

Lessons Learned...Glass Vessel Explosion

What Happened?

Students were doing an experiment involving compressed gas purging of a 20L glass vessel when the container overpressurized and burst. Broken glass and water were ejected across the lab space. Two students closest to the explosion were severely injured. Neither the students or the TA in charge were wearing safety glasses or goggles at the time of the explosion, and one student permanently lost sight in one eye from their injury.



Glass and water were blown throughout the lab space. Enough force was generated to lift the tiles above the vessel.

What went right?

- Department notified EH&S immediately to investigate.
- Department stopped lab sections to review overall safety before students returned.

What should have been done differently?

- All individuals in the laboratory should wear personal protective equipment when hazards are present. The students and TA were not wearing safety glasses.
- A thorough documented risk assessment process may have identified potential for overpressurization and opportunities to reduce the risk.

What was the cause of the injury?

- Safety culture on PPE in laboratory spaces was inadequate and use by students or TAs was not enforced.
- Pressure vessel was not rated for pressures that could be achieved in experiment.
- No pressure relief devices in use.

What corrective actions will be taken?

- Experiment was permanently retired, and remaining experiments were reviewed before they were used again.
- Instructional lab safety program was developed to address responsibilities of all parties involved in the teaching laboratory environment.
- Department established improved PPE checks for teaching laboratories to improve compliance.