

Manufacturing strategy

Competitiveness and quality on a global scale

World-scale production

■ In all market segments, but particularly for index-1.5 unifocals and bifocals, the need to stay competitive has led Essilor to seek cost-optimized production in Asia, Brazil, and Mexico. This quest has coincided with a simultaneous increase in requirements for volume and quality. Our Bangkok plant, for example, has raised its output of anti-reflective lenses by more than 50% a year since 1997, while substantially cutting production costs.

The search for capacity also concerns high indices, which will be produced in Asia, the U.S., and Mexico. We are pursuing the same strategy for polycarbonate, where production has grown 20% a year in the past four years and, after the U.S., has begun in Thailand and France.

A more regional approach for custom-made lenses

■ Custom-made lenses are sold in semi-finished form to optical laboratories, which prepare the back surfaces themselves to meet prescription specifications. These lenses for presbyopia, astigmatism, and other corrections, involve exclusive Essilor processes and are usually produced in plants located very close to their final markets.



North America 5 plants

United States

- Saint Petersburg, Florida - 1972
- Carbondale, Pennsylvania - 1995
- Dudley, Massachusetts - 1995

Mexico

- Chihuahua - 1985

Puerto Rico

- Ponce - 1986

South America 1 plant

Brazil

- Manaus - 1989

18 plants

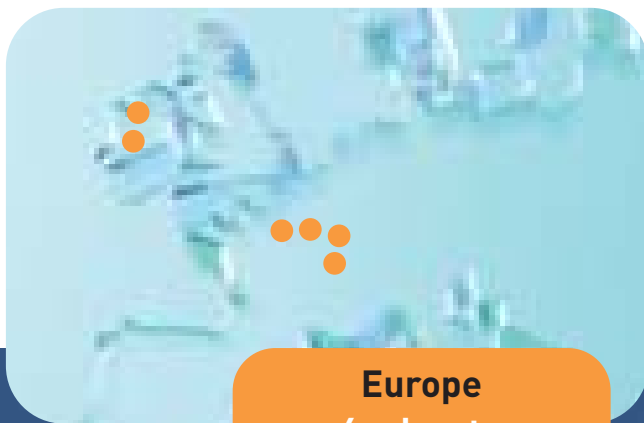
Country, locality, date opened

In 2001, Essilor produced 160 million lenses to 160,000 different specifications, at an average of one thousand lenses per specification. Our company stands at the crossroads of mass production and customized fabrication. We must therefore continuously adapt our manufacturing strategy to enhance competitiveness and meet the quality requirements for each type of lens and material that we produce.

Logistics and processes: cutting inventories

■ Controlling and reducing inventory levels is crucial for an industry that manages so many individual products.

For this purpose, Essilor invests in information systems and in supply-chain optimization—which involves a reduction in server inventories and direct delivery by plants to selected subsidiaries. The new processes are aimed at making prescription lenses to order, while minimizing the need for inventories.



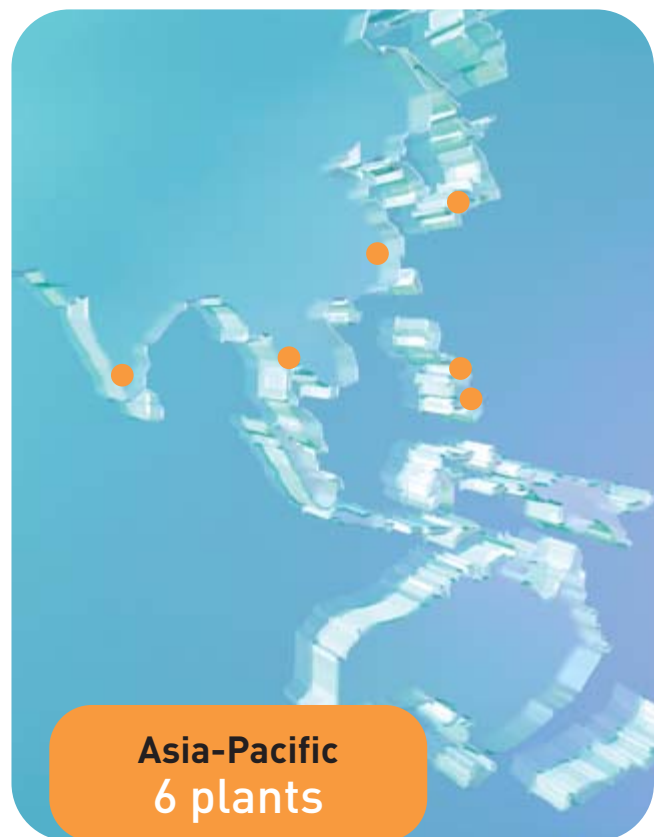
Europe 6 plants

Ireland

- Ennis - 1991
- Limerick - 1974

France

- Dijon - 1972
- Ligny en Barrois (Les Battants) - 1959
- Mouy - 1972
- Sézanne - 1974



