

Company Presentation



Intelligent Lighting Solution
our vision for the automotive industry





We are a mechatronic company



HSL is a **Mechatronic company** building products that solve the **emerging needs** of the **automotive market** and **small-series car production**.

We build **Intelligent Lighting system** and **High-performance Components** for the most innovative car makers and Tier 1 providers. As a **leader company in Europe**, with a proprietary manufacturing methodology we master the use of **Additive Manufacturing (AM)**, **Advanced CAE simulation** with **traditional production process**. The company has been established in 1988 in Trento - North Italy and now employs more than 40 people.



*The first 1988 3D System machine
in the HSL headquarter.*

Experts on Advanced Prototyping Technology **Ahead on 3D.**

HSL Italia has been the **first company in Europe** to buy and employ a commercial 3D technology system back in 1988, the year of the constitution of the company. We worked hard to be every time **ahead of customer needs** and market evolution. This approach makes us serve with **quality and efficient** the most demanding client.



HSL Manufacturing Capacity Update 2017

10.000 m²

Manufacturing Area

2.6M€

Technology & Tools Investment

5 CNC
Milling

6 Production
system

11 3D Additive
Machines

14

Dedicated team
of 14 High Skilled
Artisan for
product-series
finalization



HSL in the press

HSL and its unique approach to manufacturing and innovation, moved the market interest and we have been featured on several international media platform.

DIE WELT

ElFinanciero

CORRIERE DELLA SERA

Internazionale

Bloomberg Businessweek

WirtschaftsBlatt

24 ORE

WELT N24

InfoMoney
Informação que vale dinheiro

O GLOBO

gli STATI GENERALI

taz.

Rai

la Repubblica

Dolomiten
TAGBLATT DER SÜDTIROLER

l'Adige



A global presence

HSL Italia: production, facility and global presence



 **TRENTO - N. ITALY (HQ Unit 1)**
Main facility, Prototyping, Small series

 **TRENTO - N. ITALY (Unit 2)**
Bonding and Vibration Welding, Six axis robot with PLASMA for lens HL

 **ROVERETO - ITALY (Unit 3)**
3D Additive Metal Laser Sintering, Prototyping

 **HUNGARY (JV)**
Silicon Molds

 **CHINA (JV)**
Molds, Manufacturing



Trentino: where it's good to live and work

Our Region, our Headquarter

A "bridge" between Northern and Southern Europe

Trentino Region - situated in the heart of the Alps, is a "bridge" between Northern and Southern Europe and where Italian traditions are balanced with its Austro-Hungarian past. Here you find the highest levels of prosperity and quality of life in Italy and Europe. In industry, the mechatronics sector employs the largest number of workers with more than 800 companies operating in the field, like HSL ITALIA.

