



# **Bulk chemical transportation 101**

A shipper's guide to transporting bulk chemicals and working with transport providers to ensure safe and effective distribution

# BULK CHEMICAL TRANSPORTATION 101



Chemical transportation in bulk tanks and trailers is a different world from dry van and other types of truck transport. There are a host of regulations as well as product and equipment concerns that need to be navigated for product to move safely and without damage.

As such, a simple call or email to a transportation provider saying, “I have a product to ship, how much will it cost?” isn’t going to cut it. There’s a greater level detail required to match your load to the right provider and to get an accurate rate quote.

In this article, we’ll examine the ins and outs of chemical transport – from the product itself to the provider you choose to haul it – to help you cover all the bases before booking your next load.



# KNOW YOUR PRODUCT

The first important piece of the chemical transportation puzzle happens before your load actually ships – it's all about knowing your chemical product. To the extent possible, you will need to provide the following information to your transportation provider in order for it to match your load to the proper equipment and qualified driver.

## **Product information.**

Is the product dry or liquid? What are its safe temperature ranges? Is it hazmat or non-hazmat? If it's hazmat shipping, there are additional concerns involved such as acquiring placards and hiring a driver with the appropriate endorsements.

## **Safety Data Sheet (SDS).**

Most chemical (and all hazardous chemical) products should have a Safety Data Sheet that details the product's chemical characteristics and information related to its safe handling and transport. Key information for transportation providers includes:

- **DENSITY:** The weight per gallon will help determine the number of trucks required to handle a shipment
- **PH:** The product's pH level will determine the types of tanks or trailers in which it can be safely transported (e.g., low pH items will require rubber-lined tanks which are harder to come by than stainless steel and aluminum)
- **VISCOSITY:** The product's viscosity will determine whether the product can be pumped or if an air compressor can be used

## **Equipment information.**

Your transportation provider will need to know what special equipment requirements the product has, if any, as well as SOP details on loading and unloading (e.g., rear or center unload required; hose length needed; driver responsibilities and requirements). This also pertains to 'incompatible prior products' – a list of products that cannot have previously shipped in the tank or trailer used for your product.

## **Scale information.**

In order to get an accurate record of the amount of product being shipped, the truck will be weighed before and after your product is loaded. The difference equals the weight of your product. Your transportation provider will need to know if you have a scale onsite or if a visit to one must be factored into the driver's route.

# HAZMAT VS NON-HAZMAT TRANSPORTATION

Chemical products can either be hazardous or non-hazardous. Of course, hazardous material transportation is subject to more regulations.

Regulatory highlights include:

- The Federal Motor Carrier Safety Administration (FMCSA) requires carriers of certain types of hazardous materials to register for a Hazardous Materials Safety Permit (HMSP). It is illegal to haul affected chemicals without the HMSP.
- Under its Hazard Communication Standard, the Occupational Safety and Health Administration (OSHA) requires chemical manufacturers, distributors or importers to provide specific information about hazardous chemical products to downstream users. This information is broken up into the 16 sections of the product's Safety Data Sheet.
- The FMCSA requires that hazmat drivers have the hazmat endorsement (H) on their Commercial Drivers Licenses (CDL). Liquid tanker drivers will also need the tanker endorsement (N). Both endorsements can be combined into a single "X" endorsement.
- The Department of Transportation (DOT) requires that cargo tanks be inspected on an ongoing basis to ensure their safety. For most tanks, these inspections occur according to schedule (e.g., every 5 years) and include visual, thickness, pressure, and leakage tests.
- The FMCSA requires that any tank or trailer hauling hazardous materials includes appropriate placards on the equipment that clearly identifies the chemical class being shipped.
- The FMCSA requires liquid tanks that are shipping hazardous materials to have an internal valve to prevent the contents of the trailer from being released accidentally.



# HAZMAT VS NON-HAZMAT TRANSPORTATION

There are myriad other regulations affecting chemicals, truck drivers, trucks and bulk equipment at both the federal and state level.

Hazardous materials generally require greater freight carrier insurance coverage. Carriers are required to have both liability and cargo insurance policies, and you will want to make sure that both are current before handing your product over.



## **Liability insurance.**

This type of insurance covers damages to people and property in the event of an accident or other mishap. Most carriers are required by the FMCSA to have a liability insurance policy that covers between \$750,000 (typical for non-hazardous dry van shipments) and \$5,000,000 (typical for hazmat shipping). The exact minimum coverage amount will depend on the type of transportation being performed.



## **Cargo insurance.**

This type of insurance covers damages to the cargo being shipped. The FMCSA requires most carriers to have cargo policies with a minimum amount of \$5,000 per vehicle. As a shipper, you will want to make sure that your carrier's cargo policy includes adequate coverage for the value of your products (e.g., if you're shipping \$250,000 worth of products, your carrier's cargo policy should cover at least that amount).

