Ecovrac

Simulating pressure tanks with Castor

How to successfully make the prototype of a new pressure tank and obtain its certification right from the first attempt ? With Castor, a very particular simulation software program, Ecovrac has found the solution.

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With each innovation, Ecovrac has to take up a double challenge : improve its products while complying with the recommendations stipulated in the Codap (code for construction of unfired pressure vessels). Therefore, the products manufactured by Ecovrac, i.e. tanks designed for the transport of cattle food and flour, require great care. In fact, since they are equipped with a pressure booster capable of generating a pressure of 0.8 bar to evacuate the flour, the flour tanks require inspection by a certification body.

Success at the first attempt

Redesigning a new tank which complies with the new Codap C10-2 requirements is one thing, but making sure that the first draft is the good one is quite another. « *As we did not have simulation tools powerful enough to check our calculations, we decided to turn to Cetim to simulate the activity of the tank with the pressure booster in operation* », says Ecovrac design office manager Arnaud Bacrot. Ecovrac and the Cetim experts specialised in Castor (Cetim's software specifically dedicated to pressure calculations)

then initiated a constructive dialogue. « *The continuous and pragmatic exchanges between both parties speeded up the process, and we only needed a few days to complete the work. With a step-by-step approach (cover, tank, outer shell rings, partitions, cone, etc.), we were able to validate our design without having to start again from scratch in case of error* », continues Arnaud Bacrot.

The simulation, based on the finite element method, revealed possible improvements. In fact, a tank is comprised of four aligned cones separated by a partition. Castor allowed this principle to be immediately integrated and, as a result, it gave the prototype the ability to pass the certification stage right from the first attempt.

Cetim's asset

Castor is a software program designed and developed by Cetim. It makes it possible to design pressure equipment by integrating external data (wind, earthquakes, etc.) and requirements stipulated by the Codap, the ASME and standard EN 13445.

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