
Guideline

Quality Criteria for
Office Workplaces

L-Q 01-06



Publishers:

DIN

Deutsches Institut für Normung e.V., Berlin
Normenausschuss Holzwirtschaft und Möbel (NHM)

[German Institute for Standardization

Timber and Furniture Standards Committee]

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BAuA

Bundesanstalt für Arbeitsschutz und Arbeitsmedizin

[Federal Institute for Occupational Safety and Health]

www.baua.de

INQA-Büro

Initiativkreis Neue Qualität der Büroarbeit

[Working Group for a New Quality of Office Work]

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Preamble



This sign stands for the claim of the publishers, the German office furniture industry and the qualified specialised office trade

- to focus on **the office worker**, the people who actually do the work
- and to offer products and services that go well beyond familiar regulations and standards.

Laws, regulations and accident prevention regulations in connection with **DIN, CEN** or **ISO standards** only specify **minimum standards**. Typical health problems associated with office work continue to increase, however. In particular, muscle and bone illnesses including back pain are responsible for almost one-third of all lost working hours and have become widespread.

Recently, the defined minimum standards have – due in part to demographic development and the changes in anthropometric dimensions – become disputed and have been called into question as being **insufficiently effective**. New scientific findings have given the terms **quality, ergonomics** and **prevention** (health and safety) an increased and wider-ranging role.

These guidelines state facts and define recommendations from a new perspective of the QUALITY OFFICE which intention it is to better align work environments with the user needs.

Quality standards and prevention are a matter not only of preventing illness, but also of **promoting health**. The Goal is to increase the overall quality in peoples professional and thus private lives.

Through this an work environment evolves in which people stay healthier, perform more willingly and are committed to use the maximum of their capabilities.

It is not a matter of only preventing injuries, but rather of **promoting health!** Not simply cutting costs related to illness, but increase the potential for better performance!

Foreword

Quality standards for office furnishings are an occupational health issue

The guideline defines quality standards for office furniture under consideration of the latest ergonomic findings. The Intention is to show the additional benefit of high-quality products and services, to promote their sensible use and to more precisely define requirements for premium products.

This objective should be viewed against the following background:

When the Federal Republic of Germany, Belgium, France, Italy, Luxembourg and the Netherlands came together in Rome in 1957 to form the European Economic Community (EEC), nobody thought of European product standards. The focus was initially on integrating economies and economic laws.

It very quickly became clear, however, that a variety of different product standards represented trade barriers and were hindering the economic objective of a common internal market. The elimination of these trade barriers didn't make progress because the resolution of directives (of the EC) demanded "unanimity" which, however, was hardly ever achievable.

This impasse was eventually overcome in a number of important areas, among them the protection of health and safety, with the introduction of the Single European Act in 1986 and by introduction of the single market in 1992.

- Article 95 (prior to 1997: article 100 a) made it possible to define guidelines for minimum requirements, which, however, still required a qualified majority in the Council of Ministers.
- Article 137 (prior to 1997: article 118 a) made it possible to define guidelines for minimum requirements in the areas of both social and technical industrial safety. Here too, a qualified majority is sufficient.

On the basis of these two articles, the EU has made major advances in occupational safety and health issues within the member countries since 1986; since then, numerous guidelines have been promulgated and implemented in national legislation.

The Council Directive 89/391/EEC of 12 June 1989 on the "introduction of measures to encourage improvements in safety and health of workers at work" was implemented in national law by the law on the "implementation of the EU framework directive regarding safety and health at work and further occupational safety and health directives" of 7 August 1996.

Fears that the high standards of occupational safety and health protection in Germany could be called into question or get undermined in the interests of the free movement of goods within the – now 25 – member states of the European Union are unfounded because all legal and other regulations in European health protection are to be viewed as minimum standards¹⁾, i.e. do not imply any “upper limits”. These are the reference points of these guidelines.

They are intended to document that the German office furniture industry, in collaboration with the VBG, has been developing manufacturing and marketing products that exceed minimum standards in many different ways for decades. Employee comfort, better working conditions and an increase in performance are best served not by additional stress, but through reduction of stress to which people working in the offices are subjected – thanks to improvements in working conditions with respect to ergonomics and ergonomic systems.

The “Arbeitsmedizin und Systemergonomie” (occupational medicine and ergonomic systems) commission of the DGOOC (German society for orthopaedics and orthopaedic surgery) and the BVO (orthopaedists’ professional association)

Prof. J. Grifka

Prof. T. Peters

¹⁾ Working conditions act (ArbSchG): Law concerning the implementation of occupational safety measures for the improvement of safety and health of employees during work. Article 1 from 7 Aug. 1996 (BGBl I, p. 1246), amended by Article 9 of the employment legislation job promotion law of 25 Sep. 1996 (BGBl I, p. 1476)

Part I The Preventative Approach and the Need for Action

Product quality optimises function, safety and health protection

Consultation, technology, design and material quality are the most important criteria for a qualified choice of products. Furthermore, physical and the psychological user needs must be assigned a high degree of importance. After all, these factors lie at the centre of all influences at the workplace. If ergonomic conditions are unfavourable, particularly in case of the dominant form of work today – with a keyboard and visual display unit – then a series of physical and psychological complaints can arise. These include:

- Tension in the shoulder/neck or the shoulder/arm area and the back muscles
- Premature tiredness, nervousness, concentration problems
- Pressure on the upper thighs, circulatory problems, painful legs and swelling
- Eye symptoms and impairment of eyesight

These and additional physical and mental disorders are frequently the cause of reduced productivity, increased frequency of errors and falling motivation – all result in reduced quality of work and increased labour costs.

Check product quality

It seems there are good reasons to pay careful attention to product quality when purchasing office furnishings. On one hand this enables the functional, technical and cost sensitive requirements of the company to be fulfilled; on the other hand it takes into account the ergonomic requirements for the office worker.

