

04/23-F37

Testing of rail car seats

Due to the frequent change in the load caused by frequent user changes in conjunction with recurring acceleration processes, the following occurs, driver seats and passenger seats are exposed to strong mechanical stresses. In addition to the listed testing procedures, EPH provides the determination of VOC and formaldehyde emission from passenger and driver's seats according to ISO 16000/3/6/0.



Determination of VOC and formaldehyde emission from a driver's seat

Expertise and equipment

The Entwicklungs- und Prueflabor Holztechnologie GmbH (EPH) at the Institut fuer Holztechnologie Dresden gemeinnuetzige GmbH (IHD) is working on the basis of an accreditation according to DIN EN ISO/IEC 17025 by Deutsche Akkreditierungsstelle (DAkkS). Transfer of results from the furniture industry to the passenger seats industry is possible due to the development and research potential of IHD in the fields of usability, comfort, ergonomics and micro climatic properties of seating furniture. The EPH is accredited for the Testing Specification for passenger seats of Deutsche Bahn according to GrulaSi (Ausz. 2022, Vers. 4.1) and has, in addition to the furniture area, systematically focused its technical test know-how on the requirements for rail vehicles.

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VOC emission, formaldehyde emission

Driver's and passenger seats for rail vehicles



Strength test
Upholstery testing
Long-term function testing

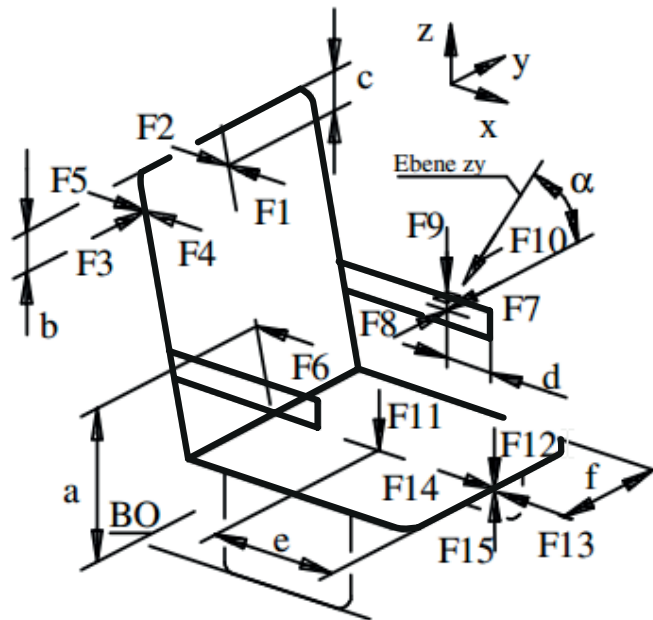
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Strength test

The following tests on the basis of national, European and international test specifications are appropriate for the proof of mechanical strength of the seat construction and the upholstery:

- GrulaSi of Deutsche Bahn AG (Ausg. 2022, Vers. 4.1) including deformation determination
- UIC 566 VE, Annex 7
- Testing of loose seats in special coaches according to UIC 566, Annex 2.3
- NF F31-119, Annex 5.1
- Endurance test according to NF F31-119, Annexes 5.4 and 5.5

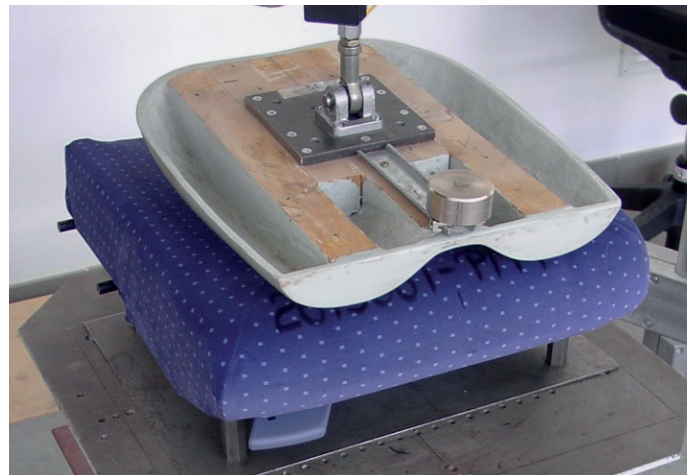


Static test forces according to GrulaSi (extract)

Upholstery testing

We conduct the following tests for the characterisation of the upholstery and for the proof of durability:

- Hardness test of upholstery according to GrulaSi, Part 5.1 including determination of spring characteristics curve
- Fatigue testing according to GrulaSi, Part 5.2 including determination of the changes of impact paths and upholstery thicknesses
- Testing of upholstered elements under load according to NF F31-119, Section 5.2
- Testing for seat and backrest upholstery following BS 6261 "Procedures for evaluation of usage properties of upholstered furniture"



Determination of the spring characteristic curve at a seat cushion

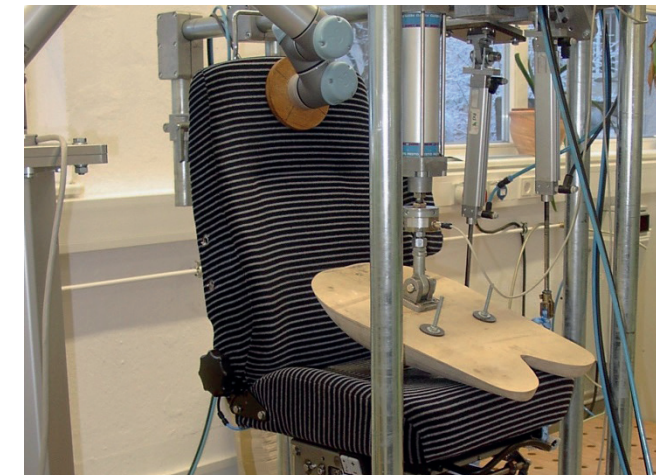
Long-term function testing

In order to identify possible weaknesses of the operating mechanism, tests as simulation of the expected stress are common. These mainly concern the adjustment of:

- Seat depth
- Backrest tilt
- Folding armrest
- Footrest
- Folding seat
- Lordosis support

on the basis of the following documents:

- GrulaSi, Part 3.1
- NF F31-119, Section 5.6
- Function simulations according to special requirements of the client



Long-term function test of the tilt adjustment on a driver seat with test robot