

D.O.T. REQUIREMENTS FOR THE TRANSPORTATION OF SAMPLE CYLINDERS

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The United States Department of Transportation (D.O.T.) is a department of the U.S. Federal Government which oversees all issues regarding transportation within the United States of America and U.S. Territories. Its influence around the world is great and widely respected, but its jurisdiction and power of enforcement is limited to the USA and its territories. As regards this paper, we will discuss the D.O.T. and its involvement surrounding sample cylinders for the hydrocarbon industry and the rules regarding the movement of these cylinders from point to point in the United States.

The most important statement to be made is that the D.O.T. and Code of Federal Regulations, Title 49 (CFR-49) is the definitive and final authority on all issues regarding the handling and transportation of sample cylinders. Much has been written and quoted over the years and many regulations have changed over the years. It is the sole responsibility of each company involved with sample cylinders, to have a copy of CFR-49 and to be responsible for clarification of any issues they have, by researching CFR-49 and consulting with D.O.T. representatives. They have the final word on any questions. D.O.T. is the enforcement agency regarding sample cylinder transportation. The author of this paper and the company he represents do not present themselves as authorities on this matter for you or your company. This paper is presented for the sole purpose of providing limited information and to encourage you and your company to become better informed for your specific needs and operations.

There are additional local, county and state regulations that may affect your operation. Remember, when you leave the confines of your company property and enter any public roadway, or present a sample cylinder for transport by common carrier or other shipping means, you immediately fall under legal jurisdiction for transportation of hazardous materials. Be informed! In January 1988, the D. O. T. informed local law enforcement agencies that anyone who had the authority to issue a citation for vehicular movement, or any person licensed in the law enforcement business, could issue a citation for improper transportation of sample containers. Prior to that time, the official had to be a D. O. T. officer. Now, any officer that is familiar with the rules and regulations of cylinder transport can issue a citation.

The D.O.T. also bears the responsibility for manufacturing rules and designs for transportable sample cylinders. CFR-49 addresses all necessary criteria for design, manufacture, testing, and marking of sample cylinders used in transporting samples in the public arena. (Highways, ships, air, and rail.) Cylinders, which deviate from CFR-49, must be submitted to the D.O.T. for design review, and if acceptable, are given an "Special Permit" status, assigned a special number and a document describing the details of the special permit. In years past, this document was known as an "Exemption", but that has changed in 2007 to "Special Permit". This document must accompany any "Special Permit" style of cylinder during transport. The manufacturers of these cylinders will issue a copy of that Special Permit with each cylinder that they sell. That document must be with the cylinder when it is being transported, and the owner of the cylinder or the person transporting the cylinder is responsible to see that it is there.

In the oil & gas industry, the most common sample cylinders are the spun-end "standard cylinder" and the constant pressure cylinder. The standard cylinder is manufactured according to CFR-49 requirements, and the most common ones (300cc and 500cc sizes) carry the stamping "DOT-3E-1800". Since these cylinders are manufactured in accordance with CFR-49, they do not require a document which describes the cylinder. The marking of "DOT-3E-1800" is sufficient. The constant pressure cylinders do not fully follow the design criteria of CFR-49 and therefore, when approved, carry the stamping of "DOT-E-XXXXX" or DOT-SP-XXXXX from 2007 forward. The older units in the field with DOT-E-XXXXX are grandfathered in and will not require new stamping or markings to "SP". The 'X's' will constitute a unique number assigned by D.O.T to a given manufacturer, based on the submittals of that manufacturer to the D.O.T. The D.O.T. will also issue a Special Permit letter with that number, describing the permit status of the style cylinder and specifically notes the areas that

they approved which were outside the standard design criteria. It is that document, which must travel with the cylinder during transport.

Be certain, that when you transport a sample of hydrocarbon products in the oil and gas industry, that you do so in a D.O.T. approved cylinder. If not, you and your company will face penalties and fines. This is as much your responsibility as it is your company's. Both of you can suffer. These fines can reach amounts of \$25,000 per cylinder, per incident. It is a very serious matter, and must not be taken lightly.

It is the intent of D.O.T. to provide safety for all concerned during the transportation of hazardous materials. Samples in the oil and gas industry are hazardous. Some more so than others, but they all can be dangerous. If you follow the rules, the hazard can be significantly reduced and almost completely eliminated. The rules are for everyone's protection...YOURS TOO!

As a part of this paper, a reference list is attached for frequently asked questions and the CFR-49 location for those answers. Also, the API 14.1 standard on Gas Sampling offers additional input on labeling and handling of sample cylinders. These references are constantly being updated and changed, and therefore it is incumbent upon you and your company to have the latest revisions to these documents so that you are in compliance with the existing law. As we all have heard since childhood, "Ignorance is no excuse from the law!" Your company's legal department should be fully versed with this issue and the necessity of following the regulations.

As examples, here are some of the issues that you must be aware of, but by no means is this a comprehensive or final list of issues surrounding the handling and transportation of sample cylinders.