Together with the qualified office furniture specialised trade, the German office furniture industry has established concrete quality criteria that go far beyond the minimum standards of relevant regulations.

When purchasing office furnishings it is recommended that a comparison of quality on the basis of the following catalogue has to be carried out.

In the last decades a process of change has commenced in the western industrialised nations that has essentially altered the structure of society. The industrial society with a large proportion of productive workers has been transformed into a society based on services. This, in turn, is now undergoing a transition of its own into an information society. In 1973 45 % of the workforce was active in services companies. Today this figure is already over 66 %.

This change is accompanied by a shift in the nature of work with an increasing portion of office activities. In turn, this has led to a continuing growth in the proportion of people with primarily sedentary occupations and to insufficient physical activity – and the concomitant static stresses on the spine and muscles. These are frequently the cause of general health problems up to and including chronic back pain. The consequences include lost work time, e.g. in the case of back problems 15.9 days (source: BKK health report 2004), and early retirements – with resulting annual costs of billions of euros to the economy.

As awareness of such problems has grown over the past years, ergonomics have become more and more central to the considerations of development and planning departments of the German office furniture industry. Ergonomically correct designed furniture and applications are not the only steps that can be taken to assist prevention (conditional prevention); the correct use of available functions can also be viewed as preventative action against possible illnesses (behavioural prevention). Due to the fact that today's workplaces are being used in many different ways (e.g. long-term use, desk-sharing, shift workplaces), the furniture – whether chairs or desks – must be capable of easy and optimal adjustment to support its user. Functions should be intuitive to use. The results of these considerations are, however, in some cases complex systems that – as already stated in the preamble – place particular requirements on the quality of products and services in question.

The need for action can be derived from these conditions and from the existing facts. The definition of wide-ranging quality criteria should be of help in the selection of the right product. In addition to high-quality products modern workplace design also requires a series of services that, where necessary, explain the complex systems described above to the user and ensure their correct long-term use.

Advice during purchase and, as necessary, customer-orientated product adaptation; training and instruction in the correct usage; after-sales activities such as online support; full-coverage customer services; and guarantees on components and follow-up deliveries are therefore services that usefully augment the quality of a premium product.

Part II Ergonomic Recommendations

Office furnishings must be designed in such a way that the range of users with different body sizes and shapes is as wide as possible to allow for ergonomically correct postures during a variety of different tasks. The design of work equipment is based on the statistically derived percentiles of the dimensions of adult humans between 18 and 65 years of age. In this process a percentile value specifies the number of people whose body size lies below or above the relevant value.

The limiting values that have proved suitable in practice are the 5th and the 95th percentile. That means that in terms of size, the smallest 5 % and the largest 5 % of adults are not taken into account.

In Germany, that means that work equipment should be suitable for users with heights from 1.51 m to 1.91 m. Taller or shorter users require customised work equipment.

In order to determine the corresponding dimensions of the products, reference postures are assumed for sitting and standing. These reference postures are, however, neither optimal nor desirable in the long term.

The working height should, both for sitting and for standing workplaces, be approximately at elbow height when the upper arms are hanging freely.

An ergonomically favourable working posture is achieved when at a work surface at standing height or at a work surface at seating height the working height and/or the seat height are adjusted to the users body.

One precondition for an optimal workplace design is to determine the height by means of one fixed point and two variables. Workplaces where the floor and the height of the work surface are fixed do not allow for a good adjustment to fit the user. An optimal and thus individual adjustment results from using the fixed point (the floor) and the variable height (seat surface and work surface).

Space within reach, fields of vision, viewing distances and motion sequences are also important for ergonomic sitting and standing postures. In order to guarantee sufficient space for an ergonomic working posture, the arrangement and the setting of the work equipment must be taken into account.

Considering currently conflicting requirements for body size and posture, the mechanical design of work equipment used, among other factors, minimum requirements for dimensions and adjustment ranges are specified in the different standards. Adequate freedom of movement is guaranteed when in compliance with minimum requirements.

Relaxed and fatigue-free postures with good freedom of movement – without using a foot support – are supported for small and large users in particular if the ergonomic recommendations of the VBG and the BAuA (BGI 650, Sections 7.3 – 7.3.2) for design and dimensions of product series are being followed.

Part III Product-Related Recommendations

1 Quality requirements for the fundamental design concept of all products

	Assessment Criteria	Advantages
1 1	Safety requirements	
1 1.1	All products offered with GS seal	The GS seal guarantees specific minimum standards for safety and ergonomics and provides legal certainty
1 2	Fundamental requirements for the product	
1 2.1	Series-produced products	Availability of follow-up deliveries
1 2.2	User-specific solutions	For solving individual tasks in context of the overall concept. Can be adapted to the individual requirements of any user by conversion or extension despite series production
1 2.3	Product enhancements and extensions, also capable of being retrofitted	Product update possible at any time by adaptation
1 3	Formal requirements	
1 3.1	Products formally and functionally matched to one another – for differing office concepts	Can be combined in all types of spaces (e.g. small, combined, open-plan office) and office concepts
1 4	Ecological requirements	
1 4.1	Applying ecological recommendations in development and production	Ecological product design, e.g. products of a single material and/or that can be separated into single materials
1 4.2	Taking back own products	Products are returned to the raw materials cycle

	Assessment Criteria	Advantages
1 5	Requirements for production management	
1 5.1	Quality management implemented	Quality assurance
1 5.2	Environmental management implemented	Focus on the environment
1 6	Requirements for information management	
1 6.1	User information via Internet or other permanently available media	Utility optimisation

