

Alcohol Dilution and Storage Guidelines



Overview

The Office of the Research Dean is assisting WCM laboratories with the procurement of 100% (200 proof) ethyl alcohol to be diluted and used for laboratory cleaning purposes. Alcohol can be purchased from the Research Store with a fund number. The following guidelines cover how to dilute alcohol to the proper concentration and store alcohol safely.

Alcohol Dilution

The alcohol available at the Research Store is 100% ethanol and must be diluted to 70% before it can be used for cleaning. Alcohol dilution must be carried out inside a chemical fume hood wearing appropriate PPE (e.g., eye protection, gloves, closed laboratory coat, covered legs, closed-toed shoes, etc.).

Use the equation below to calculate the amount of 100% ethanol to mix with water to achieve the desired volume of a 70% alcohol solution, where C stands for concentration, and V stands for volume. The starting concentration, C₁, of ethanol is 100% and the final concentration, C₂, is 70%.

$$C_1V_1=C_2V_2$$

Example: A laboratory that wants to fill a 16oz. (473mL) spray bottle with 70% ethanol. The starting concentration, C₁, of ethanol is 100% and the final concentration, C₂, is 70% with a final volume, V₂, of 473mL. Using the equation $1 \times V_1 = 0.7 \times 473\text{mL}$, V₁ is calculated to be approximately 331mL, meaning the lab would mix 331mL of the 100% ethanol with 142mL of water (473-331 = 142mL) to fill the 16oz. spray bottle with 70% ethanol. Please see the table below for additional examples.

Volume of 100% Ethanol Required	Volume of Water Required	Final Volume of 70% Ethanol
166mL	71mL	237mL (8oz.)
331mL	142mL	473mL (16oz.)
700mL	300mL	1000mL (1L)
6624mL	2839mL	9463mL (2.5G)

Alcohol Storage

WCM labs can store and use reagent alcohol and other flammable liquids, as permitted by the New York City Fire Department (FDNY). Permit types set storage limits per space, and maximum amounts of flammable liquids to be stored vary by lab location.

Chemical Owners are responsible for maintaining their stocks of flammable liquids below their work area limit. Prior to purchasing alcohol from the Research Store, laboratories must review their flammable reagents inventories to ensure that they can remain below the flammable liquid storage limit for their permit space after purchasing more alcohol. As a best practice, labs should purchase the minimum quantity of alcohol to meet their needs. **Note: FDNY container volume towards the storage limit, not content volume.**

When considering safe storage, flammability is the primary hazard to consider. Alcohol can be safely stored with other flammable materials. The best practice is to store flammable materials in vented flammable cabinets whenever possible (e.g., under fume hoods). Any secondary bottles of alcohol created in the laboratory must be labeled appropriately with the contents of the container.

For more information on storage guidelines, please refer to the [EHS Chemical Storage and Segregation Update](#). This update also details how to use the Health and Safety Door Sign to determine FDNY flammable storage limits for your lab. Flammable materials are classified as the "L" group storage. When deciding on a storage location, PIs and their delegates can consult the lab's chemical inventory in [Salute](#) to determine what other "L" group materials are already in the lab.

If you have questions or need assistance with alcohol dilution or storage, contact Environmental Health and Safety at ehs@med.cornell.edu or 646-962-7233



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Environmental Health and Safety

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