Visit investintrentino.com





Our Headquarter



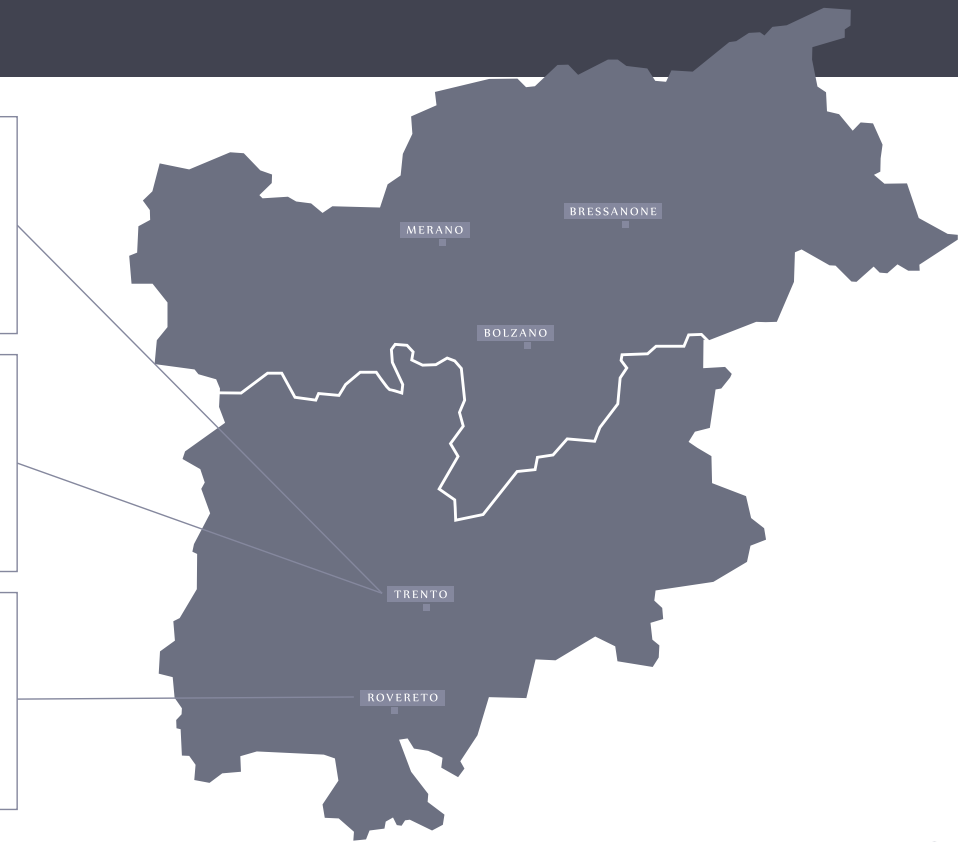
Headquarter
UNIT 1



Headquarter
UNIT 2



Mechatronic
Facility
UNIT 3





Unit 1

HSL Headquarter - Trento (North Italy)



x8

Prototyping
#8 additive
machines

Varnishing Plant

Finishing

Project Management

Design and Technology

Metrology s

Production small - series



Unit 2

HSL Headquarter - Trento (North Italy)



Bonding:
6-axis robot with
plasma

Assembly line

For lens HI vibration welding



Unit 3

HSL Mechatronic Facility - Rovereto (North Italy)

Electronics

Testing

Metrology

3D Metal
Renishaw AM400

RENISHAW



Lathe CNC
DMG Mori CTX Alpha 500

DMG MORI



Milling CNC
Lasertec 65 3D

DMG MORI





Expertise: Car small series Make small series doable.

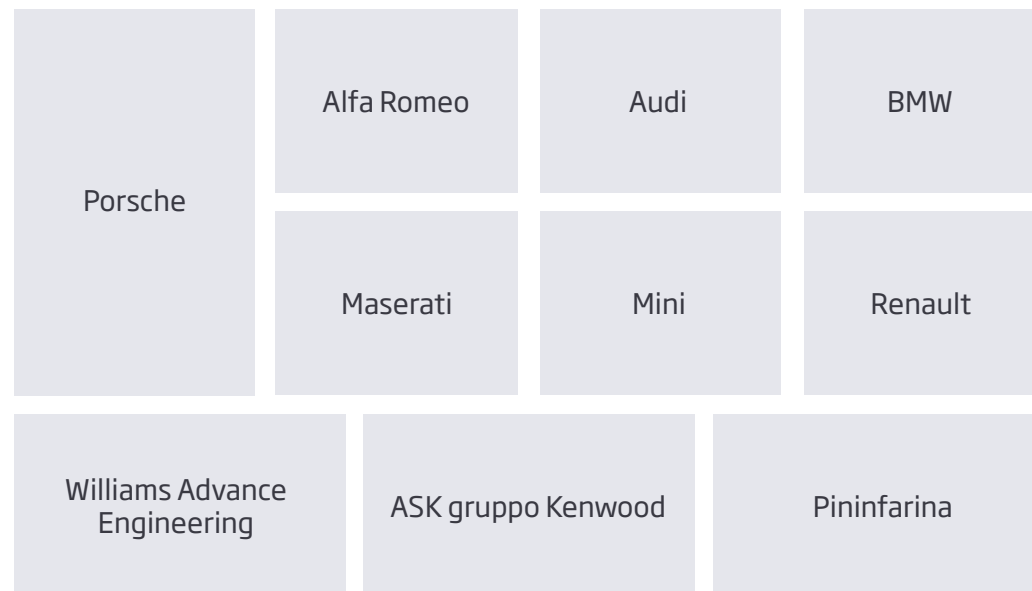
HSL has a strong expertise and track record working on car small series, providing Lighting Solutions and optimized High-performance Components. We help our client developing and bringing to the market small series, taking away all the problems and operative complications that emerge on building a small number of products.



Expertise: Automotive Sector

A cross platform
know-how.

In the last 30 years we worked with some of the most iconic car manufacturer and providing to tier the best lighting and high performance component solutions.

