

Special Secondary Containment Vessels for Liquid Chlorine Cylinders Help Aluminum Alloy Manufacturer Continue Use of Process Chlorine Safely, Effectively, and Economically

*Contracted Bulk Chlorine Storage Tank Was No Longer Available;
Having Own Bulk Tank, or Otherwise Using Cylinders, Not Feasible*



A refurbished, 1-Ton ChlorTainer secondary containment vessel with an 18-bolt door, like this one, was provided for an interim installation.



To increase chlorine held on site, while remaining within regulations, the plant will be changing to a Twin Double Ton vessel, like this one, later this year.

The plant manager for an aluminum alloy manufacturing process reports effective deployment of special secondary containment vessels for liquid chlorine cylinders, in order to continue highly desired use of process chlorine gas safely, effectively, and economically.

A long-running contract for bulk liquid chlorine delivery, including providing tank maintenance, was no longer available. Regulatory, economic, and footprint advantages made the special secondary containment vessels much more desirable than either the plant assuming responsibility for its own tank, or switching to cylinders in a more conventional fashion.

“We derive chlorine gas on site, from passing liquid chlorine through a vaporizer/evaporator, and then inject it into molten aluminum, in order to remove undesirable elements, oxide inclusions, and gases,” said the plant manager. “That is vital in helping us to give our customers the aluminum alloys within the specifications they need.”

“Using chlorine for those purposes is especially effective and efficient, so we wanted to find another way to continue doing it, when the arrangement we

had for a contracted bulk storage tank for liquid chlorine, replaced every five years, was no longer available. Switching to having our own tank was a very expensive proposition, and it also presented a whole new regulatory compliance situation for risk management, so we started looking at going to liquid chlorine cylinders.”

“When we started to consider cylinders,” he continued, “we knew we were going to have to continue accounting for safe containment in the event of a leak. That turned out to typically mean

constructing a new sub-building, which we didn't have a lot of footprint space for, plus the expense of installing a scrubber system, which would also come with a new maintenance burden."

"As an alternative means for deploying cylinders, one of our regulatory authorities was aware of secondary containment vessels for chlorine cylinders, that we could see were being effectively used in the local water district for cylinders already containing gas. That technology, which was also available for cylinders containing liquid chlorine, has solved the problem, by eliminating the need for a scrubber system, and allowing us to incorporate the new safety containment with our other chlorine-related equipment, in a revised process setup that we do have footprint space for."

"We're especially pleased to have avoided the resource demand presented by a scrubber system; probably 20-40 man hours per week, as compared to a half hour each day, 3 people, 5 days a week, just using the containment vessel for the cylinders. Initially, we didn't know everything about using the vessel, so there were some bumps during the learning curve, but after a few months we all bought into it, and are now very happy with the product."

Molten aluminum in the plant's reverb and holder furnaces often contains undesirable content, such as magnesium, that is much too high for meeting typical production specs. To remove them, liquid chlorine is piped to an evaporator/vaporizer, with subsequent chlorine gas moving into a circulating pump that injects it into the molten aluminum in the holding furnace. That enables the undesirables such as magnesium to rise to the top as magnesium oxide dross, as well as allowing for the removal of unwanted gases such as hydrogen, and a variety of other oxide inclusions.

Accordingly, large quantities of chlorine are needed to meet production needs on a timely basis, and the plant's proximity to a school and residences mandate especially stringent safety regulations. With the bulk tank no longer available, and with liquid chlorine provided as one-ton cylinders, they are safely housed in the special ChlorTainer™ secondary containment vessel, manufactured by Chlortainer/TGO Technologies, Inc. of Santa Rosa, CA. The vessels provide secondary containment and re-use of chemicals if there are any cylinder leaks.

For the initial installation last year, the manufacturer provided a refurbished, 1-Ton ChlorTainer secondary containment vessel with an 18-bolt door, allowing for daily switchout of a one-ton liquid chlorine cylinder. To increase chlorine held on site while remaining within regulations, the plant will be changing to a Twin Double Ton vessel later this year. As an extra bonus, while the bulk tank arrangement had to be abandoned because it was no longer available, the delivery of chlorine to the plant is now regarded as safer than it was with a large semi-trailer connecting hoses to the tank.

The vessels are ASME-rated pressure tanks, and any leaks are recycled to the injection system at a normal flow rate. A failsafe valve ties into the chlorine leak detection sensor, so that in the event of an external release, the nitrogen failsafe valve will close, stopping it completely.

The vessels' life expectancy is stated as no less than 100 years, given proper maintenance. This features annually changing out the Viton O-ring on the door, which takes about half an hour of time and approximately \$200. Further information about ChlorTainer is available from Chlortainer/TGO Technologies Inc., www.ChlorTainer.com, (800) 543-6603, sales@ChlorTainer.com.

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