MSC DSBA 2021 EXAM FINAL - The Essilor Group

Section 1. Essilor Group's roots

It was in 1972 that **Essel**, the workers' cooperative, and **Silor**, the industrial branch of the Lissac group, decided to join forces to create the ESSILOR group. This merger has resulted in a **great economic success** but also in a **corporate identity** that owes its strength and originality to the encounter of two cultures that everything seemed to oppose.

a. Some background...

The first glasses appeared in 1280 in northern Italy in Murano near Venice. In France, there were the first manufacturers and merchants of eyeglasses in the 15th century. It was in the 18th century that a distinction was drawn between the craftsmen-lunetiers and the master-opticians because of the scientific and technical knowledge required for their activity. In Europe, the manufacture of ophthalmic lenses became industrialized in the first half of the 19th century. Throughout the world, the main eyewear industries were created at that time: in **France**, the Société des Lunetiers (SL, now Essel) in 1849, in the **United States**, Bausch & Lomb in 1849, in **Germany, Zeiss** in 1846 or Rodenstock in 1877.

Founded in **1849** by three steel frame manufacturers, the Association Fraternelle des Ouvriers Lunetiers, which became the Société des Lunetiers (SL) and then **Essel in 1964**, first relied on a network of small Parisian workshops before setting up its first plants in eastern France. Until after the Second World War, it retained the **cooperative culture of** 19th century associations that promoted equal opportunities. Thus, when it merged with Silor in 1972, the majority of its managers began at the age of 14 at the bottom of the scale and then, climbing the ladder, became by cooptation, "associate members" then "novices" and finally "members". A large part of their salary is tied up by a system of equity participation, with all the capital being held by the employee partners.

The merger process between Essel and Silor began in 1967 with the signing of a first protocol of intent to collaborate following the first secret contacts between Raymond-Jules Cottet of SL and René Grandperret of Lissac. Five years were needed to reconcile conflicting interests: Essel wanted to preserve the principle of employee participation, Silor wanted to prepare, through an initial public offering, the succession of Georges Lissac, who died in 1969. On June 28, 1971, a merger agreement was signed: the two co-presidents shared the presidency of Essilor, their agreement being a model for all former Essel and former Silor. They have three main objectives: to successfully complete the merger, to **list Essilor on the stock market** (which will be done in 1975) and to create the Valoptec civil company, whose shares are held by the management.

b. The founding innovations

Under the leadership of Raymond-Jules Cottet, Essel is introducing **innovations** that continue to be key to Essilor's success. For example, the launch in 1955 of the **Nylor frame**, whose lenses are held on the front bar by a nylon thread, in response to the Amor frame, the first frame manufactured by the optician Lissac. This new production technique, proposed by a

small English manufacturer Chapel, allows, due to the limited number of variants, to develop mass production. This new model is being promoted in a new way at **commercial and technical information meetings** (films, newspapers, etc.).

This is mainly the launch of the first **progressive lens, Varilux**, developed by Bernard Maintenaz after eight years of research. Bernard Maitenaz, a young graduate of Arts & Métiers and the Ecole Supérieure d'Optique, joined Société des Lunetiers in 1948 as a research engineer. His father and grandfather were already working in the company. The idea of the progressive lens was born from his dual training in optics and mechanics. He notes that in optics only simple shapes (spheres, torus, etc.) are used and all of them are revolutionary. Attempts to use more complex shapes to improve the performance of corrective lenses have never been successful. The project of a progressive lens became his personal hobby and in 1951 led him to deposit the results of his research on the generation of progressive surfaces. In 1953, he presented a set of coherent calculations and manufacturing to the company's technical manager, who included this project in his work program.

In 1997, he testified to this adventure in these terms: "At the beginning it is mostly **calculation**, a lot of calculation. Very quickly it is necessary to think of the kinematics of **the machines for the** realization of these completely new surfaces. Switching from single focal point to progressive lenses is a complete **breakthrough** because the calculation and manufacturing processes, but also the checking fixtures used at the time, are absolutely not applicable. Everything needs to be rethought. My basic idea is to achieve a progressive variation of power on one side of the glass, using mechanically accessible solutions. To vary the radius of curvature, the first idea is to use the kinematics developed by the mathematician Savary. In 1954, a first **patent was granted to** demonstrate the **feasibility of** such a glass, but it is still very imperfect. To progress, it is necessary to escape the constraints linked to this process. In fact, it is a matter of imagining a machine simple enough to make any surface but also precise enough not to betray it. I then decided to abandon the "curve generation" method in favour of the "point generation" method, a method that still prevails today. To generate a diopter, we must calculate the penetration of the wheel for five thousand points distributed over the surface and then perform five thousand operations. The optical surfaces thus created have many small facets juxtaposed, which give them a slightly hammered appearance. To obtain the desired optical surface, the facets must be removed by a very thin douce, without altering the original geometry. Now, with this universal machine we can make surfaces corresponding to any mathematical equation, but not duplicate them. We then invent a kind of three-dimensional copying machine. We build a prototype from a lathe, then we make a high-precision machine. Then we create polishing and softening machines for these atypical surfaces. In 1958, the first **semi-industrial manufacturing unit** was developed."

Within the company, some believe in it, others do not, who gladly ask for news of the "patatoid" surface as they have **ironically** named it. Later on, to avoid the project being stifled in the factory, the decision was made to start production in Paris with **a completely new team**. The decisive support came from Raymond-Jules Cottet, then manager of the company, who immediately saw the interest of this new glass.

Varilux was launched in May 1959 when Lissac, now a competitor of Essel, launched the first Orma organic lenses developed by René Grandperret's team. The progressive lens ad is

seductive and intriguing. Indeed, the very idea of a progressive surface is nonsense because such a surface implies astigmatism defects **deemed unacceptable**. Quite quickly detractors do not hesitate to highlight lateral deformations and pitching induced by a head movement. The beginnings were therefore **very slow** and at the end of 1960, although the range had been extended, only 30,000 glasses were sold.

Beyond the concept, there is a huge problem of assembly by opticians. Indeed, whereas a double focus can be mounted very approximately, a progressive lens must be mounted to the nearest millimetre. Finally, thanks to the tenacity of the **sales teams**, opticians understand the importance of precise assembly and sales are growing. While sales at the end of 1964 barely reached 300,000 glasses, at the end of 1969 they exceeded two million and reached five million in 1972. Even if it has to overcome reservations, particularly in Germany and the United States, Varilux offers SL new opportunities for **growth abroad**. In 1972, the company launched Varilux 2 following research begun in 1968, and was then in seventh or eighth place worldwide in the optics and eyewear market.

Founded in 1931, the Lissac group was the **precursor of** a **new commercial approach on the** optics and eyewear market. Already owner of several assembly workshops, Georges Lissac joined forces with two of his brothers to open a **first "department store" for** optics and eyewear, rue de Rivoli in Paris in 1938. While the medical profession has little involvement in the choice of lenses and eyeglass dealers do not perform eye examinations, Georges Lissac offers a free eye examination, his commercial offer also includes the choice of frames, the calculation, manufacture and assembly of lenses.

In 1947, Lissac, until then a retailer, became a **manufacturer**. He imagines Amor, a frame whose lenses are not taken in circles but fixed to a front bar supported by shock absorbers (hence the name) and offers it to Société des Lunetiers (Essel), its main supplier. This approach being contrary to its principles, the latter refused and Lissac decided to **manufacture** Amor frames **itself. The** success of the Amor frame, which is selectively distributed in Lissac stores and some specialist retailers, is immediate.

A pioneer in light frames, Lissac is also a pioneer in the manufacture of **light and unbreakable lenses**, first for protective lenses - the Polaroid American lenses that have been fitted to Sol Amor sunglasses since 1950 - but especially for corrective lenses with the launch of the first Orma 1000 **plastic lenses in** 1959. These glasses caused a controversy between supporters of mineral glass and supporters of organic glass, amplifying the trade war with the Société des Lunetiers.

According to legend, it all begins with the dream of a fourteen-year-old child. A dream he has after spending his day in his father's workshop. There he is sometimes pushed hard so that he understands more quickly how to polish these mineral glasses that wear out his fingertips. Then, he dreams of a glass that would be made **by casting...** Eight years later, René Grandperret, a graduate of the Ecole pratique de Lunetterie, was hired by Lissac in 1940. The following year, invited by Alsthom, he and Georges Lissac experimented with unbreakable polymerized glasses, directly cast in moulds. However, the moulds are very difficult to separate and this leads to significant manufacturing waste. Anyway, he now knows that his dream can come true.

When in 1948 Lissac decided to manufacture its own lenses for Amor glasses, René Grandperret therefore started from Arthur Kingston's 1946 patent for the manufacture of corrective lenses by forging plexiglass plates, softened by raising the temperature. The first plastic lenses, called Orma 500, were released in 1952. Despite the **difficulties, as** Plexiglas scratches and demoulds with difficulty, series production begins.

That's when a tremendous **stroke of luck** occurred. Friends informed of his research brought him a piece of plastic forty times more scratch-resistant than Plexiglas. It is a resin (code name CR39) marketed by the American company Columbia Southern Chemical Corporation. It is a thermosetting resin, used in particular for warplane cockpits and developed from WWI battle gases. He contacts the company that sends him a half-litre of monomer and a summary brochure. However, nothing is certain. To this monomer, a catalyst must be added and then polymerization carried out. René Grandperret imagined it by casting it into a mould. It is then necessary to make the mold and design an oven. After **several months of testing**, on April 29, 1954, the first Orma 500 glass was released in surface moulds in a single operation. This is one more step towards casting.

René Grandperret then discovered the patents of the American John O'Beattie. He invented a mold but also a process to fill it. He decided to **buy his know-how** and negotiated his process for the sum of three thousand dollars. In the meantime, he went to work for three weeks at home in the United States. The production process developed, the first Orma 1000 lenses equip the new generation of Sol Amor sunglasses with extraordinary colours. However, the process does not allow the manufacture of lenses with a power exceeding 1 diopter.

Finally, after months of testing, the solution appears. It is not possible to make lenses of variable thickness in a rigid mold, so you need a flexible mold. René Grandperret remembers an exhibition where people walked on tempered glass steps that bend without breaking. On April 25, 1958, a patent was filed for the manufacture of CR39 lenses by polymerization and optical molding. Orma and its successors Ormex, Ormil, Transistions or Crizal will be available in hundreds of thousands of personalized references.

At the time of the merger with Essel, plastic lenses accounted for one-third of the company's revenue, as did frames. The group created by Georges Lissac was then the sixth largest in the world eyewear market.

c. **Trades and skills**

"Originally very mechanical, our profession became physico-chemical from the time of Orma. Today we have dozens of chemists capable of working on the formulation of monomers, on the polymerization and implementation of solid or thin film polymers. "said Patrick Bozec, then Essilor's Scientific and Technical Director. In 1972, the merger of the two companies brought together mechanics and chemistry. At the same time, manufacturers became more attentive to the growing demands of professionals and their customers in terms of optical performance, aesthetics, lightness and comfort. These new demands, combined with the evolution of techniques and knowledge in ocular optics, have played an essential role in the transformation of the ophthalmic optics industry.

