

**Case 106. 30-year-old male manufacturing engineer died when he was struck in the chest/head by a lid of a compression former that exploded while under pressure.**

On November 2, 2005, a 30-year-old male manufacturing engineer died when the prototype compression former he was operating under pressure exploded, causing the lid to break away from the base, and strike the deceased in the chest/head. Another company had built the unit with design specifications given by the deceased's employer. The machine consisted of a welded table constructed of 2-inch angle iron, with a steel top and a steel counterbalance welded to the front of the table approximately 12 inches above the floor. The table measured 2 inches wide by 48 inches long by 33 ¼ inches high. There were eight welded clamp brackets on the outer edges of the table, two on the front side, two on the backside and two on each end. The backside of the table also had two welded and bolted hinges and two welded stops for the lid. The lid measured 32 inches wide by 55 ¾ inches long. The dome was 12 inches deep. There was a counter balance welded on two arms off the backside of the lid. There were two solid steel bars that measured 19 inches long, welded to the front side of the lid that were used as handles to lift and lower the lid onto the table. Covering the bottom of the domed portion of the lid was a bladder, which was secured in place. Air pressure was supplied into the dome portion through a regulator attached to the table of the machine. Air was directed from the regulator through an air hose attached to the dome of the lid. On the topside of the dome was an air gage and a low-pressure safety relief valve, which was supposed to open at 20 psi in the event of air pressure exceeding 20 psi inside of the dome. There were three sight glasses made of ¼-inch Plexiglas in the dome for viewing the inside of the dome, one in the front, one in the back and one on the top of the dome. The prototype machine bonded plastic surface material to car parts under pressure. A part was placed on a fixture in the table. Air pressure was supplied into the hinged lid, forcing the rubber bladder down on the glued materials inside holding them together while they bonded. The total weight of the compression former was 1000 pounds; the lid and base each weighed about 500 pounds. The deceased was experimenting with different glues to determine bonding capabilities. An adhesive supplier, who was in the facility for another meeting, asked if he could assist the deceased set up the machine. Upon completion of installing the mold, the deceased lowered the lid onto the table and installed only two clamps to the front side of the machine. Air pressure was supplied. The deceased stated to the adhesive supplier that the pressure gauge was at 18 psi just before the explosion occurred. The supplier stated that the victim had leaned forward over the machine, looking into the top of the dome sight glass when the lid exploded. The lid became detached from the table and struck the victim in the chest/head area, knocking him immediately to the cement floor. One of the front locking devices appeared to be partially damaged. Two hinges on the back of the machine were broken; one remained connected to the lid and the other was still connected to the back of the table. It appeared that the regulator was set at 28 psi and the safety valve at 20 psi. He was pronounced dead at the scene.

MIOSHA recommended that the employer develop written safe operating procedures to follow for new machines to be operated by employees.

MIOSHA issued the following Serious citation to the employer:

Serious:

ACT 154 PA OF 1974, SEC 11(a).

Furnish to each employee employment and a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to the employee in that the employer failed to ensure on November 2, 2005, that safe operating procedures were followed on the Proto-Type Bladder machine including the tightening of all clamps and the positioning of the employee in path of trajectory. The hazard allowed employees to be struck when cover of machine is released.

Among other methods, one feasible and acceptable abatement method to correct this hazard is to ensure procedures are followed including the clamping and positioning of employee during operation.