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## Information Bulletin 1 Domestic Freight Classifications For Terpene Chemicals

Although terpene chemicals are relatively safe, many are considered hazardous materials for shipping purposes per 49 CFR Part 171. Hazardous materials have special shipping requirements, and must be handled and classified properly. This bulletin is designed to assist knowledgeable customers and distributors in the proper classification and shipping of a very select group of terpene products by ground transport in the continental US. This is not a definitive examination of the regulations, and we strongly recommend you consult the DOT (800-467-4922) before making any questionable determinations regarding the packaging, classifying, and shipping of hazardous materials. Please handle all chemicals responsibly.

### Background

The US DOT is attempting to "harmonize" domestic shipping regulations with those of the United Nations. In doing so, many substances may have become "hazardous" that were not previously classified as such. Fortunately, the DOT has allowed "exceptions" that allow reclassification of certain hazardous materials as non-hazardous in certain situations. These exceptions can be confusing, and require clarification. That is the purpose of this bulletin.

### Exceptions

The two exceptions in §173.150 for Class 3 (flammable and combustible) materials are summarized as follows. Please note that these exceptions are optional, not mandatory. The DOT neither recommends nor discourages use of these exceptions. T2 Labs routinely takes these exceptions when possible, but does not require or recommend that their vendors, customers, or distributors do likewise.

1. Certain flammable liquids referenced in table §172.101 (those having a flash point of >100°F that do not meet the definition of any other hazard class) may be reclassified as combustible liquids. Most terpene hydrocarbons (e.g. limonene and dipentene) qualify for this exception.
2. Combustible liquids (including those flammable liquids reclassified as combustible liquids per the previous exception) are excepted from shipment as hazardous materials if:
  - i. Shipment is via ground transport, not via vessel or aircraft.
  - ii. It is packaged in non-bulk packaging ( $\leq 119$  gals).
  - iii. It is not a hazardous substance, hazardous waste, or marine pollutant.

### Definitions per 49 CFR Part 171

<b>Flammable Liquid:</b>	A liquid with a TCC flashpoint $\leq 141^\circ\text{F}$ .
<b>Combustible Liquid:</b>	A liquid with a TCC flashpoint below $200^\circ\text{F}$ but above $141^\circ\text{F}$ .
<b>Marine Pollutant:</b>	A chemical listed as a marine pollutant in Appendix B to §172.101. The list includes alpha-pinene and turpentine. This is an IMDG term.
<b>Bulk Packaging:</b>	A shipping container with a maximum compartment capacity $> 119$ gals. This includes tote tanks, tank trucks, ISO containers, and rail cars (but not 55 gal steel drums).
<b>Hazardous Material:</b>	A material which the Secretary of Transportation believes is capable of posing an unreasonable risk to health, safety, or property. This is a DOT term.
<b>Hazardous Substance:</b>	A material listed or designated as hazardous and assigned a reportable quantity under CERCLA, 42 USC 9601. This is an EPA term.
<b>Non-bulk packaging:</b>	For liquids other than water, a receptacle with a maximum capacity of 119 gallons or less. This includes 55 gallon drums.

## Shipments in Bulk Packaging

Flammable liquids, combustible liquids, and marine pollutants are considered hazardous materials for transportation in bulk packaging. Liquid terpenes that are flammable or combustible are shipped in Hazard Class 3 (or Hazard Class "combustible liquid"), Packing Group III. Class 3 placards are required as listed in 49 CFR 172.504. These placards must include the identification number of the hazardous material being transported in accordance with 49 CFR 172.302. Terpenes that are not considered hazardous are not regulated by the DOT even in bulk packaging. Consult T2 Labs Product Data Sheets and MSDS for proper shipping names and classifications for all T2 Labs products.

## Shipments in Non-Bulk Packaging (e.g. steel drums)

The regulations affecting drum shipments are different from those affecting bulk shipments because of the exceptions discussed above. As a result, most (but not all) terpenes can be shipped as non-hazardous (not regulated) in 55 gallon drums (or smaller) via ground transport. Please consult T2 Labs Product Data Sheets and MSDS for proper shipping names and classifications for all T2 Labs products.

## Examples

The rules and exceptions are best understood through the following examples:

Example 1 - Flammable liquid in bulk. AlphaSolv™ Citrus d-limonene (*d*-limonene) is shipped in a 5000 gallon tank truck. It is considered hazardous because the flashpoint is 120°F TCC. The name is not found in the hazmat table in 49 CFR §172.101, so the closest match is used (terpene hydrocarbons, n.o.s.). Because the flashpoint is < 141°F, The proper shipping name, hazard class, ID number, and packing group is *Terpene hydrocarbons, n.o.s. (d-limonene), 3, UN2319, PG III*. Class 3 Placards (2319) are required.

Example 2 - Flammable liquid in drums. AlphaSolv™ Synthetic Limonene (a low-odor synthetically produced limonene solvent) has a flashpoint of 110°F TCC. A 5 gallon sample is to be shipped via UPS Ground. Because of the two exceptions of 49 CFR 173, this product is not hazardous and not regulated for ground transport (although it would be considered hazardous for shipment via air or water). The proper shipping name is *AlphaSolv™ Synthetic Limonene* or alternately *Chemicals n.o.i., Not regulated*.

Example 3 - Combustible liquid in bulk. AlphaPure™ Terpinolene 90 is to be shipped by tank truck. It is a combustible liquid with a flashpoint >141°F. It must therefore be shipped as a hazardous material. Per the T2 Labs Product Data Sheet, the proper shipping name, hazard class, ID number, and packing group is *Terpinolene, 3, UN2541, PGIII*. Class 3 Placards (2541) are required.

Example 4 - Combustible liquid in drums. AlphaSolv™ HFS (a high-flashpoint terpene solvent) is shipped in 55 gal drums. It has a flashpoint of 142°F TCC which classifies it as a combustible liquid. Because of exception 49 CFR § 173.150 (f) (2), this product can be shipped as non-hazardous and therefore is not regulated. It therefore has no hazard class or packing group. Placards are not required. The proper shipping name is *AlphaSolv™ HFS* or alternately *Chemicals n.o.i., Not regulated*.

Example 5 - Non-hazardous liquid in bulk. AlphaPure™ Terpineol (a terpene alcohol blend) is shipped in a 350 gal tote tank. It is not considered hazardous because the flashpoint is over 200°F TCC and it is not a marine pollutant. Since it is not hazardous, no hazard class or packing group is necessary. Placards are not required. The proper shipping name is *AlphaPure® Terpineol* or alternately *Chemicals n.o.i., Not regulated*.

Example 6 - Combustible liquid mixture in bulk. AlphaClean™ TEN (a terpene-based emulsion cleaning agent) is shipped in 350 gal tote tanks. It is a mixture of combustible liquids, not a pure compound. The closest match in the hazmat table of 49 CFR §172.101 is used (combustible liquid, n.o.s.). Note that the freight class for combustible liquid is "combustible liquid", as distinct from the number "3" used for other combustible liquids. Because the hazard class is the same as the shipping name, it need only be listed once. So the proper shipping name, hazard class, ID number, and packing group is *Combustible Liquid, n.o.s. (d-limonene), NA1993, PGIII*. The usual Class 3 placards (1993) are required.