

PLASTIC OMNIUM AUTO EXTERIOR



PLASTIC OMNIUM

NEW R&D CENTER • Σ-SIGMATECH





In 2002, near Lyon, **Plastic Omnium** opened one of the most advanced research and development center in its field.

The Σ -Sigmatech center is a new technological and human approach that embodies **Plastic Omnium's** commitment to customer satisfaction through creativity, innovation and industrial competence.

Plastic Omnium now has all of the tools needed to strengthen its position as an expert in the architecture of auto body systems and modules, as part of a clear effort to increase its ability to make innovative proposals for the vehicle of tomorrow.



- creativity
- exchange
- transparency
- responsiveness
- productivity
- quality
- innovation
- extended company
- industrial transposition





■ environment ■ security ■ teamwork ■ design ■
simulation ■ pilot line ■ crash test ■ project teams ■ customers ■

Key figures

- **400 employees** in the following services: R&D, purchasing, projects, industrial management, Quality, logistics, support, in order to optimize the synergies and communications, in the service of the customers.
- An investment of **20 million euros**.
- **15,000 m²** built on a site covering ten hectares.
- **300 projects** in the development stage.
- **20 new patents** filed each year.
- More than **550,000 hours** of development for 17 customers.
- **60% engineers**.
- An average age of **35 years**.
- **Customer confidentiality**.
- ISO 14001 environmental **standard**.
- TS 16 949 **certification**.



An innovative concept

A NEW R&D CENTER DESIGNED AROUND A NEW ORGANIZATION

1. Total vertical & horizontal decompartmentalization

- Establishment by project phase or by department.
- Extended company design.
- Physical and virtual decompartmentalization.
- Teamwork: worldwide "Engineering Centers" organized into networks – "round-the-clock" subcontracting.
- Project management system combined with a Data Management Product: real-time sharing of information and capitalizing on experience throughout the world.
- Creation of inter-service operational synergies.
- Development of exchanges and project communications.

2. Standardization, flexibility and modularity of the means

- Modular concept:
 - reconfiguration of the layouts in under 48 hours,
 - identical office modules for all hierarchical levels,
 - simplified maintenance, optimized purchasing.

3. Increased reliability and anticipation of the industrialization of our products – processes

PILOT LINE CONCEPT

- Integrated, configurable and flexible multi-process lines, representative of the existing plants → "Industrial Transposition" notion:
 - anticipation of the industrial Quality performance,
 - shortening of the leadtimes through sequencing of the processes,
 - decrease in the costs for start-ups and late modifications,
 - off-site robots remote maintenance, downloading, programming.

CALCULATIONS – TESTS CORRELATION

- Unique means for validating the architecture – process – materials solutions.
- Reduction in development times and in the number of prototypes.

4. A center in the service of our customers

- Optimization of the QCD projects (Quality, Cost, Deadlines).
- Innovation showroom.
- Near the Lyon – St Exupéry airport / TGV station.
- On-site meal services.





Engineering power in the service of the customers

Organization of projects

OPTIMAP development method which, for each project, defines the means and associated schedule so as to provide answers to customers in the most efficient possible manner. Rigorous monitoring of all project phases during reviews which are attended by all departments involved.

- **Project platforms:**
grouping of the project's core group (project manager, studies, process, purchasing, Quality, etc.) on one site to promote exchanges and optimum information sharing.
- **Calculation means:**
60 CAD stations and 20 digital simulation stations.
- **Usage of CAD and calculation systems:**
CATIA (V4&V5), IDEAS, UG, CADD5, EUCLID, Moldflow, Abaqus, Radioss, Cadmould, REM3D, etc.
- **Eco-design:**
taking environmental aspects into account as of the design (limiting of the number of materials, ease of disassembly and recycling at the end of life, ban on heavy metals).
- **Design pole:**
anticipation of the trends and customer expectations,
integration of style and Quality constraints with all new designs.

Unique validation means

PILOT LINE • SHORTER AND MORE RELIABLE DEVELOPMENT TIMES

- **Molding presses:**
 - 3,150 tons, 3 molding groups (polyolefin, technical alloys and fiber loaded), unloading by 7-axis robot, molding-compression.
 - 750 tons multi-process (dual materials, gas co-injection, molding-compression, modular test molds).
- **Robotic painting line** which simulates the various configurations of production sites and is compatible with “waterborne” and “solvent borne” processes.
- **Flexible assembly line** used to reproduce the various plant flow options (station to station, parallel or continuous) and to validate different assembly technologies (clipping, screwing, gluing, welding, etc.).
- **Project logistics:** ensuring the leadtimes and prototype deliveries.

LABORATORY • VALIDATING AND CORRELATING CALCULATIONS WITH TESTS

Impact management

Plastic Omnium has developed unique know-how in the area of low and medium-speed impact management, thanks to its overall expertise with the materials, processes and architecture.