1. From the Hazardous Materials Table in CFR-49 (172.101), you must specifically and properly identify the product by name which is being transported in the container, and record that name on the bill of lading, shipping papers, or manifest for the shipment or transport of the cylinders. Also, whether it is flammable gas or flammable liquid, a poison, or other classification.
2. The UN product classification number from the above mentioned table must also appear on the documentation.
3. The shipping papers must be within arms reach of the driver, and that means not in the trunk with the cylinders. They should identify the owner of the cylinder by name and address. You should have access to these papers, while your seat belt is still secured.
4. An emergency response number must be available and manned whenever the cylinders are in transit. The number must be manned, i.e., not an answering service or a recorder. If that number is not manned after office hours, you need to be off the road! If you are involved in an accident and cannot respond to questions, officials need to be able to contact someone who can tell them what to do in an emergency. They need to know if they have a serious hazard on their hands, or simply low-pressure, flammable gas cylinders. You would want to know, if you were in their shoes!
5. The cylinders must be properly packaged and protected. This includes relief valves in accordance with D.O.T. and Compressed Gas Association (CGA) rules and regulations. The valves must be protected and the cylinders restrained from free movement, i.e., carrying cases or boxes that comply with D.O.T. packaging guidelines.
6. Certain products, such as natural gas with H₂S, may require placards on the transporting vehicle.
7. Cylinders with liquids should not be filled above 80% full to allow for expansion. Cylinders which are 100% filled with hydrocarbon liquid, should not be transported. That is an extremely dangerous situation.
8. A cylinder that contains a product that meets the requirements of two or more hazardous materials must be marked and labeled for both. If you have high levels of H₂S in a gas sample, then it should be affixed with Flammable Gas labels and Poison labels, with corresponding paperwork.

When transporting empty cylinders, it would be extremely helpful if they were tagged as "Empty". While this is not a requirement, it could save a lot of time, if the cylinders were indeed "Empty" and you were detained. Every effort that you

put forth to comply with the regulations and to show that you take this matter seriously will have a positive impact on those who enforce these laws. They too, know the hazards that they face each day. Cooperation with them will go a long way.

These are but a few of the important aspects in the handling and transport of sample cylinders. Who should be aware of these rules? 1) Anyone who transports sample cylinders, 2) Anyone who offers sample cylinders for transport, 3) Anyone who prepares sample cylinders for transport, 4) Anyone who receives sample cylinders for transport. Simply stated, if a sample cylinder is moved off of your company property on to any city, county, state, or federal roadway, airway, railway or ship, you must be in compliance with D.O.T. CFR-49 and local regulations. Whether you are using specially designed sample cylinders, homemade sample cylinders, old compressed gas cylinders or any other conceivable method of transporting a hydrocarbon sample, if you are handling these cylinders in your vehicle or are presenting them for transport on a common carrier, you must be aware of the rules that govern the transport of these cylinders. Failure to comply will not only jeopardize the safety of the public and your safety, but will also make you and your company liable for penalties and fines.

This paper is presented to cause awareness to the issues surrounding the transportation and handling of sample cylinders. It is presented in a general format, and should not be used as a single source of information. Your company must study the D.O.T. regulations and interpret them for themselves and their employees. As these rules are constantly undergoing revision, care should be taken that your company remains up to date on the latest revision and publication.

Recent exceptions described in 173.6 and 171.8, regarding Materials of Trade (MOT), allow for limited relaxation to some of the rules mentioned above. Your company should review those changes and decide on the applicability for your operation.

If the author can be of any assistance, please feel free to contact.

QUICK REFERENCE FOR FREQUENTLY ASKED QUESTIONS ABOUT DOT CYLINDERS AND CFR-49

The information supplied below, is not given as authoritative, but only as a reference. Your company is solely responsible for interpretation and implementation of the CFR-49 Regulations.

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| Hazardous Materials Table | CFR-49 | 172.101 |
| Definitions | CFR-49 | 171.8 |
| Gases | CFR-49 | 173.300 |
| Liquids | CFR-49 | 173.115-119 |
| Shipping Papers | CFR-49 | 172.200 |
| Packing | CFR-49 | 173.3 |
| Marking Requirements | CFR-49 | 172.300 |
| Outside Markings | CFR-49 | 172.301 (c) |
| Labeling Requirements | CFR-49 | 172.400 |
| Vehicle Placard Requirements | CFR-49 | 172.500 |
| Shipper's Responsibilities | CFR-49 | 173.22 |
| Relief, Retest and General Usage of Cylinders | CFR-49 | 180.205 and .209 And 173.301 (f) (1,2 and 5) |
| 3E cylinders Series Spec's | CFR-49 | 178.42 |
| Empty Cylinders – Non Bulk | CFR-49 | 173.29 (c)2 |
| Materials of Trade | CFR-49 | 173.6 and 171.8 |
| Relief Valve Requirements | CFR-49 | 173.301 (f) |

Transport of Crude Oil Samples –

Crude Oil is noted in CFR 49 as ---- Petroleum, Crude Oil - UN 1267 in 173.101

Flash point for crude oil is above 100° F ---- but is less than 141° F

See CFR Parts - 173.120 and 173.150 and 173.21 through 173.40. Key on .24

DOT does not require typical 5 gallon crude containers to be DOT approved for shipment (preferably not on aircraft [last resort])

How many DOT 3E cylinders can be transported at a time?

Total weight of non-bulk cylinders (i.e. 500cc, etc) cannot exceed 1000 pounds.

Above 1000 pounds, vehicle will need placards, and other paperwork.

1000 pounds of 500cc standard cylinders is close to 100 cylinders

1000 pounds of 500cc Constant Pressure cylinders is about 62 cylinders

What is the DOT Hotline number?

1-800-467-4922

djf/jan/17