

Interview with Diego Barone, R&D Project Leader in Vin Service

Vin Service was founded in 1976 from oenologist Riccardo Guadalupi and Daniela Gennaro Guadalupi, based on the revolutionary idea of supplying quality wine, in large quantities and fast... on tap.

First Italian manufacturer of draft wine dispensers, it steadily grew and became one of the world's leader in the dispense technology, serving large international brands such as Heineken, Pilsner Urquell, Coca-Cola, PepsiCo, Carlsberg,

Budweiser and many others. Today, the core business of Vin Service is represented by dispensing equipment industry, from soft drinks to draught beer, and by cooling systems for beverages.

Vin Service is constantly innovating and improving its processes to always provide its clients with the best made-in-Italy customized dispensing solutions. Its expert R&D division is equipped with mechanical engineers, CAD 3D designer, 3D printers and a certified in-house lab for testing. Plug&Play dispensers for disposable PET kegs and innovative Peltier Technology for draught beer and soft drink towers are some of Vin Service main bespoke solutions for the beverage industry.

1) When did you first introduce the use of simulation in your company?

In 2011 we had to develop a new product for a very important customer and, to be more competitive, we decided to replace lowpressure die cast brass with injection molded plastic. Budget for moulds was so big to easily justify doing simulation-based design and virtual prototyping upfront. After this first experience, it has been easy to adopt such techniques every time a project was big enough or complex enough for us.

2) What was the main reason for introducing simulation?

Trial-and-error and over-design are old-school approaches that have no place in modern super-competitive globalized industrial markets.





Our company is growing fast and had to transform to be accepted by global customers as a real world-class manufacturing company.

3) What kind of products are you using simulation for?

Currently we're mainly doing validation of mechanical design and exploration of design alternatives according to customized load-cases or norms and standards. For example, we have recently explored a design alternative for cost reduction, reducing the number of parts while maintaining the same structural resistance of a beer countertop cooler.

4) How does simulation affect your design process?

As of today, we are still at work to transform our design process in a true simulation-based approach. We currently partner with external CAE providers, and in particular with EnginSoft, on a case-by-case basis. Replacing the old empirical approach with computer simulations allowed us to significantly speed-up and simplify our design process, enabling a 80% reduction in development time (from 12 weeks to 2-3 weeks) and a 70% reduction in project costs.

5) Do you have any plans to extend the use of simulation in your company?

We're offering simulation-based design in every proposal we issue to our customers, in order to increase demand and justify the introduction of internal resources. Next step will be expanding the use



of structural and CFD analyses on a regular basis in our R&D workflow to accelerate the feasibility assessment of new designs.

6) What is the contribution that EnginSoft can give you?

In EnginSoft we can find experts with a cumulative experience of many years in all industries and we rely on them according to the variable needs of our customers. During the past 6 years EnginSoft has been a strategic partner for the innovation of our products, from the improvement of mechanical performances of our beverage dispensers to the introduction of new cost-effective materials.

7) What value did simulation bring to your company?

Faster time-to-market, better in-depth analysis of design alternatives, virtual prototyping, process and product cost reduction, these are only some of the numerous advantages that simulation brought to our company. Switching to a simulation-guided approach for example allowed us to introduce the new Plug&Play maintenance-free dispensers for PET kegs.

This innovative technique enhanced our company perception by our customers and provided us a competitive advantage which helped Vin Service winning highly rewarding projects.

Vin Service and EnginSoft: a six-year history of innovation

1 The first collaboration started in 2011, when a new CO_2 -free dispenser was added to Vin Service product portfolio. This new countertop dispenser adopts a pressure chamber to dispense cold beer without external CO_2 supply. The technological challenges, mostly related to pressure inside the chamber, were promptly solved thanks to simulations, which guaranteed the correct structural requirements for given pressures.

2 From 2011 to 2016, 5 different column-shaped beer dispensers were analyzed and improved by EnginSoft, focusing on the mechanical resistance of the products. Innovative solutions were obtained by replacing the metallic body with fiber-reinforced polymers, ensuring both higher mechanical characteristics and lower material costs.

3 In addition, CFD simulations of the whole dispenser (from barrels to fins) were performed. The analyses quantified the effects of air heating on the thermal quality of the beer. Thermal efficiency of the dispenser was virtually tested and improved by reinforcing the insulation in selected areas, by reshaping the column, or by guiding the correct choice and positioning of the fans.





4 In 2014, structural simulations were applied to a new plug&play countertop cooler with recyclable PET kegs, so that the product could meet customer's requirements. This activity evaluated the stability of the refrigerator and determined the correct sizing of geometries and the choice of materials to minimize stresses and deformations of the structure.

5 In 2016 the plug&play countertop cooler with recyclable PET kegs was further improved by integrating mechanical, esthetical and thermal performances into a single piece, i.e. the door. This innovation allowed to significantly reduce production costs by minimizing the number of parts to produce and by lowering the complexity of the assembly.



6 The most recent innovation is the improvement of the original CO_2 -free countertop beer dispenser. Structural simulations were expanded to include thermal and fatigue analyses, plus the effects of aging of plastic materials. High stress regions were identified and modifications in the insulating layer were suggested to improve thermal efficiency.