2 Quality requirements for office chairs

21 Office chairs

	Assessment Criteria	Advantages
21.1	Requirements for dynamic sitting	
21.1.1	Seat and backrest tilt should be synchronous – i.e. the tilt of the back and the seat surface should remain at a matched ratio	Ergonomic design The backrest supports the movement of the spine – and thus the whole person – dynamically and in a manner that conforms to the body.
21.2	Requirements for the seat surface	
21.2.1	The front edge of the seat surface should not be raised too far when the user is leaning back	Ergonomic design The feet remain in contact with the floor. This supports supply to the lower limbs.
21.2.2	In the case of seats with a non-adjustable seat surface depth, the seat surface should be anatomically formed	Ergonomic design The sitting load is spread over a large area, so that uncomfortable pressure points do not arise on the upper thighs and in the seat area. The recessed form of the seat surface prevents the pelvis from tilting backwards.
21.2.3	Seat surface height can be adjusted	Ergonomic design Makes it possible to sit with the load distributed over the entire area, without pressure points arising on the seat or the upper thighs with persons of differing body size. A correct height adjustment of the work environment is attainable only by a corresponding seat height adjustment.
21.2.4	Seat height suspension	Ergonomic design The suspension of the seat should remain effective even with the seat adjusted to its lowest position in order to avoid compression of the spine (reduces the load on the spine when sitting down).
21.2.5	Seat surface depth adjustable, flat (optional)	The body size of a person is mainly determined by the length of their legs. A tall person therefore requires a chair with a longer seat area than a small person.

	Assessment Criteria	Advantages
		<p>An adjustable seat depth can be used to suitably adjust the area for resting the upper thighs and the seat region.</p> <p>The backrest is adjusted for different body sizes, spine shapes and pelvis positions.</p>
2 1.2.6	Seat tilt adjustable to some extent (optional)	<p>The seat surface is tilted forward as a unit. This raises the pelvis (to a steeper angle) and brings the spine into its physiologically correct shape (double-S shape). The result is to relieve the loads on the intervertebral disks, i.e., the pressure on the intervertebral disks is less than is the case with the otherwise typical rounded back. Relieving the loads on the intervertebral disks promotes the absorption of nutrients.</p>
2 1.3	Requirements for the back rest	
2 1.3.1	Back rest anatomically formed with lumbar support	<p>Ergonomic design</p> <p>Enables the spine to take on its ideal shape (the double-S shape) and supports the lumbar region</p>
2 1.3.2	Lumbar supports in every sitting posture	<p>Ergonomic design</p> <p>Supports the lumbar vertebral region</p>
2 1.3.3	<p>Lumbar support height can be adjusted, either by</p> <ul style="list-style-type: none"> ▪ adjustable back rest height ▪ or by means of height-adjustable lumbar support 	<p>Ergonomic design</p> <p>Adjusting the back rest for different body sizes, spine shapes and hip positions</p>
2 1.3.4	Back rest dynamic with sufficient opening angle	<p>Ergonomic design</p> <p>Supporting the upper body in any sitting posture enables fatigue-free sitting without static loads on the back musculature. The large opening angle enables an undisturbed supply to the organs via the cardiovascular system and ensures the functioning of the organs.</p>

	Assessment Criteria	Advantages
21.3.5	Back rest resistance, automatic or individually adjustable	The hardness can be adjusted to the requirements of the user. Support and movement functions are optimised
21.3.6	Back rest sufficiently high to also support shoulder/neck area	Ergonomic design Relieves the spine and muscles and uses the relative stability of the thoracic vertebrae to optimise the sitting posture
21.3.7	Lumbar support depth-adjustable	The depth-adjustable lumbar support takes account of the different properties of the lumbar spine (lumbar region) in people. The differing curvatures of the spine make it necessary to adjust the depth (strength) of the curvature of the supportive area of the backrest (backrest curvature or lumbar support) and thus the support of the user.
21.3.8	Headrest/neck support (optional)	The headrest or neck support minimises the strain on the throat and neck muscles of holding the head. This is especially necessary in the rearmost position, as otherwise it can very rapidly lead to unbalanced strain on the muscles. This is becoming more important as a greater number of swivel chairs are (or will be) fitted with a mechanism that permits a body opening angle of 125° or more, thereby causing a very high degree of strain on the corresponding muscles.
21.3.9	Headrest/neck support adjustable in height and depth (optional)	Optimised ergonomic design
21.4	Requirements for the armrests	
21.4.1	Armrest height can be adjusted	Ergonomic design Relieving the shoulder girdle, protection against irritation of the tendon and of the tendon sheath (RSI)

	Assessment Criteria	Advantages
2 1.4.2	Armrest separation adjustable in width and/or in angle	Ergonomic design Optimal relief of the shoulder girdle for different users doing different work
2 1.4.3	Armrests with soft surface	Ergonomic design Preventing pressure points on the forearms
2 1.4.4	Armrests replaceable and/or retrofittable	Ergonomic design High degree of flexibility and adjustment to changing workplace situations
2 1.4.5	Armrest depth adjustable (optional)	Optimal adjustment for different users with regard to the clearance between the table edge and the back rest
2 1.5	Requirements for the upholstery	
2 1.5.1	Upholstery with good pressure distribution	Ergonomic design Preventing pressure points in the area of the upper thigh, the seat and the ischial tuberosity
2 1.5.2	Upholstery and covers breathable	Materials for maintaining a comfortable microclimate
2 1.5.3	Upholstery and covers replaceable	User-friendly, easy to replace
2 1.6	Requirements for the chair casters	
2 1.6.1	Chair casters braked according to load	Ergonomic design Prevents the chair from rolling away when it is not occupied
2 1.6.2	Soft chair casters for hard floorings	They cause less wear on the floor covering, increase the rolling resistance and reduce noise
2 1.6.3	Hard chair casters for soft floorings	Better rolling characteristics on carpet etc.

Visitors' and conference chairs, congress chairs

Preliminary note:

Conference and congress chairs have to fulfil different requirements. Their purpose defines the criteria they must fulfil.

Defining different quality criteria according to the expected duration of sitting would appear sensible, as both technical and comfort-related criteria can be derived as a result.

