Dartmouth College Guidelines for Safe Use of

Nitric Acid

Laboratories should create their own specific SOP's for the use of Nitric Acid

(Order <68% concentration whenever possible and in minimal amounts)

Hazards	**Potential Hazards**	*Remember that only 350 lbs. of nitric acid are allowed per building* • **Very strong oxidizer: can** ignite **or** react explosively • **Mixing nitric acid with organic solvents can release gases and cause closed containers to explode.** • Concentrated nitric acid **can release vapors and toxic gases** (including NO2) • **Corrosive.** Burns skin, eyes, mucosal membranes, and respiratory tract. • For further safety information, refer to Laboratory Chemical Safety Summary for Nitric Acid (PubChem), New Jersey Right to Know Fact Sheet for Nitric Acid and manufacturer Safety Data Sheet (SDS).	
Hazard Controls	**Selection & Purchase**	• Purchase the smallest, shatter-resistant containers at the lowest concentration practical. • Consider alternate methods and use a less dangerous acid if possible. • Buy inert spill pads or pillows that can be used to absorb small spills of nitric acid.	
	Storage & Transport	• Store in secondary containment in a well-ventilated area. • Store away from incompatibles such as organics and combustibles as well as bases, reducing agents, and others. • Transport in secondary containment, preferably a polyethylene or another non-reactive acid/solvent bottle carrier. • Store below eye level but not on the floor. • Store away from metal and do not store under the sink.	
	Engineering Controls & Safety Equipment	• Eyewash and safety shower are required in immediate work area. • Work in a clean chemical fume hood that is free of organics and other incompatibles. • Keep the sash lowered while reactions are in progress.	
	Work Practice Controls	• Work should be done in a way that avoids hand/glove contact with nitric acid. • Change gloves immediately if contaminated. • Decontaminate work area by wiping it down with a soap and water solution.	

	Personal Protective Equipment (PPE)	• Dartmouth College has a Policy on PPE for Chemistry
		• Wear closed-toed shoes and clothing covering the legs.
		• Minimum PPE:
		  ○ Lab coat
		  ○ Safety glasses
		  ○ (Recommended) Safety goggles
		  ○ 5 mil NEOPRENE gloves
		• Note that nitric acid penetrates lab nitrile gloves in <5 minutes. Lab neoprene (5 mil) gloves last 10–30 minutes.
		• Dartmouth College Stockrooms provide **Purple Nitrile Gloves** which have a thickness of 0.09-0.15 mm from Cuff to Middle Finger.
		• Risk of splash/work with >100 ml add: Safety goggles face shield, impervious apron & sleeves (or coverall), and gloves rated for nitric acid (e.g., 16–18 mil neoprene gloves).
		  ○ Wash hands at time of glove change.
			

Other	**Emergencies & Spills**	• For fire or potential for a fire – Pull nearest fire alarm pull station, evacuate the building and go to a safe location to dial 911. (In Borwell, Rubin and Williamson, dial 5555)
		• Serious injury or exposure to a hazardous material -- dial 911.
		  ○ Find the nearest eyewash station or safety shower
		  ○ Flush the contaminated area with large volumes of water
		  ○ While flushing, remove any clothing which may have been contaminated (including shoes)
		  ○ If the injury is to the eyes, hold the eyes open to ensure irrigation under the eyelids (15 minutes minimum)
		  ○ Continue flushing until EMS arrives
		• Spill is beyond your ability to control (See Spill below) Contact EHS 603-646-1762 or after hours contact Safety and Security at 603-646-3333
		• For clean-up of small spills (<100 ml), neutralize with sodium carbonate from edge to center, then absorb with inert material.
		• Do not use combustible materials such as saw dust to absorb nitric acid spills!

	Waste	• Label any waste containers with the appropriate waste labels.
		• Store in secondary containers.
		• **DO NOT MIX** nitric acid waste with *incompatibles wastes*
		  ○ Organic solvents
		  ○ Metals
		  ○ Alcohols
		  ○ Reducing agents
		  ○ Carbides
		  ○ Cyanides
		  ○ Sulfides
		  ○ Alkalies
		• For waste pick up and disposal contact Dartmouth EHS by e-mailing ehs@dartmouth.edu

	Training	Dartmouth College requires certain training for employees. For this chemical Laboratory Safety/ Hazardous Waste Management is required. This training is mandatory for all personnel working in a teaching or research wet laboratory. It is an introductory program on laboratory safety and waste management in a biomedical, engineering, chemistry, earth science or physics lab at Dartmouth College. The course takes approximately 45 minutes to complete. Completion is required every three years.
	Medical Surveillance	
	Monitoring Requirements	• OSHA Permissible Exposure Limit (PEL) is 2 ppm over 8 hours.
	Questions	Contact Dartmouth Environmental Health and Safety by e-mailing us a ehs@dartmouth.edu calling 603-646-1762 or vising our website.

"I have read and understand these guidelines. I agree to fully adhere to its requirements."

Last	First	Dartmouth ID	Signature

Acknowledgement: Special thanks for Duke's Occupational & Environmental Safety Office for their permission to use this great design for our chemical guidelines. All Dartmouth High Hazard Guidelines are based on Duke OESO Chemical SOP's and Guidelines