Exercise: Factories

In this exercise, you will make acquaintance with the concept of "factories" as a means of separating the responsibility of construction of a composite object from its use.

As you go through this exercise, don't forget to stop and reflect on how you are using the factory and how it affects your design.

Your starting point is your solution to the Compression Stocking exercise from the lecture on SOLID 2, so if you have not finished this exercise you should do so beforehand.

As you may have experienced in your present implementation of the compression stocking, the composite construction of objects is non-trivial if we wish to retain our flexibility to mix-and-match the individual constituents of our software system.

It is tempting to hard-code the construction of the dependencies in a system into the high-level components. However, this approach is flawed and will rise to bite us in the rear as soon as we introduce new variants – in the case of the compression stocking, this may be in the form of new compression mechanisms, new user output mechanisms, new pumps, etc.

Construction of composite objects is non-trivial and becomes an "axis of change" – a responsibility – for the class. Mindlessly constructing the lower-level parts in the high-level in the high-level classes is thus a sure-fire way to break SRP.

Luckily, we have the factories at hand, and this is your **exercise**: Change the design of your compression stocking so that it uses a factory – or several factories – to construct the system. You must find out at what level in the design you use the factory, how much responsibility it should have (merely constructing the constituents or also connecting them?) and how to adapt the "standard" factory to your needs.