The first business is that of "caster" or ophthalmic lens manufacturer:

- **Upstream of Essilor** are the manufacturers of raw materials, such as glassmakers such as Schott or Corning or polymer chemists such as PPG, Akzo, Toray or Enichem. The latter synthesize transparent organic resins used in optics such as injectable or polymerizable thermosetting thermoplastic resins. These resins are sent to "lens" (or casters) manufacturers who use them to produce finished (single vision) and **semi-finished** (multifocal and progressive) ophthalmic lenses.
- Internally, **before manufacturing, there are** also R&D teams working on both new materials and the development of new models (called lens design). Many engineering, purchasing, logistics, marketing and finance functions **support** manufacturing.
- The manufacture of plastic lenses requires work in four areas:
    - the resins by themselves. Essilor's businesses have evolved significantly with organic lenses: in some cases, Essilor is a raw material formulator. It does not carry out chemical synthesis by inventing new molecules but formulates optimized mixtures of products supplied by the chemical industry.
    - the moulds in which the resin is cast. The moulds are made from mineral glass. The operators of Essilor's workshops have acquired extensive experience in surfacing these molds. For aspherical and progressive molds, special processes have been gradually developed by Essilor.
    - the assembly that ensures the sealing of the moulds. For the assembly, chemists have designed the formulation of flexible thermo-plastic joints which must be chemically compatible with the resins to be polymerized.
    - Polymerization and verification and control processes carried out by automatic systems.

Surface treatments, which appeared in the mid-1970s, provide glass with scratch, dirt, ultraviolet and anti-reflection resistance properties. These technologies use silicone chemistry and complex techniques, in particular the evaporation of refractory oxides by means of electron guns under high vacuum. To do this, Essilor has recruited surface physicists and chemists, as well as electronics engineers, vacuum technicians, etc.

The second business line is that of prescription laboratories ("labs") that personalize and distribute lenses.

The first prescription workshop was created at Lissac in 1946. Georges Lissac decided to organize a small workshop for "prescription glasses", whereas in France at the time, glasses were totally mass-produced. In addition, from 1960 onwards, Silor acquired from one of its American suppliers the concept of a network of integrated workshops for surfacing, a workshop capable of placing prescription orders in twenty-four hours, while the factories offer lead times varying from three to five days.
From 1972 onwards, the concept was internationalized. Distribution subsidiaries have a stock of semi-finished lenses and a prescription workshop - called a "laboratory" - capable of finishing plastic and mineral lenses. All over the world, each laboratory has the same surfacing, surface treatment and vacuum treatment equipment (colouring, anti-reflection, anti-scratch, etc.) as well as the same know-how to provide the same service as the parent company.

In the United States, where the concept was born, the "labs" provide both prescription and wholesale (distribution center) services, but also mount lenses on glasses. This specificity of the American market has meant that major manufacturers such as Essilor have limited their involvement to the production of lenses in series. As a result, products and treatments do not undergo the same evolution, their diffusion is much slower. To develop the anti-reflective lens market, the group created a small entity specialized in lens processing under contract to American laboratories and then decided to acquire Varilux distribution companies in the United States. By acquiring a significant portion of American laboratories, Essilor's objective is to build a second division, as solid as its European division, combining manufacturing and prescription activities. The laboratories are in contact with the opticians for whom they provide the distribution service.

However, the prescription remained very empirical for a long time: at the beginning of the 19th century, it was common to choose lenses from a catalogue using a small vision test; the first test boxes were created in 1860. It was at the end of the 19th century that the profession of eyecare professional underwent significant changes. Due to advances in knowledge and the design of new instruments, a distinction is made between opticians, specialists in lens prescription and optometrists, experts in the knowledge of refraction, i.e. disorders of eye function (astigmatism, myopia, etc.) related to poor conformation of the eye or aging of the lens of the thickening eye, presbyopia. Often initiated by manufacturers, whose products and treatments are increasingly complex, the training of opticians has evolved considerably since the post-war period. All over the world, trade shows (Silmo in France since 1967, Optica in Germany, Mido in Italy, Vision Expo in the USA) have multiplied. Many magazines have also been created, such as the Point de Vue eyewear magazine, created by Essilor in 1978. Through institutional screening campaigns, the consumer is made aware of vision problems.

Section 2. Essilor Group products and markets

a. Vision defects and their correction.

Normal vision depends on the eye's ability to correctly refract light. There are four vision defects corrected by ophthalmic lenses:

- Myopia, the eye does not see distant objects clearly
- Farsightedness, on the other hand
- Astigmatism, a lack of vision for both near and far objects. It may also affect myopes and hyperopes.
- Presbyopia, an age-related defect, by which individuals from 45 years of age lose their ability to see closely.

These vision defects are mainly corrected by the wearing of so-called ophthalmic optical lenses, and to a lesser extent by contact lenses and surgery (refractive surgery or intraocular lenses).

A lens is made of a material (mineral, organic with various refractive indexes, polycarbonate), a design (progressive, spherical, aspherical,...), surface treatments that improve the carrying benefits of consumers. The key to product development is a good understanding of the benefits of the lens, especially since it is sold to opticians who are the prescribers of the lenses. The challenge of designing a product is to improve the benefits while maintaining the quality of the finished product from one end of the chain to the other.

SV (Single Vision) lenses (in French, unifocal or UF) are used to correct myopia, hyperopia. Progressive and BTF lenses (bifocal or tri-focal) are used to correct presbyopia, i. e. the loss of elasticity of the lens with age, which no longer makes it possible to accommodate and therefore to see both near and far. Glasses (or *readers)* are an alternative for presbyopia, they only provide near vision assistance with a positive correction of 1 to 4 diopters. Thus for presbyopia, in Europe 66% of the population is affected and 61% wear glasses against 5% of lenses (source Ciba Vision).

b. The global market for vision correction

The worldwide turnover of the optics and eyewear sector is estimated at between 50 and 55 billion euros in 2014. In recent years, it has grown steadily at an average rate of 3 to 4% per year. This growth is supported by population growth, its ageing, particularly in mature countries (increase in the proportion of people over 45 years of age) and by better access to healthcare in emerging countries as living standards rise. In addition, there have been technological advances in optical lenses and the expansion of the range of brands and frame collections.

It is estimated that 4.3 billion people worldwide need vision correction. Of these, only 1.8 billion people (about 25% of the total population) now have equipment to correct and protect their vision. This means that 2.5 billion people still do not have the vision correction they need (including 1.6 in Asia, 0.17 in Latin America & 0.55 in Africa).

Essilor estimates the corrective lens market at 1200 million units in 2014, corresponding to 600 million people. Its value is approximately 11 billion euros. It is 90% supplied by

replacement demand, which occurs between 2.5 and 4 years depending on the country. For several years now, it has been growing steadily in volume and value (+4 to 5%/year).

	2007	2008	2009	2010	2011	2012	2013	2014
Marché (milliards €)	8,9	8,7	9	9	10,3	10	10	11
Marché (million de verres)	965	942	990	1000	1140	1180	1190	1200

Table 1: **World market for corrective lenses (source Essilor and extrapolations**)

The market is divided into Unifocal (single-vision:SV), Bifocal (BF) and Progressive Addition Lenses (PAL) lenses used to correct presbyopia.

	Single Vision SV	Bifocals B	Progressive PAL
2012	43,4%	12,4%	44,2%

Table 2: 2012 world market for corrective lenses by type (source Hoya)

The global contact lens market is estimated at USD 7.6 billion in 2013 (2013 exchange rate: 1usd = 0.7532€), with an average growth rate of 3 to 5%/year. (Source Baird). The US market is the largest (33%) and the Asian market is the fastest growing. Four companies dominate the market: Johnson & Johnson (40%), Alcon (20%), CooperVision (17%), Bausch+Lomb (10%). Lens wearers also own a pair of glasses, but on average they change them much less often.

Refractive surgery is of growing interest. The intraocular lens market was estimated at USD $3 billion in 2014 and is growing at an average annual rate of 5 to 6%. Market growth is driven by the increasing share of cataracts in the aging population. Cataracts are thought to be the cause of 48% of blindness in the world. According to WHO, the number of cataract surgeries performed in 2012 was approximately 19.7 million (19 million in 2010), with four companies dominating the market: Alcon (51%), Abbott MedicalOptics, Bausch&Lomb and Hoya. (Source Marketresearch). However, ophthalmic surgery is not 100% effective, is expensive, and requires many patients to keep corrective lenses for certain activities.

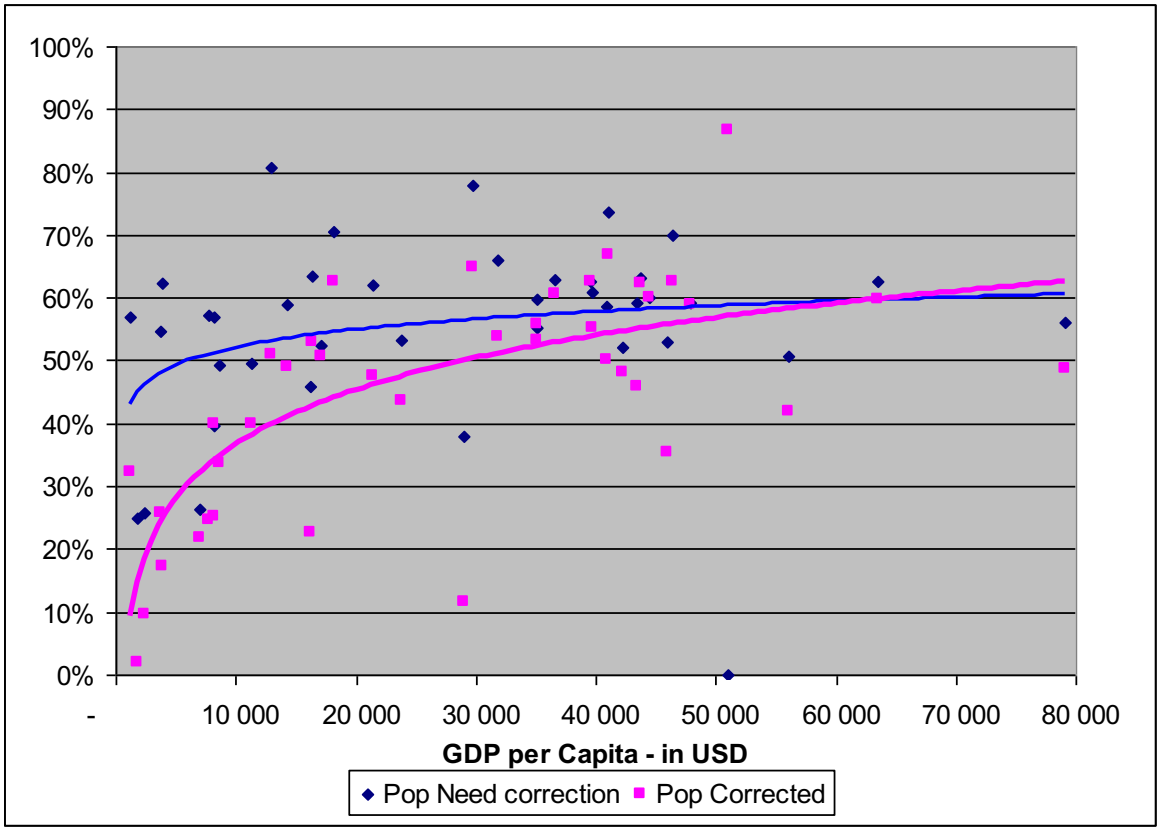
Table 3: Estimate of the value of the various vision markets in 2000 at the global level. Sales are at the "eye care practitioner" level (ECP) and not at the "wearers" level.

in B$ to ECP	**2000 WW**	**Growth in %**
Solutions	1.5	0%
Contact lenses	2.7	10%
Sunglasses	4.0	5%
Frames Prescription	8.1	3%
Lenses Prescription	8.9	4%
Readers	0.7	
	25.9	**1%**
Surgery		

c. Market dynamics

The growth in market volume is partly brought about by the enrichment of the population, there is a strong link between a country's wealth (assessed by GDP per capita) and the

population rate actually corrected for a lack of vision by one means or another. If the proportion of the population in need of a means of correction but not corrected decreases with the GDP per capita, the improvement of the correction rate requires actions relating to detection, i.e. the presence of a team capable of carrying out eye tests (training of personnel, provision of equipment, ability to identify and reach persons in need of correction) and the provision of correction equipment at costs that allow both access by potential carriers. In 1978, Essilor created a screening service that proved to be a good means of communication and promotion for the group. A real medical showcase, this service is primarily aimed at occupational and school medicine.



