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.
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.
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)
Unit 2
HSL Headquarter – Trento (North Italy)

Bonding: 6-axis robot with plasma

Assembly line
For lens hl vibration welding
Unit 3
HSL Mechatronic Facility - Rovereto (North Italy)

3D Metal
Renishaw AM400

Lathe CNC
DMG Mori CTX Alpha 500

Milling CNC
Lasertec 65 3D
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

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

(rbf-morph)™
CAD model preparation

- 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)™
Mesh assembly

Maximum dimension
9.5 millions

(rbf-morph)™
Critical regions

Maximum velocity > 150 m/s
RBF setup

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

Variable 1

Variable 2

(rbf-morph)™
RBF setup for all runners

Locations of morphing actions
Results

Pressure drop of Baseline

ΔP reduction of optimized geometries

(rbf-morph)™
Results

DP = 15044.8 P
Results

DP = 14584.8 P

Optimized 3.5% reduction

(rbf-morph)™
New 3D-printed part
New 3D-printed part
New 3D-printed part
New 3D-printed part

(rbf-morph)™
What we do
Our Product and Service

1
Intelligent Lighting System

2
High Performance Component

HILS®

HPMC®
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
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

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

Thermal analyses

CFD analyses condensation

Morphing sink BI-LED

Random vibration

Topology fixing points

Optical all functions

Lattice structure to absorb vibration
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

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.

**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.
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
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

2012-2017
AM + CAE
- CAD+CAE+AM process integration
- Mechatronic integration

> 2017
AM+CAE+AI
- Full decentralized architecture
- Digital Transformation on lighting for all car models

HILS®
HPMC®
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.