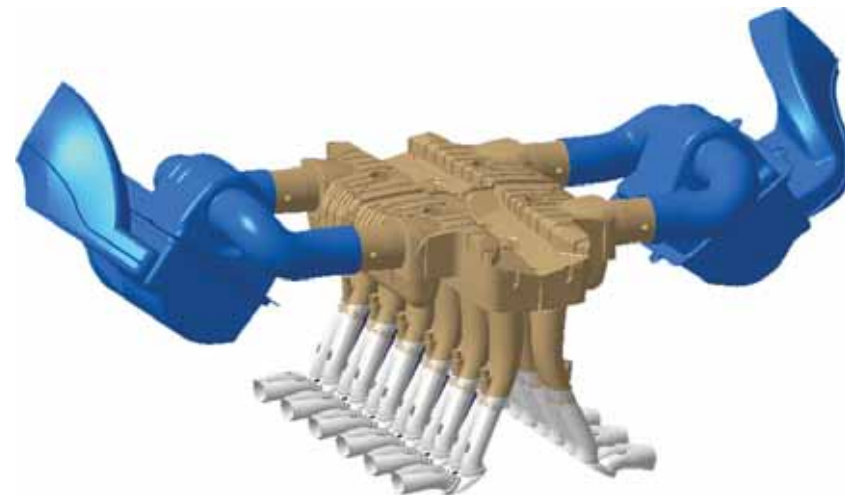


Fortissimo Case study



1

- Airbox of the **Lamborghini Aventador**
- Detailed CFD analyses of intake runners pressure drops (compressible!)
- Define a new shape for charging efficiency maximization



(rbf-morph)TM

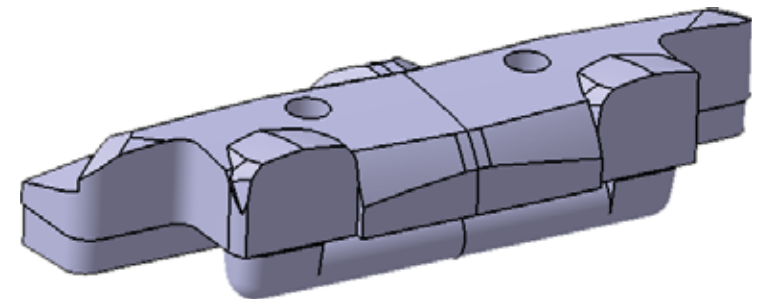
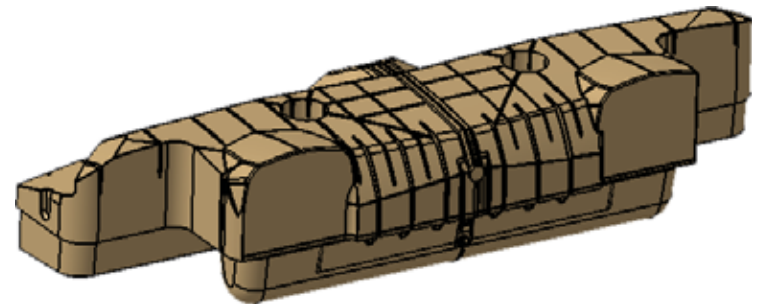




CAD model preparation

2

- CAD model rebuilt to:
 - simplify the geometry eliminating reinforcements (reduced mesh dimension)
 - clean the surfaces (steps, gaps, holes) to be suitable for CFD