These answers are optimized by cross-checking digital simulation models and “crash tests” carried out in the laboratory.

More specifically, the research carried out in the area of pedestrian safety provides a response to the European directive on pedestrian safety which will take effect in 2005, and even to anticipate its greater stringency as of 2010. Plastic Omnium also has the necessary means to reproduce all types of impacts up to 30 km/h, whether for bumpers, fenders or with complete vehicles.

Analysis laboratory

The center includes a materials analysis laboratory in which the mechanical characterization and the chemical and rheological properties of parts and materials are studied.

In addition, painted or unpainted parts undergo many tests, for example involving how they react to ultraviolet rays, impact resistance, chemical attacks, and their resistance in conditioning chambers, in order to analyze how they will stand up to aging and to various climatic conditions.

The laboratory also has the necessary means to assess the durability of products through the use of vibration beds, and it carries out colorimetry and surface aspect measurements.

Finally, the notion of laboratory test productivity was taken into account as of the center's design.



Plastic Omnium

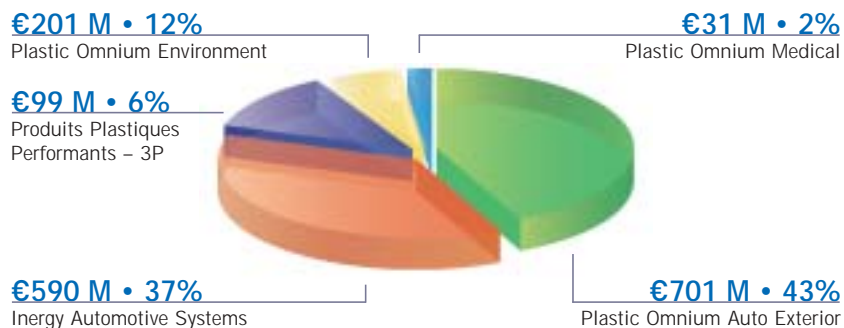
Profile

Plastic Omnium is a manufacturing and services company with European and global leadership positions in its three core businesses:

- Automobile, with Plastic Omnium Auto Exterior, Inergy Automotive Systems, a company which is 50% owned by the Plastic Omnium Company and 50% by Solvay,
- Environment,
- High-Tech, with Produits Plastiques Performants – 3P and Plastic Omnium Medical.

Since its founding in 1947, Plastic Omnium has enjoyed steady growth while serving the needs of its customers, employees and shareholders, thanks to a strategic commitment to profitability, independence, innovation and corporate citizenship.

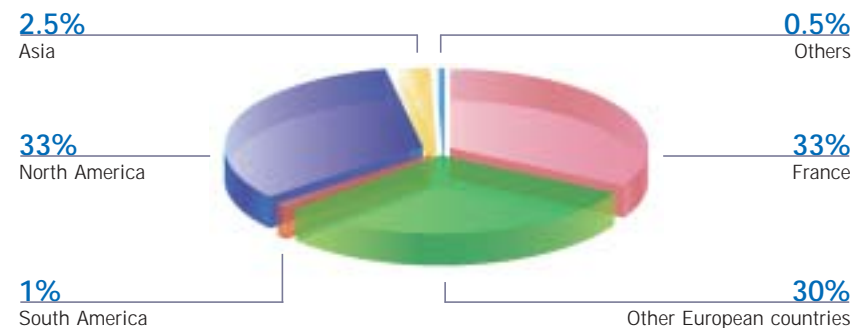
Distribution the sales figure by activity in millions of euros and as % of the sales figure



Key figures

- 2002 sales figure: **€1.6 billion**.
- Sales figure generated outside of France: **67%**.
- **9,200** employees in **25** countries.
- **66** plants and **14** Research & Development centers.
- **5.2%** of the sales figure devoted to R&D.

Distribution of the sales figure by geographical area



Plastic Omnium Auto Exterior

A WORLDWIDE LEADER IN THE MARKET OF AUTO BODY COMPONENTS AND MODULES

Line of business

A leading automobile equipment manufacturer, Plastic Omnium Auto Exterior designs and delivers integrated, multi-material auto body components and modules.

Product lines

Bumpers, fenders/body parts, front end modules, rear end modules, energy absorption components.

Key figures

- 2002 sales figure: **€701 million**.
- Sales figure generated outside of France: **68%**.
- **4,800** employees in **11** countries.
- **6%** of sales dedicated to R&D.
- **5** "Engineering Centers" and **1** International R&D Center.
- **43%** of the Group's sales figure.

Sites

22 production sites and 20 Supply In line Sequence Centers in Germany, Belgium, Brazil, Spain, the United States, France, Great Britain, Mexico, Poland, Slovakia, Turkey.

Holdings

- Inoplast: **34%**.
- Inoplastic Omnium: **50%**.
- Valeo Plastic Omnium: **50%**.

Distribution of the sales figure by geographical area





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