Asia-Pacific 6 plants

Philippines

- Mariveles - 1980
- Laguna - 1999

Thailand

- Bangkok - 1990

China

- Shanghai - 1997

India

- Bangalore - 2000

Nikon Essilor plant

Japan

- Nasu - 1979

Laboratories

Combining production and local service

Laboratories: doing the utmost to satisfy opticians

■ When a prescription laboratory receives an order for a pair of lenses from its optician customer, the optician has already sold them to its own end-user—the wearer—who needs the lenses to regain vision quality and living comfort. The order is thus always urgent.

Laboratories work on a just-in-time basis. To offer reliable, consistent service to their optician customers, they must be capable of managing very wide swings in demand both on a weekly basis and during the year.

As all satisfaction surveys among opticians demonstrate—in Europe, the U.S., and Asia—what opticians expect most from their prescription laboratories, after lens quality, is consistent on-time delivery.

Laboratories must therefore reconcile production requirements, quality standards, cost control, and customer service satisfaction—despite swings in orders that can reach up to 50% of their average sales volume.

Europe: a community of laboratories

■ Essilor's European laboratories have been traditionally close to their national customers. Only a few years ago, they were still producing all types of lenses—plastic and glass—as well as performing related treatments. With the growth in lenses made of high-index materials or requiring complex treatments based on new technologies, we have organized these laboratories into a European network to facilitate exchanges between countries. This network ensures a continuous presence near our customers—and thus a high level of service. It also enables us to concentrate new technologies in selected, internationally-dedicated laboratories across Europe. In addition, our European laboratory network represents a secure supply chain for opticians thanks to highly-efficient delivery logistics.

161 Essilor laboratories NOW COVER NEARLY ALL OPHTHALMIC-LENS MARKETS AROUND THE WORLD



North America⁽¹⁾



South America



Europe



Asia-Pacific⁽²⁾

This Essilor network is also reinforced by numerous independent laboratories that distribute Essilor products and those of the Nikon Essilor joint venture. Essilor thus has a locally-organized network for all opticians worldwide.

⁽¹⁾ 76 in the U.S. and 23 in Canada.

⁽²⁾ including Nikon Essilor in Japan and 14 laboratories in Australia and New Zealand.

Prescription laboratories take up where our production plants leave off, customizing semi-finished lenses to the wearer's ophthalmic correction requirements. Laboratories are thus involved in several stages of the production process. The first is lens surfacing, i.e., machining the back surface to obtain the correction prescribed by the ophthalmologist. Next come the treatments to enhance the lenses with a wide variety of properties such as tinting, scratch resistance, or better contrast vision. The last step is to edge the lens for mounting in the frame.

United States: first steps toward a laboratory network

■ **Until their recent acquisition by Essilor, U.S. laboratories were independent units** using standard technologies acquired from their equipment suppliers. Now part of Essilor, the laboratories are being gradually reorganized into the Essilor Laboratories of America network. At the same time, however, they will keep their long-standing ties with their customers in the optics profession.

The U.S. restructuring follows the same broad principle as the European organization, i.e., a network of local laboratories linked to regional or national laboratories that implement Essilor-developed advanced technologies. This system makes the technologies easily available to customers of all Essilor network laboratories without requiring a complex, costly installation on all sites.

Latin America, Asia-Pacific: technological deployment in progress

■ **Apart from the Nikon Essilor laboratory in Japan,** Asian prescription laboratories are much smaller than their counterparts elsewhere.

To distribute the most advanced Essilor lenses in Asia, we therefore need to adapt our latest technologies to a smaller scale while preserving the level of sophistication that will guarantee Essilor brand quality.

Once this step is completed, we gradually deploy prescription technologies in all laboratories. Australia and Brazil are the most recent examples, soon to be followed by China and Indonesia.