(rbf-morph)TM

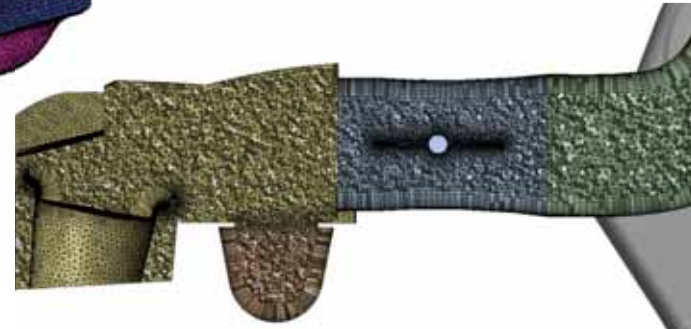
ff
FORTISSIMO

Mesh assembly



3

Maximum
dimension
9.5 millions



(rbf-morph)TM



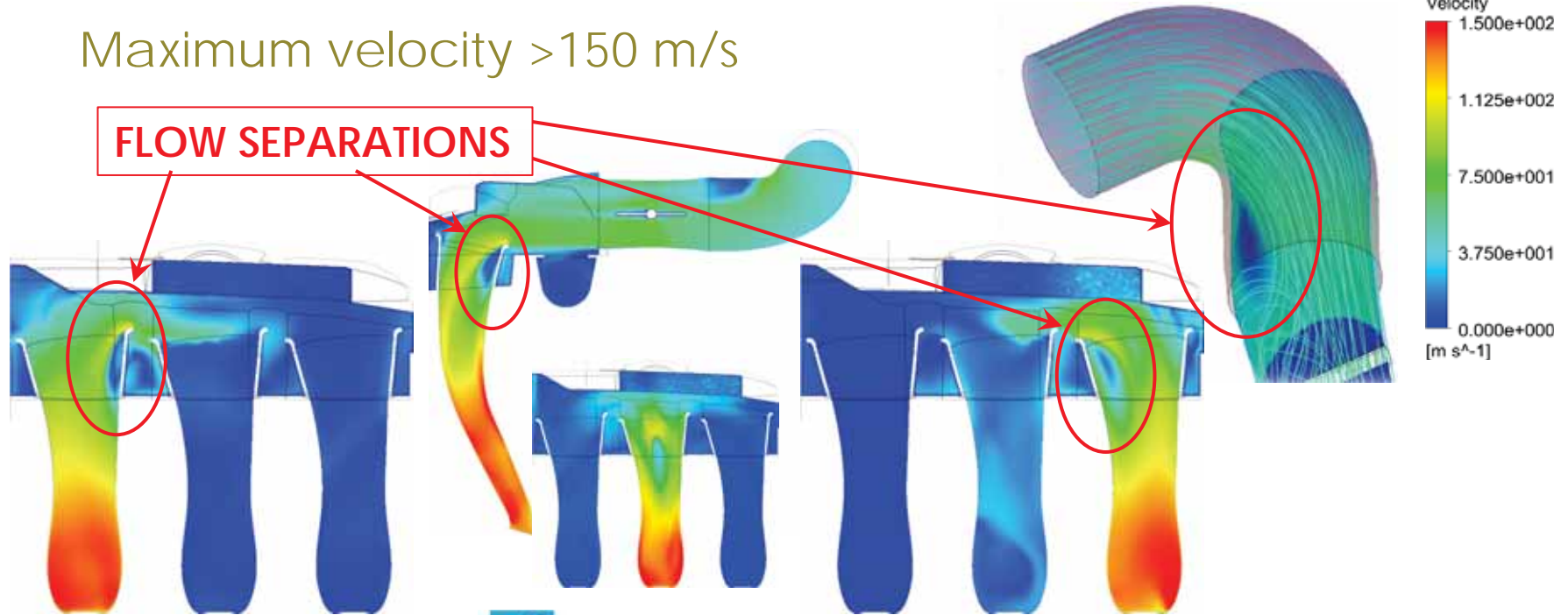
Critical regions



4

Maximum velocity >150 m/s

FLOW SEPARATIONS



(rbf-morph)TM

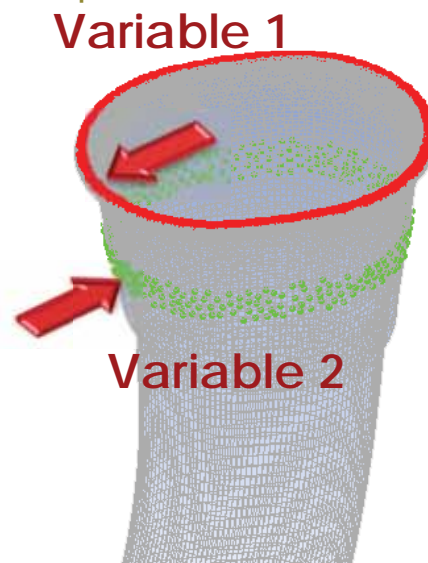
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FORTISSIMO