The distribution between the various correction modes is related to various factors:

- Age: from single-focal lenses (correction of myopia, hyperopia, astigmatism) to progressive or bi-tri-focal lenses (correction of presbyopia), the proportion of contact lens wearers decreases.
- Ethnic phenomena: the share of short-sighted people in the Asian population is much higher, which leads to higher shares of contact lens wearers; it should be noted that since short-sighted people are more important, thin lenses have first developed in Asia.
- GDP per capita: since progressive lenses are expensive, countries with low GDP per capita tend to use a higher proportion of BTFs or *readers* (magnifying glasses) and of course a lower proportion of contact lenses.

In the spectacle lens market, market growth was driven by an increase in the number of wearers and also by a change in the product mix, with higher value-added products:

- the ageing of the population, which leads to an increase in the number of presbyopes.

- the share of high-index products: thinner lenses at the edge or in the center, i. e. lenses with a high refractive index; while the first organic lens had a 1.5 index, the 1980s and 1990s saw the arrival on the market of lenses with a 1.56 index up to 1.74; it should be noted that the penetration of high index lenses in Asian countries is very high.
- safety considerations, particularly in the United States, and therefore the emergence of Polycarbonate lenses (index 1.59).
- the penetration rate of additional treatments: tints, photochromism, varnish and anti-reflection (anti-reflection penetration is particularly high in Asian countries, photochromism is high in the United States).

Until the 1970s, presbyopia was poorly experienced, as a sign of aging. New presbyopes delay the time to consult an ophthalmologist. Today, more and more seniors, most often active consumers with high purchasing power, are interested in the new products offered by manufacturers for presbyopes. Every year, tens of millions of people worldwide reach the age of presbyopia, particularly in Asia. While young presbyopes in new markets, and in most countries, are committed to the benefits of progressive lenses, including, this is not the case for their elders or some countries. Thus American presbyopes have long remained attached to bifocals for a long time. In response, Essilor is seeking to change the discourse related to presbyopia and emphasizes the technological and aesthetic aspects of progressive lenses.

Finally, it is important to note that prices are very different from one country to another; the factors that influence these prices are of course the GDP per capita, but also the competitive structure of markets (percentage of independent opticians compared to organised chains), insurance, whether social security or mutual insurance, the competitive structure of the insurance market (is optics a product on which mutuals seek to differentiate from each other), regulations and in particular the possibility for mutuals to direct insured persons towards opticians. On average, the price of a pair of corrective glasses reaches 470 euros including VAT in France according to the French Union of Consumers UFC. A cost borne very largely by consumers. The UFC calculates that the complementary health insurance reimburses 50.2% of the price and households pay 43.7% directly. The rest (less than 6%) is financed by Social Security. In total, household spending represents 10% of their health budget. As the French equipped with glasses change every three years on average, the average budget per person per year would be around 75 euros, which is much higher than the European average. These would even be the highest prices in Europe (Source: http://www.latribune.fr/entreprises-finance/services/distribution/20130423trib000761176/pourquoi-le-prix-des-lunettes-est-il-aussi-eleve-en-france.html)

d. players in the ophthalmic lens industry

- Ophthalmologists: these are medical doctors who specialize in the eye and vision treatment. They diagnose the eye, using various tests to determine all visual performance parameters, and then prescribe a corrective solution. The prescription of the ophthalmologist is requested by the optician for the delivery of glasses and the management by the.

- Retailers and Optical Chains: there are different distribution channels, independent opticians/optometrists, cooperative groups, shopping centres, optical distribution chains.

Some opticians are grouped together in central purchasing groups to benefit from the strength of a group in terms of negotiation. Distribution chains play an increasingly important role as they attract an increasing number of customers to their stores. A chain such as GrandVision (GrandOptical, Générale d'Optique, Pearle, Vision express, +Vision) has more than 4600 directly operated, franchised or associated stores around the world.

The primary role of these vision professionals is to advise their clients on the choice of lenses based on the prescription and on the choice of frames. Thus, while the acquisition of visual equipment is most often the result of a medical procedure, it is distributors, most often opticians in France, who are the key players in lens prescription. It is in particular he who, through his relationship of trust with his client, will help in the development of progressives, added values (varnish, anti-reflection, photochromism). The optician differentiates himself by his catalogue of frames, the service he offers to his customers as well as the after-sales service and of course by his prices of frames and lenses. They then send the prescription data to prescription laboratories or glass manufacturers (France and Germany). As in France and Germany, they can size round lenses supplied by laboratories and assemble them on the frame.

The distribution structure is very different in different countries. In 2000, 250,000 optical stores worldwide, including 130,000 in so-called mature countries and 120,000 in emerging countries. In mature countries, 18% of these stores are optical chains, accounting for 30% of sales volumes; this penetration in terms of number of points of sale goes up to 40% in some countries; there is also a beginning of segmentation of the chains between "low cost", "medical" and "fashions". In emerging countries, the penetration of chains is only 10%; they are concentrated in the high-end segment. Some distribution chains are integrated into laboratories, mainly in the USA. This is the case with RXOptical or PrescriptionGlasses123. PrescriptionGlasses 123 has 3 production sites worldwide.

- Prescription laboratories and cutting and mounting centres: they transform semi-finished lenses (only one side is finished) delivered by lens manufacturers into finished lenses corresponding to the exact specifications of the optician's or optometrist's order, according to two types of operations that offer a very large number of combinations: surfacing and polishing of the semi-finished lenses and then application of an anti-UV, anti-scratch, anti-reflective, anti-fouling, anti-static, light filtering, anti-mist treatment

In the USA and the United Kingdom, laboratories usually assemble the lens and frame completely and deliver ready-to-wear glasses to opticians, while in other countries such as France and Germany, they limit themselves to delivering round lenses to opticians. Prescription laboratories can be either independent or belong to glass manufacturers or distribution chains. There are rather independent laboratories in the USA. In France, they are all part of the glass manufacturers for historical reasons.

- Manufacturers of ophthalmic lenses (or casters) produce from raw materials either unifocal finished lenses used for simple vision correction, with a low diversity of products, or semi-finished lenses, which are then transformed to process more complex visual corrections, with a very high degree of customization of the products and therefore a much greater diversity of products to be managed for the manufacturer. There are 3 major

global manufacturers (Essilor, Carl Zeiss in Germany and Hoya in Japan), a few medium-sized manufacturers (Rodenstock, Indo, Vision Ease, Younger,...) and 150 to 200 local manufacturers of mainly single vision and mineral lenses. Essilor has gradually become the leader by far in this market. However, it no longer produces mineral lenses.

- Frame manufacturers: frames are made either from metal or plastic; they are often designed by leading fashion designers whose name promotes their sale. Luxottica is the world's leading manufacturer of frames. The group also has prescription laboratories, retailers and distribution chains, and a small lens production unit.

- Chemists and Glassmakers: raw materials are developed and produced by chemists for thermosetting or thermoplastic resins used for plastic lenses or by glassmakers for mineral lenses. A pair of glasses weighs 7 grams and raw materials represent only 15% of the cost of a lens (most of the cost is related to innovation). The main manufacturers of high-performance resins are based in Japan.

Section 3. The development of the Essilor Group

Between 1980 and 2000, Essilor enjoyed **steady growth in** revenue, with an average growth rate of 13%. In particular, the group won and then consolidated its position as **world leader** by regularly widening the gap with its global competitors (Table 1). The group is experiencing **strong geographical growth**, particularly with the integration in 1997 of companies acquired in the United States. Since 1997, Essilor has been truly global, both in terms of the geographical distribution of its activities and the diversity of the people who work for it, several dozen different nationalities, spread over the five continents. Its sales are still growing at a steady 9% annual average rate over the last ten years.

VERRES OPTHALMIQUES
CA EN M€

		CA 1980			CA 1992	CAGR 80 to 92			CA 2002	CAGR 92 to 02
AOC	USA	260	ESSILOR	FRA	825	13%	ESSILOR	FRA	2250	11%
B&L	USA	245	SOLA	USA	460	21%	HOYA	JAP	800	6%
RODENSTOCK	GER	245	HOYA	JAP	430	14%	SOLA	USA	530	1%
C.ZEISS	GER	245	RODENSTOCK	GER	365	3%	TRANSITIONS	USA	380	
ESSILOR	FRA	200	C.ZEISS	GER	275	1%	RODENSTOCK	GER	320	-1%
UKO	UK	90	AOC	USA	150		C.ZEISS	GER	300	1%
HOYA	JAP	90	GALILEO	ITA	90		SEIKO	JAP	150	
NIKON	JAP	90	NIKON	JAP	90		VISION EASE	USA	125	
INDO	SPA	45	SIGNET	USA	75		SIGNET	USA	125	
SOLA	USA	45	SEIKO	JAP	75		INDO	SPA	110	*4%*
TOTAL TOP 10		1555			2835	5.1%			5090	6.0%
TOTAL MARCHE		3000			4800	4.0%			7000	3.8%

Table 1

a. Internationalization.

In Europe and the United States, most of Essilor's subsidiaries have a history that is often very old and originates in the distribution and import networks of Essel and Silor. "At the time, even if it wasn't profitable, we knew we had to be there," says Gérard Cottet, son of Raymond-Jules Cottet and President of Essilor from 1991 to 1996. Our policy of relying on men has been successful. Gradually, Essilor acquired most of its European distributors and this has enabled it to benefit from a network that has long been in line with the company's working methods and organization. "Essilor's global dimension has its origins in a mosaic of cross-fertilized destinies: subsidiaries created from scratch, distributors but also family businesses created at the beginning of the 19th century and acquired by Essilor.

