

Interstate Lab Group

Glossary of Optical Terms

A

Abberation The failure of light, after reflection or refraction, to focus

Addition The power that a lens segment has in addition to that power already present in the main portion of the lens

American National Standards Institute (ANSI)

An organization that sets the standards, limitations, tolerances, and testing procedures that must be adhered to for first quality eyeglass lenses

Anti – Reflective Coating (AR) An application of a very thin film to glass or plastic lenses for the purpose of reducing or eliminating reflections. AR coating improves contrast, reduces glare, and improves the appearance of lenses

Aspheric Eyeglass lens in which the front surface is not curved as part of a sphere but is relatively flatter in the periphery. Provides a better quality image and minimizes magnification in refractive error corrections over 3 diopters of power

Astigmatism Optical defect in which refractive power is not uniform in all meridians. Light rays entering eye are bent unequally by different meridians, preventing formation of a sharp point focus on the retina. Instead light rays form two focal lengths. Corrected by a cylindrical (toric) eyeglass or contact lens. To correct astigmatism with eyeglass lenses, the lens must be ground with two different curvatures, a sphere and a cylinder, so that it exactly cancels the distortion produced by the cornea or lens.

Axis Meridional position of zero power in a cylindrical lens, perpendicular to the meridian containing the maximum cylindrical power. Used to denote diopter lens orientation for correcting ocular astigmatism

B

Balance Lens An eyeglass lens that is used when a person has limited sight in only one eye.

Base Curve Refers to the curvature of the front surface of ophthalmic eyeglass lens, and the back curve of a contact lens.

Base of Prism The thick edge of a prism

Bevel or Bevel Edge The V-shaped edge of a spectacle lens. The bevel helps to secure the lens in the eyewire of the frame.

Biconcave A lens with two concave surfaces (Minus lens)

Biconvex A lens with two convex surfaces (Plus lens)

Bifocal Lens An eyeglass lens that incorporates two different refracting powers within one lens. Power in the upper portion of the lens is for viewing distant objects. The power in the lower portion of the lens is for viewing close objects. The power used for viewing things up close is called the add. The part of the lens that contains the add is called the seg.

Bridge The crosspiece between the two rims (eyewires) of an eyeglass frame that support the glasses by resting on the bridge of the nose

Baume' Degrees A system used to quantify the concentration of slurry based on the specific gravity of the slurry.

Blank, finished lens A lens having both front and back surfaces ground to the desired power and thickness

Blank, semifinished lens A lens with only one side having the desired curvature. The second side must yet be surfaced in order to bring the lens to its desired power and thickness

Block The device which is attached to the surface of a lens in order to hold it in place during the surfacing or edging process

Blocker The device used to place a block on the lens in order to hold the lens in place during the surfacing or edging process

Blocking, off-center The practice of placing the surfacing lens block at the desired location for the major reference point of the lens. Off-center blocking does grind prism for decentration

Burn, polishing A lens surface defect that looks like a blister or a small group of blisters on the lens surface. Polishing burn may be the result of a polishing pad that has not been sufficiently wetted with polish

C

Calipers An instrument that is used for thickness measurement.

Center, geometric 1. The boxing center. 2. The middle point on an uncut lens blank.

Center, optical That point on an ophthalmic prescription lens through which no prismatic effect is manifested

Center Thickness The thickness of a lens measured at the optical center

Centimeter	A unit of metric measurement: 100 centimeters equal one meter 10 millimeters equal one centimeter 2 1/2 centimeter is about one inch
Centration	The act of positioning a lens for edging such that it will conform optically to prescription specifications
Chem-Tempered	Glass lenses chemically treated to increase impact resistance. Chemical tempering (chem.-tempered) Is the preferred method for maximum impact resistance. Chem tempering requires more time than heat treating (usually 16 hrs).
Chiller	A refrigerator unit used for cooling generator coolant, Fining or polishing slurry, or blocking alloy in the ophthalmic surfacing laboratory
Chromatic Abberation	The dispersion of colors arising from unequal reflections of different wave lengths of the spectrum
Coating, Antiscratch	A thin, hard coating applied to plastic lens surfaces in order to make them more resistant to scratching
Coating, Antireflection	A thin layer or series of layers of material applied to the surface of a lens for the purpose of reducing unwanted reflections from the lens surface and thus increasing the amount of light that passes through to the eye
Compound	A term used to describe a sphero-cylindrical lens
Concave	A hollow curved surface (minus lens)
Convex	A surface like the outside of a sphere or ball (plus lens)