RBF setup

5

Two shape modifiers for each runner acting in the region of separation



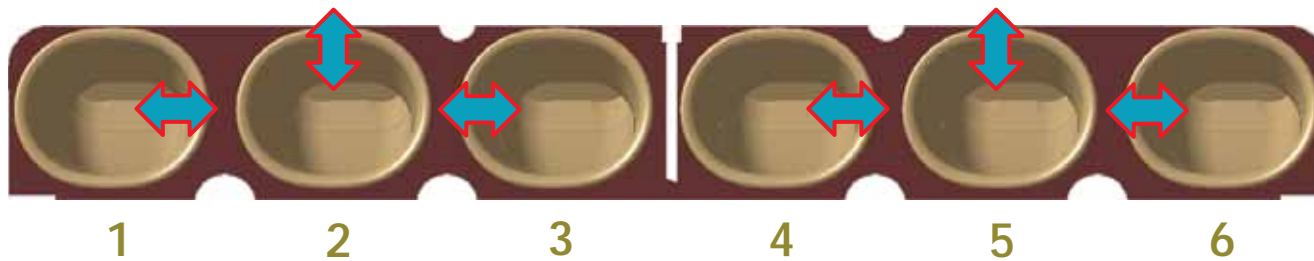
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RBF setup for all runners

6



Locations of morphing actions

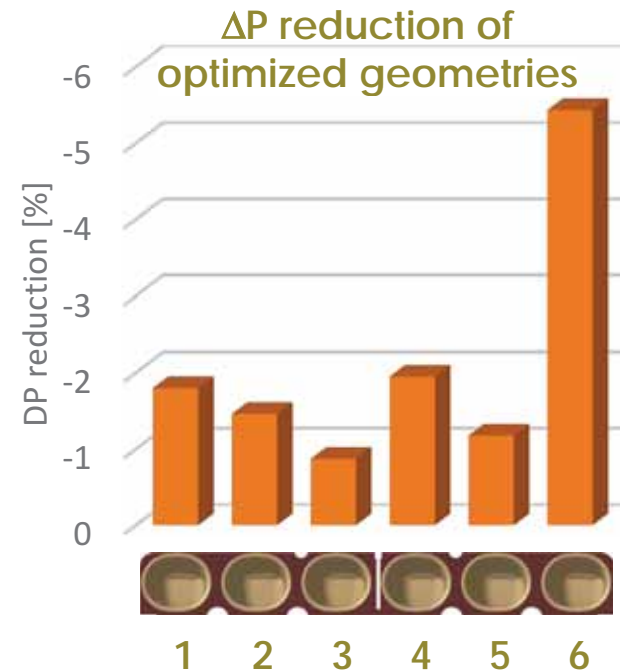
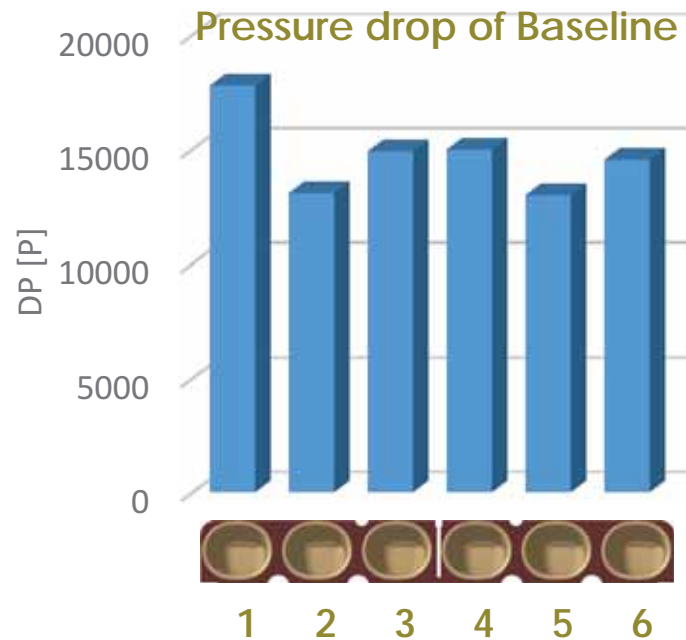
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Results