Internationalization requires the establishment (via FDI and direct investments abroad) first of commercial subsidiaries and then of production and R&D sites. The value created for the company by location results from the difference in labour costs between countries. It is only significant for productions that require a high level of manpower and are relatively un-automated.

b. Integration of prescription networks.

While in Europe, the activity started directly by integrating the labs and therefore selling to opticians, the integration of American labs will only start in 1995 with the acquisition of Omega labs and continue to this day. Thus, a lab acquisition policy will be implemented in Australia and England. The challenge is to capture the customer base of these labs, which are opticians, to direct their purchases towards products manufactured in the group's factories, thus capturing the entire value chain margin and optimizing the factories' production costs as well as the costs of the entire supply chain.

The key issue of any vertical integration is the power of the network. Vertical integration means (unless you buy out all the players) that you will have to compete with your own customers and, in Essilor's case, Essilor's laboratories will compete with those that have remained independent. This only works if the products sold by Essilor are essential to independent laboratories.

Several factors enable Essilor to embark on this integration:

- product performance: Essilor has the best progressive lens design on the market, which guarantees that wearers adapt well and therefore that opticians do not have any problems, but also the best anti-reflective lenses or the best varnishes.
- the power of the brand: Varilux or Crizal are recognized by wearers or opticians as quality products that an independent laboratory cannot "not have" them; Essilor can even charge them slightly higher prices.

The power of the brand is expressed in several ways:

- the ability to allow for additional pricing
- losses of customers of a distributor who does not have this brand

and is measured in part by brand awareness, i.e. the percentage of consumers surveyed who recognize the brand, whether in assisted awareness, within a list of brands (*aided awareness*) or without a list of brand names (*unaided awareness*).

c. The Group's innovation policy

Innovation is a key success factor in that it increases prices by delivering differentiated benefits for eyeglass wearers and/or opticians who prescribe them. Innovations focus both on lens design, as shown by successive versions of progressive lenses, in particular the launch of the Varilux Comfort in 1993, but also on materials and treatments (varnish, anti-reflective, photochromic).

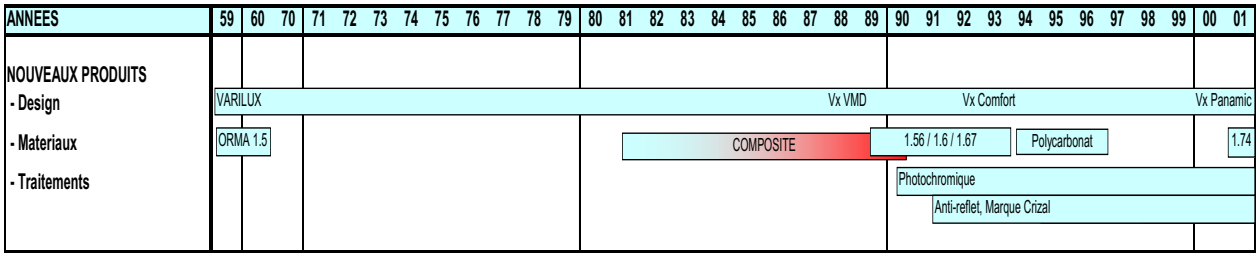


Table 2

Since 1972, Essilor's industrial property department has filed twenty to thirty patents per year. However, innovation is profoundly transformed during the group's development, it becomes

multidisciplinary and becomes more professional. At the end of the 1990s, the group's scientific and technical community represented more than 400 people in France and the United States and the group devotes 5% of its turnover to R&D. The R&D department is structured into three main divisions corresponding to the major areas of expertise that make Essilor the technological leader in ophthalmic optics. A project management team is being set up to make the best use of the resources available in the three areas of expertise. Strategic marketing, which ensures that market needs are aligned with Essilor's offering, now plays a key role in research management. A small monitoring team is based in Japan.

Following the success of Orma (index 1.5), no major innovations were developed in materials for two decades. Research conducted for composite lenses did not lead to product launches and was abandoned at the end of the 1980s. New materials, derived from CR39, appeared and led to the launch of Ormex lenses, thinner and lighter but with an average refractive index (1.56) in 1991 and Ormil, with a high refractive index (1.6), for maximum lens thinness, in 1995.

Polycarbonate appears to be the most serious competitor of CR39 derivatives due to its good performance and impact resistance forty times higher than standards and its better protection against ultraviolet rays. In 1969, Gentex, a New York textile company founded in 1890, to whom the American army, to whom it supplies silk parachutes, asked to design helmets with a transparent visor, became interested in the ophthalmic qualities of polycarbonate and decided to manufacture these visors in this material, then protective glasses, sun lenses and finally, in the 1980s, corrective lenses. Through research, Gentex improved the techniques associated with polycarbonate manufacturing, increased diversification and established itself as the leader in polycarbonate lenses under the name Gentex Optics before being acquired by Essilor in 1995. Finally, it is the creation of a joint venture (joint venture or JV) with Nikon that will provide access to index materials 1.67 and 1.74. in 19

The first anti-reflective coatings date back to the 1960s. In the 1970s, Esilor designed the single anti-reflective coating on plastic lenses in 1975, multi-layer on mineral lenses in 1978 and multi-layer on plastic lenses in 1983. At the same time, Essilor is learning to master anti-scratch and anti-fouling treatments. In its applied chemistry laboratories, the company is developing a new family of organosilicon varnishes adapted to the different polymers used in the manufacture of plastic lenses. In 1994, Essilor produced Crizal, a multi-performance organic lens that incorporates a highly curing specific varnish, a high-efficiency multilayer anti-reflective coating and a final waterproofing coating that makes the lens waterproof and oleophobic. The first organic photochromic lens was introduced by PPG, Essilor's supplier in 1989, when all competitors in the sector tried in vain to produce such a lens. Essilor reacts immediately. An agreement leading to the creation of a joint venture was signed with PPG in May 1990. At the end of the same year, Essilor launched Transitions lenses, which will become a worldwide success, particularly with the more elaborate Transitions III lenses. The sophistication of treatments and products, which are increasingly tailor-made, are indeed at the heart of the competition.

d. Essilor's value chain

Research Centres

Essilor has 4 research centers, 1 in France, 1 in Florida, 1 in Singapore and 1 in Japan as a joint venture with Nikon. Innovation is very important for Essilor, which devotes 5% of its revenue to the development of new products and processes.

Key figures (source: Essilor website)

- 143 new patent applications filed in 2017
- 8,780 patents filed worldwide
- 450 researchers worldwide
- 4 Research Centres including 3 Innovation & Technology Centres
- + 200 million invested in 2017 by Essilor in research & innovation

Production Units

25 plants specializing in the manufacture of corrective lenses, 14 of which are owned by the Group (4 in North America, 1 in South America, 4 in Europe and 5 in Asia) and 11 plants in partnerships, which have enabled the Group to develop its international positions, its product offering and its technological portfolio.

Jointly owned plants: 1 in Japan with Nikon (1999), 1 in Korea with Samyung Trading Co. Ltd (2002), 5 in China including 1 with Samyung Trading Co (2002), and 1 with Wanxin Optical (2010), 1 in Vietnam, 1 in Israel with Shamir Optical (2011), 1 in the United Kingdom, 1 in the USA).

These plants produce finished lenses (mainly single vision lenses) and semi-finished lenses.

Prescription laboratories & assembly cutting centres

Since 1980, Essilor has invested in prescription laboratories that transform semi-finished lenses into custom finished lenses. It continues to develop its network, particularly in China and Thailand, and currently has 490 laboratories worldwide. This active acquisition policy allows the Group to better penetrate certain markets, by developing a local presence, understanding the specific local needs of opticians, and using a channel to introduce its products and services.

Laboratoires de Prescription					
	Europe	Amérique du Nord	Asie Océanie	Amérique du Sud	Total
2004	32	116	32	3	183
2007	42	155	63	10	270
2008	45	170	68	10	293
2009	45	180	74	12	311
2010	45	190	81	16	332
2011	47	166	153	24	390
2012	47	163	161	31	402
2013	45	200	174	35	454
2014	44	169	244	33	490

Table 3. Essilor Prescription Laboratories (source Essilor)

Distribution centres.

These distribution centers or continental stocks ensure the reception of finished and semi-finished lenses and their shipment to distribution subsidiaries and prescription laboratories. Sixteen centres are located around the world: 6 in Asia, 5 in Europe, 3 in North America and 2 in Latin America.

The distribution of the products of the Essilor group and its subsidiaries is then carried out by:

- the Group's subsidiaries or networks in the countries where Essilor operates;
- or distributors when the Group does not have its own subsidiaries.

Section 4. Competitive dynamics, Essilor and its competitors

a. Essilor's positioning

The Essilor Group is organized into three divisions:

- Glasses and optical equipment (for opticians).
- Prescription laboratory equipment: created in 2008, with the acquisition of Satisloh, a world leader in prescription laboratory equipment.
- Readers: In 2010, Essilor acquired FGX International, the North American leader in non-prescription reading lenses. This acquisition led to the creation of the Readers division

Essilor designs, manufactures and customizes corrective lenses adapted to the visual needs of each individual, in all market segments and on all continents. Essilor is present in all lens categories with global brands, the most representative of which are:

- Varilux and its various versions for progressive lenses, including Varilux S series, a new range of lenses launched in 2012;
- Crizal and its various versions for lenses with anti-reflective, anti-fouling and antistatic surface treatments, including CrizalPrevencia, a new generation of anti-reflective lenses launched in 2013.
- Optifog for anti-fog lenses, a category that was created in 2011;
- Xperio for polarized lenses;
- Nikon, Transitions (photochromic lenses) and Kodak, brands used under agreements with Nikon Corporation, Transitions Optical Inc. and Kodak.

