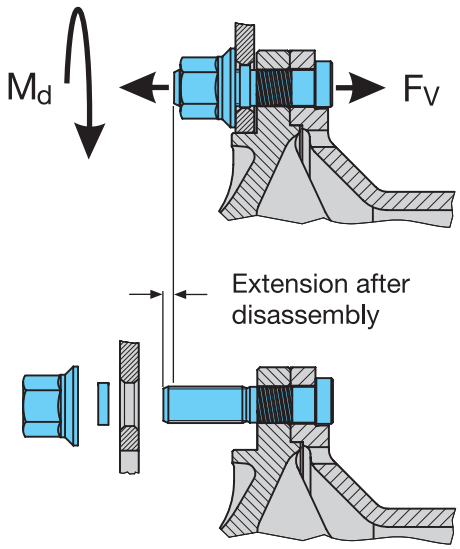
Coefficients of friction for wheel studs and wheel stud threaded connections with spigot mounting.

In threaded connections, there is a direct relationship between the coefficient of friction (μ_{tot}), the tightening torque (M_d) and the preload force (F_v). **The coefficient of friction itself is dependent on several factors**. These influencing factors include the **thread type**, the **material**, the **surface**, the **coating** and the **lubrication**. In addition, it is necessary to differentiate between the friction in the thread (μ_{thr}) and the friction for the head or nut contact (μ_H).

The large number of influencing factors indicates that the coefficient of friction is not a fixed value, but is one with a degree of tolerance. It is essential to remain within this tolerance range (see table) in order to achieve uniform results from threaded connections:

- Given the same tightening torque, an **inadequate coefficient of friction** produces a **higher preload force** in the threaded connection. If this force is greater than the maximum permitted force then there will be **plastic deformation** (extension of the bolt, deformation of the thread, etc.).

- Given the same tightening torque, an **excessive coefficient of friction** produces a **lower preload force** in the threaded connection. In this case, there is a risk that the residual clamping force might no longer be sufficient and, in **extreme cases**, the threaded connection **can come undone**.



In conclusion, it should be remembered that major fluctuations in the coefficient of friction represent a **safety risk and potential source of damage** that should not be underestimated.

Following extensive tests and in accordance with the relevant standards, BPW recommends the following coefficients of friction:

Designation	Coefficient of friction with spigot mounting	Remark
Wheel stud	μ_{thr} = 0.12 - 0.18	Measured acc. to DIN 946 or DIN EN ISO 16047
Wheel stud threaded connection	μ_{tot} = 0.09 - 0.12	Measured similarly to DIN 946 using suitable bolt test rigs

When using screw connection components from **different manufacturers**, check these **coefficients of friction and make sure the values are permissible**. BPW can only **guarantee** the correct coefficient of friction providing **genuine parts** are used.