7



(rbf-morph)TM



Results



8

DP = 15044.8 P



(rbf-morph)TM

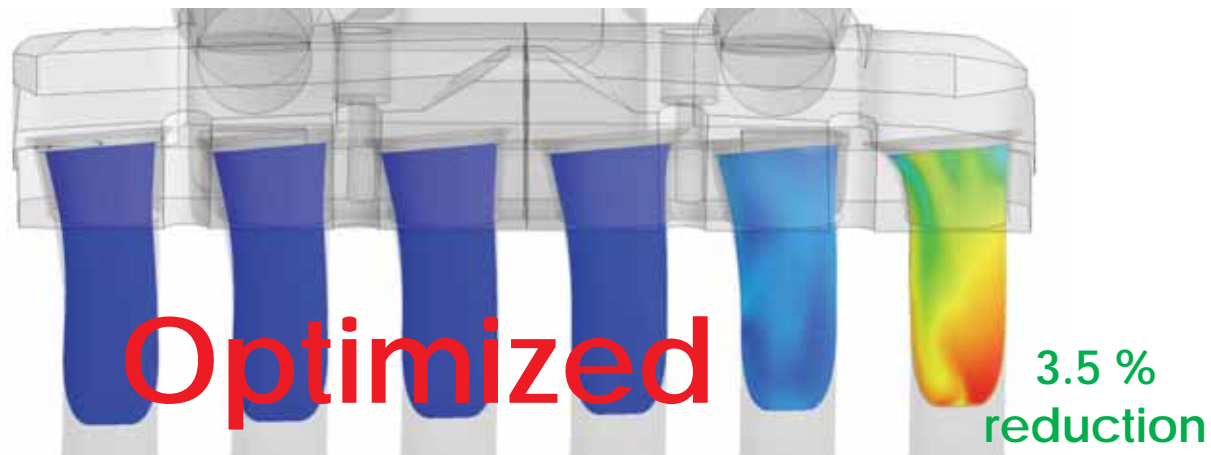


Results



9

DP = 14584.8 P



(rbf-morph)TM



New 3D-printed part



10



(rbf-morph)TM



New 3D-printed part



11



(rbf-morph)TM



New 3D-printed part



12



(rbf-morph)TM



New 3D-printed part



13



(rbf-morph)TM





What we do

Our Product and Service

1

Intelligent
Lighting
System



HILS®

2

High
Performance
Component



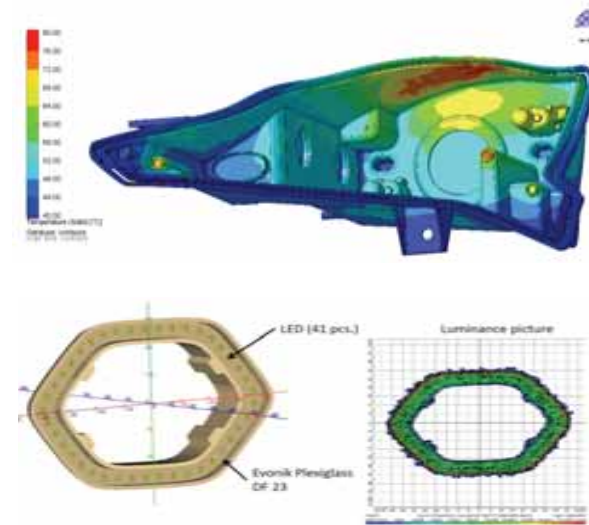
HPMC®



1 Intelligent Lighting System



We support the development and production of **intelligent lighting systems** on small series, with innovative technologies and concepts for the **new generation** of vehicles.





