

Formaldehyde Solutions —When to Regulate

When you look up “Formaldehyde” in the Hazardous Material Table of 49 CFR (or the dangerous goods lists in international regulations) you will see two entries for formaldehyde solutions.



A DOT Clarification

“Formaldehyde solutions, flammable” (UN 1198) is used for those solutions that are flammable and corrosive, and “Formaldehyde solutions” (UN 2209) is used for those solutions which are just corrosive. This second proper shipping name is followed by “with not less than

25% formaldehyde” which indicates that solutions with less than 25% formaldehyde do not meet the definition of corrosive and therefore are not regulated under this proper shipping name. However, that does not mean they are not regulated. Formaldehyde solutions of less than 25% can still be quite noxious—which is one of the criteria for hazard class 9. Does this mean formaldehyde solutions of less than 25% are still regulated and, if so, at what point are they no longer noxious enough to be regulated? Here, in an excerpt from a recent letter of clarification the US DOT Office of Hazardous Materials Safety addresses these questions:

“...it is the opinion of this Office that formaldehyde solutions with less than 10% formaldehyde mixed with non-hazardous materials do not meet the definition of a class 9 hazardous material, and provided they do not meet any other hazard class, are not subject to the HMR. Formaldehyde solutions with 10% to 25% formaldehyde are regulated as class 9 hazardous materials when shipped by aircraft due to its noxious odor. The preferred proper shipping name is “Aviation regulated liquid, n.o.s.”

So, when traveling by air, 10% is the magic number to stay below if you don’t want your formaldehyde solution to be regulated as a hazardous material.

You can read more letters of clarification at the

US Air Force Issues New Hazmat Regulations For Military Aircraft

AFMAN 24-204(I) Now Effective



The US Air Force has updated its dangerous goods regulations. Preparing Hazardous

Materials For Military Air Shipments was revised and reissued December 11, 2001. There was a transition period between the old and new regulations which ended February 28, 2002. Also revised is the Air Force document name and number for this regulation. Air Force Joint Manual 24-204, AFJMAN 24-204, has become Air Force Interservice Manual 24-204, AFMAN 24-204(I). This document can be downloaded in its entirety at:

<http://www.afmc.wpafb.af.mil/hazmat>

Also available at this web site is a summary of the new changes found in AFMAN 24-204(I).

The US DOT Transportation Safety Institute can provide training on AFMAN 24-204(I) to non-DOD personnel (DOD personnel must attend DOD training). ♦

DOT Hazmat web site:

<http://hazmat.dot.gov> under the Rules & Regulations section. ♦

Notes on formaldehyde solutions from TSI:

- Formaldehyde is often purchased in a solution called “formalin”. Formalin users should be aware that full-strength formalin (which is flammable and corrosive) is typically a 37% formaldehyde solution to begin with (100% formaldehyde would be a gas not a liquid). So if you had a 25% formalin solution, you would only have about a 9% formaldehyde solution and would not be regulated for transportation (provided your formaldehyde solution doesn’t meet the definition of any other hazard class).
- We have seen that when traveling by air, formaldehyde solutions 10% to 24.9% are in hazard class 9. But what about the other cutoff point? When does a formaldehyde solution go from being flammable and corrosive (UN 1198) to just corrosive (UN 2209)? Well, formalin (37% formaldehyde) typically has a flashpoint of 140°F (60°C). A flashpoint of 141°F (60.5°C) is the upper limit for hazard class 3, flammable liquids. So diluting formalin with water by just a little (amounts vary with size of receptacle and original flashpoint) can eliminate the flammability hazard.