Better products, better service: the challenge for laboratories

Laboratories must continuously improve the service they offer to their optician customers, in particular with respect to information on order-fulfillment status, punctual delivery, and assistance in defining technical solutions to all correction needs. At the same time, they must guarantee the level of quality associated with the Essilor brand. And this dual challenge must be met despite the growing sophistication of technology and the need to curb costs in order to maintain maximum competitiveness on a global scale.

High-growth lenses are precisely those that embody the most advanced technologies, such as Airwear® in polycarbonate, Transitions® lenses, and Thin & Lite® 1.67—together with Crizal® treatments, which combine several advantages for consumers such as scratch-proofing, reduction of parasite reflections, and surface treatments for easier maintenance.



Vacuum treatment

Environmental protection

A civic ethic

Implementing environmental management systems

■ **After the ISO 14001 certifications of our plants in Ireland and Brazil,** 2001 saw the certification of the Ligny en Barrois lens factory in France. Seven plants are currently applying for certification: five of them should receive it in 2002. Our Indian plant, in addition, although not included in the ISO 14001 certification process, undergoes an annual audit that enables it to take environmental parameters effectively into account.

We also carried out a program to update regulation compliance in France and extended it to other countries, despite the fact that no Essilor plant is classified as “Seveso,” i.e. vulnerable to a major hazard. In 2001, we achieved the near-elimination of halons—still officially allowed—in fire-extinguishing systems. Glycol ethers have been replaced by products that are safe for human health. The use of methylene chloride has been definitively abandoned in several plants, and the Dijon site has also stopped using trichlorethylene. Nearly all transformers containing PCBs (polychlorinated biphenyls) have been replaced.

Reducing the consumption of water and electricity

■ **Essilor has implemented several programs to reduce water consumption** either through lower use or through recycling.

In France, for example, the Ligny en Barrois plant has cut consumption by 26% and the Dijon plant by 35%. In Mexico, our plant saved 23,500 cubic meters thanks to water recycling in several processes, and in the U.S. our Dudley

plant recycles the water from the coating shop to the cooling towers of the air conditioning system. In Germany, the Freiburg laboratory performs a complete recycling of machining water in a virtually closed circuit.

We also achieved sizable cuts in electricity consumption in 2001: 10% in Puerto Rico, 26% in Ennis (Ireland), and 29% in India. In the U.S., our Saint Petersburg plant saved 3 million kWh, the Carbondale plant installed energy-efficient motors, and the Dudley plant upgraded its compressed-air production system.

Emission and waste management

■ **Water**

Most Essilor production facilities have their own wastewater treatment plants. Our Indian facility recycles the water treated by its plant, and its quality makes it fit for use in lawn watering.

■ **Solid waste**

A great majority of our industrial and commercial sites have set up highly selective waste-sorting systems. This approach also generates large savings. To mention only two of many examples, Ennis (Ireland) has cut its consumption of acetone by 26% and of sodium chloride by 70%; our Mexican plant has reduced its consumption of corrosive products by 35%. In Germany, we introduced processes to regenerate and re-use polishing products. In Sweden, new processes separate cutting oil from machining chips—which considerably lengthens the oil’s useful life. In Saint Petersburg (U.S.), an intranet site was created to manage the use-by dates for chemical products, a move that has saved 23 metric tons.

Essilor and all its units around the world have long been committed to respecting the environment. Although we are among the least polluting industrial companies, we are dedicated to implementing an environmental management system that aims to minimize the impact of our activities in terms of resource depletion and waste emissions.

■ Air

Most sites have implemented systems for testing gas emissions. Meanwhile, several programs have reduced such emissions. In the U.S., the Saint Petersburg plant has cut its emissions of VOCs (volatile organic compounds) by 50 metric tons in three years, and the Dudley plant has lowered its VOCs by 21%. To improve gas emissions, three of our French facilities have altered their heating systems and replaced fuel oil with city gas.



Industrial-waste plant at the Ligny en Barrois (Les Battants) factory in France

ISO 14001 CERTIFICATION

Certified plants

Ireland

- Ennis
- Limerick

Brazil

- Manaus

France

- Ligny en Barrois (Les Battants)
- Sézanne

Plants in the process of being certified

France

- Dijon

United States

- Saint Petersburg - Florida
- Dudley - Massachusetts
- Carbondale - Pennsylvania

China

- Shanghai

Philippines

- Laguna

Thailand

- Bangkok

Human resources

Essilor, a global enterprise

Essilor, a responsible enterprise

■ **Essilor is committed to strict compliance with social and environmental regulations**, and to fostering personal development, in all countries where we have a workforce responsibility.