1 Lighting: Metrics and Results (2000-2016)



4 Few Off
+50% YoY
(#2 in 2016)

200+
Sample A produced

400 Tools
Level-C

110+ Avant
Serie

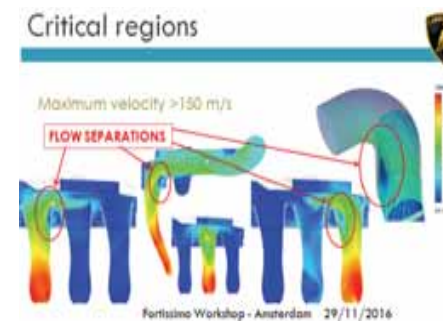
20.000+ Km Continuous
reliability



2 High Performance Component

HPMC®

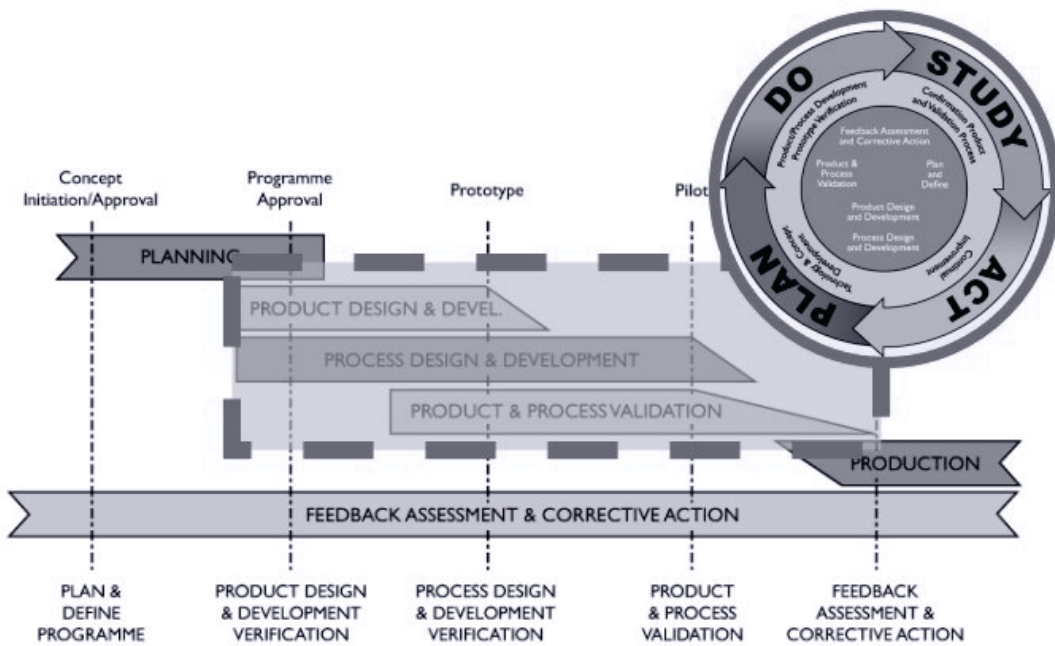
Continuous efficiency search on **high performance** mechatronic components through fluid-dynamic and **CAE optimization** technologies of all types of powertrain.





We are an Agile Company

Our approach: Agile Development & Engineering



30 months → 15 months

We master development lifecycles utilizing advanced manufacturing technology. We provide to our clients efficient solutions, less expensive in less time.

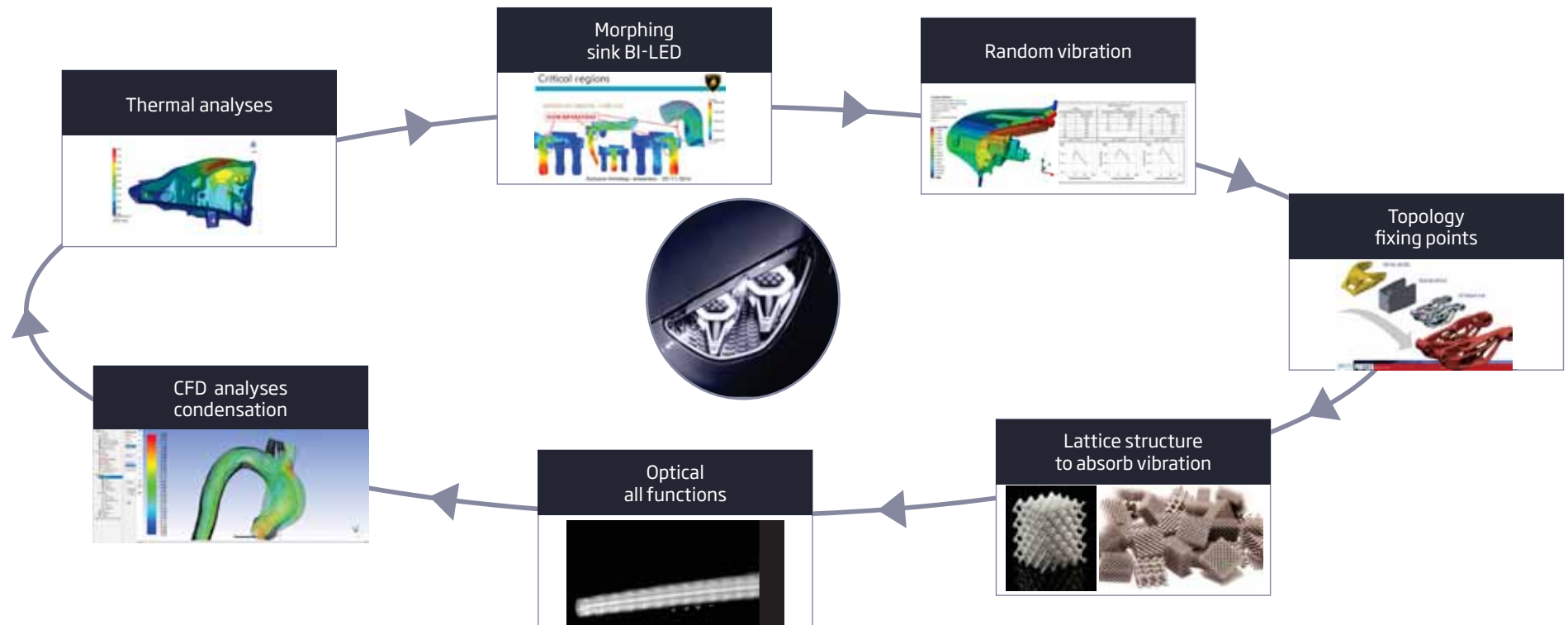
The use of "iterative" and "incremental" approach let us cut from 30 to just 15 months the traditional product lifecycles cost and time to market.