Essilor is pursuing a policy of stimulating demand by developing information campaigns and screening for visual defects, as well as initiatives to make visual correction accessible to as many people as possible. Its sales have increased constantly by 9% at an average annual rate over the past 10 years

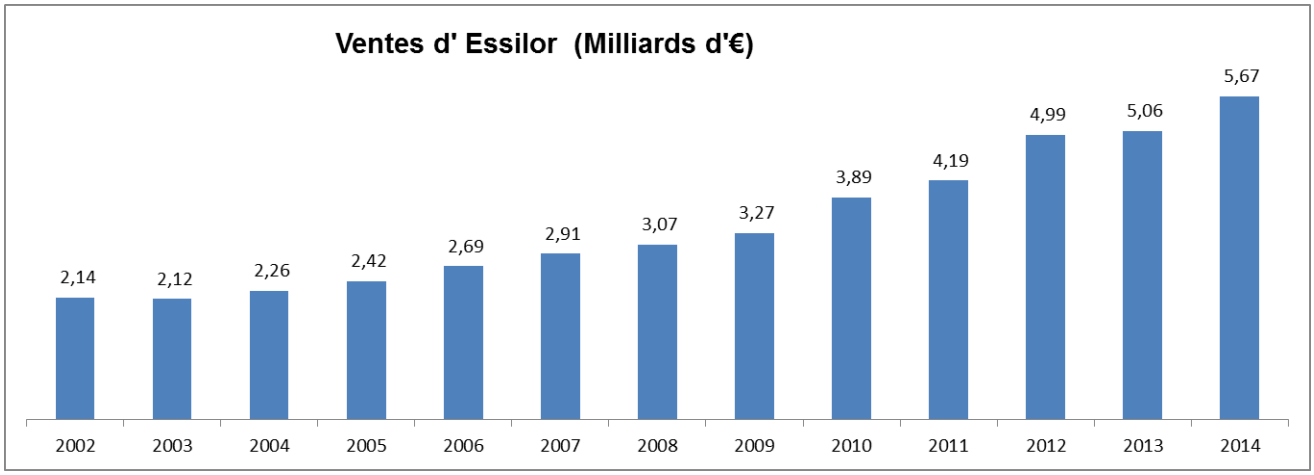


Table 4: Essilor sales (€ billion) - Source Essilor

Verres de Prescriptions	2007	2008	2009	2010	2011	2012	2013	2014
Production (millions d'unités)	241	245	255	280	350	430	432	465

Table 5: Essilor sales (million lenses) - Source Essilor

	Verres et Matériel optique				Equipe-ments	Readers	Total
	Europe	Amér. nord	Asie Océanie	Amér. sud			
2007	1,32	1,21	0,27	0,11			2,91
2008	1,36	1,25	0,30	0,13	0,04		3,07
2009	1,33	1,35	0,34	0,13	0,10		3,27
2010	1,40	1,51	0,45	0,19	0,15	0,19	3,89
2011	1,47	1,52	0,56	0,25	0,19	0,21	4,19
2012	1,57	1,78	0,78	0,32	0,20	0,34	4,99
2013	1,57	1,77	0,81	0,35	0,21	0,36	5,07
2014	1,65	2,04	0,90	0,38	0,20	0,50	5,67

Table 6: Essilor sales by geographic region (€bn) - Source Essilor

	2008	2009	2010	2011	2012	2013	2014
Evolution annuelle	0,17	0,19	0,62	0,30	0,80	0,08	0,61
En base homogéne	0,13	0,00	0,10	0,19	0,22	0,11	0,19
Effet de périmètre	0,15	0,15	0,34	0,19	0,39	0,17	0,49
Effet de Change	-0,12	0,04	0,19	-0,08	0,19	-0,19	-0,07

Table 7: Breakdown of sales growth (€ billion) - Source Essilor

This growth is driven in particular by the launch of value-added products supported by strong advertising campaigns. Increased differentiation also has a positive price effect on these products. Essilor has 4 research centers, 1 in France, 1 in Florida, 1 in Singapore and 1 in Japan as a joint venture with Nikon. Innovation is very important for Essilor, which devotes 5% of its revenue to the development of new products and processes. Each year, the Group devotes a significant portion of its revenue to Research and Development and Engineering as well as to the development of new processes ('150 million in 2014).

The innovation mainly concerns the combination of new developments related to materials (new plastics), designs (progressive lenses) and treatments (anti-reflective, anti-fouling and photochromic above all). In addition, the digital surfacing technology used since 2006 has made it possible to develop new generations of progressive lenses combining a revolutionary method of calculating glass optics (design) and a high-precision production technique. This innovation in products, services and technologies results in the launch each year of a significant number of products with improved performance and new benefits for wearers with unresolved visual problems. Nearly 45% of the group's sales are generated by products that have been on the market for less than three years.

	2009	2010	2011	2012	2013	2014
Nb de nouveaux produits	120	240	235	232	200	300

Table 8: Number of new products launched per year - Source Essilor

Essilor relies on the mid-range to get back on track
By Gaëlle Fleitour - Published on August 29, 2013, at 4:50 pm

After a rather disappointing first half, the Frenchman, the world leader in ophthalmic lenses, plans to use his talent for innovation and marketing to reach consumers with the lowest incomes. For once, Essilor is experiencing a little less well. In the first half of 2013, the French group posted revenue of €2.576 billion, up 1.8%, and profits of €310 million, up 3.2%. This is not much, considering the spectacular results traditionally presented by the world leader in ophthalmic optics. The reason? The first half of 2012 had been particularly good, boosted by the difficulties of the Japanese competitor Hoya, whose flagship plant had been shut down for six months following the floods that occurred in autumn 2011 in Thailand. Like most major groups, Essilor is also seeing a slowdown in growth in emerging markets, even though they now represent 20% of the group's revenue.

Worse still, while the French had recorded a spectacular 19.1% increase in turnover in 2012 to €4.989 billion, it has just revised its forecasts downwards for 2013, expecting growth of nearly 7%. Because Essilor should lose 40 million orders this year from a major European customer from whom it wanted to sell, and who, in retaliation, changed supplier even before the end of the contract... "There is no risk of this happening again with another customer," says Hubert Sagnières, the group's CEO. He prefers to focus on Essilor's major project for the second half of 2013 and 2014: to strengthen its position in the mid-range segment worldwide. This market is expected to grow by 5%, with 205 million annual consumers, compared with 2.5% for Essilor's traditional high-end segment and its 155 million customers.

To achieve this, the company, ranked among the 30 most innovative companies in the world by Forbes, intends to use its agility and marketing talent. By adapting its top-of-the-range innovations, such as its E-SPF 25 lenses to protect the eyes from UV rays, to the mid-range market (count an additional two euros per lens for protection). Inspired by the strategy used for sunscreens, Essilor will launch lenses with "better than the competition but more affordable" protection, with protection ratings of +15 and +10, costing one euro and fifty cents more per lens respectively. Polarized lenses will also be available for the mid-range segment, using "appropriate materials and know-how". Finally, consumers in this segment will also benefit from their own little innovation: "customized" lenses for right- and left-handed people! The part of the lens they use for near vision is not the same, Essilor assures us. We can trust him to put in the resources and try to make us forget a disappointing first semester.

b. The competitors

Hoya is the second largest supplier in the world with a market share of 8%. The group has two activities, Information Technology (Imaging and Electronics) **and Life Care** (Production and distribution of ophthalmic lenses, medical endoscopes and intraocular lenses).

Hoya 2014 Ventes par Division (€ milliards)		
Technologie de l'Information	Photomasks for LCD, Glass disks for hard disk drives	0,8
	Optical lenses/glasses, Lens modules for digital	0,3
Soins pour la Vie	Eyeglass lenses, Contact lenses & accessories	1,4
	Medical endoscopes, Intraocular lenses, Bone	0,5
Autres		0,0
Total		3,1

The Group is focusing its growth on the Life Care business, which accounts for 56% of sales in 2013 and 62% of sales in 2014. The ophthalmic lens sector represents 27% of the Group's total revenue. Hoya is commercially present in 52 countries, 31 of which are direct sales. The headquarters is in Thailand. Hoya is pursuing a strategy of international expansion in both developed and emerging countries. It is based on its technology, on the one hand, a patented lens design, and on the other hand, surface treatment, the efficiency of its production plant in Thailand, its frame adjustment process and its remote control system.

Activités	Total	Europe	Asie	Commentaires
Usines de Production	6	1	5	Thaïlande 2, Chine 1, Vietnam 1, Philippines 1
Laboratoires de Prescription	6	1	5	Thaïlande 3, Philippines2

Table: Number of Hoya prescription lens plants and laboratories (source Hoya)

Carl Zeiss Vision gmbh is the third largest supplier of ophthalmic lenses with a market share of 7%.

The Group is involved in the fields of optics and optoelectronics. It is active in the semiconductor industries for automotive and mechanical engineering, medical and biomedical technology, ophthalmic lenses, microscopy, metrology and home optics (camera lenses, planetariums).

Carl Zeiss Ventes par Division (€ milliards)	
Semi conductor Manufacturing Technology	1,0
Medical Technology	1,0
Vision Care	0,8
Microscopy	0,7
Industrial Metrology	0,6
Consumer Optics	0,2
Total	4,3

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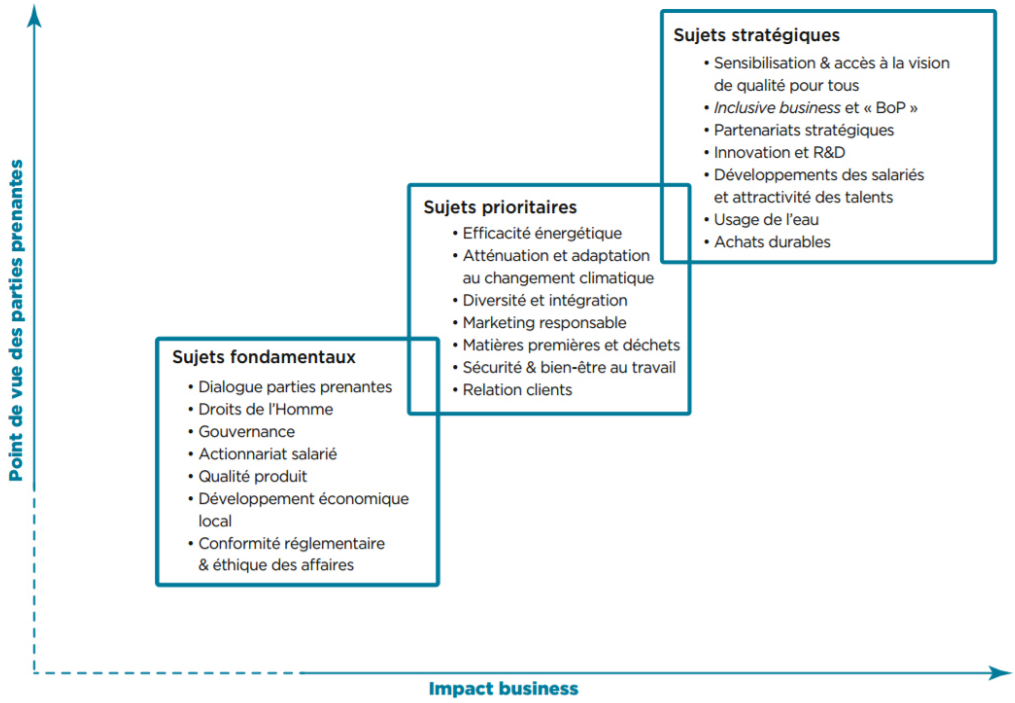
The Vision Care division produces both ophthalmic lenses, ophthalmic examination devices and services for opticians.

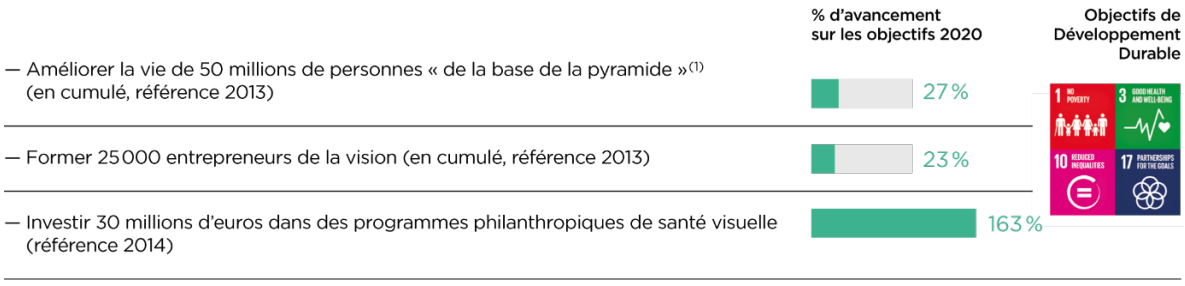
The group is present in more than 30 countries, with 33 production plants and 50 distribution sites (including 27 in Europe).
It seems to be moving towards a "high-end" strategy, offering more efficient products (such as "automatic" tinted lenses). The group sold more than 100 million ophthalmic lenses in 2013, and Zeiss also offers contact lenses produced and marketed by Wöhlk.

