

RESPIRATORY SAFETY

I. Hazards

A. Particulates

1. Glass frit and enamel
2. Dried bead release
3. Ground glass and fine glass dust
4. Grinding and polishing abrasive
5. Metallic fumes and vapors
6. Smoke

B. Gases

1. From combustion process
2. From chemical reactions

II. Response: See doctor for chronic and/or severe symptoms

III. Precautionary Actions

- A. Clean with water/damp cloth to keep dust/etc., the a minimum
- B. Follow manufacturer's directions or NIOSH instructions when using materials
- C. Have adequate ventilation and/or ventilation system in workplace
- D. Replace worn respirator as needed

IV. Protective Equipment : Respirators

A. Dust Mask

1. Filters only nuisance dust (example: from sanding)
2. Ineffective against removing hazardous particulates or gases

B. Disposable Respirator Rated N100

1. Designed and tested to remove 99.97% of most particles,
2. Including dust particles, bacteria, metallic fumes, and cold-worked glass particles

C. Cartridge-Style Respirator

1. Rated for specific chemical and toxic gas hazards
2. Use the one that is certified for the specific hazard

REFERENCES

Henley, Vince. "Studio Safety: Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.16/15, issue 2), Spring 2008.

Henley, Vince. "Studio Safety: Part Two--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.15, issue 3), Summer 2008.

Henley, Vince. "Studio Safety: Part Three--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.15, issue 4), Autumn 2008.

Henley, Vince. "Studio Safety: Part Four--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.16, issue 1), Winter 2009.

Henley, Vince. "Studio Safety—Respirators Revisited." *The Glass Bead* (v 17, issue 2), Spring 2010.

Simmons, R.B. "X-Ray Microanalysis of Art Glass Surfaces." *Microscopy Today* (v18, no 6), September 2010. http://content.yudu.com/A1ot70/MTO18Issue5/resources/index.htm?referrerUrl=http%3A%2F%2Fwww.microscopy-today.com%2Fjsp%2Fprint_archive%2Fprint_archive.jsf

ADDITIONAL RESOURCES

Arts, Crafts & Theater Safety. "Respiratory Protection: New Rules." NY: ACTS, n.d. 7 p.
<http://www.artscraftstheatersafety.org/datasheets.html>

Bako, Pat. "Demo: Secrets of the Coldshop Exposed." *The Glass Art Society Journal*, (2007), pp. 127-128, ill. Note: Mainly about workshop safety, and the use of grits for polishing; also includes tips from other artists.

Chouinard, Joanne. "The Long and Short (Term Exposure) of It!" *Glass Craftsman*, no. 162, Oct./Nov. 2000, pp. 36-38+. Note: Health and safety issues.

Chouinard, Joanne. "Personal Protective Equipment and the Studio Environment." *Glass Craftsman*, no. 161, Aug./Sept. 2000, pp. 26-29+. Advice on safety.

Conway, Judith Finn. "Studio Safety: Respirator for Glass Artists." *Batch*, v. 5, no. 3, Feb./March 2007, pp. 12-15, ill. Note: Supplement to *Glass Craftsman*, no. 200, Feb./March 2007. Types, care, and storage of respirators.

Fallon, MD, Fleming. "Health & Safety...Filter Masks and Material Safety Data Sheets." *Stained Glass News*, issue 93 (Jan. 2009), p. 8, ill. Note: Includes working with chemicals.

Henley, Vince. "Studio Safety: Do I Need a Respirator?" *The Glass Bead*, v. 14, issue 3 (Summer 2007), p. 37.

Henley, Vince. "Studio Safety: [Part One]: Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.16/15, issue 2), Spring 2008.

Henley, Vince. "Studio Safety: Part Two--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.15, issue 3), Summer 2008.

Henley, Vince. "Studio Safety: Part Three--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.15, issue 4), Autumn 2008.

Henley, Vince. "Studio Safety: Part Four--Hazardous Substances and Alphabet Soup." *The Glass Bead* (v.16, issue 1), Winter 2009.

Henley, Vince. "Studio Safety: Respirators Revisited." *The Glass Bead*, v. 17, issue 2 (Spring 2010), pp. 22-23, ill. Note: Also includes explanation of airborne hazards.

Johnson D, Vincent J. "Sampling and sizing of airborne particles." In: DeNardi SR, ed. *The Occupational Environment: Its Evaluation, Control, and Management*. Fairfax, VA: American Industrial Hygiene Association, 2003.