Carriers often hold both policies with the same insurance provider – but this is not always the case.

# CHEMICAL TRANSPORTATION BASICS

## CHEMICAL TRANSPORTATION METHODS

Bulk chemical freight is generally shipped in one of three ways:

### Liquid bulk tanks.

Bulk liquid freight is shipped in liquid bulk tankers that are typically made from stainless steel or aluminum and hold 6,000-7,000 gallons. The tank may consist of a single compartment or be divided into two to four compartments for hauling different commodities at once. Air compressors or pumps are used to load and unload bulk liquids to and from the tank. Liquid bulk tanks can be insulated to protect temperature-sensitive products, or non-insulated. Some insulated tanks will also be equipped with an in-transit heating system to further protect against temperature degradation.



### Dry bulk trailers.

A dry bulk trailer is basically a metal cylinder with a series of cone-shaped hoppers at the bottom. At the bottom of each hopper is a valve, opening into a pipe that runs below the trailer. Those valves are closed when a shipper loads the truck. When it comes time to unload, the driver opens them, letting product run out of the hopper and into the pipe. However, some loads may require a vacuum unit for loading, and/or a blower for unloading. Dry bulk trailers come in different sizes. For example, Polar Tank Trailer sells models that range in capacity from 550 cubic feet with a single hopper to 2,800 cubic feet with six hoppers.



### Totes within a dry van.

Chemical products, whether raw goods or finished products, can also be loaded into containers and shipped in a regular dry van trailer. The types of containers commonly used for chemical transport include drums and intermediate bulk containers (IBC). These IBC totes can handle large quantities of liquids or granulate materials, and range in carrying capacity from 180 to 550 gallons. They are available in plastic or stainless steel and can be stacked.





# CHEMICAL TRANSPORTATION BASICS

## CHEMICAL TRANSPORTATION COST

The cost of shipping liquid or dry bulk chemicals in bulk tanks or trailers is going to be higher than regular dry van shipments for a number of reasons.

- The equipment is more expensive. A regular dry van trailer will cost a carrier up to \$40,000 to purchase whereas a liquid bulk tank will cost up to \$125,000, plus the cost of special equipment.
- Deadhead miles are commonly baked into a carrier's rate as each delivery requires the truck to visit a tank wash for cleaning prior to its next load.
- Hazardous loads are likely going to be more expensive than non-hazardous because of the higher insurance requirements and increased driver training associated with hazmat.



# CHOOSING A CHEMICAL TRANSPORTATION PROVIDER

You can ship your liquid and dry bulk chemical products by working directly with a carrier that has the appropriate equipment, drivers, certifications, licenses, and insurance. Or you can work with a bulk freight broker who has relationships with such carriers and can match your load to the most qualified provider. Unlike carriers, freight brokers do not own equipment and instead rely on their carrier network to move your loads.

Whether you choose to work with a carrier or freight broker, the most important thing to look for is experience with your product (or similar products). Chemical products can be temperamental, and a transportation provider that has experience handling it can make all the difference between a successful and unsuccessful load.

Most freight brokers don't specialize in chemical transportation, but there are a select few who do. If you ship chemicals and want the convenience of working with a freight broker, it may pay to partner with one of these chemical-focused freight brokers.

The following are some of the advantages of entrusting your chemical loads to a freight broker that specializes in bulk freight.

- **Freight brokers are equipment agnostic.** Asset-based carriers have their own equipment and are going to want to use it to service your load. Freight brokers, as mentioned earlier, have no equipment of their own. What they do have, however, is a large network of carriers that they can choose from to meet your needs. This model ensures that only the most qualified carrier will haul your product.
- **Freight brokers have capacity during tight markets.** Another advantage of freight brokers is that they are not restricted by a finite number of trucks, drivers and trailers. Their capacity is as big as their carrier network. So, when one carrier lacks capacity, the broker can turn to another in its network to get your load on the move.
- **Freight brokers can offer one-stop pricing.** Let's say you have product that can be shipped in a bulk trailer or in totes. With one call to your freight broker, you can receive quotes for each mode of transport to help guide your decision. This saves you the time of hopping from carrier to carrier and going through repeated input processes to receive quotes for each mode.
- **Freight brokers can augment a bulk shipment with dry van.** In cases where you have more product than you can ship in a single bulk tank or trailer – but not enough to fill up a second tank or trailer – your chemical freight broker can ship the remaining product via dry van. As with the one-stop pricing benefit, this augmentation would be part of one single shipping process, allowing you to handle all shipping details one time with one single freight broker.
- **They handle the vetting for you.** Another one-stop benefit of shipping with a freight broker is that quality freight brokers vet their carriers thoroughly so that you don't have to. Licensing, insurance, and regulatory compliance information for every carrier in a freight broker's network is managed and kept current – saving you the headache of acquiring and maintaining this information for multiple carriers on your own.



