

TRANSPORTATION OF DANGEROUS GOODS IN CANADA: METHANOL BY AIR

TECHNICAL
BULLETIN

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For projects in remote locations, such as Canada's Far North, transporting samples to the laboratory by air is often the only viable option. Although most preserving agents dispensed in environmental sampling containers are not considered dangerous goods, the transport of methanol by air when using VOC methanol vials requires special considerations. Maxxam has prepared this technical bulletin to provide customers information on safe and successful sampling programs that are in compliance with applicable regulations.

****This technical bulletin is meant to provide a quick summary of these considerations and is not intended to replace the necessary training and certification. The information provided in this document has been prepared with guidance from Transport Canada and a review of readily accessible industry standards documents. Maxxam assumes no liability and recommends to its customers that they directly consult TDG regulations or licensed consultants.****

Transport Canada regulates the air transport of dangerous goods (TDG) by incorporating the International Civil Aviation Organization Technical Instructions (ICAO TI) (www.icao.int). In addition to the ICAO TI's manual, the industry's technical Standards and guidelines are also outlined in the International Air Transport Association (IATA) Dangerous Goods Regulation (DGR) manual (www.iata.org). These Standards specify that proper TDG training and certification is required prior to transporting methanol by air.

Because methanol is categorized as a Class 3–Flammable Liquid, special provisions are enforced when transporting any quantities of pure methanol. Small quantities of dangerous goods such as VOC methanol vials may be shipped as Excepted Quantities (EQ) as per IATA section 2.6. Dangerous goods shipped under the EQ scenario are exempt from some of the more detailed requirements of the ICAO / IATA TDG regulations.

TDG by Air: Training Requirements

IATA training is mandatory for anyone managing the air transport of any quantity of methanol. The packer / shipper must be IATA trained. Supervision by an IATA trained individual is not acceptable.

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VOC methanol kit

IATA training and certification may be procured through designated third party companies specializing in national and international transportation of dangerous goods and hazardous materials. Organizations providing dangerous goods training in Canada can be found on Transport Canada's website: <http://wwwapps.tc.gc.ca/saf-sec-sur/3/train-form/search-eng.aspx>. Alternatively, the services of a third party TDG Consultant can be employed to assist and offer guidance with processing DGs for transport.

Volume & Weight Limitations

According to the IATA Dangerous Goods Regulations for air shipment of Excepted Quantities, each outer package must not exceed a net quantity of 500mL of dangerous goods and the maximum inner net quantity is 30ml/30g.

Although each VOC vial may contain approximately 5-10 g of soil and 10 ml methanol, the contents of these vials may not be declassified as non-dangerous goods. The classification is based on the solution's flashpoint (<60 °C for Class 3—Flammable Liquids). Studies performed by Maxxam have shown that the methanol in VOC vials containing soil and methanol still has a flashpoint well below the 60 °C limit.

This means that each outer package (e.g., Maxxam cooler) cannot contain more than 25-33 VOC vials (depending on the volume of soil / vial) to remain within the 500 ml requirement. There is no limit to the number of separate outer packages that can be included per shipment, other than the provisions for the aircraft's carrying capacity.

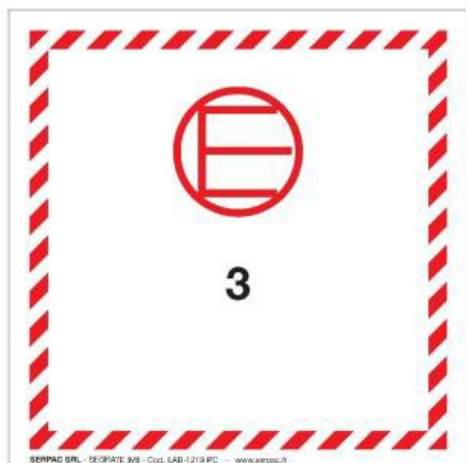
Packaging Requirements & Applicable Documentation

Each outer package (ie. cooler) must have an Excepted Quantities (EQ) label that lists the primary hazard class of the dangerous good (ie. Class 3 for methanol). Unless listed elsewhere, the consignor and consignees (sending and receiving parties) name and address must also be placed on the package, in the label area. An example of the EQ label is provided below. The packaging must contain sufficient absorbent material to mitigate potential spillage of the entire volume of methanol being shipped and the package must also meet drop testing requirements outlined in the Regulations. Maxxam has completed these tests in-house to ensure the packaging meets the required durability requirements and therefore its recommended same absorbent material and packaging be used for the return trip.

A Shipper Declaration is not required; however a Bill of Landing or Air Waybill must be included and must contain the following statement: "Dangerous Goods in Excepted Quantities".

Below is a quick list of key steps towards proper packaging of methanol preserved samples, prior to return shipment.

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The following protocol is required in order to meet IATA requirements

1. The packer / shipper must be IATA trained and current for the minimum curricula requirements as noted in Table 1.5A in the IATA Dangerous Goods Regulations handbook. Seal the vials securely, ensuring there is no soil adhering to the threads. Methanol is aggressive and will be lost if this is not done.

2. Use the cooler, packaging and sorbent material in which the vials were provided for return shipment. This is essential because the cooler and packaging have been tested and proven to meet IATA drop test requirements.

- Place the vials, maximum 500 mL total, soil plus methanol, in the cardboard box in which they were shipped. Seal.
- Ensure the sorbent / cushioning material in the cooler remains there. It is an IATA requirement that there be enough sorbent material to retain the entire volume of methanol in case of a spill.
- Place the cardboard box in the large ziplock bag also containing the Chain of Custody and place on the sorbent material in the cooler. Add ice to a second zip lock bag. Fill voids with bubble wrap. Close and seal the cooler. Note: Other jars, containing non-hazardous material, such as soil moisture jars, may be placed in the cooler
- Other types of hazardous materials that are also permitted under TDG Excepted Quantities rules (e.g. acid preservative vials) may in some circumstances be combined with methanol shipments within the same cooler, but the most stringent requirements for total quantities apply, as per the applicable TDG “alphanumeric code” for Excepted Quantities (i.e. E1 – E5). Contact your laboratory for further guidance.
- Ensure the bill of lading or air waybill includes the statement “Dangerous Goods in Excepted Quantities” and the number of packages shipped. Some couriers have equivalent paperwork such as Purolator Eship which does not require an air waybill.
- Ensure the IATA Excepted Quantities label is on the cooler.

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Maxxam is the Canadian market leader in analytical services and solutions to the energy, environmental, food and DNA industries and a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services. We support critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2500 employees.

For more information please contact:
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Table 1. MSDS information for Methanol

Methanol	
Classification	Class 3 (6.1) - Flammable
Description	Clear colourless liquid
Chemical Formula	CH ₃ OH
Packing Group	II - Medium Danger
UN Number*	1230
Flash Point	11 °C
Solubility	~100% in water
Boiling Point	64.7 °C
Vapour Pressure	97 mmHg
Handling Provisions	Avoid heat, flames, sparks, strong oxidizers, plastics, rubber and coatings.

* Four-digit number that identifies hazardous substances and articles in the framework of international transport.