



Gary Henneke, Manager of Transportation for Texas Petrochemicals, LP, stands behind a manway that was recently upgraded to the Drylok™ dry disconnect coupler.

Zero Tolerance

Texas Petrochemicals and OPW Engineered Systems team up to create the world's safest transfer of butadiene.

The chemical known as 1,3-Butadiene, or $\text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2$, has many benefits. It is used in the manufacture of several helpful products such as tires, telephones, footwear, road surfaces and carpet backings, to name a few. However, getting butadiene from Point A to Point B can be a difficult challenge. As a colorless, non-corrosive gas and liquid with a mild aromatic odor, butadiene is extremely flammable. According to the Occupational Safety & Health Administration, the permissible exposure for persons who are working with the chemical may not exceed one part butadiene per one million parts of air averaged over the 8-hour workday.

So, in essence, butadiene should not be touched or inhaled by anyone — the near equivalent of zero tolerance. That’s easier said than done when transporting this chemical in pressurized railcars that have been in service for several years and are equipped with connection devices that are outdated and difficult to use.

One of the largest manufacturers of butadiene, and other C4 chemical products, is Houston-based Texas Petrochemicals, LP (TPC). The company has manufacturing facilities in the industrial corridor adjacent to the Houston Ship Channel, Baytown and Port Neches, TX and Lake Charles, LA, respectively. TPC ships its butadiene via railcar and has been doing so successfully for quite some time. In fact, the company recently was honored with the 2006 Union Pacific Railroad Chemical Transportation Safety Pinnacle Award. TPC is one of only 30 winners with the distinction of having zero non-accident releases and implementing safe loading practices, out of 1,200 Union Pacific hazardous material shippers. TPC has won this award a total of six times now, so the commitment to safety is not just a catchphrase for this company. It’s a way of life.



TPC recently won the 2006 Union Pacific Railroad Chemical Transportation Safety Pinnacle Award for its commitment to safety and having zero non-accident releases.

Continuing the Commitment to Safety

A few years ago, TPC became concerned about the butadiene particulate remaining in the nipples and couplers on the standard valve systems that were in use at its facility and other facilities it regularly does business with throughout the supply chain.

“TPC has always been concerned about the environment, people around us and our workers, so we have always



TPC has upgraded its railcars that transport butadiene to the OPW Engineered Systems’ Drylok™ coupler.

tried to develop ways to prevent emissions,” said Gary Henneke, Manager of Transportation for Texas Petrochemicals, LP. “The leftover particulate from the connections had us very concerned.”

The equipment that was in use at the time was meeting regulations set forth by the Environmental Protection Agency, Occupational Safety and Health Administration and Texas Commission on Environmental Quality.

However, the fact remained that TPC was not content to let its existing equipment perform under their expectations.

In June 2005, Henneke began searching for the ideal dry disconnect coupler system for possible installation on all of TPC’s butadiene railcars. The company leases its railcars from major suppliers such as Union Tank Car, ARL, and Trinity Industries, and has over 3,000 in its entire fleet with roughly 600 units devoted to transporting butadiene. The capital outlay for an upgrade such as the one that Henneke and TPC were about to embark on was substantial. Therefore, without the ideal system, Henneke would not be as eager to spend the time and money involved on this upgrade.

During his search, Henneke met with Ray Lingo, Regional Representative for OPW Engineered Systems, Lebanon, OH. It was in this meeting where Henneke was introduced to the Drylok™ dry disconnect coupler and educated on its many benefits. However, Henneke wanted more hands-on experience with the coupler before any decision would be made.

“In October 2005, I went to OPW Engineered Systems’ headquarters in Lebanon and met with their engineers and Greg Carrino (Director of Sales and Marketing) to see exactly how this product worked,” said Henneke. “I liked what I saw and it was during that meeting that we also began our preliminary work to receive the proper approvals from the American Association of Railroads (AAR). Since the Drylok™ product was already approved by the AAR, it made it easier for us to seek out approvals for our specific application.”



The Drylok™ coupler helped drastically reduce the average time it took a TPC worker to connect the loading arm to the railcar valves from 35-40 minutes down to 35-40 seconds.

Upon securing approvals from the AAR and TPC's Board of Directors, and passing a capping test that was performed by Culture Industries, Henneke began the conversion process. He worked with Matt Tierney, Southwest Regional Manager, and David Garlington, Vice President, of TransQuip USA, Inc., a railcar equipment distributor and service provider, to assist in the actual equipment upgrades.

Benefits of Upgrading to Drylok™

For the last 40 years, TPC employees had been loading or discharging its butadiene railcars with the use of several tools and a lot of sweat equity. To load a railcar, a worker would open the lid of the manway located on top of the railcar, remove a plug with the help of a 36-inch pipe wrench, pick up a two-and-half-foot steel nipple and thread that nipple into that valve. Then the worker would drag the hammer union fitting to that nipple, put it on that nipple, start it, then take a hammer and beat that fitting on the valve. This is a very time-consuming process, not to mention, the worker is bent over and expending quite a bit of energy.