Section 5. Corporate responsibility and governance

https://www.essilor.com/fr/engagements/



Providing people with concrete social and economic benefits: "improving vision to improve life".



https://www.essilor.com/fr/medias/communiques-de-presse/essilor-confirme-sa-solide-reputation-en-matiere-de-rse/

Corporate Knights revealed yesterday, at the Davos Forum, that Essilor is ranked among the 100 most responsible companies in the world for the second year in a row.

Section 6: Innovation and Renewal

https://www.acuite.fr/actualite/economie/

Essilor moves up in the Forbes ranking of the world's most innovative companies
22/06/2018 |
For the eighth consecutive year, Essilor ranked among the most innovative companies in the Forbes ranking. This American magazine produces an annual ranking of the 100 companies identified by investors as having the highest innovation potential. In the 2018 Forbes ranking, the glassmaker ranks 52nd (+16 places compared to 2017).
The launch in 2017, after 5 years of R&D, of the Varilux X series progressive lens "illustrates the group's capacity for innovation". In addition, in 2018, as part of a partnership between Transitions Optical and Johnson & Johnson Vision, photochromic technology will be deployed for the first time on contact lenses.
"Innovation is a historical pillar of our mission and strategy. As a leader in our industry, we consider it our responsibility to provide solutions to correct and protect the vision of everyone, everywhere. Our innovation approach is in line with today's collaborative, creative world, with networked operation to adapt to the ever-changing lifestyle of all those who wear glasses and to meet the unmet needs of the 2.5 billion people who suffer from uncorrected poor vision on a daily basis," commented Laurent Vacherot, Essilor's Executive Vice President.

Essilor is making a change by changing its R&D and marketing methods
01/03/2017 |
"Essilor is moving away from traditional research and development (R&D) methods and product design towards an innovative approach focused on customer needs," said Alain Riveline, Essilor International Vice President of Strategic Marketing, at the 2016 earnings conference with financial analysts.
The French glassmaker is beginning a new shift in its approach to innovation. "Until now, it was based on technique and know-how, physical and chemical properties, engineering and optical design. We decided to completely change this approach by focusing on the consumer's vision," he said.
How? How? By studying social networks, online communities and selfie videos. Essilor has also created a laboratory to test products "in real-life situations, not just clinical situations". "A whole year was spent studying social networks. We have also created our own online communities in China and the United States, which has put us in touch with thousands of carriers. We know the prescription they carry. We submit questions to them and have an ongoing dialogue with them," comments Alain Riveline. According to Alain Riveline, the first product to be developed using these new methods will be a Varilux progressive lens for the new generations of presbyopes. They represent 1.5 billion people worldwide, with 100 million new carriers each year. This launch will be accompanied by "a new in-store personalization experience," concludes enthusiastically the Essilor International Vice President of Strategic Marketing.

Extract from the Group's website
https://www.essilor.com/fr/mission/innover-au-service-de-tous/linnovation-selon-essilor/

An evolving vision health market

The vision health market is changing. Today, it is driven by several major societal trends such as the aging of the population, the development of digital uses and new consumers with limited financial resources. To meet these new challenges, the ***Essilor group spends more than 200 million euros each year on research and innovation****. 45% of the products we sell today were designed less than 3 years ago.*

Innovation at the heart of our mission

INNOVATION BY ESSILOR

Innovation has always been a major pillar of our strategy. Innovating today for Essilor means taking into account, in a permanent and evolving way, the needs of consumers in order to meet them with the most advanced expertise. It also means organizing to be constantly on the lookout for new scientific discoveries, to engage in long-term commitments with our external research partners and to recruit the best skills from our teams.

INNOVATE TO MEET NEW VISUAL HEALTH NEEDS

Optical lenses are high-tech products. While innovation is essential for us, it is also very important to continue to develop existing solutions. This allows us to respond to all the new needs related to changing demographics or changes in our lifestyles. We find solutions first by being highly innovative in terms of technology, developing new manufacturing processes or creating new categories, such as Eyezen™ lenses, perfectly adapted to our connected lives. The Essilor Group also enhances all levels of its product range, from customized lenses to the simplest equipment. In this way, we provide efficient and accessible solutions that meet the needs of each consumer.

Anticipating tomorrow's needs

Poor vision is the world's leading disability: ***4.6 billion people need vision correction****. There will be 5 billion of them in 2020. Needs are changing, particularly as a result of demographic ageing and changing lifestyles. All over the world, the intensive use of screens is creating new needs for prevention and protection.* ***Essilor's ambition is to protect the sight of the world's 7.4 billion people****. Launched in 2015, the Eyezen lens range was born from one observation: our digital environment generates visual fatigue that affects 3 out of 4 people today. To meet this new need for protection, Essilor R&D teams have combined two technologies, Eyezen™ Focus, which allows visual correction to be adapted to the reading distance of each digital medium, including "ultra close" vision, and a technology that filters light and thus protects the eyes from harmful blue-violet light emitted by digital screens in particular.*

Essilor has always developed its progressive lenses by studying the wearers of glasses. The glasses
Varilux® X series™ are designed to meet the changing needs of presbyopes. These are the only progressive lenses that incorporate Xtend™ technology, a revolutionary approach that allows you to see clearly in the vision area within arm's reach. No need to constantly move your head to find the right area of vision, which very often happens with ordinary progressive lenses.

Varilux® X series™ is the result of five years of research and development, studies conducted with thousands of eyeglass wearers and 15 new patents (1).

Essilor, alone against all, by Gaëlle Fleitour - Published on November 14, 2013 | The New Plant

Essilor defends its position as the world leader in optical lenses against new entrants. The world leader in ophthalmic lenses is seeing its business model shaken by new entrants: pure web players, glass competitors and low-cost distributors.

The king of ophthalmic optics

- Turnover €5 billion in 2012 (+19%)
- Net income €584 million 2012 (+15.5%)
- Market share 40% worldwide, 75% in France

We must protect the health of the French people's eyes against these "*cowboys who do not look out for the consumer's interest*", Hubert Sagnières asserts. Essilor's CEO counter-attacks new entrants who threaten its near-monopoly in the ophthalmic lens market. First targeted, Marc Simoncini, the founder of the Meetic dating site, who drew the first one by launching Sensee, a site selling glasses and lenses, in March 2012, with the objective of halving prices by 2020. Marc Simoncini accuses Essilor of "*locking down the optical market*" by refusing to provide "the bottom of the market that online distributors are". Half a dozen pure web players (Happyview, bought by the M6 group, Direct Optic) want to dethrone physical opticians. Their argument is the continued decline in the purchasing power of the French. "The *latter tend to postpone the purchase of eyeglasses or spend less on them,*" confirms Delphine David, from the research firm Xerfi-Precepta. As a result, "*despite powerful structural drivers, such as an ageing population, the economic situation is slowing down the growth of the optical market, from 5% in value in 2011 to 2.5% in 2012, and is expected to decline to 1% in 2013".*

It is understandable why tension is rising on both sides! Even if Essilor refuses to block online sales. "The *Internet may be appropriate for certain product categories, such as contact lenses, of which 15% are sold on the web, or sunglasses, but not for complex corrective lenses such as the latest generation progressive lenses*," says Hubert Sagnières. In fact, web cowboys have to prove themselves on the virtual fitting of frames and struggle to free themselves from the adjustments at the optician's. The result: "The *market share of online corrective lenses is limited to less than 1% in France, 3% to 4% in the United States and 6% to 7% in Sweden, a country with a strong mail order history*," says Maher Kassab, president of the consulting firm Gallileo.

For the moment, because the consultant Pascal Perri believes that Sensee and the other pure players can disrupt the market, like the role played by Free in telecoms, by sooner or later forcing "*the players to lower their prices, without causing an economic apocalypse on the market"!* As proof that the threat is taken seriously by Essilor, it has invested in eyewear sales sites by quietly buying two online distributors in the United States in 2010 and May 2013! *"You won't find our brands or progressive lenses there, but it satisfies consumers who want a frame at 3 a.m.,*" Hubert Sagnières explains.

However, the immediate threat to Essilor does not come from these e-opticians. For the second time in three months, the group has revised its growth targets downwards: 6% instead

of the more than 7% expected in 2013. These weaker results are the result of a slowdown in emerging countries, a slow recovery in the United States... and Asian competition. With its cheaper products, Japan's Hoya, the world's third largest glassmaker, had doubled its market share in France in five years, reaching 13%. This increase was slowed by the floods in Thailand in autumn 2011, with production at its main plant being suspended for six months. But, with massive investments in its European sites and aggressive commercial offers, Hoya took its main customer from Carl Zeiss, Germany's number two, forcing it to restructure heavily in France. He could also benefit from Essilor's termination of its contract with the Hal group (owner of the GrandOptical franchise), which paid him €40 million a year.

The French company Essilor is also being attacked by low-cost retailers. In France, they would have taken 20% of the market. It was the Dutch optical chain Hans Anders that dug up the hatchet in 2008 by setting up its stores in France and a grinding and assembly centre in Reims (Marne), which carries out all the assembly work, traditionally done by opticians. Lenses are provided discreetly by major manufacturers - including Essilor - provided they are unsigned white marks. Only Hoya displays his name. "*With more than 450 stores, our purchasing power from the most renowned glassmakers is considerable," says the Hans Anders group. The discounts we receive are immediately reflected in our sales prices*." Dutch offers a choice of 1,000 frames at 35 euros and "*half the price*" lens prices. But it is struggling to increase the number of shops in France, just like its competitor Lun's, the low-cost Krys brand. "*Lowcost works in countries where people pay for glasses out of their own pockets,*" explains Mathieu Escot, health policy officer at UFC-Que-Choisir. This does not mean that the ambitions of a new entrant, named Leclerc, cannot be curbed. With its 69 Leclerc Optique stores, the distributor claims to "*offer prices that are 10% to 25% cheaper on 2,000 optical references (basic unmarked products and national brands)*". On the spot, you can find Essilor lenses... Probably because Leclerc is ready to trim on its margins to shade traditional opticians.

Opticians are also threatened and defend themselves. After Optical Center, Krys and Optic 2,000 launched online sales sites, offering lower prices or the possibility of comparing products. But it is always in their shops that the customer withdraws his order. This is the model chosen by the Evioo website, launched in 2010 by the former boss of the Spartoo online shoe store. Lenses and frames are selected online, but fitted by partner opticians. With Essilor's customers in the loop, the company played along... discreetly. His name does not appear on the site. Only Zeiss agreed to sell its own brands there. *"We have been able to develop agreements with the main glassmakers, while reducing our margins: we offer glasses that are 40% cheaper and of the same quality,*" says Philippe Wargnier, Evioo's co-founder. A drop in margins that, in the long term, threatens the entire supply chain.

