottom of an almost empty container.

Mall pellet storage unit with mole 2500

- Storage capacities of between 6.5 m³ and 12 m³
- Single and dual family homes
- Mole 2500 removal system
- For walk-on or drive-on surfaces

Mall pellet storage unit for large-scale systems with mole 3000

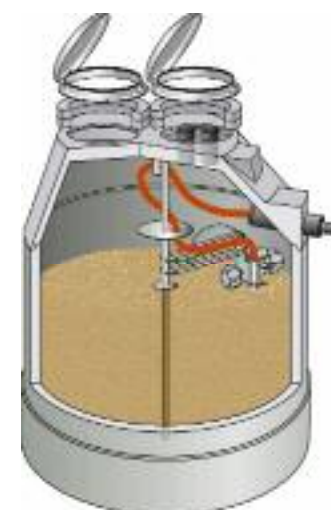
- Storage capacities of between 15 m³ and 22 m³
- Multi-family homes, commercial premises or public areas
- Mole 3000 removal system
- Pneumatic system with integrated PLC control unit
- Compatible with many boilers
- For walk-on or drive-on surfaces

Mall large-scale pellet container With mole 6000 removal system

- Storage capacities of between 45 m³ and 60 m³
- Commerce, industry, schools, nursery schools, sports facilities
- Mole 6000 removal system
- Pneumatic system with integrated PLC control unit
- For walk-on or drive-on surfaces

Without removal system

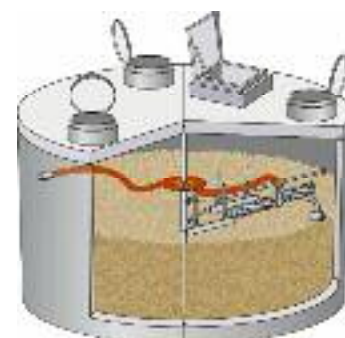
- Storage capacities of between 45 m³ and 60 m³
- Commerce, industry, schools, nursery schools, sports facilities
- Removal system using worm conveyors on site by the customer, or from the boiler manufacturer
- For walk-on or drive-on surfaces



Overview of Mall pellet storage units

Type	Internal diameter mm	Storage capacity m ³	Pellet storage weight ¹⁾ kg	Total weight kg
MW 2500	2500	6,5 – 12	4.230 – 7.800	7.130 – 9.130
MW 3000	3000	15 – 22	9.649 – 14.243	14.275 – 17.305
MW 6000	5600	45 – 60	30.000 – 66.000	57.650 – 64.350

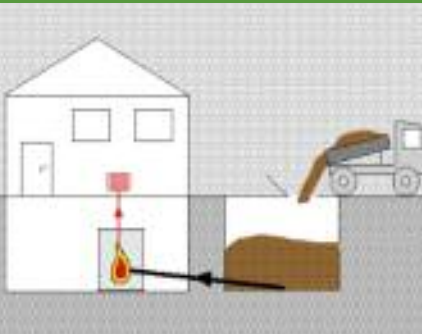
¹⁾ At a bulk density of 650 kg/m³





Mall large woodchip containers

Diagram of a large woodchip container

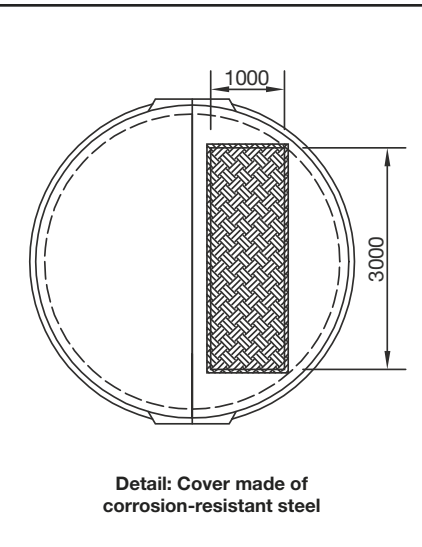


Mall large woodchip containers
Type MHS 60

Woodchip heating is being used increasingly in the municipal sector.

