PHIDRIVE

DRIVING TECHNOLOGY

Co-funded by the Horizon 2020 programme
of the European Union

Top performance designs

ABOUT US

Phi Drive is an Italy-based startup founded in 2013. Among its achievements, Phi Drive already counts with a number of patents and highly innovative products as rotating piezoelectric motors.

Phi Drive's technicians, researchers and engineers give **design and consultancy support** for the realization of high-precision **customized solutions.**

The technical skills and creativity of Phi Drive have been awarded with the "Premio Nazionale per l'Innovazione", "Premio dei Premi" and the "Seal of Excellence H2020 EU Innovation Programme".

PHI DRIVE'S ACTIVITIES:

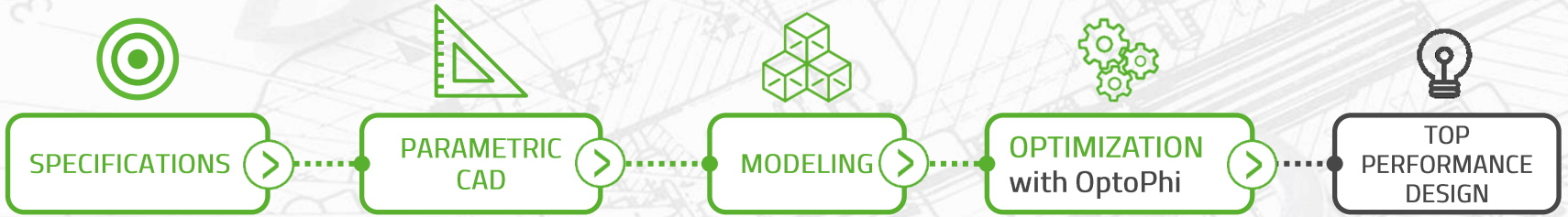
- DESIGN OF ROTATING ACTUATORS AND HIGH PRECISION POSITIONERS
- FEM ANALYSIS
- MECHANICAL DESIGN
- PROJECT MANAGEMENT

OPTIMIZED DESIGNS

Phi Drive knows how important it is to get the best from each project. For this reason, we have brought in the **most innovative techniques** that allow to obtain designs with **optimal performances**.

These techniques are based in the **automatic calculation** of the physical quantities of interest, allowing to obtain designs dimensioned according to the specifications in **shorter times** and with **reduced prototyping costs**.

We have developed a **working method** in which, starting from the project specifications, we arrive to an **optimal design** through the use of different tools such as parametric CAD, FEM or lumped parameter modeling and **OptoPhi, the optimization suite** developed by Phi Drive.



We care about your project

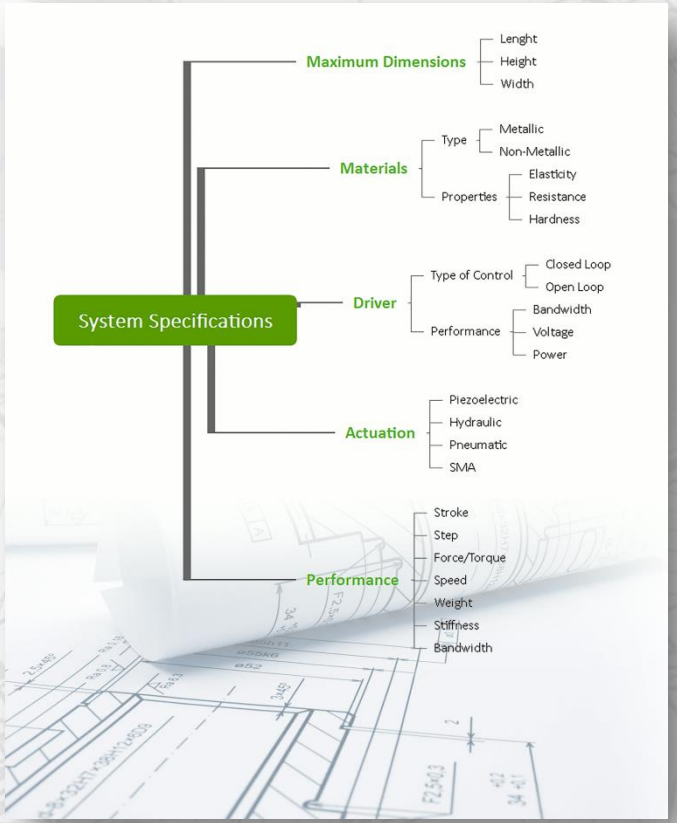
custom solution development

SPECIFICATIONS

The **starting point** of each project is the definition of specifications, the data set giving the **guidelines** to the project. Phi Drive can work directly on specifications given by the client or contribute to their definition.