France, a true Eldorado of optics

With an optical market of €5.8 billion (57% of which is for lenses), France is a hot topic of interest. Despite competition between no fewer than 11,000 optical stores, the Court of Auditors and the government agree: eyeglass prices are too high. At 470 euros on average per pair, they are the most expensive in Europe according to UFC-Que-Choisir. Of course, progressive lenses, which are very expensive, are particularly popular in France. But not only that. "Six players share this market," says Marc Simoncini, the founder of Sensee. Essilor holds the near-monopoly of lenses, Luxottica and Safilo share most of the branded frames, and five major retailers account for 70% of sales!" For UFC-Que-Choisir, it is the excessive margin level of opticians that is at stake, because "the impact on the total invoice of manufacturers' prices

is not that significant". Price opacity, market complexity with more than 100,000 lens references... Responsibilities seem to be shared.

"New entrants open new markets"

Jérôme Pouyet, competition specialist, research fellow at the CNRS and professor at the École d'économie de Paris

You estimate that opening up the optical market would result in savings for consumers of between €330 million and €1.5 billion...?

There are few economic analyses available in the optical market. At the request of Altermind, I therefore drew, with the economist David Martimort, from all possible documentary sources, with their imperfections, to carry out a study, without knowing that it was intended for Sensee. In France, surprising things are happening, with prices appearing higher than in other countries.

In your opinion, Essilor is one of the main contributors to these high prices...?

Upstream of the chain, the producer manufactures lenses, used by distributors to make glasses. The price of lenses therefore largely guides the price of glasses. What is spectacular in France is Essilor's dominant position upstream. In this kind of situation, economists suspect that this results in high prices for distributors, which, despite their strong competitive situation, reflect the same prices. To have a competitive sector, you need competition at all levels! In 2010, Essilor and four other lens manufacturers were condemned by the German competition authority for illegal price fixing[which the French group contests, having filed two appeals]. Collusion is all the easier when competition is concentrated....

Can web players lower prices?

In the United States, the market share gained by online distribution has led to a reduction in prices with a view to offering new products in untapped markets. The "readers" segment, for example, these pre-mounted and inexpensive glasses, has developed well in some countries. This should reassure producers like Essilor: entrants are not only there to break prices, but also to open new markets!

The Essilor empire counterattacks the pure-players of online optical sales, by Elodie Vallerey. Published in the magazine l'Usine Nouvelle - Published on February 27, 2014, at 5:39 pm

On February 27, the group announced the signature of an agreement to acquire Coastal Contacts, publisher of the online sales website Coastal.com, one of the world leaders in the sector. For 430 million Canadian dollars ('282 million), Essilor has 5 million potential customers worldwide, mainly in North America, Europe, Asia-Pacific and Brazil.

Hubert Sagnières, who has been a long-time critic of newcomers to the ophthalmic lens market since late 2011, used arguments to attack the envious of his near-monopoly, with pure Internet players such as Sensee (created by web entrepreneur Marc Simonicini), HappyView and Direct Optic at the top. "The *Internet may be appropriate for certain product categories, such as contact lenses, of which 15% are sold on the web, or sunglasses, but not for complex corrective lenses such as the latest generation progressive lenses,*" he said at a press

conference in late 2013. In recent years, Essilor has begun to wage war against its virtual "enemies". By making small investments on the Internet, especially in the United States, with the acquisition of FramesDirect, EyeBuyDirect and the MyOnlineOptical platform, the group has taken positions from these new types of competitors.

With the acquisition of Canadian company Coastal.com (€143 million in revenue in 2013), Essilor's CEO is now taking two essential steps towards the sustainability of his group: online sales and B2C commerce, ideal for eliminating intermediaries. "The *Internet has an undeniable role to play (...). In our industry, as in many others, the purchasing process is diversifying and the Internet, if properly used, can contribute to market growth by promoting consumer education and facilitating access to visual health,*" Hubert Sagnières concedes in the press release. After the takeover of American online distributors in 2010, the French boss justified himself: "*You won't find our brands or progressive lenses (Varilux) there, but it satisfies consumers who want a frame at 3am*". A line that should not be crossed after the acquisition of Coastal.com now ensures Essilor.

Essilor acquires an e-commerce site for eyeglasses

JDN Net log 13/05/2013 12:26

The world leader in ophthalmic lenses has acquired a majority stake in EyeBuyDirect.com, an eyewear retailer active in the United States, China and Hong Kong.

Corrective lens manufacturer Essilor has acquired a majority stake in the EyeBuyDirect.com e-commerce site, which sells eyeglasses online in China, Hong Kong and the United States. "*At Essilor, we embrace the Internet as a wonderful tool to provide access to vision correction to as many people as possible around the world,*" commented Jean Carrier, CEO of the French group's American branch, Essilor of America. "*It will become increasingly important for opticians to adopt an all-round strategy and use e-commerce and mobile to complement the traditional in-store shopping experience. Essilor is committed to providing these services that will enable opticians to be competitive in this field*."

Known in France for refusing to sell its lenses to pure online eyewear players, Essilor is therefore expanding its portfolio of directly operated online stores, which enable it to control its distribution network, customer relations and access new markets around the world. In 2010, the group had already acquired a majority stake in the FramesDirect.com eyewear retail site.

Helping opticians move to e-commerce

Excerpt from the Essilor website: E-novation Magazine section (accessed December [1], 2014)

The rise of online shopping by consumers has created opportunities, but also challenges for most traditional sales professionals. Many optical products, such as glasses and contact lenses, are now sold through this channel. And this trend is expected to continue to grow in the coming years, driven by new technologies. To help opticians and optometrists seize all Internet-related opportunities, Essilor offers them ad hoc technological tools. Good visual health requires regular checks by an optical professional, who carries out complete check-ups. With the prescription in hand, the patient can then obtain the prescribed optical products in different ways. While many people remain loyal to the advice and services of expert opticians, some prefer to order their equipment online to take advantage of a wider

choice of products or faster delivery. For several years now, Essilor has been offering MyOnlineOptical, a turnkey solution dedicated to professional opticians in North America who wish to develop their business on the Internet in addition to their optical store. MyOnlineOptical thus helps opticians to create their own online sales site with a much wider range of products in stock than in the shop. For many professionals, Essilor's customers, this approach is the logical next step in developing by adapting to consumers' new purchasing preferences. It is also an essential investment to continue to provide the general public with an essential advisory service for any online purchase of optical products. MyOnlineOptical allows independent professionals to acquire an attractive and practical showcase with quality products. A site that becomes an extension of their in-store offer and allows them to remain open 24 hours a day, 7 days a week!

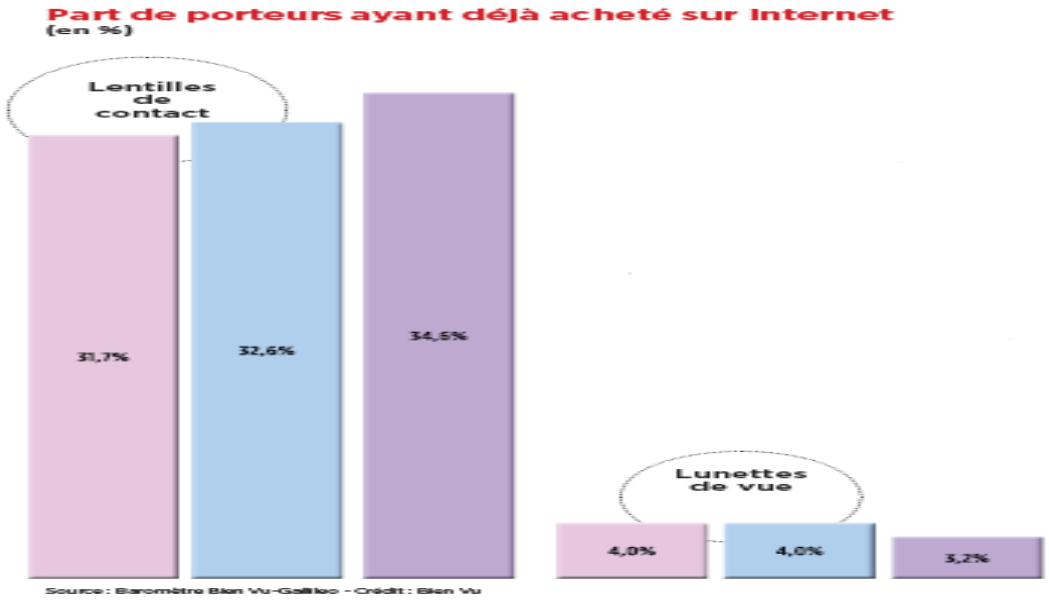
https://www.acuite.fr/pratique/chiffres-et-economie/marche-de-loptique-2016

e-optics in the digital age

Online sales are running out of steam and are finding it increasingly difficult to convince cardholders, nearly 66% of whom believe that this type of sale is unreliable. However, competition is still very strong in the field of contactology and solar energy. From now on, the time has come for hybridization. Websites are multiplying showrooms and points of sale, while optical chains are developing their online presence. This is particularly the case of Alain Afflelou who recently acquired Happyview.fr and Malentille.com.

Today, drive-to-store has become an essential part of the process. More and more brands are developing digital tools in their stores as well as online functionalities. 89% of consumers are interested in a hybrid offer. Atol's recent campaign confirms the reactivity of carriers: the company sent nearly 3 million SMS messages, with a claimed reactivity rate of 82%.

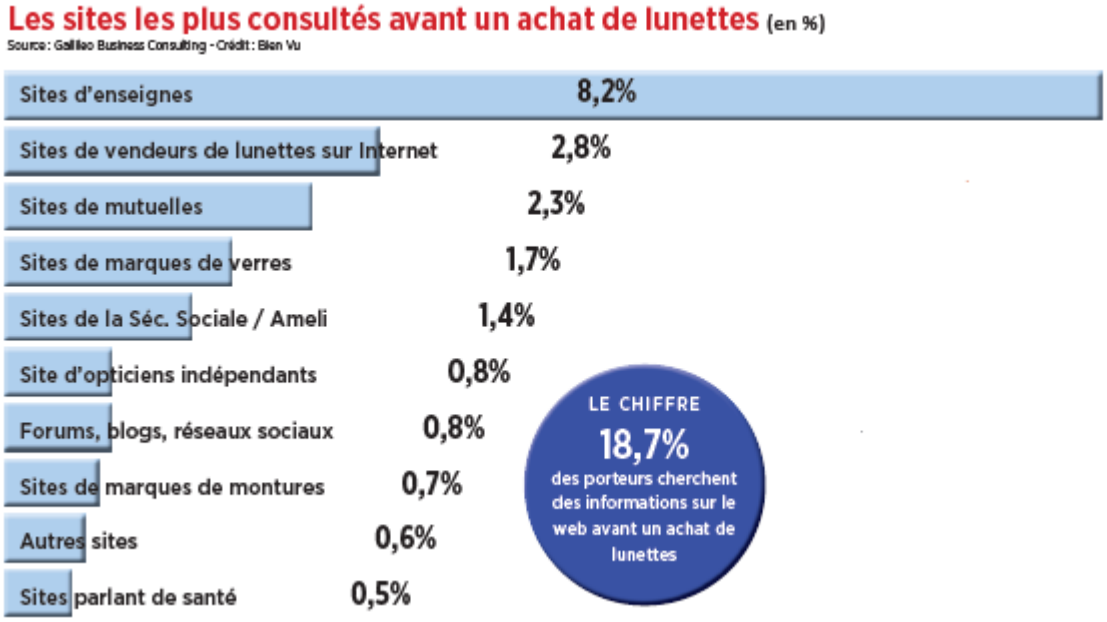
The shift to a "phygital" model has some limitations. The first of these is the speed at which technological supports are translated. While the transformation of websites has already begun, new media are beginning to take over from customer relations. This is the case with the smartphone according to the Mappy barometer: 3 out of 5 owners would like to receive more promotional offers through it and 13% have already ordered a missing product online. This is also the case for social networks: according to the same barometer, they are consulted in 44% of cases to learn more about the technicality of a product and in 19% of cases to evaluate a price considered too high. Second obstacle: the speed of behavioural change. However, the "millenials" generation, which today is the most consumer of these new media, is still very little present in optics.



