

Not the End of the Line: Recycling Your Acetylene Cylinders

By Erik Cannon

Aging acetylene cylinders have long been a headache for distributor operations managers and compliance personnel. Their unique composition and the volatility of their contents require that they be handled with the utmost care throughout their lifespan. As they contain materials that are potential health hazards, they also must be disposed of diligently to avoid potential liability.

Unlike most compressed gas cylinders, acetylene cylinders are not entirely hollow. While most cylinders are basically steel shells pumped full of gas, acetylene cylinders contain a solid core. The core contains dissolved acetylene along with acetone, which acts as a stabilizing agent for the highly flammable acetylene gas. The secondary chemical, acetone, is necessary for safety purposes, but makes disposing of the cylinder a complicated process.

Over time acetylene cylinders break down and eventually fail requalification. At this point the cylinder can no longer be used safely and must be disposed of, acetone-laden core and all. Historically this has meant one of two things; the cylinder can either be shipped off to landfill, or left outside an owner's facility to rot away. Each of these methods has unique risks for the cylinder owner.

The latter option, leaving them on-site to rot, raises risks of leakage and soil leaching, human injury and other Health, Safety and the Environment (HSE) issues for the site owner. Exposure to moderate-to-high levels of acetone, considered a volatile organic compound by the National Institutes of Health, can cause many adverse physical reactions. Acetone exposure can occur via contaminated air, drinking water, or food.

Landfilling acetylene cylinders is also risky as decaying cylinders present an opportunity for acetone contamination to groundwater. Liability for cylinders in landfills rests with the cylinders' last owner. This disposal method also eliminates the opportunity to reuse/sell scrap steel from the cylinders and recycle acetone back into the market.

CYLINDER DISPOSAL SOLUTION

Massachusetts-based Cylinder Recyclers and its Ohio-based affiliate have developed a unique disposal method that collects any residual acetone for reuse, scraps the steel shell of the cylinder, and disposes of the lime silica core. The Company does this by slowly heating each cylinder under a vacuum until the acetone in the core becomes a gas. The acetone gas can then be cooled back into a liquid for reuse. The cylinder's steel shell is then cut open, its core removed and disposed of in accordance with proper environmental guidelines, and the steel sold as scrap.

The European Union is already moving toward more environmentally friendly acetylene disposal methods. While there is no legislation in place banning acetylene cylinders from landfills, the EU has developed safe handling procedures and recommends solvent removal prior to disposal, specifies the wet removal of the core, and requires the removal of any acetylene and acetone solvent before disposal. For cylinders made prior to 1984, which may contain asbestos, the solvent must be removed before disposal.

Recycling acetylene cylinders keeps tons of reusable steel and acetone out of landfills and saves it for reuse. Recycling can help limit liability and the risk of groundwater contamination and human exposure to acetone. Many companies have already begun taking an active stance against potentially hazardous disposal methods and have instituted corporate-level sustainability efforts. Many have chosen to stockpile scrap cylinders as they are wary of landfill liabilities. For these companies, recycling is an obvious choice.

For companies pursuing six-sigma quality standards, ISO 14001:2004 certifications or other quality credentials, recycling programs, sustainability efforts, and environmental risk reduction must be high priorities. Sustainability measures such as recycling and pursuit of ISO 14001:2004 certification are valuable tools that can be used to the benefit of the business.

Perhaps most important, many organizations today use environmental responsibility as a criteria for vendor selection. More and more



Acetylene cylinders that have been processed and are waiting to be sawed.

businesses are evaluating their supply chains with an eye toward sustainability and overall environmental costs. This has significant implications for distributors of industrial equipment such as acetylene cylinders. According to the sustainability consulting firm Cameron-Cole, "Corporations worldwide are utilizing environmental supply chain management strategies to help drive procurement decisions to not only manage potential risk from their suppliers, but also to improve the overall footprint of their products and services."

SUSTAINABLE AND PROFITABLE

What is surprising to many acetylene cylinder owners is just how much reusable material is left over in each scrap cylinder. While most scrap cylinders hold about 2–3 gallons of acetone within their core, large cylinders may contain as much as eight gallons in addition to their salvageable steel shell. According to Cylinder Recyclers founder Jim Hemeon, "We have removed almost seven gallons of acetone from some cylinders," adding that "we've even pulled some out of landfills that still couldn't pass a flame test."

For cylinder owners the long-term risks of landfilling and stockpiling can impede long-term growth. Potential liability, HSE hazards and handling and transport issues, environmental compliance drivers, and the market value of being a "green" vendor and employer combine to make recycling acetylene tanks a preferred practice.

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