

SAFETY ALERT

INCORRECT USE OF VALVE OUTLET CONNECTIONS AND BACKFLOW CONTAMINATION

Through its member companies, Compressed Gas Association, Inc. (CGA) is aware that specific cylinder valve outlet connections are being incorrectly used for mixtures of butane and propane. There is one specific connection for liquid withdrawal and one for gas (vapor) withdrawal. It is important that the specified outlet connection be used to prevent adverse effects.

Mixtures of butane and propane are used for the extraction of oils from cannabis. This process can result in backflow contamination of these oils into the cylinder, which can create problems if the cylinder is used in a different application after the next fill.

This Safety Alert is being issued to notify users of the correct valve outlet connections, to provide recommended practices to prevent the risk of backflow into cylinders, and to provide general information on handling these cylinders prior to use.

Propane and butane can be used for two different applications: one for liquid and one for gas (vapor) systems each with its own specific valve connection. Specific concerns for liquid and gas (vapor) systems include but are not limited to:

- When liquid is introduced into a gas (vapor) system, a sudden unexpected, uncontrolled flame can occur and/or an unexpected equipment failure can occur, which could result in personal injury, property damage, or both; and
- When gas (vapor) is introduced into a liquid system, vapor locks can occur, pressure in the system can increase to greater than normal operating pressures, and equipment might not function due to lack of Btu availability in gas (vapor) propane versus liquid propane.

CGA connection number 555—Liquid withdrawal

In CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections*, cylinder valve outlet connection number 555 is the specified valve outlet connection for liquid withdrawal [1]. For additional information on determining outlet connections, see CGA V-7, *Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures* [2].

- Applications that use liquid withdrawal include, but are not limited to, engine fuel, refrigeration, and cannabis extraction; and
- Connection number 555 is used because liquid product provides a greater Btu capacity than gas (vapor) and acts as a solvent for extraction processes.

CGA connection number 510—Gas (vapor) withdrawal

In CGA V-1, cylinder valve outlet connection number 510 is the specified valve outlet connection for gas (vapor) withdrawal [1]. See CGA V-7 [2].

- Applications that use gas withdrawal include, but are not limited to, liquefied petroleum (LP) gas cooking appliances, LP gas illuminating appliances, heating, and refrigeration; and
- Connection number 510 helps to ensure that the user does not unexpectedly get liquid product, which can create operational and safety concerns such as a more intense flame.

Prevention of backflow contamination

Recommended practices to prevent backflow contamination include, but are not limited, the use of:

- Cylinder valve designed to prevent backflow from the process such as a Type 1 residual pressure valve. See CGA V-15, *Use of Residual Pressure Valves* [3];
- Properly designed customer equipment employing the use of backflow devices such as check valves; and
- Separate and properly designed vessel for the extraction process. Do not use a gas cylinder as the extraction container/vessel.

For these recommended practices, use compatible materials of construction for both gas and pressure.

Handling cylinders suspected/known to be used in cannabis extraction

Contaminated cylinders can be difficult to detect during the filling process. Cylinders exposed to the conditions from the cannabis extraction process require extra attention in the receipt, inspection, cleaning, and repair processes prior to reuse. Risk of cylinder contamination with oil from cannabis shall be assessed by the company filling the cylinder based on the market applications, known hazards, prior incidents, and/or available literature. Cannabis oil contamination represents a safety hazard for the cylinder filler, customer, and/or user as well as an additional quality issue for users.

Based on the assessed hazard, preventive and/or mitigation measures shall be implemented and documented in a company's written procedures. Alternative technologies that address and mitigate this particular contamination hazard may be used. All mitigation measures should be verified to ensure they meet the objective of reducing risk by identifying and removing any contamination.

CGA continues to evaluate industry best practices regarding contamination with oil from cannabis, identification, and mitigation of cylinders.

References

Unless otherwise specified, the latest edition shall apply.

[1] CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections*, Compressed Gas Association, Inc. www.cganet.com

[2] CGA V-7, *Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures*, Compressed Gas Association, Inc. www.cganet.com

[3] CGA V-15, *Use of Residual Pressure Valves*, Compressed Gas Association, Inc. www.cganet.com

Additional reference

CGA PS-64, *CGA Position Statement on Handling Carbon Dioxide Cylinders Previously Used in Cannabis Extraction or With Food Products Containing Cannabis*, Compressed Gas Association, Inc. www.cganet.com