



Sophisticated Software Supports Sustainability

By Emmanuel Duffaut, Sustainability Director, RETAL

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The common thread running through all industries is sustainability. The desire and the demand to design manufacture, and supply products and services that are as responsible as they are reliable.

For the packaging industry, this mega-trend has a particular sense of urgency. With the perfect storm of an increasing demand for convenience matched only by the increasing understanding of our environmental footprint, all stakeholders in the packaging value chain must do all they can to deliver sustainable solutions.

Global plastic packaging manufacturer RETAL develops and produces high-quality packaging solutions, including PET (polyethylene terephthalate) preforms, HDPE (high-density polyethylene) closures, PET containers, and films. Employing over 1500 people, operating 17 production sites in 10 countries and supplying customers in over 60 countries worldwide, RETAL has gained its reputation for quality and flexibility thanks to continued strategic investment and an ability to deliver packaging solutions.

With drop tests, squeeze tests and top load simulations all possible without creating a prototype, this complex software addition to RETAL's R&D department makes it faster, cheaper and easier for our global brand customers to choose best preform and design optimal bottle for their food and beverage applications."

RETAL's Sustainability Director Emmanuel Duffaut appreciates how this software adds an extra feather in the cap of the group's ambitious aims to reduce and mitigate its environmental impact, which includes the use of renewable energy, energy efficiency, products light-weighting, waste management and use of recycled PET and bio-based materials. Duffaut says, "We only invest when there is both a technical and an environmental benefit; the Dassault Systemes software brings advantages in both areas. By allowing advanced tests that make a physical prototype unnecessary, we can save all the production associated with the prototype, so it's a very resource-efficient solution, for us, our customers, and the environment."

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Another sustainable advantage that the Dassault Systemes suite offers RETAL is its ability to create precise information regarding performance relating to the distribution of the thickness and stretch ratio of the bottles without needing to produce a physical product, helping to create even lighter preforms. This hot topic of light weighing is crucial to the future success of the packaging industry, with lighter preforms meaning less draw on oil feedstocks. Duffaut notes, "Our design team worked together with our global beverage brand customer to create a lighter preform. Working together right from the start meant that every element of the project was focused on the solution they needed. The customer explained to us how their current 5l container needed to evolve; they wanted a PET container that was 20 percent larger and so the preform used to make a new bottle had to be 15 percent lighter."



RETAL invests in advanced CAD (Computer Assisted Design) and FEA (Finite Element Analysis) software from Dassault Systemes to support its ongoing dedication to strengthening its design capabilities. By integrating this sophisticated software, RETAL has advanced its sustainability commitment even further, due to its intuitive and precise bottle design and bottle performance simulations that do not need physical prototyping.

Faster, cheaper and easier

Designer Andzejus Buinovskis explains, We searched the market for a dedicated software suite that would allow us to simulate the stretch blow molding process, but we couldn't find what we wanted, so we worked with Dassault Systemes' partner Rand Finland to add several plug-ins to its ABAQUS product that provided simulation types and parameters we require.

Strong and sustainable

Buinovskis and the RETAL R&D team harnessed the Dassault Systemes' CATIA and ABAQUS software and the newly developed plug-ins to rise to the challenge. He says, "Having advanced 3D modeling software, preform, and bottle design is a relatively fast and easy task. Without years of relevant experience, it is difficult to predict if a new preform or new bottle design will be successful. But with the global trend of light-weighting, empirical methods of design quickly become outdated. That is why we had to use simulation for this project."

RETAL took the original container and reverse-engineered it. The initial plan was to apply a lighter neck type and introduce minimal adjustments to existing bottle design. Buinovskis explains, "However, our simulations showed that bottle performance would not be satisfactory. This led to a decision to redesign a bottle completely, allowing us to match new preform and bottle geometries in the most optimal way. Stretch-blow molding simulation confirmed that it was possible to produce a newly designed bottle using a new preform. While top-load and drop-test simulations showed much better bottle performance compared to previous designs, which later was confirmed by laboratory tests performed on our newly produced bottles. Dassault Systemes' CATIA and ABAQUS are powerful tools that save considerable time and money associated with prototyping."

RETAL is delighted to highlight how working with the Dassault Systemes suite of CAD and simulation software has brought an extra sustainability dimension to its design capabilities, with sustainability at the heart of its investment.

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