

Installation instructions

Mall shaft systems

1. Preliminary note

The basic element of Mall monolithic tank systems is a reinforced concrete prefabricated element, manufactured according to current standards and poured "upside-down". This production method makes it possible to realise a jointless tank, completely reinforced with steel, without a construction joint at the critical intersection between wall and base. The diameters of these round tanks vary between 800 mm and 3,000 mm. Alternatively, structures made of individual shaft rings are possible.

The extent to which complete systems (incl. shaft attachments etc.) can be delivered in a pre-assembled state, depends on the travelling height, the installation weight and the available hoists (see below).

For the joining of individual tank sections, there are generally 2 possible methods:

1. Bolting with elastomer rubber sections or with standardised socket seals ("dry")
2. Grouting with suitable grouting materials ("wet")

2. Excavation pit

The excavation pit must be excavated according to the component dimensions in observance of DIN 4124 (lateral work space: at least 50 cm, slope etc.) and of the inlets and outlets. When installing so-called multi-tank systems (see DIN 1989), a minimum clearance between tanks as per DIN 4124 (> 50 cm) is to be ensured.

The base of the pit is to be levelled with a straightedge and is to comprise approximately 10 to 20 cm of compacted gravel sand (max. grain 16 mm). It is essential to avoid point pressure and edge pressure. If the subsoil is problematic, it may be necessary to replace the subsoil, or to install a lean concrete layer.

The sealing requirement is a Proctor density of approximately $D_{pr} = 1.0!$

A specific information sheet is available regarding the integration of sumps. When determining the relative elevation for the excavation pit base, the height of the overflow for connection to the sewer system is to be considered (see DIN 1986-100, DIN 1989-1 and DIN EN 12056 - backflow level etc.). The base of the excavation pit must be free of groundwater and stratam water! (Risk of buoyancy!) The edge of the pit is to be safeguarded in accordance with the regulations.

3. Provision of access route, unloading

A sealed, unobstructed and safe access route is a prerequisite for delivery to the construction site with an HGV and hydraulic loading crane. In cases of uncertainty as to whether the access route can support the vehicle, the decision is made by the driver. It must be possible to support the HGV-mounted crane. For this purpose, it may be necessary for the Customer to provide planks / square timbers on site. Lighting and / or drainage must be provided on site by the Customer, according to the weather. Before installation, the possible extension arm lengths are to be clarified with the supplier / derived from crane load diagrams (clearance between support and edge of excavation pit: approximately 1 m).

The Customer, or the Customer's representative, bears the expense and risk of unloading and lowering into the excavation pit – unless expressly arranged otherwise. Any towing costs which result from poor access route conditions which were not clearly apparent shall also be borne by the Customer; the same applies to delays on the construction site which are caused by the customer.

During positioning of the reinforced concrete tanks, it must be ensured that the appropriate and approved transport straps are attached to the concrete-encased screw anchors. The threads are to be completely screwed in.

The lifting tackle must have sufficient load-bearing capacity. The weight of the heaviest single part is indicated in the order confirmation. The angle between the lifting gear and the horizontal line may not be less than 60°. No persons may linger beneath suspended loads (see also accident prevention regulations).

4. Installation

1. "Dry" bolting

In general, this involves proven joining methods, whereupon the components are geometrically aligned and the high-quality bolting and sealing materials are included in the delivery. Our own procedures are used in addition to standardised procedures (e.g. DIN 4034, part 1 – without bolting). Generally, if the Customer provides an on-site assistant, this is sufficient to ensure that installation proceeds very rapidly.

2. "Wet" grouting

The spigot and socket design of Mall prefabricated elements for on-site grouting is based on current regulations, in particular DIN 4034, part 2. The Customer is generally obliged to provide material and personnel for grouting the joints; any time during which our (crane) vehicles are left waiting constitutes an extra service and is charged for separately.