To meet this demand, Mall offers a woodchip container für large-scale systems with storage capacities of 15 m³ to 120 m³ and pouring openings for HGVs to suit various removal systems. With its large woodchip container, Mall has reinforced its position as a leader in the production of precast reinforced-concrete containers.

- Storage capacities to up 120 m³
- Commerce, industry, schools, nursery schools, sports facilities
- Custom removal opening, meaning the container can be combined with almost all removal systems
- Cover plate made of reinforced concrete that can be driven over by HGVs (60 t HGV)
- Cover for filling opening made of corrosion-resistant steel, custom sizes upon request
- Direct filling using dumper trucks or wheel loaders
- Integrated fall protection for the highest safety level



Detail: Cover made of corrosion-resistant steel

Mall large woodchip containers

Type	Inner diameter	Storage capacity	Woodchip storage weight ¹⁾	Equivalent amount of heating oil	Total height	Total weight
	mm	m ³	t	l	mm	kg
MHS 15	3000	15	3	1200	3700	20.200
MHS 25	4000	25	5	2000	3500	30.250
MHS 35	5600	35	7	2800	3750	64.000
MHS 60	4000	60	12	4800	6200	44.000
MHS 90	5600	90	18	7200	5700	75.000
MHS 120	5600	120	24	9600	6700	84.000

¹⁾ At a bulk density of 200 kg/m³

Mall Solitherm buffer storage tanks – The available options



Mall Solitherm buffer storage tanks

The use of large-volume buffer storage tanks in the efficient utilisation of solar thermal energy or biomass is often not possible as part of refurbishment projects because of narrow stairwells, narrow doors or basements that are too low – however, access problems during installation become a thing of the past with the Mall buffer storage tank! Installation in the ground means that valuable floorspace in the basement is not taken up.

- Ready for connection to the heating system
- Underground installation means no space is taken up in the basement
- Minimisation of heat losses thanks to favourable ratio between volume and surface area
- High-quality materials for long-term safety and reliability
- Storage volume of between 2,000 and 10,700 litres – at 3 bar pressure or non-pressurised



Mall Solitherm non-pressurised buffer storage tanks

Mall Solitherm non-pressurised buffer storage tanks with stainless steel internal tanks

Type	Storage capacity l	Height of internal tank mm	Diameter of internal tank mm	Internal diameter mm	Total height mm	Weight kg
PUS 2000	2030	1150	1500	2000	2445	7.220
PUS 3500	3530	2000	1500	2000	3245	8.885
PUS 4200	4170	2550	1500	2000	3545	9.470
PUS 6900	6910	2200	2000	2500	3545	11.307

Subject to technical modifications without notice

Mall Solitherm buffer storage tanks for 3 bar operating pressure

Type	Storage capacity l	Height of internal tank mm	Diameter of internal tank mm	Internal diameter mm	Total height mm	Weight kg
PUD 2000	2050	1650	1500	2000	3045	7.970
PUD 3000	3000	2250	1500	2000	3545	9.410
PUD 4800	4800	1830	2000	2500	3045	10.060
PUD 6500	6500	2323	2000	2500	3545	11.220
PUD 8400	8400	2082	2500	3000	3305	15.710
PUD 10700	10700	2560	2500	3000	3805	17.510

Subject to technical modifications without notice



Mall Solitherm buffer storage tanks for 3 bar operating pressure



Mall subsidiaries and sales partners

- Mall has been setting quality standards for decades
- Consultancy, advice and service all over Germany
- Ask your local contact person



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www.mall.info



Mall GmbH

Hüfingerring Straße 39-45
78166 Donaueschingen
Phone +49 771 8005-0
Fax +49 771 8005-100

Mall GmbH

Grünweg 3
77716 Haslach i. K.
Phone +49 7832 9757-0
Fax +49 7832 9757-290

Mall GmbH

Industriestraße 2
76275 Ettlingen
Phone +49 7243 5923-0
Fax +49 7243 5923-500

Mall GmbH

Roßlauer Straße 70
06869 Coswig (Anhalt)
Phone +49 34903 500-0
Fax +49 34903 500-600

Mall GmbH

Oststraße 7
48301 Nottuln
Phone +49 2502 22890-0
Fax +49 2502 22890-800

info@mall.info · www.mall.info