“Three valves on each railcar have to be done that way. He is hammering with those hammers, he is using those pipe wrenches, busting those knuckles, and hurting those

By incorporating the Drylok™ couplers into its railcars, TPC has realized four major benefits:

- 1. Reduced Emissions:** As the driest disconnect in the industry, the Drylok™ eliminates threaded connections that allow fugitive emissions. It also meets emission requirements set by EPA, OSHA and TCEQ.
- 2. Time Savings:** The average time for a TPC worker to connect the loading arm to the railcar valves was reduced from 35-40 minutes down to 35-40 seconds.
- 3. Ergonomic Benefits:** No longer do TPC workers have to use cheater bars, pipe wrenches or hammers to connect the valves. Now they just turn a lever to connect — no heavy lifting or bending over for long periods of time.
- 4. Increased Railcar Safety:** In today's world of possible terrorist threats, TPC was pleased to find that the Drylok™ product is tamper-resistant. This eliminates the possibility of sabotage, theft and contamination. Only the manufactured mating piece allows access to the system.

backs,” Henneke explained. “Now with the new system, all the worker has to do is open the lid, pull the loading arm over the manway, set the Drylok™ female fitting over the male connection, and open the valve. That's basically it. Hooking up a car goes from a half-an-hour to just seconds now. It's like moving from the 19th century to the 21st century with this addition.”

Creating Buy-in From Everyone

The decision to upgrade its connections, and the choice of equipment was the easy part for TPC during this entire process. The difficult part of this was convincing everyone — TPC workers, suppliers and customers — that this upgrade was needed, beneficial and will be the correct choice in the long run.

“I don't care how good a product design is, if you put it up on that rack and say, ‘See-ya,’ it's not going to work. You have to put it on that rack, you have to build a relationship with that worker, that team leader, and show him exactly how it works. Then you have to give him your business card and say, ‘If you have a problem you call me.’ You have to check up on him until he is very comfortable,” explained Henneke. “OPW Engineered Systems was focused on making sure every equipment upgrade is a smooth transition. That's why this has been a success story. My hat goes off to everyone involved.”



In addition to its own employees, Henneke and the entire team of OPW Engineered Systems and TransQuip personally met with all of the company's customers and suppliers to ensure that the upgrade was explained thoroughly and the proper training was in place for everyone involved.

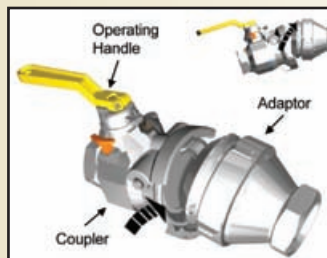
"We're still converting railcars and racks today. We're working with Huntsman (Odessa), Nova Chemical, Chevron, Phillips and several other customers right now," mentioned Henneke. "In fact, we have some of our comrades in the business that are calling us and asking about this product."

"We have the most technically advanced railcars in the country. Since we carry hazardous material, we have built unique safety features inside each railcar. We have safety valves that release faster than anywhere else in the nation. We have valves that are less fatiguing to our loaders. We have put in the fastest flow gauges in the industry," boasted Henneke.

He continues to point out that through the efforts of many, especially OPW Engineered Systems, TPC now has the safest railcars in North America. "I would highly recommend the Drylok™ system to any carriers of butadiene and other hazardous liquids. Its value has been proven to me. I would attribute the successful integration of the Drylok™ system as a key component to the success of TPC receiving the 2006 Union Pacific Railroad Chemical Transportation Safety Pinnacle Award. Only the companies that are focused on safety and continually improve their operations are honored with the UP's Pinnacle Award," said Henneke.

For more information on the Drylok™ system, or other products from OPW Engineered Systems, Lebanon, OH, please contact Greg Carrino, Director of Sales & Marketing, at gcarrino@opw-es.com or (513) 696-1500.

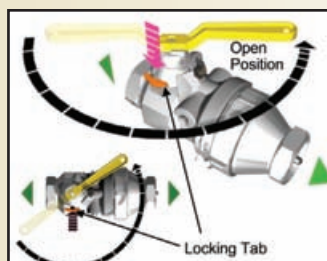
How Does the Drylok™ Dry Disconnect Coupler Work?



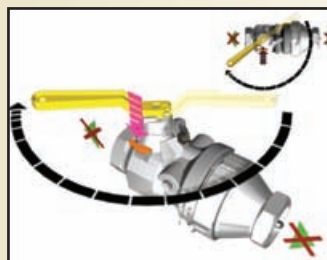
1 Push coupler onto adaptor by first engaging lower jaw of coupler under lip of adaptor and tilting the coupler upward to engage top jaw.



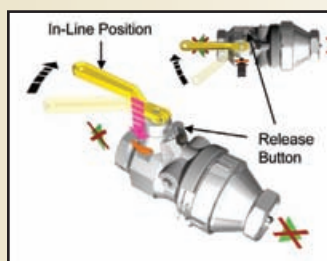
2 Turn handle counter-clockwise until lock engages. Coupler and adaptor are locked together but valve is closed.



3 Press button on coupler down and turn handle counter-clockwise until it locks. Valve is now open and product will flow.



4 To disconnect – press button on coupler and rotate handle clockwise until it locks. Valve is now closed.



5 Press button on coupler down and turn handle clockwise to the "in-line" position. Press tab on opposite side of coupler to release the upper jaw and move coupler away.