2.2 Visitors' and conference chairs

Visitors' and conference chairs are generally used for short periods of sitting. Models with a four-legged or cantilever frame are especially suitable for this.

	Assessment Criteria	Advantages
2.2.1	Requirements for the seat surface and back rest	
2.2.1.1	Comfort	The objective is to provide the user/owner with a maximum of comfort and "hospitality". Upholstery, upholstery properties, micro-climate and additional flexibility of the back rest (e.g. material flexibility) all play a major role here.
2.2.1.2	Seat surface anatomically formed	Ergonomic design The sitting load is spread over an area, so that uncomfortable pressure points do not arise on the undersides of the upper thighs and in the seat area. The recessed form of the seat cushion prevents the pelvis from tilting backwards.
2.2.1.3	Back rest anatomically formed with lumbar support	Ergonomic design Enables the spine to take on its ideal shape (the double-S shape) and supports the lumbar region
2.2.2	Requirements for the upholstery	
2.2.2.1	Upholstery with good pressure distribution	Ergonomic design Preventing pressure points in the area of the upper thigh, the seat and the ischial tuberosity
2.2.2.2	Upholstery and covers breathable	Materials for maintaining a comfortable microclimate
2.2.2.3	Upholstery can be replaced	Ease of service and hygiene, variability

	Assessment Criteria	Advantages
2 2.3	Requirements for the formal design	
2 2.3.1	Formal aspects, appearance	<p>The visitors' chair should be formally matched to the respective model of office chair:</p> <ul style="list-style-type: none"> • Uniform and consistent formal language appropriate to the office chair used • Supports the implementation of the corporate image • "All from a single source"
2 2.4	Requirements for the technical concept	
2 2.4.1	Chairs easy to assemble without the need for special tools	Ease of service and assembly
2 2.4.2	Optionally stackable four-legged and cantilever frame chairs	<p>Stacking capability increases the opportunities for use of visitors' and conference chairs:</p> <ul style="list-style-type: none"> • Increased variability • Can be cleared away to save space
2 2.4.3	Low weight (optional use of casters)	<p>It is important to ensure that the visitors' chair permits a high degree of movement:</p> <ul style="list-style-type: none"> • Products are easy to clear away, set out, move • Increased comfort in use

2.3 Congress chairs

Congress chairs are products that are frequently used for longer periods of sitting. Due to the longer sitting times, the requirements for these products should be set higher than those for **visitors' and conference chairs**. Alongside chairs with four legs and cantilever frames, products that are both formally and functionally similar to office chairs (family resemblance) can also be considered here. Alternatively, products derived from premium office swivel chairs could be used.

Examples include:

- Office swivel chairs with fixed heights, swivel or non-swivel, without controls
- Derivations from office swivel chairs with reduced mechanisms or a maximum of comfort, e.g. thanks to high material flexibility
- Swivel-chair solutions

	Assessment Criteria	Advantages
2.3.1	Requirements for the seat surface and back rest	
2.3.1.1	Comfort	The objective is to provide the user/owner with a maximum of comfort and "hospitality". Upholstery, upholstery properties and micro-climate play an extremely important role here. The use of products with mechanical parts approaching those of an office chair is important. Swivel solutions are advantageous.
2.3.1.2	Seat surface anatomically formed	Ergonomic design The sitting load is spread over an area, so that uncomfortable pressure points do not arise on the upper thighs and in the seat area. The recessed form of the seat cushion prevents the pelvis tilting backwards.
2.3.1.3	Back rest anatomically formed with lumbar support	Ergonomic design Enables the spine to take on its ideal shape (the double-S shape) and supports the lumbar region

	Assessment Criteria	Advantages
2 3.2	Requirements for the upholstery	
2 3.2.1	Upholstery with good pressure distribution	Ergonomic design Preventing pressure points in the area of the upper thigh, the seat and the ischial tuberosity
2 3.2.2	Upholstery and covers breathable	Materials for maintaining a comfortable microclimate
2 3.2.3	Upholstery can be replaced	Ease of service and hygiene, variability
2 3.3	Requirements for the formal design	
2 3.3.1	Formal aspects, appearance	<p>The congress chair should be formally matched to the model of office chair used. Alternatively, an independent solution within the constraints of the CI or CD can be considered. In this case, attention should be paid to a comprehensive range (surfaces, materials, upholstery).</p> <p>Variability in use must be guaranteed (cantilever frames and chairs on four-legged or five-pointed star frames are ideal):</p> <ul style="list-style-type: none"> ▪ Sufficient design latitude is granted ▪ Reaction to organizational circumstances (e.g. hierarchies)
2 3.4	Requirements for the technical concept	
2 3.4.1	Chairs easy to assemble without the need for special tools	Ease of service and assembly
2 3.4.2	Optional stacking capability	Stacking capability increases the opportunities e.g. for use of congress chairs

3 Quality requirements for office furniture

31 Office desks

	Assessment Criteria	Advantages
31.1	Requirements for universality of use	
31.1.1	Generally capable of expansion and/or conversion for all office tasks (manual and technical)	Flexible and universal use of all elements that enable task-related workspace design
31.2	Requirements for the functional concept	
31.2.1	Workplace as individual desk or capable of combination into multi-area workplaces	System unity of all furnishing elements – can be converted as required
31.2.2	Vertical extension of the working area upward possible (third level)	<p>Possibility of more economical use of expensive office space – privacy screens – contribution to improving the room acoustics</p> <ul style="list-style-type: none"> • Organizationally useful thanks to paper management collections • Ergonomically useful as privacy screen • Ergonomically useful as acoustically effective screening
31.2.3	Extension of the width and depth of the working area by extension elements for meetings, technical systems, CPU etc. possible	Workplace enhancement according to need and limited to the area necessary
31.3	Requirements for the ergonomic concept	
31.3.1	Height adjustment for seated working tables	Adjusting the work surface height to the individual body measurements of every user. Universal application of tables for working while seated. No need for foot supports
31.3.2	Use of seated/standing working tables (optional)	<p>Rapid change of working posture to avoid unbalanced strains. Adjusting working height to the individual measurements of every user. Universal application of tables for working while standing and seated.</p> <ul style="list-style-type: none"> • Height adjustment for seated and standing working tables easily and simply activated by the user • Ease and speed of setting guarantee that the function will be used and not be neglected due to laziness