Specific requirements regarding the quality and application of the mortar – particularly for sewage treatment plants – are to be observed; the minimum requirement is MG III (cement mortar). The Customer is liable for any damage caused to prefabricated elements as a result of point pressure and edge pressure caused by insufficient application of mortar. Mortar layers are to be trowelled across the entire width of the wall and, after repositioning, thoroughly trowelled flush on the inside and the outside, then sealed.

5. Pipe insertion

Generally, the articulated integration of pipes is to be taken into account already during the planning phase. As standard, Mall shaft structures come with approved and tested sealing systems (link seals or multiple lip seals for filling the annular gap). In each instance, the circumference and quality of the pipe insertion is to be arranged upon placement of the order. Cut-outs or drilled core holes to be grouted on site are also provided on request.

6. Leak test

Monolithic tanks for use as rainwater tanks as per DIN 1989 (Rainwater utilisation systems) do not need to be re-tested for watertightness on site. Systems which are put together differently, or which comprise multiple elements, are to be subjected to a water leak test after the tank has been installed and assembled, and before (!) placement of the earth backfill. Justified complaints are to be reported to us immediately.

7. Backfill

Due to the high stability, the previously excavated material can generally be used as backfill without any problems. However, the settlement tendency and the (traffic) load on the surfaces above are to be taken into account. The loads applied to the tanks by (heavy) compactors may not exceed the guaranteed load class. Particular care (correct embedding) is called for in the vicinity of the connected lines.

1.0 Field of application:

- 1.1 The following terms of sale and delivery apply exclusively to all business conducted between us and our Customer if the Customer is an entrepreneur, a legal entity under public law, or a special fund under public law. Differing, conflicting, or additional general terms and conditions on the part of the Customer, even if these are known, shall not form part of the contract unless it is expressly agreed in writing that they apply. Our terms of sale and delivery shall also apply if we make the delivery in knowledge of conflicting or differing terms and conditions on the part of the Customer.
- 1.2 Our terms of sale and delivery do not apply to contracts with consumers. This does not affect the retention of title as per section 5.0 of these terms of sale and delivery. The retention of title is also agreed upon with consumers.

2.0 Contract conclusion, obligations, description of properties:

- 2.1 Our order confirmation for the Customer includes our delivery commitment and specifies the properties of the contractual products to be delivered, taking into account the technical data in our brochure "Technical data and prices" for the respective calendar year and article numbers which represent our standard products and which describe the obligations and properties. For products and systems manufactured on a Customer-specific basis according to Customer specifications, the content of the order confirmation applies exclusively, insofar as it deviates from the content of the "Technical data and prices" brochure. If our Customer does not have the brochure "Technical data and prices", this shall be delivered to the Customer for the respective calendar year on request.
- 2.2 In general, the properties of the contractual products to be delivered are defined only by the product description in our order confirmation, taking into account the technical data in our brochure "Technical data and prices". Public statements, presentations or advertising realised by us, by our vicarious agents and sales representatives, or by the manufacturer, do not constitute contractual specifications of properties of the delivery items.

3.0 Prices and terms of payment:

- 3.1 Our prices for our standard products are derived from our brochure "Technical data and prices" for the respective applicable calendar year. The Customer is obliged to request this brochure from us if the Customer does not have a copy. For domestic deliveries, the prices specified for our standard products are subject to statutory VAT. For customers based abroad, VAT shall not be charged if the Customer provides us with the VAT number / export certificate.
- 3.2 Our prices apply ex works. If we realise the delivery, the Customer is charged extra for freight costs. The freight costs are derived from the relevant specifications in the brochure "Technical data and prices".
- 3.3 Unless otherwise arranged in the order confirmation, the Customer is obliged to settle any invoice within 10 days after it is handed over or dispatched. Once this deadline expires, the Customer shall be in default of payment.
- 3.4 If the Customer invoices the Customer's end consumer, this does not free the Customer from the Customer's own, or joint, liability for settlement of the invoice issued to the end consumer. It is incumbent upon the customer to verify client's ability to pay.
- 3.5 Against our receivables, our Customer can only offset or exercise a right of retention on the basis of claims that are undisputed or have been determined as legally binding. Offsetting and retention on the basis of disputed claims is excluded between us and the Customer.

