

EYE SAFETY

I. Eye hazards and good vision requirements

A. General hazards

1. Dust and powders in the eye cause irritation and corneal scratches
2. Frit and glass flakes also cause scratches and cuts to the cornea
3. High air flow leads to eyes drying out

B. Work Specific Hazards and requirements

1. Warm/Hot Glass

- a. IR radiation hazard from kiln/furnace/glory hole

2. Lampworking Soft Glass

a. Sodium Flare Filtration

- Sodium Flare is a bright yellow ball of light that appears when glass is placed into the flame. It is not hazardous to the eye structures, but it does need to be filtered for clarity of vision of the working area on the glass piece.

b. Contrast Enhancement Filters

- Contrast enhancement filters should be worn when working outside or in a brightly lit area. Because of the sun or bright work lights, the flame oftentimes becomes invisible and a good contrast enhancement filter (like the ACE glass) will allow the at least the outline of the flame to be seen. Changing backgrounds to a dark color also helps.

3. Lampworking Borosilicate Glass

a. Sodium Flare Filtration

- Sodium Flare is a bright yellow ball of light that appears when glass is placed into the flame. It is not hazardous to the eye structures, but it does need to be filtered for clarity of vision of the working area on the glass piece.

b. Intense bright light flares (from silver, gold, other metals in glass)

c. IR radiation hazard from working with larger torches, larger pieces

4. Other jewelry work

- a. Metalworking/brazing/enameling by torch/kiln has similar hazards to above

II. Requirements for eyewear

A. Eyewear needs to be in good condition

1. Lenses not scratched (breakage hazard)
2. Frame/temples/hinges functional
3. Nose pads clean (keeps frames from slipping down nose)

B. Eyewear needs to be properly adjusted to fit your face

1. Good fit ensures long wearing times
2. Proper adjustment of nose pads and temples helps to keep frame from slipping down nose

C. Eyewear needs to have good coverage of the eye socket

1. Lens opening should cover the entire orbit/socket of your eye

2. Narrow vertical measurements of the lens openings allow light to pass under the frame or allow peeking over the top of the frame.
 3. Lens openings too wide increase the weight of the spectacles
- D. Safety frames/side shields
1. Optional in most cases – check with your studio owner if you rent/use space there
 2. Safety frames are tougher and withstand more abuse than “street” frames
 3. Safety frames are the only frames available with side shields to prevent debris from entering the eye from the side, very useful in teaching sessions where students are on either side of you
 4. Clip on frames help eliminate having to purchase multiple pairs of spectacles, useful if you wear prescription lenses and your prescription changes
- E. Proper lens selection
1. Each type of work (listed in section IB) requires specific filters; there is not much cross-over where one filter will work well with different types of work.
 2. Didymium was discontinued by the manufacturer about 10 years ago; it is still available from some suppliers. Its replacement is ACE (Amethyst Color Enhancement), sold under a variety of brand names. This filter is the basis for both soft glass and borosilicate glass working. It should not be used for kiln work unless additional IR filters are used in conjunction with the lenses.
 3. Prescription lenses are always better than wearing multiple pairs or clip on’s, but your budget should come first!

Created 1/20/2011 by Michael Aurelius, exclusively for the International Society of Glass Beadmakers Safety Brochure

ADDITIONAL RESOURCES

Aura Visual Concepts, blog articles:

- Energy Radiance Information for Glassworkers- Monday, April 09, 2012: <http://www.auralens.net/blog?pagenumber=2>
- Glassworker Filter Recommendations- Monday, April 09, 2012: <http://www.auralens.net/blog/tag/glassworkers>
- Laser Information Sheet- Monday, April 09, 2012: <http://www.auralens.net/blog/tag/laser>
- X-Ray Protection Technical Information- Monday, April 09, 2012: <http://www.auralens.net/blog/tag/x-ray>

Aurelius, Mike. “Superstition, Myth, and Urban Legend: Protective Eyewear and the Glassworker.” The Glass Art Society Journal, 2003, pp. 128-129.

Crook, Morgan. The neon engineers notebook. By Morgan Crook & Jacob Fishman. 2nd ed. Northbrook, IL : Lightwriters Neon, 2007. 233 p. “Better eye protection,” pp. 105-108.

Dodson, Ricky Charles. “It’s Cheaper Than a New Pair of Eyes!” Glass Line, v. 8, no. 6, April/May 1995, p. 1. Note: The need to wear didymium glasses.

Dunham, Bandhu Scott. Contemporary Lampworking: A Practical Guide to Shaping Glass in the Flame. 3rd ed. Prescott, AZ: Salusa Glassworks, 2002. “Health and Safety,” vol. 1, chapter 9, pp. 229-244.

“Eyewear for Glass, Ceramic, & Metal Workers: Updated Recommendations.” ACTS Facts, v. 14, no. 4, April 2000, pp. 3-4. Note: [ACTS = Arts, Crafts and Theater Safety]. Glowing-hot glass emits infrared radiation.