Correction	Refers to the specific lens prescription required
Cross Fitting	A reference point 2 to 4 mm above the major reference point on progressive-addition lenses. The fitting cross is positioned in front of the pupil
Crown Glass	Usually refers to ophthalmic glass of refractive index
CR-39	The trade name for conventional plastic eyeglass lenses
Curve, Tool	The 1.53 index referenced surface power of a lap tool used in the fining and polishing of ophthalmic lenses
Cylinder	A lens having a refractive power in one meridian only and used in the correction of astigmatism
Cylinder axis	The meridian in which the sphere power functions
D	
DBL	Distance in millimeters between lenses when in a mounting
Decentration	The displacement of a lens optical center away from the wearer's line of sight for the purpose of creating a prismatic effect
Diopter	The unit of optical measurement used to express the power of a lens. Diopter values can be positive (plus) or negative (minus).
Diopter, Prism	The unit of measurement that quantifies prism deviating power, one prism diopter is the power required to deviate a ray of light 1 cm from the

position it would otherwise strike at a point 1m away from the prism.

Drilling

The process of making a hole in a lens to permanently mount a lens to drill mount frames

E

Edgecoat

A color treated edge or paint applied to the eyeglass lens edge.

Edging

Cutting an uncut blank lens to match the shape of the frame. Each lens must be edged.

Effective Diameter

Twice the longest radius of a frame's lens aperture as measured from the boxing center (Abbreviated ED)

Eyeseize

The size of the eyewire measurement

Eyewire

The rim of the frame that goes around the lens

F

Farsightedness

Hyperopia – plus lenses – thick in the middle

Fining

In surfacing, the process of bringing a generated lens surface to the smoothness needed so that it will be capable of being polished

Finishing

The process in the production of spectacles that begins with a pair of uncut lenses of the correct refractive power and ends with a completed pair of spectacles

Form, minus cylinder

The form a prescription takes when the value of the cylinder is expressed as a negative number

Form, plus cylinder The form a prescription takes when the value of the cylinder is expressed as a positive number

Frame A plastic or metal structure for holding eyeglass lenses

G

Generating The process of rapidly cutting the desired surface curvature onto a semifinished lens blank

Glazing The insertion of lenses into a spectacle frame.

Grayness A lens surface defect caused by incomplete polishing

Gradient Tint A lens that is tinted darker on top and gradually lightens toward the bottom

H

Heat Treating A High temperature process which increases the resistance to breakage of a glass lens

High Index Can be Glass or Plastic. A Lens material with a higher refractive index than glass and regular plastic. The High Index material can be thirty percent thinner than a regular plastic or glass lens of the same prescription.

Hide A Bevel Trade name for an edge-grinding system that produces a shelf effect behind the bevel on thick-edged lenses

Hyperopia Farsightedness – plus lenses – thick in the middle

I

Image Jump The apparent sudden displacement of an object when the line of sight of the eyes passes across the visible line that separates the distance and near zones of bifocals or trifocals. Image jump is eliminated in progressive lenses

Imbalance, vertical A differential vertical prismatic effect between the two eyes. At near this can be induced by right and left lenses of unequal powers when the wearer drops his or her eyes below the optical center of the lenses

Index of Refraction An indication of the “bending” power of lenses. The higher the index, the sooner light rays are bent as they pass through the lens. A high index lens, therefore, enables the prescription to be ground thinner than a lower index

Industrial Safety Glasses that are prescription or non prescription designed to protect the eyes from injury. Industrial Safety Glasses must meet ANSI Z87 Standards

Intermediate The area of a trifocal lens between the distance viewing portion and the near portion

K

Knife-edge A plus lens ground to an absolute minimum thickness such that the edge of the lens is so thin that it has a knifelike sharpness to it, Ex: an edge thickness of zero.