3 2 Office Containers

	Assessment Criteria	Advantages
3 2.1	Requirements for the design	
3 2.1.1	Exclusive use of coated chipboard panels also in carcass interior	Minimized formaldehyde emissions
3 2.1.2	Sides with floor, top, rear wall in tongue-and-groove and plugged if possible with additional lateral stabilisation in carcass interior	Stable and extremely durable even if opened and closed frequently
3 2.2	Requirements for the functional concept	
3 2.2.1	Office container can be organized and changed	Individualised and optimised possibilities of use
3 2.2.2	Separate pull-out material shell	Clearly structured, convenient and ergonomic
3 2.2.3	Full-extension drawers	High storage capacity through the utilisation of the container's full depth; cost benefits
3 2.2.4	Full-extension hanging filing systems	Optimally structured and extremely quick document access
3 2.3	Requirements for the ergonomic concept	
3 2.3.1	Table-high stand containers that can be equipped with height-adjustment systems	Balanced working platforms
3 2.3.2	Drawers on laterally hidden guide rails	No risk of injury for the user prevents dirt or damage on clothes.
3 2.3.3	Smooth and quiet running guide wheels	Minimal disturbance of employees when drawers are pulled out. Positive contribution to maintaining a low noise level in the room
3 2.3.4	Cushioned closure (optional)	Ergonomic aspect. Positive contribution to maintaining a low noise level in the room

	Assessment Criteria	Advantages
3 2.4	Safety and security requirements	
3 2.4.1	Container is stable, as it is fitted with a double extension lock and central locking system, a counterweight in the rear or similar systems.	Safety aspect, accident prevention
3 2.4.2	Container wheels are secured against rolling away unintentionally when the drawers are handled	Safety aspect, accident prevention
3 2.4.3	The drawer cannot be unintentionally removed from its guide rails	Safety aspect, as users might otherwise injure themselves
3 2.4.4	Use of folding keys (optional)	Safety aspect
3 2.5	Requirements for the formal design	
3 2.5.1	Uniform appearance of joints	Linear appearance of the front
3 2.5.2	Various types of materials available for the container covers	Visually identical with the adjoining working platforms (tables, cabinets etc.)

3 3 Office cabinets

	Assessment Criteria	Advantages
3 3.1	Requirements for the product concept	
3 3.1.1	Different front panel designs and locking systems; all front panels are lockable	Variable use
3 3.1.2	Full availability of the cabinet's interior width, no projecting hinges	Optimum utilisation of space
3 3.1.3	Wing doors provide access to the free interior dimensions of the cabinet's body	Ergonomic access and full availability of the entire interior width
3 3.1.4	All folder heights are truly addable (i.e. the addition of the folder heights equals the total folder height)	Variable use
3 3.1.5	Use of sound-insulating materials in front and rear panels (optional)	Ergonomic aspect; contribution to maintaining a low noise level in the room
3 3.2	Requirements for the interior organization of the cabinet	
3 3.2.1	All interior furnishings can be mounted at variable heights and are interchangeable	Variable use
3 3.2.2	Pull-outs pull out smoothly from frames or hanging filing system with hidden guide rails	Variable use No risk of injury for the user Prevents dirt or damaged clothes. Minimal disturbance of employees
3 3.2.3	Organizational elements are used for all lower cabinet drawers and cabinet pull-outs	Variable use
3 3.2.4	Small compartments for forms can be installed	Variable use
3 3.3	Requirements for the quality of the shelves	
3 3.3.1	Shelf carrier has a pin inserted into the shelf	Stabilisation of carcass against bulging and to prevent slipping
3 3.3.2	In cabinets with sideways shutters, the upper shelves are secured against sagging so that the sideways shutter can still be moved even if the upper shelf carries a heavy load*	Variable use * (e.g. a top cabinet)

	Assessment Criteria	Advantages
3 3.3.3	Shelves (optional) made of chipboard or steel	Variable use
3 3.4	Requirements for the base design	
3 3.4.1	The base is load-bearing on all sides	Can be transported when full
3 3.4.2	Cabinets on bases with adjusting screws (operable from the interior of the carcass)	Level adjustment
3 3.4.3	Adjusting screws are encased in plastic	Protects floor surfaces against damage
3 3.5	Requirements for the technical design	
3 3.5.1	Sides with floor, top, rear wall in tongue-and-groove and plugged if possible with additional lateral stabilisation in carcass interior	Stable and extremely durable even if opened and closed frequently
3 3.5.2	Uniform appearance of joints when combining several cabinets with revolving doors or cabinets with revolving doors and a diametrically opposed visible rear panel	Linear appearance of the front
3 3.5.3	Cushioned closure (optional) for pull-outs and hinges	Ergonomic aspect. Positive contribution to maintaining a low noise level in the room
3 3.5.4	Electronic locking system that can be integrated into the building's security system, if necessary (optional)	Safety and comfort
3 3.6	Safety and security requirements	
3 3.6.1	The pull-out frame and the hanging filing system cannot be loosened from the guide rails unintentionally	Safety aspect, as users might otherwise injure themselves
3 3.6.2	Shutters with slide-through prevention	Safety aspect, accident prevention
3 3.6.3	Use of folding keys (optional)	Safety aspect

