BASIC OPHTHALMIC GLOSSARY

LEONARDO

A

ACCOMMODATION

The ability of the eye to change its focus from distant to near objects (and vice versa). This process is achieved by the crystalline lens changing its shape.

AMBLYOPIA

Amblyopia also known as “Lazy eye”, is an early childhood condition where a child’s eyesight in one (or both) eyes does not develop properly. Unilateral amblyopia occurs when one eye experiences a blurred view and the other a normal view (upon best corrected vision), but the brain only processes the normal view. Bilateral amblyopia occurs when both eyes still experience blurred view even upon best corrected vision.

AMD

Age-related Macular Degeneration. AMD is a disease that damages the macula, the central part of the retina, leading to a loss of central vision and leaving only the peripheral or lateral vision intact. AMD sufferers begin to have trouble distinguishing colors and see straight lines as if they were deformed.

A

AMETROPIA

Characterizes all eyesight disorders that prevent a clear image from forming on the retina, with the exception of age-related presbyopia. Myopia, hyperopia and astigmatism are all forms of ametropia.

ANISOMETROPIA

Anisometropia means that the two eyes have a different refractive power, so there is unequal focus between the two eyes. It is the second most common cause of amblyopia.

ANTI-FOG COATING

Optifog eliminates the condensation of moisture on lenses that causes fogging. So your lenses and vision stay clear when you make the transition from a cold environment to a warm one. It may also keep your lenses from fogging up during sports and other times when you are hot and perspiring.

A

ANTI-REFLECTIVE COATING

Anti-reflective coating (also called AR coating or anti-glare coating) is a microscopically thin multilayer coating that eliminates reflections from the front and back surface of eyeglass lenses. By eliminating reflections, lenses with AR coating provide better vision for night driving and more comfortable vision for reading and computer use. It makes lenses nearly invisible so people can focus on the eyes, not distracting reflections from eyeglasses.

AQUEOUS HUMOR

Transparent liquid responsible, together with the vitreous humor, for maintaining the pressure within the ocular globe and hence the shape of the eyeball.

A

ASTIGMATISM

Astigmatism is a very common vision condition that causes blurred vision due either to the irregular shape of the cornea or the curvature of the lens inside the eye.
Most people have some degree of astigmatism. Slight degree of astigmatism usually don't affect vision and don't require treatment. However, higher degrees of astigmatism cause distorted or blurred vision, eye discomfort and headaches.

B

BIFOCAL LENS

A bifocal lens is created with two different areas of vision correction, which are divided by a distinct horizontal line across the lens. The top portion of the lens is used for distance vision, while the bottom portion of the lens is used for near vision.

BLINDNESS

Blindness is strictly defined as the state of being totally sightless in both eyes.

C

CATARACTS

A cataract is a clouding of the crystalline lens of the eye that impairs vision. Cataracts are the most common cause of vision loss in people aged over 40 and are the principal cause of blindness in the world.

COATINGS

Lens coatings can enhance the performance and appearance of your eyeglass lenses.
Several types of coating can be applied to corrective lenses: scratch-resistance, anti-reflective, polarizing, coloring, antistatic, anti-smudge.

CONE CELLS

Cone-shaped photoreceptive neurons located in the retina used for central vision and color perception.

C

CONJUNCTIVITIS (PINK EYE)

Conjunctivitis, also known as “pink eye”, is an inflammation of the conjunctiva. The conjunctiva is the thin clear tissue that lies over the white part of the eye and lines the inside of the eyelid. Pink eye caused by some bacteria and viruses can spread easily from person to person, but is not a serious health risk if diagnosed promptly.

CONVERGENCE / DIVERGENCE

Movement of the eyes together turning inward/outwards so that they are both “aimed” towards the object being viewed.

CORNEA

Transparent front part of the ocular globe shaped like a spherical, or slightly domed, cap. In combination with the crystalline lens the cornea plays an important role in focusing images on the retina.

C

CORRECTIVE LENSES

Corrective lenses are designed to correct eyesight disorders. The corrective lens is a combination of material, optical surface and coatings.