Firth, Mike, "Letter to the Editor," Glass Artist, no. 3, April/May 1995, p 3.

Glassworkers and Metal Workers Protective Eye-wear Buyer's Guide. St. Cloud, MN: Aura Lens Products, 1996; 2000.

Gruenig, David. "Eye Protection." Independent Glassblower, no. 35, Sept.-Nov. 1994, p. 4.

Gruenig, David. "Eye Protection for Furnace Glassblowers," GlassGazette, Fall 1992, pp. 4-6.

Hart, Mostyn. Manual of Scientific Glassblowing. St. Helens: British Society of Scientific Glassblowers, 1992. "Safety – 3.1.8 Personal Injury," pp. 56-57. [good chapter on "Safety -- The Hazards of Glassblowing and Allied Operations," pp. 49-85.]

Hughes, Bronwyn, "Eye Protection for Furnace Glassblowers," Ausglass Magazine, Spring/Summer 1991/1992, pp. 20-22.

Kerkvliet, Brian, "Beads From the Beginning," Glass Art, v. 10, no. 1, Nov./Dec. 1994, pp. 4-9. "Safety: Eye Protection," pp. 7-9.

Layton, Peter. "Eyes and Safety." British Artists in Glass Newsletter, no. 9, July 1979, pp. 20-21. Note: Glassblowers exposed to infrared radiation.

Lehman, Richard. "Practical Eye Protection for Glassworkers." Independent Glassblower, no. 53, March-May 1999, p. 1-4.

Malchow, Lisa M. "F.Y.Eyes," Fusion, May 1993, pp. 72, 74, 76-78. [American Scientific Glassblowers Society]

Myers, Gary E., "Optical Radiation Hazards in Glassblowing," Fusion, Aug. 1976. [American Scientific Glassblowers Society, Toledo, OH]

Moss, C. Eugene and Burton, Nancy Clark. "NIOSH Health Hazard Evaluation Report, HETA 98-0139-2769, The Society of Glass Beadmakers, Corning, NY, p. iv. "Exposures during Glass Beadmaking" 2004.
<http://www.cdc.gov/niosh/hhe/reports/pdfs/1998-0139-2769.pdf>

Oriowo, Olanrewaju. "Glassblowers' Ocular Health and Safety: a Technical Report," Fusion, Aug. 1997, v. 44, no. 3, p. 45.

"Product Information Bulletin: Didymium Glass Types for Art Glass Blowers, Scientific Glass Blowers, and Lamp Workers," Fusion, Aug. 1993, p. 38, 40. Reprinted from Aura Lens Products.

Rossol, Monona. "Good Glasses for Gazing at Glowing Glass," Common Ground: Glass, Fall 2000, p. 4.

Schell, James, "Eyecare for the Hot Glass Artist," Glass Art, v. 10, no. 2, Jan./Feb. 1995, pp. 36-37; also in: Glass Line, v. 8, no. 3, Oct./Nov. 1994, pp. 9-10; also in: Professional Stained Glass, no. 124, June/July 1994, pp. 52-53.

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Turley, Kristian. "Lampworking Eye Protection." Common Ground: Glass, Spring 2003, p. 11-12.

Turley, Kristian. "The Importance of Protecting Your Eyes!" Glass Line, v. 16, no. 5, Feb./March 2003, p. 8.

Viesnik, Peter. "For Your Eyes Only--Eye Protection Advice." NZSAG Newsletter, Dec. 2000, pp. 6-7. New Zealand Society of Artists in Glass.

Weisbart, E. "Letter re: Proper Eye Protection." The Bead Release, v. 4, no. 4, Fall 1997.

"Your Health and Safety." The Bead Release, v. 4, no. 3, Summer 1997, pp. 6-7. Note: Eyewear for filtering out infrared radiation.

"Your Health and Safety." The Bead Release, v. 4, no. 4, Fall 1997, pp. 14-16. Note: Includes information on proper eye protection for hot-glass work.

Information about the optical glass:

Bach, Hans and Neuroth, Norbert, ed. The Properties of Optical Glass. Berlin ; New York : Springer-Verlag, 1995. (Schott Series on Glass and Glass Ceramics). Compiled "to describe the properties of the optical glass developed by Schott." Also includes grinding and polishing, ophthalmic glasses, photochromic, ultraviolet-transmitting, infrared transmitting, laser glasses, special glasses for nuclear technology, colored glass and glasses for eye protection.

Technical studies

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Vos, J. J., & van Norren, D. (1994). Weighing the Relative Significance of Three Heat Dissipation Mechanisms to Produce Cataract. Lasers and Light in Ophthalmology, 1994, v. 6, no. 2, pp. 107-117.

Websites

(with thanks to Jesse Kohl):

- Electromagnetic spectrum http://www.colourtherapyhealing.com/colour/electromagnetic_spectrum.php
- Ocular damage spectral dependence <http://www.westernsafety.com/laservision2008/laservisionindex.html>