3 4 Room divider elements

	Assessment Criteria	Advantages
3 4.1	Requirements for the product concept	
3 4.1.1	Room divider elements should be mobile	Switching room divider elements makes it possible for temporary teams to carry out project-related work
3 4.1.2	Room divider elements should be linkable at various heights and at various angles.	They make it possible to create variously sized room areas. Individual work areas can be created.
3 4.1.3	Room divider elements should help reduce direct sound waves and reflected sound waves (sound-absorbing materials).	Reducing the noise in open-plan offices increases employees' well-being
3 4.2	Requirements for organizational use	
3 4.2.1	The elements must be usable for organizational purposes (storage trays, pin board, small shelves).	Workplaces can be extended into the third level (saves space)
3 4.3	Requirements for materials and material variety	
3 4.3.1	The room divider elements should serve as privacy screens using many different interchangeable materials (ranging from totally opaque to completely transparent => does not provide privacy).	In open-plan offices, privacy screens help create a sense of privacy at the workplace
3 4.3.2	The profiles have to be designed in such a way that the room divider elements can have various fillings made of different types of materials.	The room is divided into different zones through the use of different fillings but the same design vocabulary
3 4.4	Requirements for the technical design	
3 4.4.1	Room divider elements must be stable and have a high-quality, wrinkle-free covering (solvent-free adhesives or adhesive-free covering).	Increases safety and reduces the amount of pollutants in the office
3 4.4.2	Easy assembly and no restrictions with regard to width	The room divider elements can be optimally adapted to different room sizes

	Assessment Criteria	Advantages
3 4.5	Requirements for fire protection	
3 4.5.1	The materials must be fire retardant	Lowers the fire load in the office

4 Quality requirements for electrical installations and integrated technology

	Assessment Criteria	Advantages
4 1	Requirements for the technical concept	
4 1.1	In general, electrification should be carried out in accordance with the "Guidelines for electrical installations in office furniture"	Ensures safety as electrification is carried out correctly and professionally
4 2	Safety and security requirements for electrification	
4 2.1	Strain relief on frame	Electrical safety
4 2.2	Cable routes must be smooth and free of sharp edges	Electrical safety
4 2.3	Parts of linked assemblies that are permanently linked electrically must also be permanently linked mechanically.	Electrical safety
4 3	Requirements regarding the functionality of the energy supply	
4 3.1	Cable ducts for electrification should run throughout the unit	Ordered cable runs to avoid the risk of stumbling or falling down
4 3.2	Reduced energy consumption and data flow at several points of the workplace, vertical and horizontal supply	Variable use
4 3.3	Quick and easy access to the cable duct	No free areas needed on the table surface

Part IV Maximising the utility of quality products

High-quality products and excellent services – a holistically integrated offer

The issue addressed here was recognised by the German office furniture industry several decades ago. As a result, ergonomics have been a focus of the sector's product development for a long time now, alongside function and costs. This has led to the creation of **office furnishings with optimum safety features and ergonomics** that can be adapted to the specific needs of each user.

For many decades, the office furniture industry and the qualified office furniture specialist trade have also recognised that these measures alone are not enough to effectively prevent risks. In order to fully exploit the products' potential in practice, they offer a comprehensive package of **services** for using and operating the furnishings. This is important because the benefits of a product are activated only if the **workplace and the working environment are designed in a task- and problem-orientated manner**. Having in-depth knowledge on how to use a product allows users to exploit the full potential of high-quality products.

The resulting requirement for a symbiotic relationship between product and expertise has prompted the German office furniture industry and the qualified office furniture specialist trade to develop comprehensive quality standards for their products that go far beyond the generally formulated minimum requirements. This applies both to product quality and to qualified service.

In other words, whether dealing with a new building or renovating an old one, anyone purchasing new furnishings or augmenting an existing set bears considerable responsibility for maintaining employees' health and ensuring permanently optimised costs that go far beyond the expense of purchasing new furniture or logistics. In individual cases, room planning determines not only whether valuable office space can be effectively utilised, but also whether labour and operating costs can be substantially reduced. If a company succeeds in doing so, it will open up all the opportunities for

- optimising and accelerating work processes
- reducing the burden on the employees
- maintaining the employees' health and capabilities in order to
- boost their performance and the quality of their work which, in turn
- significantly reduces labour and office costs
- designing friendly workplaces that help motivate employees.

When purchasing office furniture, it therefore makes sense not only to check product quality, but also to compare the scope and quality of the sale and consulting services offered.

The following checklist provides an overview of the possible services and thus enables potential customers to determine their value to their projects.

5 Quality requirements for services

Qualified services for maximising the utility of quality products

51 Sales services

	Assessment Criteria	Advantages
51.1	Requirements for on-site sales services	
51.1.1	Qualified sales personnel on site	Fast, effective solutions
51.1.2	Viewing and trying out products in the showroom	Quality and performance of office furnishings can be judged only by using an original product; decisions on the basis of a catalogue alone can result in unsuitable choices Particularly when purchasing office chairs, trying out seating is a must
51.1.3	Provide original samples of office chairs	For different users to try out at their own workplace for longer periods
51.2	Requirements with regard to delivery and assembly	
51.2.1	Provide qualified technical personnel on site	Fast and qualified customer service (expansion, conversion/extension)
51.2.2	Organizing deliveries and setting up products for use on site	Combination of elements according to planning measures
51.2.3	Final inspection (in cooperation with client) and handing over all furnishings	Accepted basis for final invoicing
51.2.4	Customer service assembly	Optimal customer care
51.3	Requirements regarding after-sales service	
51.3.1	Support for proper use following delivery	Instruction in the proper use of delivered furnishings – including individual items
51.3.2	Checking delivered furnishings for optimal function	Recommendations for supplementary solutions – follow-on deliveries – renewed instruction
51.3.3	Providing qualified and understandable operating instructions	Helping users to help themselves
51.3.4	Maintenance package for furnishings (optional)	Contracts covering maintenance, repair and operation with fixed service intervals and repair fees

