Certificate „ergonomics approved“

A method for testing swiveling office chairs has been existing since the mid-1990s. The corresponding certificate “ergonomics approved” is awarded by the TÜV Rheinland and the LGA QualiTest GmbH for ergonomically and functionally superior swiveling office chairs.

A similarly positioned certificate for seats for commercial vehicles was recently developed by the LGA in cooperation with EIM (Ergonomie Institut München GmbH). The “ergonomics approved” certificate takes the following aspects into account:

- Ergonomic design of the seat
- Ergonomic design of controls
- Vibration-attenuating properties

The Grammer driver seats of the MSG 90.6 series are the first seats for commercial vehicles qualifying for this certificate. It includes the models Kingman High Performance (Comfort), Kingman Cool High Performance and Linea/Tourea High Performance.

These driver seats have pneumatic suspensions and numerous functions for flexible adjustment to suit every user. They excel through outstanding ease of use and intelligent ergonomics.

The goal of ergonomic design is to create a seat that optimally adjusts to each user’s physical dimensions and optimizes the operator/machine interface. In the case of driver seats, the aim is to preserve the driver’s health and ability to perform.

The certificate “ergonomics approved” can (at least in Germany) be submitted to insurers for subsidies.

Findings for the Grammer driver seats of the MSG 90.6 series

Ergonomic design of the seat

The geometrical design of the seat and backrest as well as the available setting functions and ranges fully meet the relevant ergonomic requirements. The same holds for the angle ranges of the seat and backrest. The cushions of the seat and backrest are well-suited in terms of their contours and stiffness.

Ergonomic design of controls

The concept applied for designing the controls may be described as ergonomically very successful. The individual controls are easy to tell apart due to their placement, accessibility and shapes, making them very user-friendly.

Vibration-attenuating properties

The vibration-absorbing properties of these seats are very positive, delivering a high level of vibration comfort for both light and heavy drivers.

Summary

Ergonomic design of the seat	✔
Ergonomic design of controls	✔
Vibration-attenuating properties	✔
Overall evaluation	The ergonomic design of the seat, its controls and vibration-attenuating properties fully meet the requirements.

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Certificate „ergonomics approved“

The TÜV Rheinland Group is a strong partner for safety, quality and service worldwide.

The experts of the Furniture Testing Institute of the LGA QualiTest GmbH accompany the products from the idea to the satisfied end customer. LGA product certificates for furniture, furniture parts, components and accessories are a distinguishing feature of tested and monitored quality and safety.

LGA-monitored component quality is applied systematically and on a network basis for qualified use in final products, which brings decisive advantages on the increasingly hard-fought international markets.

The LGA
A certifier with international competence

- internationally recognised institution for testing and product certification
- participation in national and international commitees for furniture (e.g. CEN TC 207, ISO TC 136, CEN TC 252)
- cooperation with competent institutes and organisations worldwide, mutual acceptance
- testing to all current national and international standards (DIN, DIN EN, ISO, EC directives, BS, NF, NEN, ANSI/BIFMA, Consumer Guide, etc.)
- recognized test unit for the GS mark and RAL GZ 430 (DGM)

ERGONOMIE INSTITUT MÜNCHEN
Dr. Heidinger, Dr. Jaspert & Dr. Hocke GmbH

Ergonomie Institut München GmbH — Dr. Heidinger, Dr. Jaspert & Dr. Hocke GmbH (EIM) in Munich, Germany studies the conditions under which people work and relax. In addition to performing classical ergonomic tasks such as designing workplaces, work environments and the organization of work, the EIM pays special attention to:

- Sitting postures and the design of furniture for sitting (office chairs, car seats, travel seats, medical sitting aids, etc.)
- Lying postures and the design of furniture for lying (mattresses, bed frames, water beds, medical lying aids, etc.)

For evaluating the ergonomic and functional attributes of furniture for sitting and lying, the EIM develops special test methods that are technically standardized yet geared to the actual situations of sitting or lying persons.

Aspects covered by the certificate „ergonomics approved“

Ergonomic Seat Design

The first group of tests deals with the most important requirements that a driver seat must meet, namely the dimensions and shape of the seat and backrest and the setting functions and ranges. These play a crucial role in adapting the seat to each user's body. The comfort of the cushions is also checked.

Ergonomic Design of Controls

The second group of tests serves to assess the arrangement, accessibility and shape of seat controls, as well as the forces required to operate them.

To qualify for the "ergonomics approved" certificate, the controls must meet various requirements. Their arrangement, accessibility and shape must comply with the following principles:

Functional hierarchy
Are the individual controls arranged so that the most frequently used ones are easier to reach than those that are needed less often?

Functional placement
Are the individual controls located where they are expected to be, considering their functions?

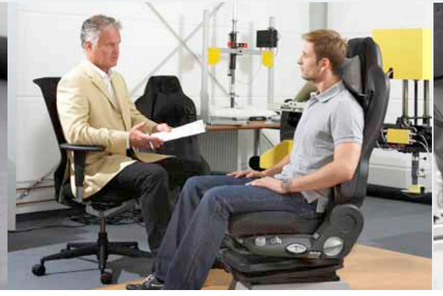
Intuitive recognition of functions and their mode of use
Are the individual controls designed to directly communicate their functions to the user, and is it immediately obvious how to operate them?

Clear delimitation of controls:
Are the controls placed and designed to prevent them from being confused with one another?

Vibration-Attenuating Properties

The third group of tests is devoted to evaluating a seat's vibration-attenuating properties. It is necessary to ascertain how the suspension system works with regard to its natural frequency, vibration-attenuating properties and seat effective amplitude transmissibility (SEAT) value. The suspension's ability to adapt to the driver's weight is checked by plotting its force-deflexion graph.

Test procedures



Ergonomic Design of the Seat

Data for analyzing the seat functions is captured applying a standardized measurement procedure, then supplemented with subjective assessments of sitting comfort by test subjects. The principal instrument used for this is the "sedometer", which allows standardized measurement of how well seats meet actual human requirements.

For this group of tests, the sedometer is used to evaluate the geometric design of the seat and the seat / backrest angle ranges.

For evaluating seat comfort, the sedometer is used to perform a standardized cushion pressure measurement on the seat surface. This involves measuring the pressure exerted on the seat by the ischium (the part of the pelvis that supports weight while sitting).

To supplement this, test subjects of different sizes (5th percentile woman, 50th percentile man, 95th percentile man) are asked to assess the comfort of the cushions (shape, stiffness).

Ergonomic Design of the Controls

The extent to which the controls meet the discussed requirements is determined by having three test subjects of different sizes (5th percentile woman, 50th percentile man, 95th percentile man) using a questionnaire to rate on a scale of five their subjective impressions of how easy the controls are to use.

Supplementing the subjective assessment of the ease of use of the controls, the forces that must be applied to operate them are measured and factored into the ergonomic evaluation.

Vibration-Attenuating Properties

The vibration measurements were performed on a single-axis, electrohydraulic vibration test rig. First vibrations are applied in a sinusoidal pattern to determine the seat's natural frequency. Then the seat is subjected to vibrations at that natural frequency to test its vibration absorption performance (according to DIN 45678). The range of weight adjustment is determined by plotting travel (displacement) as a function of force. The frequency-valued acceleration on the driver seat is also determined according to DIN 45678.