Specifications are necessary for each kind of project. Phi Drive can **develop new products** on demand with new or patented functioning principles, or **intervene on existing designs** to adapt them on clients' request.

Whithin the specifications there should be defined which features of the project will be fixed and which will be **targets to optimize**. Some examples of fixed specifications can be encumbrance or materials while targets can be the static and/or dynamic performances of the system.

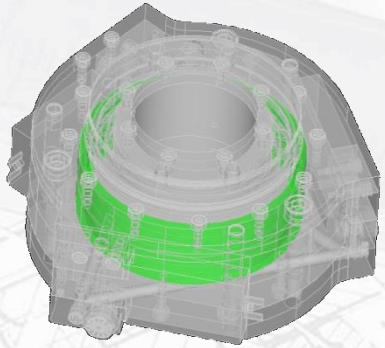


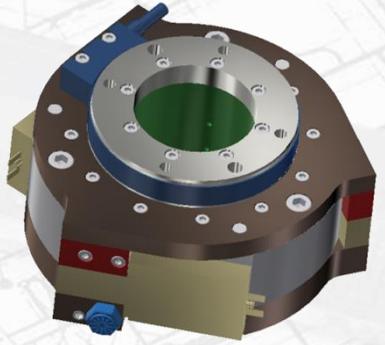
PARAMETRIC CAD

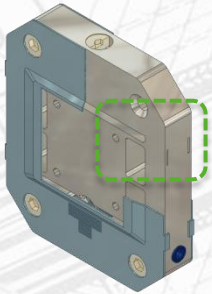
After definition of specifications, a **3D drawing** is built.

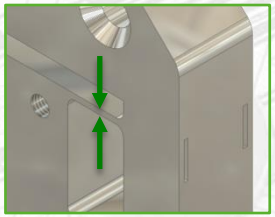
The most important dimensions are configured **parametrically**, they change automatically. This way it is possible to analyze **how performance varies depending on design dimensions**.

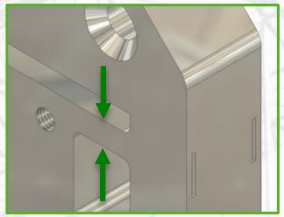
Phi Drive has developed methods to manage the parametrization of **complex parts and assemblies**, with the automatic update of both the 3D and constructive drawings.





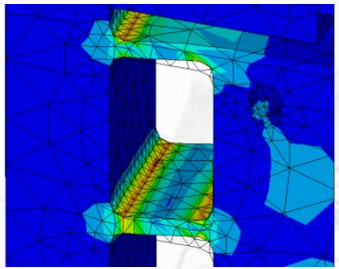


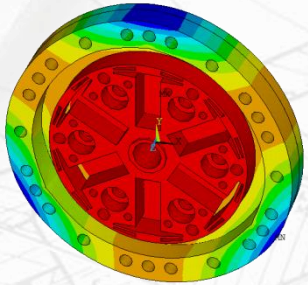


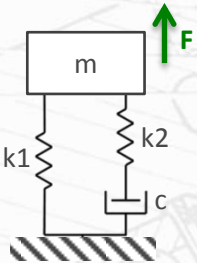


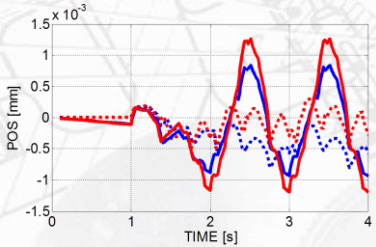
MODELING

Phi Drive has developed competences in computer-aided **modeling of mechanical systems** throughout the years. Models describe real systems in the most suitable way, and allow Phi Drive's engineers to **calculate the performances** of a design to be optimized, such as the torque-speed characteristic of piezoelectric motors, or in general the deformation of a mechanism as well as their dynamic response.









