

# Sizing a Bolt

## Mechanical Engineering

From joint load to a fully specified fastener, in six steps.

*A teaching sequence. Real joints follow the governing standard.*

1

### Resolve the joint load

Separate tension from shear, and apply the load factor.

2

### Choose a property class

8.8 or 10.9 for steel. Proof stress sets the available preload.

3

### Try a size, check preload

Preload of 0.75 times proof times stress area must beat the clamp need.

4

### Check joint separation

External tension must stay below the preload, with margin.

5

### Check the clamped parts

Bearing under the head, and enough thread engagement length.

6

### Specify the tightening

Torque, lubrication state, sequence and how it will be checked.

Simplified teaching sequence. Real joints follow VDI 2230 or the governing code. Educational reference.