



## *Technical Bulletin*

### Lokring™ & Welding: Mechanical Safety

“Welding, cutting and brazing are hazardous activities that pose a combination of both safety and health risks to more than 500,000 workers in a wide variety of industries. The risk from fatal injuries alone is more than four deaths per 1,000 workers over a working lifetime.”

-US Occupational Safety & Health Administration Welding Health Hazard Statistic  
Source: <http://www.osha.gov/SLTC/constructionwelding/index.html>

#### **OSHA Welding Health Hazard Statistics:**

- “Fifty-eight deaths from welding and cutting incidents, including explosions, electrocutions, asphyxiation, falls and crushing injuries were reported by the Bureau of Labor Statistics in 1993.”
- “For the construction industry, welders flash (burn to the eyes) accounts for 5.6% of all construction eye injuries.”
- “In Alberta Canada, 21% of workers compensation claims for eye injuries were to welders.”
- “Ultraviolet radiation (UV) is generated by the electric arc in the welding process. Skin exposure to UV can result in severe burns, in many cases without prior warning. UV radiation can also damage the lens of the eye...Exposure to ultraviolet rays may also increase the skin effects of some industrial chemicals (coal tar and cresol compounds, for example).”

Source: [www.osha.gov](http://www.osha.gov)

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Lokring Tech Bulletin Welding Series - Mechanical (11-07-07).doc



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#### Further Welder Injury Statistics:

- "An estimated 2.3 million construction workers, or 65% of the construction industry, work on scaffolds frequently. Protecting these workers from scaffold-related injuries would prevent 4,500 injuries and 50 deaths every year, at a savings for American employers of \$90 million in workdays not lost." [www.osha.gov/SLTC/scaffolding/index.html](http://www.osha.gov/SLTC/scaffolding/index.html)
- "Falls account for more than one-third of all fatalities on construction sites in 2001, according to the Bureau of Labor Statistics." [www.ecmweb.com/ar/electric\\_oshas\\_top\\_construction/](http://www.ecmweb.com/ar/electric_oshas_top_construction/)
- In Canada, 1999, "Flash and flame burns to older adolescents and adults...were most often due to welding flashes (40.7%) or combustion of flammable materials (22.9%). There were 49 patients who sustained burns while welding." <http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/chirpp-schirpt/21se02/>

#### Reported Accidents as a Result of Human Error While Welding:

- "On January 3, 1998, a weld defect located on a fitting caused a pipeline to rupture at a location east of Pendleton, Oregon, resulting in the loss of gas service to 10,000 customers in the Walla Walla area."  
-Washington Utilities and Transportation Commission, "Pipeline Safety Section: Natural Gas Leak History," 2001
- On May 7, 1999, "Welding slag ignited an accumulation of oil in the lact skid. Welding was taking place 25 feet from the skid. Oil was dripping in the skid when a ½-inch ball valve was bumped open."  
-U.S. Department of the Interior Minerals Management, Service Engineering and Operations Division, "Incidents Associated with Oil and Gas Operations, Outer Continental Shelf," 1999



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#### **Reported Accidents as a Result of Hot Work or Material Error While Welding:**

- On January 23, 1999, "A welder caused a small flash fire while starting to cut the surface casting after a cement job. The wellhead area and the annulus were checked with a gas detector; there was no evidence of gas. The annular fluid was 6 feet below the wellhead when the cut began. Slag fell into the annulus and caused the flash fire."  
-U.S. Department of the Interior Minerals Management, Service Engineering and Operations Division, "Incidents Associated with Oil and Gas Operations, Outer Continental Shelf," 1999
- On March 18, 1999, "Welding slag from a construction project ignited a small fire from a fitting on a small gas supply line. The fitting did not seal tightly. The fire began sometime during the morning; however, it was not noticed until nightfall due to the small intensity and height of the flame."  
- U.S. Department of the Interior Minerals Management, Service Engineering and Operations Division, "Incidents Associated with Oil and Gas Operations, Outer Continental Shelf," 1999

#### **Reported Incidents of Welder Fatalities:**

- "On December 19, 1988, a 27-year-old male...died when he fell from a suspension scaffold and his safety lanyard snapped...Examination of the lanyard after the event showed burn damages at several places, including the point of failure...The lanyard had been returned to the storage bin even though it had probably been damaged earlier during cutting and welding operations."  
-NIOSH Case Reports, [www.cdc.gov/niosh/92-108.html](http://www.cdc.gov/niosh/92-108.html)
- "A welder entered a steel pipe to grind a bad weld...Before he entered, other crew members decided to add oxygen to the pipe near the bad weld. He had been grinding intermittently for about five minutes when a fire broke out enveloping his clothes...the welder died the next day from his burns."  
-OSHA Accident Report No.25,  
[www.jobcorpshealth.com/html/SafetyCircle/articles12/fatal%20fact%2025/htm](http://www.jobcorpshealth.com/html/SafetyCircle/articles12/fatal%20fact%2025/htm)



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#### **Lokring Incident Reduction Plan (IRP):**

- Less safety requirements are needed for Lokring installations, thus reducing cost of protective gear and the possibility of forgetting to implement a health standard.
- Since installation is cold and only requires uses of a compact, lightweight hydraulic pump, fittings and adjacent piping components are not susceptible to hot work damages.
- Furthermore, Lokring connections can be installed in all types of weather conditions.
- There is no chance of workers being burned from sparks, slag, spatter and arc rays, etc.
- Installation rarely requires scaffolding, which decreases set up time and cost, and scaffold-related injuries and fatalities
- Installer technique cannot influence joint integrity since reliability is "machined into" the connections by using the hydraulic tool. Hence, a secure fitting is not dependent on worker skill.

#### **Additional Websites of Interest:**

"Industrial Fire World: Incident Log, May 2003"  
[www.fireworld.com/incidents/may03.htm](http://www.fireworld.com/incidents/may03.htm)

"Office of Pipeline Safety, Pipeline Statistics," <http://ops.dot.gov/stats.htm>

Primedia Business Magazines and Media: "OSHA's Top 25 Construction Violations"  
[www.ecmweb.com/ar/electric\\_oshas\\_top\\_construction/](http://www.ecmweb.com/ar/electric_oshas_top_construction/)