

A Worker Is Injured When Flammable Fumes From Brake Cleaner Explode While He Is Welding

A mechanic was working to prepare a pump drive unit for an excavator. He cleaned the parts inside the unit using an aerosol brake cleaner. He then went to remove a bushing from the drive unit. To make the job easier, he started by welding one bead to the bushing and then examined his work. When he resumed welding, there was an explosion in his face. The force of the explosion sent his welding helmet flying, and he suffered minor burns, two broken teeth and a cut on his chin.

Serious Accident

Date: January 24, 2015

Category: Maintenance

Task: Mechanical maintenance

Position: Diesel mechanic



Causes of the Accident

- Ignition of flammable fumes from a brake cleaner that was used in the confined space of the drive unit, causing an explosion.
- Hot work in a confined space and in the presence of flammable fumes without first assessing the risks.

Preventative Measures by the Employer

- Assess the possibility of replacing brake cleaners with less flammable or non-flammable alternatives.
- Limit the use of flammable products to the absolute minimum in confined spaces, and ventilate enclosed spaces to reduce the concentration of flammable fumes.
- Establish a safe work method including gas tests prior to performing hot work in a confined space, a tank or a container that previously held flammable material.
- Give a training session to tell concerned employees and supervisors about the accident and the corrective measures taken and thereby increase their awareness of the importance of assessing risks before performing any hot work in or around enclosed spaces, tanks or containers, and noting the observations and corrective measures.

Note: Several companies have banned the use of this product and quickly replaced it with a less toxic and less explosive product.

The APSM would like to mention that a worker died in 2011 in similar circumstances when he was performing repair work in the combustion chamber of a furnace. Flammable fumes from a brake cleaner ignited while he was welding, resulting in an explosion that caused the chamber to collapse on the worker and created a fire.

Additional Information

Regulation

- *Regulation respecting occupational health and safety, DIVISION XXVII*
 - View online or purchase at www.publicationsduquebec.gouv.qc.ca

Standard

- *CAN/CSA W117.2-M94 Safety in Welding, Cutting and Allied Processes.*
 - Purchase at <http://shop.csa.ca/en/canada/products/icat/publications>

Other documents

- Commission de la santé et de la sécurité du travail du Québec. Direction régionale de Lanaudière. *Rapport d'enquête sur accident mortel survenu le 22 novembre 2011.* Québec: CSST, 2012. Call number: EN-003922
 - Available online at <http://www.centredoc.csst.qc.ca/pdf/ed003922.pdf>
- ASP Construction. "Pour effectuer le travail à chaud en toute sécurité." *Prévenir aussi* newsletter, Volume 29, No. 2, summer 2014, 7 p.
 - Available online at http://www.asp-construction.org/components/com_gdwgestion/download.php?fileid=517
- ASPHME. *Guide de prévention pour le soudage et le coupage.* 2nd edition, 2014. 146 p.
 - Available online at <http://www.asphme.org/upload/pdf/soudage.pdf>

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