Negative pressure, depressurization, differential pressure

Information on how the program handles negative pressure or depression and when it is possible to calculate differential pressure.
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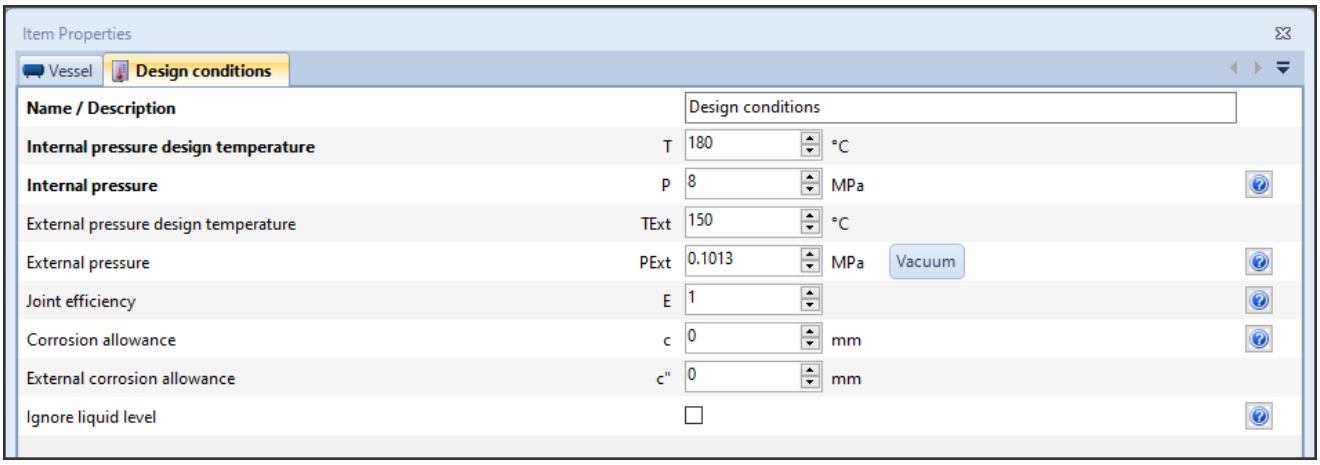
In a pressure vessel, the negative internal pressure - sometimes referred to as depression - acts with the same criteria as an external pressure.

For this reason, in the case of the presence of negative internal pressure, the software setting must be performed by setting a positive value of external pressure.

The setting of these values must be done in the section Item > Properties > Design Conditions



Definition of internal and external pressure at different temperatures

Concomitance of internal and external pressure

A pressure vessel subjected to both internal and external pressure, at different or coinciding times, must be calculated with the presence of only the internal pressure and only the external pressure.

The calculation at internal pressure and external pressure, except in exceptional cases, is therefore performed independently and can occur at different temperatures.

Presence of external pressure only

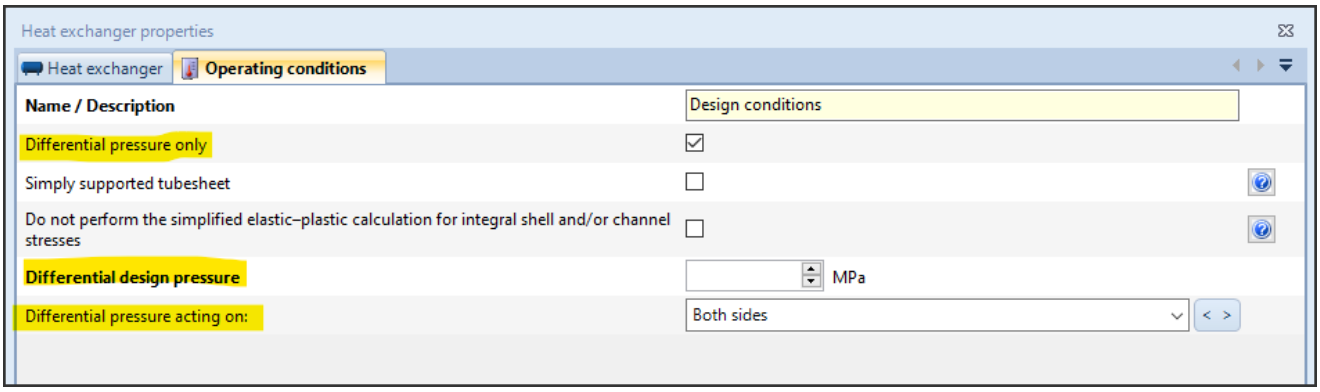
In the case where the device is to be validated only at external pressure (or negative pressure), we recommend setting a minimum internal pressure value: this is necessary because several validation operations are performed by the software only in the presence of internal pressure. A minimum pressure is sufficient and the care not to make this value the dimensioning value, taking care that the required thicknesses are always higher in the external pressure verification.

Differential pressure

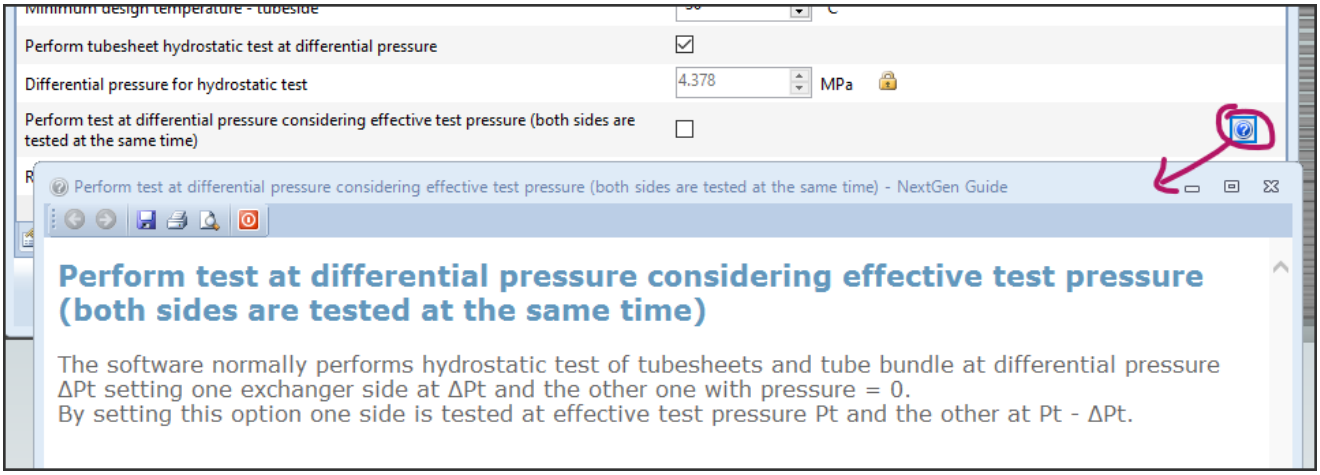
In certain scenarios, some types of exchangers can be designed with differential pressure: this means that the action of the pressure in a chamber on the common parts (tubesheet, tubes, floating head) can be attenuated and compensated by the counteraction brought by the pressure on the opposite side.

> *For safety reasons, it is essential that the exchanger has specific devices and is designed so that the pressure drop on one side simultaneously causes depressurization also on the opposite side.*

The differential pressure must be set in the Design Conditions of the exchanger.



In case the exchanger is also tested at differential pressure, the relative properties must be set in the Tests section



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