	Assessment Criteria	Advantages
5 1.4	Requirements for formulating contracts	
5 1.4.1	Agreement on suitable storage for delivered standard models	Rapid problem solving and delivery of additional products
5 1.4.2	Deadlines for follow-up delivery by agreement	Guaranteed availability of follow-up deliveries – also individual items
5 1.4.3	Defect notification procedures above and beyond legal requirements	High reliability of guarantee
5 1.4.4	Monitoring relevant deadlines	Guarantee periods etc.
5 1.5	Requirements for the national sales organization	
5 1.5.1	Technical support by the manufacturers' customer services	Optimal customer care
5 1.5.2	Qualified sales personnel in the entire Federal Republic	Use of a wide range of specialist experience and optimal, consistent advice at branches and companies

5.2 Office consultancy

	Assessment Criteria	Advantages
5.2.1	Requirements regarding the organizational design of the workplace	
5.2.1.1	Determine the task and the current situation with regard to materials and space	As the foundation for task-orientated and future-orientated workplace and room planning
5.2.1.2	Determine work processes and methods Present suggestions for improvement and discuss alternatives	Office furnishings are more than furniture – they are tools that serve concrete purposes: <ul style="list-style-type: none"> • Easing and accelerating work processes • Reducing the strain on the people with the objective of improving competitiveness through improved performance and quality of work • Use of expensive office space • Minimisation of working and space costs
5.2.1.3	Workspace design in accordance with the task and the office technology used, while taking into account ergonomic findings and space-saving aspects on the basis of legal stipulations	The individual workspace is the basis for architectural requirement and space division – and thus for the acceptance of the planned measures by the workforce
5.2.2	Organizational and functional requirements for room planning	
5.2.2.1	Drawing up comprehensive room layouts in accordance with predefined functional and communication conditions	Guarantee of functional and ergonomically correct space design. Conformity with the currently valid legal, employer's liability insurance association and other relevant regulations Economic use of expensive office space (reducing requirements)
5.2.2.2	Development of a network of data connections and power supply points If necessary, draw up detailed plans in cooperation with specialists	For connecting any workplace to the internal power supply

	Assessment Criteria	Advantages
5 2.3	Interior design requirements regarding the planning of colour schemes and interior work	
5 2.3.1	The colours of the products used	Matching colours, materials and forms of workplace furnishings and seating
5 2.3.2	The development of a comprehensive colour scheme and interior work concepts by specifically defining an integrated range of colours, shapes and materials	Designing the office as a unit in terms of colour, form, material and function
5 2.4	Requirements for office-orientated lighting plans	
5 2.4.1	Assessment of the lighting situation, naming specialists if necessary	Especially with regard to the problems of working with visual display units and conforming to the (German) Ordinance for work with visual display units (BildscharbV)
5 2.4.2	Development of lighting concepts taking into account the problems of working with visual display units – with the involvement of specialists if necessary	Today, the visual display unit (VDU) dominates the workplace, and the VDU workplace the office – therefore, correct (strain-free) lighting is of fundamental importance. VDU workplaces must not be too brightly lit and the screen must be free from direct or indirect reflections; the VDU workplace's position relative to the window is as important as the correct illumination
5 2.5	Requirements for office-orientated acoustic planning	
5 2.5.1	Working out acoustically acceptable conditions for small and/or open-plan offices Naming specialists if necessary	Ergonomic aspect, productivity increase
5 2.6	Requirements for office-orientated planning of the indoor climate	
5 2.6.1	Advice on the climatic requirements for office work If necessary, planning complex air conditioning installations in cooperation with specialists	Discussion of the fundamentals

Assessment Criteria	Advantages
5.2.7 Requirements for office-orientated renovation planning	
5.2.7.1 Taking over complex renovation plans for existing office buildings: <ul style="list-style-type: none">▪ Workplace design taking into account functional, ergonomic, technological and economic aspects▪ Room planning with regard to the integration of tasks and interior architecture▪ Conception of acoustics, climate and lighting▪ Cost planning for conversions, removals and new purchases	The objective is the task-orientated integration of the different trades for the realisation of an office that, on one hand, is appropriate for the working processes and supports the performance of the employees by providing good working conditions and, on the other hand, also makes optimal use of the available space and enables the company to minimize the office operating costs

5.3 Office Services

	Assessment Criteria	Advantages
5.3.1	Requirements for the planning of space requirements and space	
5.3.1.1	Economical workplace design, budgeting and cost control	Modern office furnishings must be designed according to economical points of view: for the optimisation of working processes and of space with the minimum financial expenditure
5.3.1.2	Predicting the space requirements for a foreseeable period of time by <ul style="list-style-type: none"> ▪ Collecting data on the actual personnel numbers with assigned functions ▪ Taking over the expected development values of the company ▪ Working out a space structure and requirements forecast 	The objective is the provision of sufficient, not over-sized office space in order to be able to optimally adapt to future developments
5.3.2	Requirements with regard to needs and procurement management	
5.3.2.1	Recording the furnishing requirement on the basis of existing or newly drafted plans	A concrete outline of the quantities involved – divided according to points of utilisation – can be derived from this
5.3.2.2	Calling for tenders to meet requirements: <ul style="list-style-type: none"> ▪ Drawing up qualified, product-neutral tender documents ▪ Evaluation of incoming offers and pre-selection of suitable products and/or suppliers 	To accomplish this – e.g. according to the criteria listed in Part III – concrete requirements must be defined and individually weighted according to the circumstances in each case. This is followed by a pre-selection of the possible suppliers
5.3.2.3	Organization and staging of the sample exhibitions	The objective is a concrete assessment according to the defined quality criteria
5.3.3	Requirements for project management	
5.3.3.1	<ul style="list-style-type: none"> ▪ Taking on the project management for the furnishing of new buildings ▪ Taking over the project management for complex renovation projects involving existing buildings 	A series of coordinated measures is required in order to guarantee absolute adherence to specified deadlines, quality and costs: <ul style="list-style-type: none"> ▪ Scheduling, controlling and checking on the renovation and expansion measures