CRYSTALLINE LENS

Transparent biconvex optical lens located behind the pupil. The crystalline lens refracts light to focus images on the retina. The aging of the crystalline lens causes presbyopia.

D

DIOPTER

A diopter is the power of the lens that is needed to correct your sight to normal vision, the higher the number the stronger the lens.

DIPLOPIA (DOUBLE VISION)

Diplopia, also known as double vision, is the simultaneous perception of two images of a single object. It is a symptom to take seriously.

D

DISTANCE VISION

Vision of objects at a distance of around 5-6 meters or more.

DISTORTION

Deformation of an optical system resulting in an image which does not reflect the real shape of an object.

E

EMMETROPIA

Emmetropia describes an eye that lacks visual defects. This means the image that is formed on a person's retina is clear and precise. The eye with emmetropia doesn't require contacts or eyeglasses, it is sometimes described as perfect vision. It is the opposite of ametropia.

F

FINISHED LENSES AND SEMI-FINISHED LENSES

Prescription laboratories transform semi-finished lenses into finished lenses by processes of surfacing, coloring, coating and edging/assembly. In all cases the front face is finished in the plant and the rear face is surfaced on demand.

FOVEA

In the eye, a tiny pit located in the macula of the retina that provides the clearest vision of all. Only in the fovea are the layers of the retina spread aside to let light fall directly on the cones – the cells that give the sharpest image.

G

GLAUCOMA

Increase in intra-ocular pressure resulting, if left untreated, in an irreversible deterioration of the optical nerve and of the retina, as well as an alteration of the visual field, i.e. a reduction in visual performance, often accompanied by headaches and aching eyes.

H

HALF-EYE GLASSES

Half-eyes are the smaller “Ben Franklin” style glasses that sit lower down on the nose. They allow you to look down and through the lenses for near work, and up and over them to see in the distance.

HYPEROPIA

Hyperopia, or far-sightedness, is an eyesight defect due to an eye that is too short and/or insufficiently powerful. The image forms behind the retina, which explains why a person with hyperopia thus sees badly in near vision but well in far vision. Hyperopia is the opposite of myopia.

I

INTERMEDIATE VISION

Vision of objects situated between 40 centimeteres and 1.5 meters from the eye.

INTRAOCULAR PRESSURE

The fluid pressure inside the eye and which is an important aspect in the evaluation of patients at risk from glaucoma.

IRIS

Circular membrane that delimits the pupil. The iris acts as a diaphragm that contracts according to the intensity of light. The pigmentation of the iris determines the color of the eyes.

K

KERATOCONUS

Keratoconus is a progressive eye disease in which the normally round cornea thins and begins to bulge into a cone-like shape. Keratoconus can occur in one or both eyes and often begins during a person's teens or early 20s. As the cornea becomes more irregular in shape, it causes progressive nearsightedness and irregular astigmatism creating additional problems with distorted and blurred vision. Glare and light sensitivity also may occur.

M

MACULA

Central part of the retina. The macula is composed uniquely of cone cells directly exposed to rays of light and enables the precise vision required for reading or for the recognition of details. This is the area with the maximum activity in the eye.

MATERIAL

Corrective lenses are most often manufactured from either organic or mineral glass. Organic lenses are divided into two categories: thermo-hardened and thermoplastic (polycarbonate). The properties of these materials are: a high refractive index in a thin and lightweight lens, transparency, lightness, protection against ultraviolet rays and resistance to shocks.

M

MID-DISTANCE LENSES

Mid-distance lenses are intended for people with presbyopia; these are lenses designed for near vision but with an extended depth of field.

MYOPIA

Myopia (near-sightedness) is an eyesight disorder caused by an eye that is too long and/or too powerful. Causing the image to form in front of the retina. A person with myopia has difficulty seeing at distance but has good near vision.

N

NEAR VISION

Vision of objects situated 25-50 centimeteres from either the eye.

NYSTAGMUS

A repetitive unvoluntary movement of the eye whose direction, amplitude and frequency is invariable.

