

# Ergonomics in practice

## – Maintenance –

The consideration of ergonomic requirements when carrying out maintenance activities is a great challenge for companies.

Two essential stress factors are the work with heavy components that occur in the most diverse places in the company (e. g. lifting, holding and moving) and working in places that are difficult to access. The latter has the consequence that many activities can only be carried out in forced postures, i. e. activities with forced body postures, and/or the use of lifting and transport aids is not possible. Often, maintenance workers accept high physical stresses when working what implies a high risk for injuries and illnesses of the musculoskeletal system.

### Hints for the ergonomic design of maintenance activities

#### Planning

When planning halls and facilities, make sure that access is as easy as possible and that there is sufficient space for maintenance work. Like this working in forced positions can be avoided and the unproblematic use of work equipment such as lifting aids can be enabled.

Take into consideration that work equipment such as forklifts and cranes can be very heavy. Design the building statics (permissible load) accordingly.



Attachment points on the hall ceiling are another possibility to lift and move heavy machines (parts) by means of rope/chain hoists, ceiling rails and cranes. Here, too, the statics have to be taken into account.

For works in places that are difficult to access and could not be equipped with the above-mentioned constructions, it is advisable to cooperate with a competent scaffolding company.

Make sure that accesses are not subsequently impeded or even made impossible by installations such as cable harnesses, pipelines or other plant components.

#### Equipment for lifting heavy loads

Where possible, use mobile lifting aids or mini cranes to lift heavy machinery (parts). Easy access to the workplace, including access and exit routes, is a prerequisite here. If space is limited, small and manoeuvrable electric lifts can also be used. These are available with a wide range of lifting devices (e. g. simple forks, mandrels, plates, drum clamps) and in various performance classes.

If the above-mentioned standard solutions do not provide sufficient support, you should use special solutions of your own design. Make sure that the construction is safe and that it conforms to CE standards.

If no technical measures for lifting and carrying heavy loads are possible, work with several persons.

#### Transport of heavy components and work equipment

Use, for example, a handcart for transporting work equipment such as tools and equipment.



Use electric pulling/pushing aids for pulling and pushing particularly heavy loads. These are available with different lifting devices and are already recommended for smaller masses of less than one tonne.



### Ergonomics in the maintenance workshop

Ensure sufficient space and good working conditions also in the workshop. Height-adjustable worktables and scissor lifts enable ergonomic working, no matter how large and in which orientation the workpieces are.

### Organisation of maintenance

A preventive maintenance strategy reduces the number of faults and machine failures. Good planning and preparation of maintenance work helps to avoid hectic and stressful situations. This also benefits a more efficient and safer way of working: downtimes are minimised and the risk of accidents is reduced.

### Spare parts store

In the spare parts store, it is recommended that the shelves are sorted according to the rule “light to the top – heavy to the bottom”. Heavy parts, which are taken out of the shelves by hand, are an exception. These should be stored at about belly height.

### Personal measures

Select competent persons for the maintenance activities who have the necessary physical characteristics (e. g. muscular strength). Also consider mental abilities, such as psychological resilience, head for heights or the ability of the employee to work in confined or enclosed spaces without fear.

### Encourage health-conscious behaviour

Encourage health-conscious behaviour among employees, e. g. through

- occupational health instruction, counselling and training, e. g. on proper lifting and carrying,
- enabling compensatory exercises immediately after heavy work or forced postures. These exercises loosen, relax and prevent discomfort or complaints.



- **Workplace health promotion**

Special offers for compensatory sport as well as cooperation, e. g. with physiotherapeutic counselling and treatment, have a long-term positive effect on the health and performance of employees. Clarify correspondent plans in advance with your company doctor.

### Safe work

A risk assessment has to exist for every activity, including maintenance activities. In time-critical moments, a “First Minute Risk Analysis” or “Last Minute Risk Analysis” can be used, as described in the DGUV publication “Troubleshooting”.

### Too heavy

Give your maintenance personnel the possibility to refuse or stop work with high physical loads if physical damage is feared as a result. An alternative procedure must then be planned within the risk assessment.



- **BGN Branchenwissen**  
<https://bgn-branchenwissen.de/ergonomie>
- **FBHM-127 Fachbereich AKTUELL Sichere Störungsbeseitigung an Maschinen und Anlagen**  
<https://publikationen.dguv.de>
- **DGUV Information 208-033 Muskel-Skelett-Belastungen erkennen**  
<https://publikationen.dguv.de>
- **Branchenspezifische Ausgleichsübungen**  
[www.bgn.de](http://www.bgn.de)
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