Assessment Criteria	Advantages
5 3.4 Requirements for removals management	<ul style="list-style-type: none"> • Monitoring, controlling and checking on the furnishing and removal • Acceptance of work done and services • Billing and cost control
5 3.4.1 Taking over an integrated removals project management	<p>The objective is the rapid execution of the removal and avoiding operational down-times</p> <ul style="list-style-type: none"> • Scheduling and determining the actual situation of the existing building • Definition of new furnishing requirements and/or assembly work • Travel and personnel planning • Calls for tenders for shipping and evaluation of the tenders received • Removals monitoring • Help with furnishing for the employees
5 3.5 Requirements for information management	
5 3.5.1 Provision of current product information	e.g. project experience reports in the Internet
5 3.5.2 Organization of presentations, information training courses etc. concerning problems in the office	Extending the knowledge of employees, works councils, facility managers etc. – e.g. concerning ergonomics, use of space etc. for improved use of the available resources
5 3.5.3 Taking over objective-orientated information events for the employees	New furnishings and removals present the employees with new working conditions, in terms of both space and the work equipment. Comprehensive, professionally founded information to provide grounds for the change is therefore essential.
5 3.5.4 Training facility managers and/or caretakers in technology and assembly	Helping users to help themselves at optimised cost

Appendix

1.1 EU laws, regulations, directives, accident prevention regulations

- European framework directive on industrial safety: "Council Directive on the introduction of measures to encourage improvements in the safety and health of workers at work" of 12 June 1989 (89/391/EEC)
- Occupational Health and Safety Act (ArbSchG): "Law concerning the implementation of occupational safety measures for the improvement of safety and health of employees during work" (Article 1 of the law concerning the implementation of the EC framework directive on occupational safety and further occupational safety directives) of 7 August 1996 (BGBl. I p. 1246)
- European directive on display screen equipment: "Council Directive on the minimum safety and health requirements for work with display screen equipment" of 29 May 1990 (90/270 EEC)
- Ordinance for work with visual display units (BildscharbV): "Ordinance on safety and health protection in relation to work carried out using display screens" of 4 December 1996 (BGBl. I p. 1843)
- European safety and health ordinance: "Council Directive concerning the minimum safety and health requirements for the use of work equipment by workers at work" of 30 November 1989 (89/655/EEC)
- Ordinance on industrial safety and health (BetrSichV): "Ordinance on safety and health protection during the provision and use of working tools, safety during the operation of facilities requiring surveillance, and the organisation of occupational safety and health" of 27 September 2002 (BGBl. I p. 3777)
- German Equipment and Product Safety Law (GPSG) of 6 January 2004 (BGBl. 2004)
- BGV A1 "Prevention principles", January 2004

1.2 Fundamental standard specifications not related to a specific product

- DIN EN ISO 9241-5, Ergonomic requirements for office work with visual display terminals – Part 5: Workstation layout and postural requirements (ISO 9241-5: 1998); German edition EN ISO 9241-5: 1999
- DIN EN ISO 10075-1 – Ergonomic principles related to mental workload – Part 1: General terms and definitions, (ISO 10075: 1991); German edition EN ISO 10075-1: 2000
- DIN 33402-2 – Human body dimensions, values

1.3 Fundamental standard specifications related to a specific product

- Standards series DIN EN 1335, Office furniture – office work chair
- Standards series DIN EN 527, Office furniture – work tables and desks
- DIN 16550-1, Office furniture – tables for upright working position
- DIN 16555, Office workplace – space for communication workplaces in office buildings
- DIN 4543-1, Office workplaces – space for the arrangement and use of office furniture
- Standards series DIN EN 14073, Office furniture – storage furniture
- DIN EN 14074, Office furniture – Tables and desks and storage furniture – Test methods for the determination of strength and durability of moving parts; German version EN 14074: 2004

1.4 Technical specifications

- DIN Technical Report 147 – “Guidelines for the security requirements on work tables and storage furniture”

1.5 Information from employers’ liability insurance associations

- BGI 650 “Computer monitor and office workplaces”
- BGI 827 “Solar protection in the office”
- BGI 856 “Office lighting”
- BGI 5050 “Planning office space”

2 Acoustics

- DIN 18041 – Acoustic quality in small to medium-sized rooms
- DIN EN ISO 11690-1 Acoustics – Recommended practice for the design of low-noise workplaces containing machinery – Part 1: Noise control strategies (ISO 11690-1: 1996) German version EN ISO 11690-1: 1996
- DIN EN ISO 11690-2 Acoustics – Recommended practice for the design of low-noise workplaces containing machinery – Part 2: Noise control measures (ISO 11690-2: 1996); German version EN ISO 11690-2: 1996
- VDI 2569 – Sound protection and acoustical design in offices
- “Arbeitswissenschaftliche Erkenntnisse” Report No. 123 – Assessment and minimisation of noise at visual display terminals in small offices, published by: Federal Institute for Occupational Safety and Health, Dortmund, 2003
- “Arbeitswissenschaftliche Erkenntnisse” Report No. 124 – Assessment and minimisation of noise at visual display terminals in offices with several workers, published by: Federal Institute for Occupational Safety and Health, Dortmund, 2003

3 Lighting

- Standards series DIN 5035 – Artificial lighting
- Standards series DIN 29241 – Ergonomic requirements for office work with visual display terminals (VDTs)

4 Climate

- Ordinance on working premises: ArbStättV Paragraph 6: Work rooms etc.
- Workplace guidelines: ASR 6/1.3 Room temperatures

5 Ecology

- VDI 2243: Recycling-oriented product development
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