Medford, Marsha Kay. *Respiratory Health Hazards of Artists in Their Studios*. Ann Arbor, Mich.: University Microfilms, 1989.

Mominee, Terry. "Tool Tips by Terry: Being Prepared...and Proactive." *Stained Glass*, v. 105, no. 2 (Summer 2010), p. 96, ill. Note: Quarterly of the Stained Glass Association of America. Inspection and maintenance of personal protective gear, power tools, hand tools, shop tables, materials storage, and safety equipment.

“Oh Blast It!” The Guild of Glass Engravers Newsletter, (Spring 2009), p. 4. Note: Brief descriptions of six types of sandblasting masks.

“Respiratory problems found more often in glassblowers.” ACTS Facts, v. 7, no. 7, July 1993, p. 2. Additional info: Arts, Crafts and Theater Safety

“Safety Topics: Inhalation of Fumes from Silica Working Could Generate Nitric Acid in Lung Tissues.” Hot Gas, v. 5, no. 3, Winter 1998, p. [19], ill. Note: Scientific Glassblowers Association of Australia.

“Silica targeted for special emphasis by OSHA.” ACTS Facts, v. 10, no. 7, July 1996, p. 2. Additional info: Arts, Crafts and Theater Safety.

“Silicosis Still a Deadly Problem.” ACTS Facts, v. 7, no. 6, June 1993, p. 2. Additional info: Arts, Crafts and Theater Safety. Note: Sandblasting dangers.

Simmons, Robert. “Safety and Soft Glass: Heavy Metals.” The Glass Bead, v. 18, issue 1 (Winter 2011), pp. 7-9+, ill. Note: Health effects of working with metals and metallic compounds.

Websites:

OSHA Occupational Safety and Health Standards. Personal Protective Equipment, Respiratory Protection, Standard Number: 1910.134:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=standards

OSHA Occupational Safety and Health Standards. Air Contaminants, Section 6 - VI. Health Effects Discussion and Determination of Final PEL [permissible exposure limits]:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=770

Information about a wide range of air contaminants, including exposure limits for silica containing dusts “SILICA, CRYSTALLINE - QUARTZ CAS: 14808-60-7; Chemical Formula: None H.S. No. 1355” (“...high exposure of silica-containing dusts have revealed high lung cancer risks....”), exposure limits to hematite dust (ferric oxide) used as a polishing agent for glass, jewelry, etc., and other chemicals used by glassmakers.

Explanation of OSHA Permissible Exposure Limits (PELs): <http://www.osha.gov/SLTC/pel/>

OSHA Occupational Safety and Health Standards, Air Contaminants, Section 7 - VII. Feasibility and Regulatory Analyses:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=771

US Office of Health, Safety & Security website: www.hss.doe.gov/

High Efficiency Particulate Air (HEPA) Filters info:

<http://www.hss.doe.gov/nuclearsafety/ga/hepa/>

National Institute for Occupational Safety and Health (NIOSH). “Notice Prevention of Silicosis Deaths.” DHHS (NIOSH) Publication No. 93-124: <http://www.cdc.gov/niosh/updates/93-124.html>

With thanks to Jesse Kohl:

For personal OSHA air sampling: http://www.osha.gov/dts/osta/otm/otm_ii/otm_ii_1.html

Particles: Size “Particles in Practice: How Ultrafines Disseminate in the Body” raises questions about how particles < 100 nanometers (or 0.1 µm) are able to be absorbed into the body and distributed in the cells: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1310959/>

Environmental Health Perspectives, Environews by Topic page, <http://ehp.niehs.nih.gov/topic>.
Choose Air Pollution, Particulate Matter

Canadian Lung Association, The Respiratory System,
http://www.lung.ca/children/grades7_12/respiratory/respiratory_system.html

Canadian Centre for Occupational Health and Safety: What are the effects of dust on lungs?
http://www.ccohs.ca/oshanswers/chemicals/lungs_dust.html#_1_2

How do particulates enter the respiratory system?
http://www.ccohs.ca/oshanswers/chemicals/how_do.html

Freitas R, Jr. Nanomedicine [online book]: Navigational bronchography,
<http://www.nanomedicine.com/NMI/8.2.2.htm>

Clearance of inhaled particles, <http://www.nanomedicine.com/NMIIA/15.4.3.3.2.htm>

Pima County, Arizona, Department of Environmental Quality: Animation on particulates (click on “Lung Attack”), <http://www.airinfonow.org/html/activities.html>

Health effects of particulates and other air pollutants, <http://www.airinfonow.org/html/health.html>