Our Agile Methodology let us build the right, optimized product providing the most competitive solutions to our clients.



Integration of CAD+CAE+AM

Our approach





Traditional Process and AM

Our approach



Integrate Advanced Manufacturing with conventional technology

Assembly

- Vibration - RL reverse
- Bonding - HL housing - outer lens
- Ultrasounds - HL car holdings

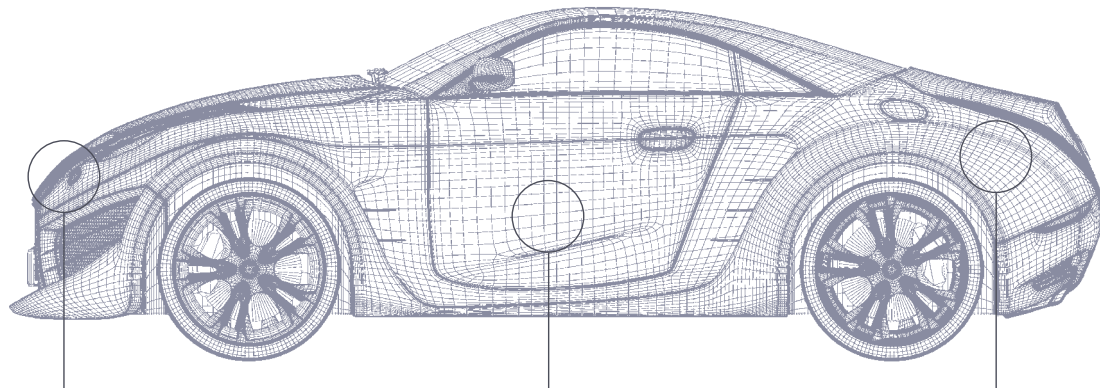
Coating

- Varnishing
- Sputtering



Improving Product Lifetime

Our paradigm



Lighting Systems

With HILS® we support the development and production of intelligent lighting systems on small series, with innovative technologies and concepts for the new generation of vehicles.

Car Intern

Development of interior lighting and customization of aesthetic and functional details.



High Performance Component

With HPMC® we push efficiency search on high performance mechatronic components through fluid-dynamic and AME optimization technologies of all types of powertrain.

We believe in a new design paradigm, where the use of higher technical performance components inside an optimized manufacturing process can deliver outstanding products, with better and more sustainable lifetime.



Clients and Market

Our approach

In the past 30 years we supported our network of international clients working with the major car makers and tier-1 supplier. Our solutions are used by:

ASK	Automotive Lighting	Ducati	Ferrari	Italdesign Giugiaro	Johnson Controls
KSS	Magneti Marelli	LEAR Corporation	Poltrona Frau	Scuderia Toro Rosso	Valeo



Our vision

Bringing speed,
reliability and new solutions
to a changing industry: automotive.

Our strategy



2002-2007
Process

- Internal process definition
- Requirements
- Results valuation check



2007-2012
AM

- Stabilize AM process
- AM integration with conventional technology
- AM material characterization
- Avant Series validation

HILS®



2012-2017
AM + CAE

- CAD+CAE+AM process integration
- Mechatronic integration

HPMC®



> 2017
AM+CAE+AI

- Full decentralized architecture
- Digital Transformation on lighting for all car models

HACS®



The Future Car Equation

Car is an equation where components, intelligent system, AI and high performance come together to provide the most satisfying emotion on hearth: **time**.

Company Presentation

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Intelligent Lighting Solution

our vision for the automotive industry

