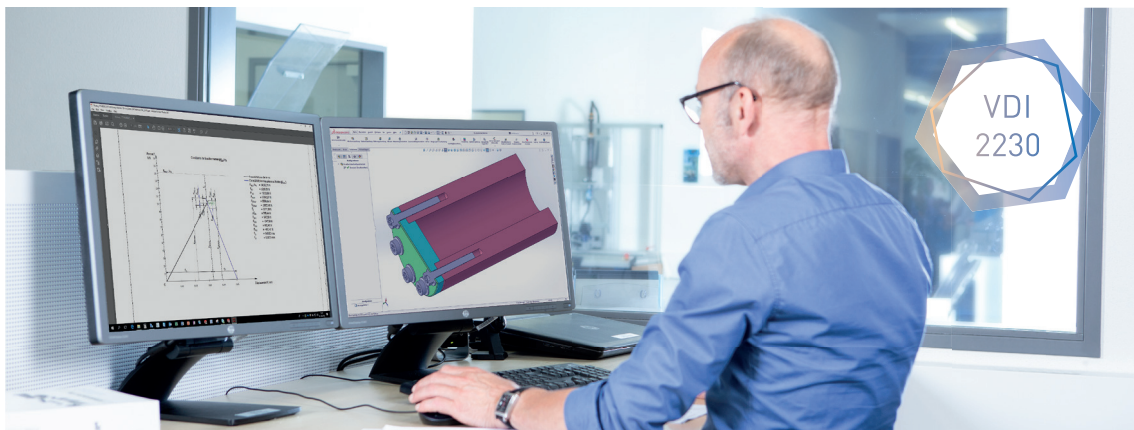


**ASSEMBLY TECHNOLOGY EXPERT**

Calculation of Bolted Joint: Ensuring the quality and safety of your design

Design your product with a focus on fastening joints from the very beginning. To ensure the quality and safety of your bolted joints, the VDI 2230 guideline provides you the highest standards.



What is the VDI 2230 guideline about?

The VDI 2230 is a German guideline of the VDI e.V. – The Association of German Engineers – initially developed for the automotive industry and today recognized by all industries internationally as the standard reference work for calculating high-strength bolted joints. It provides the calculation of your bolted joints and explains the relationships between forces, moments and deformations and gives detailed calculation information for your application.

Why is the guideline so important?

Nowadays, all products must be designed as small and light as possible. The main focus is on lightweight construction, no matter what kind of product we are talking about. It is therefore strongly recommended to do a calculation of bolted joint connections to ensure that no limits are exceeded. As VDI 2230 describes bolted joints which have to transmit constant or alternating working loads, the application of the guideline ensures, that the bolts are designed such that the joined section fulfils its allotted function and withstands the working loads occurring.

What is the customer benefit?

For those applications where you want to be really sure about the quality and safety of your bolted joint, our specially trained engineers will be pleased to support you, so that you can sleep well at night. Our calculations follow the internationally recognized VDI 2230 guideline strictly and make use of the latest state-of-the-art software-supported design and calculation methods. You will obtain a complete bolt calculation with all relevant information. By applying the guideline, you will reduce the failure and problem rate to a minimum.

AN EXPERT DESIGN SERVICE

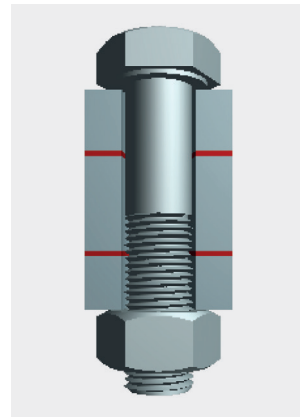
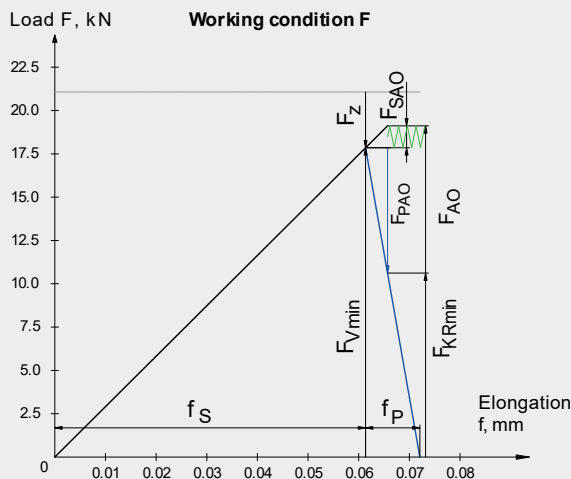
Calculation of Bolted Joint (VDI 2230)

What does the service consist of?

Based on your specific assembly conditions and surface specifications, our service aims at a.o. determining the required bolt dimensions and property classes. In addition to our bolted joint calculation, we also offer you the verification of the results through specific tests performed by our Expert Test Services:

SERVICE	WHAT YOU GET	PHASE
Bolted Joint Calculation	Design of a secure fastener for your application Calculation taking into account all influencing factors including operating loads to ensure the process safety of the connection during the specified lifetime. The calculation is based on the customer's specifications and further required assumptions.	Design
Expert Test Services	A set of required tests to verify the defined solution for your application In addition, it is recommended to verify the initial assumptions made in the design phase by carrying out various tests. The review of the initial assumptions includes full test reports for your application.	Verification

What you get from the calculation according the VDI 2230 guideline are securely calculated joints and the certainty that the defined fastener will withstand the load for the specified lifetime under the tested conditions. This includes the verification of the load capacity of the screw connection.



Left figure: Force-elongation diagram with operating loads.

Right figure: Visualization of the specific customer situation of a bolted joint.

Why is Bossard the best choice?

To design your best product, the Bossard experts offers you a wide range of consulting support and a platform of technical information and tools. Moreover, we believe that the customers themselves should become experts in fastening technology. Therefore, we offer seminars covering the systematic and needs-based qualifications of personnel in the field of fastening technology:

- Calculation of bolted joints (VDI 2230)
- Information on the right selection of fasteners
- Functionality of bolted joints
- Determination of the tightening method

Do not hesitate to contact us with any questions regarding all possible fastening challenges. We are happy to serve you. Please contact us at: www.bossard.com