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| **Duke OESO Guidelines for Safe Use of**  **Formalin, Formaldehyde Solutions, and Paraformaldehyde**  ***Complete Lab-Specific Safety Information on page 2.*** | | | | | | | | |
| **Facts** | * **Formaldehyde** (CAS 50-00-0) is H2CO. This is the simplest aldehyde and is a gas at room temperature. * **Formalin** is a saturated **formaldehyde** solution (usually 37%), so 10% **formalin** is roughly 3.74% **formaldehyde**. * Some solutions have methanol added to stop polymerization; these solutions may be flammable or combustible. * **Paraformaldehyde; PFA** (CAS 30525-89-4) is polymerized **formaldehyde**. **PFA** is used to make very pure **formaldehyde** solutions or can be heated to create pure **formaldehyde gas**. | | | | | | | |
| **Hazards** | **Potential Hazards - Formaldehyde** | * **Acutely toxic** via ingestion, inhalation, and skin contact. * Causes **skin corrosion** and **serious eye damage**. * **Skin sensitizer**; may cause an allergic skin reaction. | | | * **Suspected mutagen**. * **Carcinogen**. | | | |
| **Hazard Controls** | **Selection & Purchase** | * **Use** a [**safer alternative**](https://www.safety.duke.edu/laboratory-safety/work-practices-ppe/safer-alternatives) when possible. * Purchase the smallest containers at the lowest concentration practical. * If storing a large amount (>2L), purchase spill kit with formaldehyde neutralizer or solidifier. | | | | | | |
| **Storage & Transportation** | * 03-439, 03-439AStore with flammables in **tightly-closed** **shatter-resistant** containers. * Store away from oxidizers, reducing agents, metals, and acids **(not in cold room).** * Use **secondary container** for transport. | | | | | | |
| **Engineering Controls** | * **Eyewash required** in immediate work area. * Eyewash-drench hose preferred. * **Safety shower may be required** for large quantities. | Safety Shower, Shower, Douche, HelpEye Shower, Eye Wash, Rinse Eyes, First Aid, Sign | * Work with concentrated solutions (>4%) and all solids only in a chemical fume hood. * Dilute solutions (<4%) can be used on benchtop in small quantities if containers are opened only briefly. | | | | Chemical Fume Hood Flow Diagram |
| **Work Practice Controls** | * + Labs handling >100 ml **regularly** **on the benchtop** must contact OESO Lab Safety for exposure assessment.   Formaldehyde Work Area: Danger! Toxic!   * + **Designate a work area** for formaldehyde and **label it**. ↗   + **Tare** (pre-weigh) empty container with lid.   + Go to **hood**, add **powder**, **close lid**.   + Go to balance to weigh.   + **Return to hood.**   + Keep **containers closed** as much as possible.   + Line work area with absorbent, leak-proof bench pads.   + If weighing, place **balance in hood** OR use **Tare Method** →   + Decontaminate with soap and water solution. | | | | | | |
| **Personal Protective Equipment** | **Minimum PPE:**   * **Nitrile (or latex) gloves** (Change immediately if contaminated and every 2 hours. Wash hands at time of change.) * **Splash goggles** * Fully buttoned **lab coat** with sleeves extending to the wrists. | | | | nitrile gloveslab coat2goggles | | |
| **Risk of splash/large amounts:** (in addition to the above, wear)   * **Face shield**. * **Tyvek sleeves** and/or **gown/apron.** | | | | | 3XE79_AS01?$zmmain$8400131-24 | |
| **Other** | **Emergencies** | See Emergency Response [webpage](https://www.safety.duke.edu/emergency) or flip chart and/or lab specific chemical hygiene plan.  Contact OESO Spill team for spills outside fume hood if there is eye or respiratory irritation. | | | | | | |
| **Waste** | See lab-specific chemical hygiene plan. **≤**10% **formalin** (**≤**3.75% **formaldehyde**) can be disposed down the drain. **PFA** & solutions must be collected as chemical waste. | | | | | | |
| **Training** | Sign signature page in Lab-Specific Chemical Hygiene Plan to indicate review and follow lab-specific instructions for “Online Training” below. | | | | | | |
| **Questions** | Contact OESO Lab Safety at 919-684-8822. | | | | | | |

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| **Lab-Specific Safety Information for**  **Formalin, Formaldehyde Solutions, and Paraformaldehyde**  ***Supplements the Guidelines for Safe Use of Formalin, Formaldehyde solutions, and PFA*** | | | | | |
| **Lab** | **PI Name** | Click or tap here to enter PI Name | | | |
| **Location** | Enter building(s) and room(s) where lab is located | | | |
| **Lab-Specific Hazard Controls** | **Purchase**  **Details** | Select Type of Product | **10% Formalin or**  **10% Neutral Buffered Formalin (NBF)** | **37% Formaldehyde solution** | **Paraformaldehyde Solid and/or PFA solution** |
| Maximum container size | Enter maximum container size purchased | Enter maximum container size purchased | Enter maximum container size purchased |
| Container type | Enter the container material | Enter the container material | Enter the container material |
| Specific product information | Enter supplier name/product number or purity/grade to purchase | Enter supplier name/product number or purity/grade to purchase | Enter supplier name/product number or purity/grade to purchase |
| **Storage** | Specific location  **Not in cold room!** | Enter specific storage location | Enter specific storage location | Enter specific storage location |
| **Use Information** | Designated work area | Enter rooms and areas designated for use | Enter rooms and areas designated for use | Enter rooms and areas designated for use |
| Max. quantity to use at a time | Enter maximum quantity | Enter maximum quantity | Enter maximum quantity |
| Max. conc. to use at a time | Enter maximum % if different than 10% | Enter maximum % if different than 37% | Enter maximum % if solution |
| Location and type of spill supplies | Spill supply type and location | | |
| **Waste Disposal** | Select Method of Disposal for Chemical Waste | Drain Disposal  Waste Collection:  Collection Location | Drain Disposal ONLY if final USE conc. is <3.8%  Waste Collection:  Collection Location | **NO Drain Disposal**  Waste Collection:  Collection Location |
| **Online Training** | Formaldehyde Exposure Awareness | Recommended by OESO for all users before starting work  Required by PI for all users before starting work  Required by OSHA for users in Clinical, Pathology, and Anatomy labs exposed to >0.1 ppm formaldehyde in air (see training for specific scenarios) | | |
| Formaldehyde Hazard Communication | Required by PI for all users before starting work  Required by OSHA for users in Clinical, Pathology, and Anatomy labs exposed to <0.1 ppm formaldehyde in air (see training for specific scenarios) | | |
| **Details of Process** | Click or tap here to enter details specific to your lab’s process with formalin, formaldehyde solutions, and/or paraformaldehyde. | | | |