4.0 Delivery deadlines and dates, transfer of risk:

- 4.1 Delivery deadlines and dates are determined by the respective written order confirmation. Adherence to delivery deadlines requires agreement on all commercial and technical issues, punctual provision of all documents to be provided by the Customer, the necessary official approvals and certificates, approval of the installation drawings etc., particularly of plans, as well as observance of the agreed terms of payment and other obligations of the Customer. If these prerequisites are not met punctually, the deadlines are extended accordingly; this shall not apply if we are responsible for the delay.

- 4.2 Operational faults, delays on the part of our suppliers, hindrance of the delivery of raw and auxiliary materials due to official measures, embargos, strikes, lockouts, force majeure, or natural hazards affecting us or our suppliers, as well as similar unforeseeable events for which we are not responsible, relieve us of the duty to meet our contractual obligations while these events continue. Delivery deadlines and dates are postponed by the length of time for which the events continue. In particular, the Customer is not entitled to withdraw from the contract and / or to claim compensation for damages in such cases.

- 4.3 Unless otherwise arranged in the order confirmation, our arrangements are "EXW" as per Incoterms 2000 (ex works).

- 4.4 The risk of accidental loss or deterioration of the delivery items is transferred to the Customer upon handover of the delivery items or, in the case of dispatch, upon handover of the goods to the forwarding agent, freight carrier, or other person or establishment assigned to realise the dispatch. If the Customer takes out transport insurance, the Customer is obliged to cede to us all compensation claims already now, insofar as these are based on the material risk and price risk transferred to the Customer. We hereby accept this cession. Default of acceptance by the Customer shall also apply as handover.

5.0 Retention of title:

- 5.1 We shall retain title to the delivery items until full settlement of all receivables arising from the current business relationship. If the value of all security rights to which we are entitled exceeds the realisable value of all apparent claims by more than 10%, we shall, if so requested by the Customer, relinquish an appropriate portion of these security rights; it is our responsibility to select the security rights to be relinquished.

- 5.2 During the period of retention of title, the Customer is obliged to treat the delivery items carefully. The Customer must regularly perform maintenance and inspection work at the Customer's own expense, insofar as this is required. During the period of retention of title, the Customer is obliged to insure the delivery items against fire damage, water damage and other damage. The Customer is obliged to name the insurer and already now shall cede to us any payments to be received from the insurer. We hereby accept this cession.

- 5.3 The Customer is obliged to inform us immediately if any third party gains access to the delivery items, for instance in the event of seizure, as well as in the event of damage or destruction of the delivery items. If the delivery items change hands, or if the Customer's domicile or place of business changes, the Customer is to inform us immediately.

- 5.4 In the event of contract-violating conduct on the part of the Customer, particularly in the event of payment default, or breach of an obligation described in section 5.2 or 5.3 of this agreement, we are entitled to withdraw from the contract and to reclaim the delivery items.

- 5.5 The Customer is entitled to resell the delivery items within the ordinary course of business. The Customer hereby cedes to us all claims, in the amount of the invoice sum, which the Customer accrues against any third party as a result of the resale. We hereby accept this cession. After this cession, the Customer is authorised to collect these claims. Nevertheless, we retain the right to collect the claims ourselves once the Customer fails to fulfil their payment obligations properly and defaults on payment. The Customer is not permitted to pledge the delivery items which are subject to retention of title, or to assign them as security.

- 5.6 Any handling or adaptation of the delivery items by the Customer always occurs in our name and on our behalf. If the delivery items are adapted using items that do not belong to us, then we shall acquire co-ownership of the new object in the ratio of the value of the delivery items to the other items used. The same applies if the delivery items are combined with other items which do not belong to us.