L

Lap A tool having a curvature matching that of the curvature desired for a lens surface. The lens surface is rubbed across the face of the tool and, with the aid of pads, abrasives, and polishes, the surface is brought to optical quality.

Layout The process of preparing a lens for blocking and edging or surfacing

Lens Any piece of glass or other transparent material with ability to bend light rays predictably

Lens Clock A mechanical device for measuring surface curves in dioptic power

Lens, Finished A spectacle lens that has been surfaced on both front and back to the needed power and thickness. A finished lens has not been edged for a spectacle frame, but is still in uncut form.

Lens, Laminated An ophthalmic lens that is made up of more than one layer. Examples include polarized lenses, lenses that have a glass front and a polyurethane back surface

Lens, Photochromatic A lens that changes its transmission characteristics when exposed to light

Lensometer An instrument used to measure the refractive power of an eyeglass lens or contact lens

M

Marker A centering device used to position a lens accurately and stamp it with reference lines for use in lens blocking

Marks, block A surface defect on a plastic lens caused by pressure from the block or heat from the blocking alloy

Marks, generator A surface defect on a lens that consists of parallel, curved marks across the surface of the lens caused by the generator wheel

Marks, swirl A lens surface defect that indicates that a larger grain of abrasive material was trapped in the pad and scratched the surface in a swirl pattern

Minus A concave surface or lens having negative diopters. Thinner at the center than at the edge, used to correct myopia

Monocular Pertaining to one eye

MRP Major reference point

Multifocal Lens that incorporates several different optical powers, to permit focusing at different distances

Myopia Nearsightedness – Minus lenses – thick on the edges

N

Nasal The side of the lens or frame that is toward the nose

Neutralize To determine the refractive power of a lens

No-Line Bifocal Lens A bifocal lens that does not show a visible line where the power of the lens changes

O

OC Optical Center

OD- Oculus Dexter Means the right eye

OS- Oculus Sinister Means the left eye

OU- Oculus Uterque Means both eyes

Ophthalmic Pertaining to the eye

Optics The science of sight

Optometrist (O.D.) One who examines the eye, determines vision problems

Ophthalmologist (M.D.) One who treats diseases and performs surgery on the eye

Optician One who makes and fits the eyeglasses according to the doctors prescription

Orange Peel A surface defect on a lens that looks like a peel of an orange and is caused by watery polishing compound

Oversize Lens A larger than normal lens is required to fabricate eyeglasses

P

Pad, gripper A friction-grip fitting/polishing pad system that eliminates difficulty in stripping the pad from the tool. By using a special backing on the tool, the pad sticks to the backing

Pattern A device used to determine the shape of a frame, we trace each frame in order to determine its pattern shape

PD	Pupillary distance; the distance from the center of one pupil to the center of the other
PD, Distance	The wearer's interpupillary distance specified for a situation equivalent to when the wearer is viewing a distant object
PD, Monocular	Half the interpupillary distance as specified for each eye individually with the center of the frame's bridge as a reference point
PD, Near	The interpupillary distance as specified for a near viewing situation
Photochromic Lens	A lens that darkens when exposed to light and lightens when the light source is diminished. Common brand names for this lens are photogray (turns gray) and photobrown (turns brown). A common brand of photochromatic plastic lenses is Transitions
Plano	A lens, which has no prescription-plain material
Plus	A convex surface or a lens having a positive diopter
Polishing	The last step in bringing a lens surface to its needed state of optical clarity
Polarized	Glass or plastic lens, laminated with a polarized filter which reduces visible light, thus removing reflected glare. These lenses provide 100% UV protection, and depict colors naturally. Excellent for all outdoor uses, especially useful for driving a vehicle
Polycarbonate	A strong, plastic lens material often used for safety eyewear and children's lenses

- Presbyopia** The natural age-related progressive loss of the accommodative (focusing) ability. Usually happens after 40 and will require bifocals to see correctly
- Prism** A wedge shaped addition to the lens to correct vision imbalances
- Progressive Lens** An eyeglass lens that has a gradual blend of multiple viewing zones for seeing objects clearly at all distances. Used for the correction of presbyopia.

