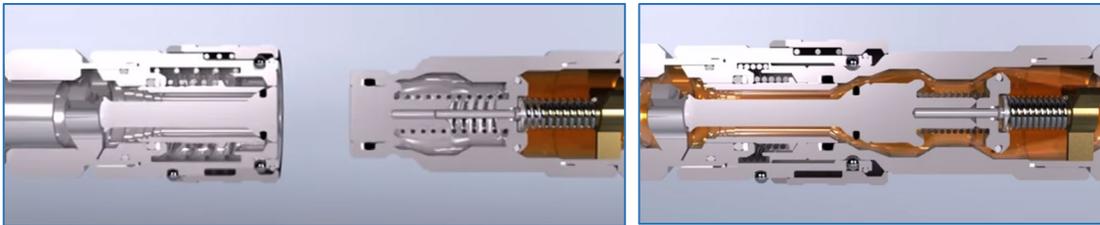


## Coworking project, CEJN and Chalmers 2021-2022

**Title of project:** Design guide for closing valves.

**About CEJN:** Products from CEJN are mainly in the range of pneumatics, hydraulics and fluids quick connect couplings. Head office locates in Skövde, 85% of all sales are exports to around 25 different countries and handles by CEJN's 17 different sales offices around the world. CEJN-group has 550 employees of which close to 300 are located in Skövde.

**Project description:** Most of CEJN's quick connect couplings got some kind of valve to prevent spillage during non-connected time and during disconnection. A spring pushes the valve to close properly. Soft seals are normally used to prevent from leakage.



*Figure 1, shows a section of a disconnected coupling and nipple with oil held at rear side of coupling.  
Figure 2, shows a section of a connected coupling and nipple with oil flowing through.*

CEJN would like to know what minimum spring force is needed to close the valve. To find out, it is necessary to know what force that is needed for the valve to compress the seals so that the valve can slide through the seals.

This might seem easy at its beginning but has several questions that needs an answer. Different media might get different results as well as internal pressure, surface roughness, friction, temperature etc. There also is a conflict, too high connection force and the customer will complain about the ergonomics and too low connection force there will be leakage/spillage, this need to be considered.

It is often very costly, both in time and money, to test which spring is necessary. Therefore it would be of great interest for CEJN to be able to do theoretically studies of this in an early design phase.

**The outcomes** CEJN is looking for, is a calculation formula in a design guide of which their engineers can use in an early design phase. There are lots of different valve designs so those need to be studied and have to be considered. Perhaps the project can show a number of different parameters, that has to be, to be able to close a valve properly. If this can be solved, the project group will have made a great impact for CEJN. Also, how much money could be saved with a proper design guide? Can a quick connect coupling have a different design to allow higher connection force?

CEJN hope to work together with the project team to get the best possible outcome. If the pandemic situation allows, the project group are very welcome to visit and work at CEJN.

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