# CHEMICAL TRANSPORTATION MISTAKES TO AVOID

THE FOLLOWING ARE SOME POTENTIALLY COSTLY CHEMICAL SHIPPING MISTAKES TO AVOID.

## 1. **DON'T** book a load without sharing required details with the carrier

Without some requisite information, carriers and freight brokers won't fully understand your needs. Even if a quote was provided based on limited information, it would be much higher than normal because all that uncertainty will be baked into the price.

Your chemical transportation provider needs information to ensure that it can move your load safely and efficiently. The more information you can provide, the better your carrier's or broker's ability to quote you accurately. This includes timing/delivery requirements as well as loading and unloading requirements.

## Wrong product information leads to ruin

A few years ago, a shipper of a phosphoric acid blend booked a load with a liquid bulk carrier. The problem? The shipper provided the carrier with the SDS of a different product, which had a completely different water-to-acid ratio. The carrier assigned the load to a bulk tank based on this incorrect information. After the tank was unloaded at the destination and the driver arrived at a tank wash facility to clean the tank, he was shocked to discover that the inside of the tank was now completely pitted. The damage was so severe that the tank had to be put out of service. And it all resulted from incorrect product info at the start.



# CHEMICAL TRANSPORTATION MISTAKES TO AVOID

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## 2. **DON'T** hire a carrier without vetting it first

When entrusting a load to a carrier, it is not uncommon for shippers to fast track or even skip the carrier-vetting process in order to get product on the move faster. This can be a costly mistake. For example, if something goes wrong with the shipment and your carrier doesn't have adequate insurance, you may be on the hook for a lot more than you bargained for.

Thoroughly vet your carriers – or turn to a freight broker instead. Some freight brokers have dedicated personnel tasked with maintaining the necessary information for every carrier in their networks.

## 3. **DON'T** get blindsided by supply chain interruptions

Whether caused by bad weather or seasonal shortages, supply chain interruptions can cripple your supply lines. When such interruptions hit, shippers scramble to find a carrier that can move product immediately to replenish a stock shortage. But when highways are closed due to a blizzard, “immediate” is not an option.

You must prepare in advance for interruptions by setting aside emergency stock. While some interruptions occur without warning, others – like those caused by severe weather – can be forecasted several days out. Those forecasts should be the impetus to kick your supply chain into high gear and move your product before the bad weather strikes. It's also an opportunity to build up an emergency stock in case an interruption takes longer than anticipated.

# CHEMICAL TRANSPORTATION MISTAKES TO AVOID

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### 4. **DON'T** put all your eggs in one (carrier) basket

Some shippers are content to funnel most freight with one carrier they like. There are downsides to this. First, carriers tend to get complacent. While they value your business, they might not mind raising your rates from time to time. Next, there are times when a carrier may experience capacity shortages. If you haven't built a relationship with other carriers or freight brokers, you'll essentially need to pause your supply chain while you set up a new account with a new provider.

Get your eggs out of the one-carrier basket by establishing relationships with other carriers. Or, better yet, establish relationships with hundreds of carriers by partnering with just one freight broker that has a national carrier network.

### 5. **DON'T** forget to inform your transportation provider of blind shipment products.

While it's relatively common practice within the chemical industry to have one product marketed under different names, it's important that you notify your chemical transport provider of any variations. To illustrate, a driver once arrived at a plant to load a liquid chemical. However, the product listed on the SDS sheet, the product listed on the paperwork given to the driver at the loading facility, and the original product name given when the load was booked were three different product names. The driver was pulled over during a random DOT stop and he was written up due to these discrepancies.

Ensure that your transportation provider fully understands the product it is carrying, along with any variations in the product's names. This will help protect the safety of everyone who encounters the product downstream and will help you avoid potential fines caused by naming discrepancies.



A large tanker truck is shown from a side-rear perspective, driving on a multi-lane highway. The truck has a long, cylindrical tank with multiple compartments. The scene is set during sunset or sunrise, with a bright, low sun on the horizon creating a strong orange and yellow glow. The road ahead is straight and recedes into the distance.

# GET YOUR CHEMICAL PRODUCTS ON THE MOVE

**As you can see, there's a lot to digest when it comes to chemical transportation. But, fortunately, you don't need to go it alone.**

If you can pull together the basic information about your load (product details, shipping lane information, special requirements), an expert transportation provider should be able to help you fill in the gaps and get your product on the move.

Though a rarer breed than dry van transport partners, there are many carriers and freight brokers that specialize in bulk chemical transportation across North America. Many of whom will have expertise shipping your chemical or another just like it.

# ABOUT BULK CONNECTION

Founded in 1987, Bulk Connection is a licensed, bonded and insured freight broker that gives shippers safe, reliable capacity for bulk freight and other shipments. Our freight specialists average 20 years in the business, so you deal with experts, not order takers, who can advise you on the best shipping methods.

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