R

- Refraction** To determine the refractive error of an eye and the best corrective lenses to be prescribed.
- Removal, stock** The thickness of semifinished lens material that must be removed to bring the lens to its desired thickness
- Rimless** Having to do with frames (mountings) that hold lenses in place by some method other than eyewires. Most rimless mountings have two points of attachment per lens
- Roll and Polish** Edges of eyeglass lenses are rolled and highly polished to produce a cosmetically pleasing appearance on high prescription lenses that helps to make the lens appear thinner. Rimless lenses of all powers are also rolled and polished

- Rx** Abbreviation for a prescription

S

- Safety Glasses** Impact resistant spectacles: available with or without correction for workshop or street wear protection for adults and children

Scratch Coating	A thin coating applied to plastic lenses to reduce the susceptibility to surface scratches and abrasions. A dip process or a spin coating process is used to apply scratch resistant coating
Segment (seg)	An area of a spectacle lens with power differing from that of the main portion
Segment Height	The vertical measurement of distance between borderline of the bifocal segment and the lowest part of the frame
Segment Width	The lateral measurement of a multifocal segment width. Ex FT-28, FT-35, FT-45 (Flat Top Bifocal)
Semifinished	A lens or blank with one surface completely finished
Single Vision Lens (Sphere)	This is a lens with smooth spherical surfaces that bends light rays equally in all meridians used to correct myopia and hyperopia
Slab Off Prism	The process of surfacing or molding a prescription lens to reduce vertical prismatic effect in the reading portion of the lens without effecting the optical center of the distance lens.
Slurry	Particles suspended in liquid. In surfacing, abrasive particles are suspended in the fining and polishing slurries
Special Base Curve Lens	An eyeglass lens that has a deeper ground curve on the inside and outside of the lens than the curve that is normally indicated for the prescription. It is commonly used for people with long eyelashes

Sphero-cylinder	A lens or lens surface which is combination of a sphere and cylinder power
Spotting	The placing of spots on a lens with a lensometer in such a manner that the lens will be oriented correctly for axis and positioned for major reference point and horizontal meridian locations
Standard Alignment	An impersonal standard, independent of facial shape, for alignment of spectacle frames. Completed jobs are sent to the account with this alignment
Surfacing	The process of creating the prescribed refractive power, prism, and major reference point location on a lens by generating the required curves and bringing the surface to a polished state
T	
Take – off	Synonym for stock removal
Temporal	The area of a lens or frame that is toward the temples
Tinted Lens	A general term for a colored lens. Can be a cosmetic tint, to as dark as a sunglass tint
Trifocal Lens	A lens with three refractive powers (viewing zones) The upper power is for distant vision, the lower for near vision, and the middle for intermediate (arm's length) distances.
Twenty/Twenty Vision (20/20)	Normal Visual acuity. Upper number indicates that a patient is able to see standardized symbols on a chart 20 ft (6m) away: lower number indicates that the same symbols can be seen at 20 ft by an eye with a normal optical system

U

Ultraviolet Coating A filtering dye that can be added as a coating to regular plastic and glass lenses. It filters out two types of harmful ultraviolet light radiation, UVB and UVA

Uncut A lens that has been surfaced on both sides but not yet edged for a frame

W

Wave A defect in lens surface curvature, which causes a slight, irregular variation in the surface power

Wheel, Roughing (Cribbing) An edger or cribber wheel that rapidly cuts a lens to near its finished size.