We work with two main types of models:

FEM/CFD:
We can simulate from mechanics to fluid dynamics with the most advanced simulation techniques. Geometry is included in the model for increased accuracy.

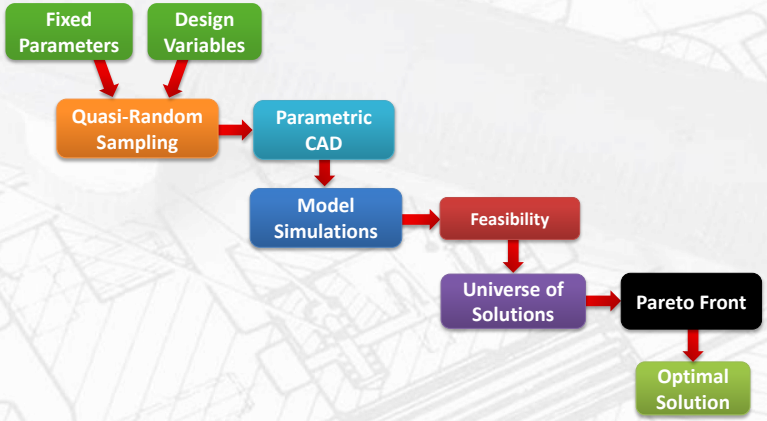
Lumped Parameter:
A simplified representation of the system is built which allows for an accurate calculation by minimizing computational burden at the same time.

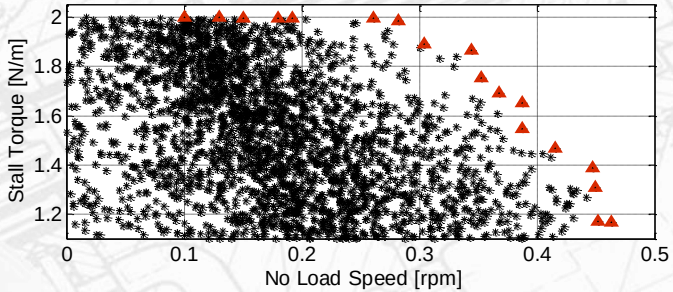
OPTIMIZATION with OptoPhi

Phi Drive has developed the **optimization software** OptoPhi for exploring the space of optimal solutions of a project. The suite implements multi-objective design techniques based on quasi-random samplings, generating points which explore uniformly the space of solutions.

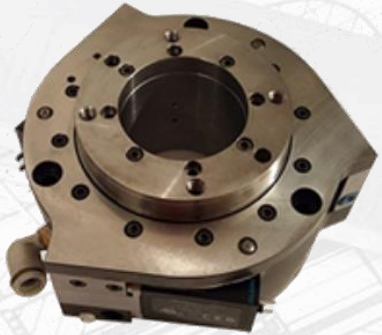
At each iteration the CAD geometry is modified and the model is updated, giving as outputs the targets to be optimized. This way, the **space of optimal solutions** called Pareto-optimal front is identified.

This process **is automatic**, and the designer is involved aftwerwards in the **choice of the optimal solution** according to the best trade-off.





TOP PERFORMANCE DESIGNS



Our **working method** has been applied to our motors and positioners, as well as for clients' projects, allowing to obtain highly technological products with **top performances,** with a **competitive advantage** deriving from the possibility of **creating innovative solutions in short timeframes.**

The optimization works as a **virtual laboratory**, letting the evaluation of multiple virtual protoypes and **cutting down the costs** related to a high number of make&try iterations.