Essilor is also engaged in maintaining constructive dialogue with bodies representing employees and with labor unions wherever they exist.

Highlights for 2001 include:

In France

- The agreement obtained on the improvement of supplementary health-insurance coverage and provident insurance for employees in two major categories.
- The negotiation launched on the prevention of all forms of discrimination among employees.

In Spain, an innovative agreement on working time that allows employees to work on designated holidays in order to improve service to other Essilor companies in Europe.

Essilor, a job-creating enterprise

■ **As a creator of production jobs in countries such as Thailand and China**, Essilor offers new employees intensive training in order to build up their competencies over the long term. We strive to create working conditions that enhance job content and thus foster loyalty among our skilled staff.

Newly-hired employees accordingly attend training programs for 15-25% of their working time in their first year, depending on the position filled; special training is provided for any later job changes.

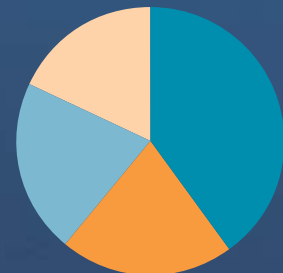
Working conditions and safety and ergonomics standards in our Asian plants are equivalent to those of our European and North American units.

In France and the U.S., engineering and managerial jobs are being added to general administration departments, engineering departments, and R&D facilities. The new jobs involve responsibilities in, or management of, international projects that bring together women and men from different backgrounds and cultures. We are therefore gradually introducing multi-cultural training programs aimed at helping teams to work in harmony.



Personnel of the Laguna plant in the Philippines

Workforce (breakdown by area)



In 2001, restated for the sale of our contact-lens business (approximately 600 employees), Essilor's workforce rose 3% owing to the acquisition and/or integration of laboratories in the United Kingdom and India.

In the past decade, the Essilor workforce has grown by an average 5% a year. One-third of the growth comes from hirings, mainly in Asian plants; two-thirds is due to acquisitions in North America, Australia and, to a lesser extent, India and Europe.

What are the consequences of these changes on Essilor's human-resource policies?

Essilor, a multi-cultural enterprise

■ **Essilor is doubly multi-cultural**—by its geographic reach, and through the acquisition of companies that each have their own specific history.

The integration of new companies most often entails the implementation of new technologies and procedures, as well as a renewal of information systems. These changes are conducted, however, with a respect for existing teams and their distinctive cultures, as well as by keeping on and motivating their management teams.

Essilor's decentralized management culture helps foster commitment by the company's newcomers. The diversity of this continuously-replenished community, in turn, strengthens our own corporate and executive-team cultures.

A dedicated information program is aimed at developing employees' sense of affiliation with Essilor while preserving their local identities, including:

- A four-monthly information magazine in English, French, and Spanish on the company and its units that is distributed to the entire workforce.

- Some fifty local magazines that highlight the distinctive features of each facility and its employees' culture.
- And, after France, an intranet information site opened by Essilor's U.S. units for their employees in 2001.

MOTIVATION AND RESPONSIBILITY

The history of Essilor and its culture merge with a long tradition of employee shareholding, particularly among managerial staff, going back to the company's beginnings in the mid-nineteenth century.

Today, more than 25% of all employees worldwide—including nearly one-half of the management—own shares in their company under various forms. Current and retired management shareholders are active in **Valoptec Association**, which takes part in key Essilor decisions and is represented on the Board of Directors.

At Essilor, we view this large employee stakeholding as a force for responsibility, stability, and commitment.

A new stock-option plan was introduced in 2001 as an incentive for management to create value for Essilor and to acquire stakes in the company. In 2001, options were granted to almost 35% of our executives, or 6% of the total workforce, 55% of whom work outside France.

Essilor is aware of the value of its unique human capital, and strives to leverage this asset while respecting its diversity.

- North America 40%
- France 21%
- South America/Asia 21%
- Other European countries 18%

The geographical distribution of Essilor's **22,300 employees** (including 1,700 in Transitions Optical Inc. and Nikon Essilor) illustrates the global dimension of our human community.



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