O

OCULAR GLOBE

Spherical organ (the eyeball) that receives vision. It consists of three layers, the sclera, the uvea and the retina and their content: vitreous humor, crystalline lens and aqueous humor.

OPHTHALMOLOGIST

Physician specialized in the treatment of eye diseases and conditions, and in the correction of eyesight disorders. Ophthalmologists may also carry out corrective surgery.

OPTICAL ABERRATION

An optical aberration is a distortion in the image formed by an optical system compared to the original.

O

OPTICAL ADDITION

The optical power (of a lens) required for near vision, in addition to that required for far vision.

OPTICAL CORRECTION

The most common method of correcting vision is optical correction using eyeglasses or contact lenses, which correct refractive errors by refocusing light rays on the **retina** to compensate for the shape of your eye. An eye exam will determine your need for vision correction or a change in your correction.

OPTICAL NERVE

The optic nerve is located in the back of the eye. The job of the optic nerve is to transfer visual information from the **retina** to the vision centers of the brain via electrical impulses.
Although the optic nerve is part of the eye, it is considered part of the central nervous system.

O

OPTICAL POWER

Optical power defines the ability of a lens or contact lens to correct a visual defect. Optical power is measured in diopters.

OPTICAL SURFACE (OR DESIGN)

Surface on which either a reflection or refraction of light is produced. The optical surface gives the material its ability for optical correction. The number of optical surfaces is almost infinite: they may be single-vision, bifocal or progressive.

OPTICIAN

Optician are trained to dispense and fit spectacles and other optical aids, working from the prescriptions written by optometrists and ophthalmologists. They advise patients on various types of lenses and spectacle frames.

O

OPTOMETRIST

In many English-speaking countries, optometrists are eyecare specialists who are able to diagnose eye diseases, dispense contact lenses and perform refractive examinations. Optometrists do not carry out surgery.

ORTHOPTICIAN

Branch of ophthalmology treating eyesight disorders by means of re-education and eye-training sessions. Orthoptics is a paramedical profession exercised by a medical aide, the orthoptician.

P

PERIPHERICAL VISION

Vision resulting from stimulation of the retina outside the fovea or macula.

PHOTOCHROMIC LENSES

Photochromic lenses are eyeglass lenses that darken automatically when exposed to sunlight, then fade back when you return indoors. Other generic terms sometimes used for photochromic lenses include “light-adaptive lenses” and “variable tint lenses.”

P

POLARIZED LENSES

A polarized lens is a quality sun lens that not only reduces bright light from the sun, as regular tinted sun lenses do, but also eliminates dazzling polarized light thanks to a very thin polarizing film inserted inside the lens, playing the role of a Venetian store. This results in a better clarity of vision, a truer color perception, and a greater visual comfort.

POLARIZED LIGHT

Polarized light is an intense reflected glare that dazzles the eye and which appears when the sun's rays hit a smooth, horizontal surface. This is particularly common in areas where reflected light is intense (sea, mountains, road surfaces etc.).

POLYCARBONATE

Material characterized by its exceptional lightness and resistance to shocks. Its high refractive index enables the manufacture of extremely light, thin lenses. Polycarbonate cuts out 100% of UV rays and is scratch-resistant thanks to its hardened coating.

P

PRODUCTION PLANTS

These mass-produce finished lenses (mainly single-vision lenses) and semi-finished lenses in great numbers.

PROGRESSIVE LENSES

Progressive lenses, sometimes called “no-line bifocals,” are designed to correct presbyopia by varying optical power progressively. They provide the ability to see at all distances. Lifting your head, you can see clearly across the room and at a distance. At mid-distance, you can also view your computer clearly. When you lower your gaze you can read and do near vision tasks comfortably.

P

PRESBYOPIA

Eyesight disorder caused by the aging of the crystalline lens, which with time thickens and loses its elasticity. As the crystalline lens becomes more rigid, it changes shape less easily and the subject sees less and less well in near vision. As the crystalline lens become more rigid, the subject finds near vision tasks more difficult. The onset of presbyopia usually starts in the early to mid 40s.

