

GSV Guidelines

**Handling and
Maintenance Instructions
for Formwork Systems**

Version October 2003

Güteschutzverband Betonschalungen e.V.
(Quality Protection Association for Concrete Formwork)

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GSV Guidelines

“Handling and Maintenance Instructions for Formwork Systems“

(Version October 2003)

1 Preliminary remarks

These "Handling and Maintenance Instructions for Formwork Systems" guidelines issued by the Quality Protection Association for Concrete Formwork define the minimum requirements for appropriate and correct handling as well as the maintenance of formwork systems. This is necessary to ensure cost-effective and technically efficient utilisation over the intended working life.

Valid safety regulations, assembly instructions and the manufacturer's operating instructions are to be used. These are to be requested by the user.

Characteristics of the individual products are to be taken into consideration.

2 Handling and Maintenance Instructions

2.1 Delivery and return delivery

At the time of delivery, formwork systems and equipment are in a clean, technically proper and functional condition, corresponding to the latest GSV "Quality Criteria of Rental Formwork" guidelines.

Materials are to be sorted and bundled in shipable units. Correct securing of the load is to be carried out, e.g. lashing belts, so that no damage is caused to those formwork components being transported.

For return deliveries, the same conditions apply as for deliveries with the exception of individual agreements between the hirer and rental company, e.g. cleaning.

Application of release agent before formwork materials are returned is not permissible.

2.2 Loading, unloading, intermediary transport and storage

Formwork panels are to be put down in a stable position. Suitable intermediate protection layers must be used when stacking one on top of the other; permissible stacking heights are to be observed at all times. The formlining must be protected.

Storage is to be carried out on load-carrying and flat areas.

Only operationally reliable load-carrying equipment is to be used.

For special demands on the formlining, e.g. visible concrete surfaces, increased care and attention is to be taken.

2.3 Setting

2.3.1 Application of concrete release agent

Before the first time of use as well as before each additional concreting cycle, those system components at least which come into contact with the concrete are to be treated with a suitable release agent. Dosage and protective clothing must correspond to specifications laid down by the release agent manufacturer as well as complying with health, safety and environmental regulations.

Problems occur when using release agents, among other things, during the application of the dosage. Formwork wax is used, otherwise the release agent is sprayed on. Here, the viscosity of the release agent provides information about the processing characteristics which are important for the application and the subsequent treatment:

- solvent-free release agent:
viscosity of approx. 20 mm²/s (20 °C) → fine coating hardly possible.
- solvent-based release agent:
viscosity of approx. 1-2 mm²/s (20 °C) → fine coating possible, due to decrease of the coating thickness through solvent evaporation by approx. 50 - 80 %.
- watery release agent emulsion → fine coating possible; after the water has evaporated, a thin film remains.

Appropriate and correct dosage of the release agent depends on the qualification and experience of the worker administering the agent and the quality of the spraying equipment being used. In order to achieve the correct spraying result use, among other things, high pressure spraying devices (5-6 bar pressure, oil-resistant hoses) as well as appropriate nozzles.

2.3.2 Erection of formwork systems

When erecting formwork systems, the manufacturer's assembly instructions and operating handbook must be used. Erection areas must be even and clean. Suitable alignment tools are to be used.

2.3.3 Working on horizontal formwork

When placing heavy items, such as re-bar bundles, suitable support and protection must be used so that the formlining is not damaged. In addition, the load-bearing capacity of the formwork system is to be checked. Suitable spacers are to be used.

2.3.4 Fixing material on the formlining

Double-headed nails should be used for any fixings required to the formlining. This facilitates the removal of the nails later and reduces formlining damage. The nail length should normally not exceed 65 mm. For mounted components, appropriate fixing means are selected to ensure that any damage to the formlining is kept to an absolute minimum. The GSV "Quality Criteria of Rental Formwork" booklet is to be used.

2.3.5 Tie holes

Unused tie holes and drillings in the frame wall formwork are to be closed. This prevents the need for additional cleaning or repair work. All tie holes plugged with concrete are cleaned using suitable tools.

2.4 Concreting

2.4.1 Concreting loads

Maximum permissible loads for the formwork and tie systems caused by fresh concrete pressure as well as dead, concreting and live loads may not be exceeded.

2.4.2 Use of concrete compaction equipment

When using vibrator compaction procedures, corresponding DIN 4235 guidelines are to be observed. Especially for horizontal formwork, only internal vibrators with rubber caps should be used.

2.4.3 Cleaning

Concrete surplus should be removed directly after each concreting cycle has finished.

2.5 Striking

2.5.1 Striking procedure

Striking is to be carried out in such a way that damage to the formwork elements is avoided.

2.5.2 Cleaning

Any surplus is to be removed from those areas in contact with the concrete immediately after striking. Following this, the release agent can be applied.

Procedures for the rear sides of the formwork elements are carried out in accordance with § 2.4.3.

For cleaning, only tools may be used which do not damage the formlining and any other system parts. The use of sandblasting equipment, angle grinders, wire brushes and pointed tools lead to damage.

3 Repairs

Any repair work required on the formwork systems is to be carried out by qualified personnel. In the case of rental formwork, refer to the GSV "Quality Criteria for Rental Formwork" guidelines.

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