



better together

CASE HISTORY

Zenit Group cuts logistics and production costs on exhibition pumps thanks to additive printing technology.

THE COLLABORATION WITH 3D PRINTING PARTNER QUALITY CONTROL HAS LED TO A REVOLUTION THAT CUTS COSTS RELATED TO THE PRODUCTION AND LOGISTICS OF DISPLAY PUMPS, PAVING THE WAY FOR A NEW USE OF 'ADDITIVE MANUFACTURING'.

Situation

3D printing technologies entered the global scene in the early 1980s, but only in the last decade have they been used introduced fully into a wide range of sectors, including manufacturing, construction, medicine, aerospace and industrial parts, with the ultimate goal of transforming digital models into tangible objects.

3D printing, also known as 'additive manufacturing', consists of a set of manufacturing processes in which a three-dimensional object is created by adding material layer upon layer, usually plastic, metal, ceramic or other. This is a reverse process compared to traditional industrial manufacturing, where we use the term 'subtractive production', as the material is processed from a solid block to obtain the desired shape. Even in the production of submersible electric pumps, there are examples of additive manufacturing involving not only impellers and mechanical components but also, as in this case, finished pumps. The Zenit Group has been manufacturing submersible electric pumps, mainly in cast iron, for over sixty years. Over time, the target audience of our solutions has evolved based on the needs of our customers, first and foremost, but also due to internal requirements.

In fact, the production of electric submersible pumps of limited power and size for domestic, residential and light civil engineering use has increasingly given way to a civil, municipal and industrial target market, resulting in an increase in the size, weight and overall dimensions of the machines.

This contributed to a continuous improvement in performance, but also negatively affected the logistical management of these products in terms of transport and handling costs.

Also disconnection, often required for exhibition pumps and trade fair material, was in some cases difficult or very costly, both economically and in terms of the manpower hours required, due to the high thicknesses and consistency of the materials.

This led to the need for a solution to facilitate the management of material for trade fairs or commercial visits to customers, without sacrificing the level of attention to detail guaranteed by an industrially-derived finished product.

Solution

We set out in search of a partner who could guarantee a result compatible with our needs and expectations, i.e. the creation of prototypes with compact dimensions, high quality and faithful to the original model down to the smallest detail.

Approximately two years ago, after testing, we started a fruitful collaboration with 'Controllo Qualità', a young but solid company from Modena that has been involved in 3D printing since 2013 and now boasts excellent experience and important company collaborations in the automotive, biomedical, mechanical engineering, motorsport and aerospace fields.

With them, we focused on producing the first samples of our Uniqa and Grey electric pumps.



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The moulded models had to be identical in every way to those produced on the assembly line. Furthermore, the specific request was that all models should be disconnected, so that we could show how they work internally as well as the internal components. They had to be identical in every way to the original models.

The first step towards starting production of these models required the direct intervention of Zenit's Technical Department, which provided 'Quality Control' with the original files in STEP format, modified ad hoc on the basis of the specific requirement, grouping various components, where agreed with the supplier, increasing the tolerances of the joints between the components to be assembled and simplifying, if possible, the shape of the objects themselves, eliminating superfluous or excessively small details on the print output.

The realisation also included the implementation of some disconnection points, in jargon 'cut-offs'; for this reason, the parts of the relevant pump were left 'uncovered' on the models, identifying those to be kept movable and/or rotatable, scaling down when necessary and taking into account the consequent adaptation of the screws.

The objective, which was achieved, was to obtain a scaled object that was as faithful as possible to the original object but movable without great difficulty, in order to be able to use the final product both for promotional activities and for training purposes, while respecting the principles of additive technology, including sizing thicknesses that are too thin, and therefore unfeasible, the correct scaling of components such as screws and fastening systems, etc.

Benefits

We are delighted to announce that, despite some minor impasses, completely resolved and of normal management and administration, encountered during the various phases of the project, the end result of this project was extremely positive and allowed us to show the world the outcome of this collaboration during some of the most important trade fairs in the wastewater treatment sector, in Italy and worldwide.

We firmly believe that this experience was just the first step towards an increasingly fruitful collaboration with 'Controllo Qualità', and we are equally aware that the path to growth passes through numerous transitions, some of which will certainly involve an increasing use of 3D printing technology in the manufacturing and industrial sector, with a view to optimising logistics management costs and saving energy.