Percentage of holders who have already purchased on the Internet

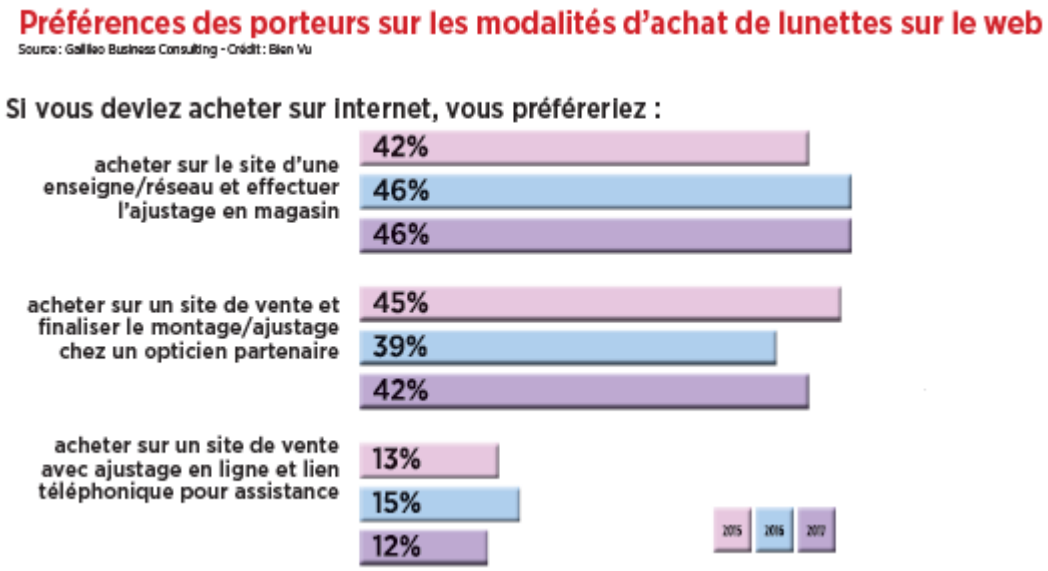
Graphic comment: The trend is now confirmed: online sales are refocusing on contact lenses. The proportion of regular buyers is constantly increasing - attracted by attractive subscription

systems and optimized service quality: 60% of Internet users find lenses cheaper online and 90% say they are satisfied with their shopping experience on the website (compared to 77% at the optician!), according to Gallileo Business Consulting. On the other hand, eyeglass sales on the net fell for the first time in 2017.



The most visited sites before buying glasses

Graphic comment: The brands' sites consolidate their position as the leading site where Internet users look for information before buying (8.2% go there compared to 7.5% last year). The price is the main reason for consultation. (74% advance it compared to 61% last year). But Internet users will also increasingly make virtual tests of equipment (43% mention it against 29% last year) and learn about care (4th reason for consultation in 2017, 6th in 2016). It should be noted that mutual and social security websites attract nearly 4% of cardholders among the 18.7% who obtain information online.



Wearers' preferences on how to buy glasses on the web

Graphic comment: The drive-to-store model, which allows for withdrawal and adjustment in store after online purchase, sees the number of its followers increase by 2 points in one year (42% in favour of adjustment by a partner optician compared to 39% in 2016). But the evolution over 2 years confirms above all the consolidation of an audience now familiar with this hybrid distribution model. 88% are in favour of it, via a brand site (adjustment) or partner optician (assembly and adjustment) against 87% in 2015.

October 01, 2018 13:01 ET | **Source:** Essilor International

Essilor and Delfin complete the merger of Essilor and Luxottica by creating EssilorLuxottica,
a world leader in ophthalmic optics and eyewear

- **EssilorLuxottica brings together two pioneering and complementary global players to meet the growing visual health needs and changing lifestyles of consumers**
- **The new entity provides a growth platform ideally positioned to seize future opportunities with a combined pro forma revenue of more than €16 billion, nearly 150,000 employees and an unparalleled global presence**

Luxembourg and Charenton-le-Pont, France (October [1], 2018 - 7:00 pm) - Delfin Sàrl ("Delfin"), majority shareholder of Luxottica Group S.p.A. "("Luxottica") and Essilor International (Compagnie Générale d'Optique) ("Essilor"), announce the completion of the merger between Essilor and Luxottica. The combined entity, EssilorLuxottica, is a world leader in the design, manufacture and distribution of corrective lenses, optical frames and sunglasses.

The new ensemble Essilor and Luxottica have joined forces around a common mission: "Helping everyone to see better, to be better to fully enjoy life" by responding to the evolution of their visual needs and their aspirations to express a personal style.

EssilorLuxottica draws on more than 150 years of innovation, operational excellence, entrepreneurship and international openness to develop innovative solutions in ophthalmic optics and eyewear to adapt to the changing lifestyles of today's consumers. At the same time, EssilorLuxottica can create new ways to raise awareness and reach the 2.5 billion people[2] with uncorrected vision and the 6 billion people who do not protect their eyes from the sun or other harmful rays. The group will also rely on a set of vertically integrated activities, the result of the complementary expertise of two major pioneers - one in advanced lens technologies and the other in branded eyewear design - to develop the richest and most complete range of visual solutions for consumers and optical professionals.

With pro forma combined revenue of more than €16 billion in 2017 and nearly 150,000 employees, EssilorLuxottica is ideally positioned to seize growth opportunities resulting from strong demand in the ophthalmic optics and eyewear markets, driven by increased needs for vision correction and protection and consumer appetite for high-profile brands.

Leonardo Del Vecchio, Chairman and Chief Executive Officer of EssilorLuxottica, said: *"We are opening a new chapter in our history in which we believe in particular: bringing frames and lenses under one roof and completing our vertical integration. We will strengthen the excellence of Luxottica and Essilor in order to improve the level of service and offer consumers around the world better products, by combining their preferred brands with cutting-edge technologies in lenses. By expanding our offer, we will promote the development of our customers and the industry as a whole.* »

Hubert Sagnières, Executive Vice President and Chief Operating Officer of EssilorLuxottica, added: *"The birth of EssilorLuxottica is a decisive moment in our fight to elevate good eyesight to the status of a fundamental human right and a recognized lever in global economic development. EssilorLuxottica now has the means to give this very important cause much greater visibility. The group is in a position to grow the entire ophthalmic optics*

and eyewear industry through its presence in all major segments, from lenses and frames to physical and online distribution. Our commitment to greater innovation, enhanced customer service and a new consumer experience will benefit all stakeholders. Finally, our policy of broad and active employee ownership will only strengthen our corporate mission and play a central role in EssilorLuxottica's governance model."

EssilorLuxottica will benefit from significant value creation opportunities through revenue and cost synergies representing an estimated net amount of between €420 million and €600 million of EBIT per year in the medium term, a level that will accelerate in the longer term. 200 to 300 million and will result from EssilorLuxottica's ability to develop new and better-quality products that optimize the interaction between frames and lenses, and to better serve the industry through broader distribution and more efficient logistics, accelerate the development of high-growth countries, strengthen e-commerce, increase the penetration of sunglasses with or without vision correction, and mobilize consumers around vision correction and protection as well as their aspiration to experience brands. Cost synergies are expected between €220 and €300 million and will result from the optimisation of the entire combined production/logistics chain, and savings on overheads and procurement.

Completion of the merger

All conditions precedent to the completion of the transaction were met, including approval by Essilor shareholders in May 2017, the spin-off of almost all of Essilor's businesses to Essilor International SAS (a wholly-owned subsidiary of Essilor) in November 2017 and the approval of all competition authorities whose approval was a condition precedent to the completion of the transaction.

Following the contribution by Delfin, Luxottica's majority shareholder, of its 62.42% stake in Luxottica to Essilor on October [1,] 2018, Essilor became the parent company of Luxottica and was renamed EssilorLuxottica. In consideration for Delfin's contribution of its stake in Luxottica to Essilor, Essilor issued 139,703,301 new ordinary shares through a capital increase without preferential subscription rights, in accordance with the resolution approved by Essilor shareholders in May 2017. Following completion of the transaction, EssilorLuxottica's share capital is composed of 358,840,853 shares. Its main shareholders are Delfin (38.93% of the share capital, with voting rights capped at 31%) and EssilorLuxottica employees (4.9%). The remaining 56.8% of the share capital is held by the public. As of October 2, 2018, EssilorLuxottica shares will be listed on Euronext Paris under the mnemonic code EL and with the same ISIN code FR0000121667. They will be included in the CAC 40 and Euro Stoxx 50 indices.

Questions

A. Characterize the ophthalmic lens market based on the case data.
   - Identify market segmentation criteria, volumes and growth drivers. Describe the prescription mechanism in this market.
   - Who are the market players? Who are Essilor's customers? What are the two possible levels for evaluating the market?

B. Establish the value chain of the ophthalmic lens sector and distinguish the different types of positioning on this chain. Qualify the power relations

C. Identify Essilor's main strategic orientations

D. Characterize the choices made by Essilor in the construction of its value chain

E. Identify the distinctive skills and nature of Essilor's competitive advantage

F. Essilor's marketing positioning :
   1. List the main elements of Essilor's Marketing Mix
   2. Analyze and comment on the geographic and structural trends in Essilor's sales and market share in corrective lenses over the past six years. Use the TCAM if possible
      - Sales growth in relation to the market
      - Market share
      - Sources of sales growth
      - Geographical distribution of sales
      - Sales growth by region

G. What are Essilor's strengths and weaknesses in the face of the Internet? How do you explain Essilor's entry into online optical sales? What are the expected risks and benefits?

H. Are competitors better positioned than Essilor to take advantage of the Internet: who are they? What are the reasons why the Internet represents an opportunity and a threat for the Essilor Group?

I. By comparing the elements of the SWOT diagnosis gathered in this way (Internet context), identify the strategic alternatives offered to Essilor in the face of the Internet

J. How would you assess the value provided by the merger with the Luxottica group ?