OUR TEAM

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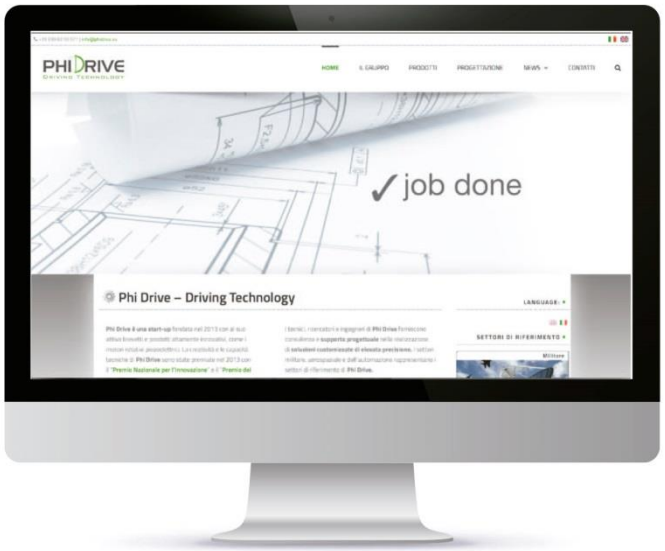

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COMESTERO SISTEMI GROUP

FOUR COMPANIES, ONE GROUP

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Since 1976, specialized in the production and commercialization of electrical and electromechanical components.

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Penta Group Srl

Since 1999,specialized in customization and assembly of electrical and electromechanical components.

www.pentagroupsrl.it

NSF Controls Ltd.

Since 1948 in England, is leader in Europe for the production of rotary and open frame solenoids.

www.comestero.com

Phi Drive Srl

Start up founded in 2013 develops linear and rotary drives compatible with piezoelectric and pneumatic actuators.

www.phidrive.eu

NUMBERS OF COMESTERO SISTEMI GROUP

EMPLOYEES, HEADQUARTERS, PRODUCTION SITES E COMMERCIAL OFFICES

153 EMPLOYEES
In Italy and UK

4 OFFICES
3 in Italy and 1 in UK

3 PRODUCTION SITES
In Europe

29 COUNTRIES
Commercial network

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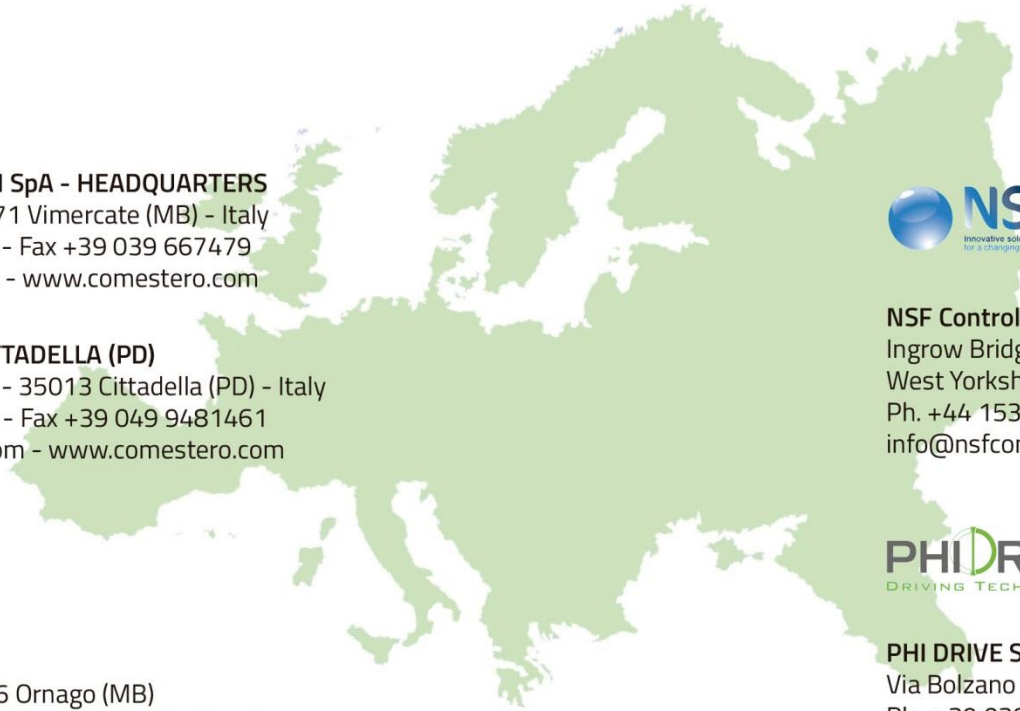

NSF
Innovative solutions for a changing world

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THANK YOU FOR YOUR ATTENTION

The team Phi Drive Srl is
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