PRESCRIPTION LABORATORIES

Production units that transform semi-finished lenses into finished lenses according the precise characteristics of a prescription. The customization work of laboratories enables us to provide a wide variation of optical combinations for wearer needs, especially as regards the correction of presbyopia. Laboratories are responsible for surfacing (grinding and polishing) and coating (coloring, anti-scratch, anti-reflective, anti-smudge etc.) the lenses.

PRISMATIC EFFECT

The change in direction imposed on a ray of light induced by an ophthalmic lens when the eyes look in various directions (except through the optical centre). The prismatic effect at each point on the lens has an impact, in the central vision area, on the wearer's oculomotor strategy.

P

PUPIL

Central opening of the iris through which rays of light enter the eye. The diameter of the pupil varies according to the ambient light level.

PUPILLARY DISTANCE (PD)

The distance between the centres of the pupils of the eyes. PD measurement is used to ensure proper monocular lens placement monocularly. It is a major measurement in dispensing progressive lenses.

R

READERS OR READY-MADE GLASSES

Ready-made glasses are inexpensive eyewear that are sold without prescription. They contain lenses with an equal power for each eye, and they are primarily used for the correction of presbyopia (reading glasses). They are suitable for people who spend a lot of time on near vision tasks. However, if you look up and across the room through the reading lenses, everything appears blurry.

REFRACTION

Change in the direction of propagation of a ray, determined by variations in the speed of propagation. Term used to qualify the optical examination.

R

REFRACTIVE INDEX

Used to characterize the capacity of a transparent optical material to refract light and produce an optimal correction. The higher the index is for the same correction, the thinner the lens.

REFRACTOMETER

Device used to automatically measure the refraction of the eye.

RETINA

Light-sensitive membrane at the back of the eye on which object images are formed and which transmits information to the brain. This hypersensitive membrane plays an essential role in the perception of light, colors, details, shape and movement.

RODS

Thin, cylinder-shaped cells located in the retina that react to light but which are incapable of distinguishing colors. Rods are highly sensitive and ensure vision in very low light conditions. Retinal rods are external extensions of the rod cell, which are neurons located in the retina.

S

SCRATCH-RESISTANT COATING

Lenses that are treated front and back with a clear, scratch-resistant coating have a much harder surface that is more resistant to scratches, whether from dropping your glasses on the floor or occasionally cleaning them with a paper towel.
Kids' lenses, in particular, benefit from a scratch-resistant hard coat for greater durability.

SEMI-FINISHED LENSES

See finished lenses

SINGLE VISION LENSES

Single vision lenses are used to correct ametropia. They may also be used for the correction of presbyopia but far vision will be blurred. The power is the same over the entire surface of the lens.

STRABISMUS

Strabismus is a visual problem in which the eyes are not aligned properly and point in different directions. One eye may look straight ahead, while the other eye turns inward, outward, upward, or downward. It is a common condition among children.

S

SURFACING: TRADITIONAL VS DIGITAL

Traditional lens manufacturing, which had many limitations, used semi-finished moulded blanks to which progressive surfaces were added. The laboratory then ground the patient's prescription into the blank's rear surface, after which it was polished by surface finishers. This process was unable to customize progressive designs.
Digital manufacturing uses sophisticated software to produce highly customized and accurate finished lenses taking prescription, frame fitting details and wearing position into account. The software sends mathematical data in the form of point files to the free-form generators that produce unique lenses precisely addressing patients' individual needs.

V

VISUAL ACUITY

Visual acuity describes the acuteness or "sharpness" of vision; that is the ability to perceive small details.

VISUAL FATIGUE

Visual fatigue is characterized by discomfort or acute irritation of the eyes, blurred vision and headaches, most often at the end of the day.

VITREOUS HUMOR

Transparent and vitreous gel contained between the pupil and the retina, located behind the crystalline lens.

SOURCES

All terms are sourced from **essilor.com**