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| **Duke OESO Guidelines for Safe Use of**  **Toxic & Health Hazard Powders**  **(and suspensions/solutions)**  ***Examples:*** *acrylamide, boric acid, trypan blue, many hazardous drugs*  ***Complete Lab-Specific Safety Information on pages 2- 4 for particularly hazardous powders.*** | | | | | | | | |
| **Hazards** | **Potential Hazards** | * **Acutely toxic** powders can cause systemic **toxicity or death**. * Exposure to powders can also cause **health hazards** (such as **cancer**, **reproductive** effects, **mutations**, **respiratory sensitization**, and **organ damage**) and/or **irritation** of the eyes, skin, or respiratory system. * Some powders may also have **physical hazards** (not covered by these guidelines). * Powders (and suspensions/solutions) can form **aerosols** that may lead to **exposure**. * See chemical Safety Data Sheet (SDS) for specific hazard information. | | | | | | |
| **Hazard Controls** | **Selection & Purchase** | * Purchase the smallest quantity practical. * When possible, **order** the material | | | | | | |
| * + In **liquid** form OR | * + In **pre-weighed** amounts, in a sealed **septum-top** vial, so that diluent can be injected directly into the vial. | | | | | |
| **Storage & Transport** | * Dry powders must be in sealed **shatter-resistant containers** during transportation. Use a secondary container if the container is not shatter resistant. * **Keep toxic powders away from any incompatible materials.** | | | | | | |
| **Engineering Controls** | * Usea **chemical fume hood** with [*particularly hazardous*](http://www.safety.duke.edu/laboratory-safety/chemical-hygiene/particularly-hazardous-substances) and respiratory sensitizing substances if **aerosols** could be created, including for:   + Any work with **open** containers of **dry** powder, and   + Open or **pressurized** manipulations of **suspensions or solutions**. * *When there is no risk of exposure to* ***hazardous vapors or gases***, a **biological safety cabinet** (BSC) may be used instead. | | | | | | Chemical Fume Hood Flow Diagram |
| **Work Practice Controls** | * **Designate a specific work area** for toxic powders and **label** the area. * Line work area with **absorbent, leak-proof bench pads.** * If **weighing** dry powders, **place balance in hood** OR   + **Tare** (pre-weigh) an empty container with a lid.   + Go to **hood**, add **powder to container**, **close lid**.   + Go to balance to weigh.   + **Return to hood to make solution or manipulate powder**. * Use an anti-static gun if powder sticks to sides of vial, etc. * **Decontaminate** the work area: | | | | |  | |
| * + **Wet-clean** using a compatible solvent OR | | * + **HEPA vacuum** daily. | | | | |
| **Personal Protective Equipment**  **(PPE)** | * **Minimum PPE:** fastened lab coat, nitrile (or latex) gloves\*, and safety glasses * **If “fatal in contact with skin”:** 2 pairs nitrile gloves\* | | | nitrile glovesImage result for safety glasseslab coat2 | | | |
| * **Risk of splash/large amounts,** add: Goggles & Tyvek sleeves * *Change gloves immediately if contaminated & every two hours.* * **Wash hands** at time of glove change. | | | | 8400131-24 | | |
| ***\*Check the manufacturer’s glove guide for glove effectiveness with any solvents you are using.*** | | | | | | |
| **Other** | **Emergencies** | See Emergency Response [webpage](https://www.safety.duke.edu/emergency) or flip chart and/or lab specific chemical hygiene plan. | | | | | | |
| **Waste** | See lab-specific chemical hygiene plan, [Lab Chemical Waste Management Practice](http://www.safety.duke.edu/sites/default/files/labwastemgt.pdf), and [Drain Disposal Practice](http://www.safety.duke.edu/sites/default/files/drain_disposal_practice.pdf). | | | | | | |
| **Training** | Sign signature page in lab-specific chemical hygiene plan to indicate review. | | | | | | |
| **Questions** | Contact OESO Lab Safety at 919-684-8822 or [labsafety@dm.duke.edu](mailto:labsafety@dm.duke.edu). | | | | | | |

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|  | | **Lab-Specific Safety Information for**  **Toxic & Health Hazard Powders**  ***Supplements the Guidelines for Safe Use of Toxic & Health Hazard Powders***  ***for particularly hazardous (Action B) powders.***  ***May also be used for hazardous (Action C) powders.*** | | | |  |
| **Lab** | **PI Name** | Click or tap here to enter PI Name | | | | |
| **Location** | Enter building(s) and room(s) where lab is located | | | | |
| **Notes for using this Guideline: ONLY** for use with chemicals that meet ALL of the following criteria:   * Action B or C (NOT Action A) as determined by the GHS Lookup Tool or [Action Matrix](https://www.safety.duke.edu/sites/default/files/GHS_Action_Matrix.pdf) & SDS for your product * Solid at room temperature * ONLY have HEALTH hazards in any of these classifications: acutely toxic (inhalation, dermal, and/or oral), carcinogens, mutagens, reproductive hazards, respiratory/skin sensitizers, irritants, corrosive to skin/eyes, and/or specific target organ toxicity.   If the chemical is [flammable](https://www.safety.duke.edu/sites/default/files/GuidelinesFlammableLiquids.pdf), [corrosive](https://www.safety.duke.edu/sites/default/files/GuidelinesCorrosives.pdf), and/or an [oxidizer](https://www.safety.duke.edu/sites/default/files/GuidelinesOxidizers.pdf), check the relevant box(es) below and attach the appropriate guideline(s) to this completed toxic powders guideline.  If the chemical has **other physical hazards** (reacts violently with water, contact with acid forms toxic gas, etc.) in addition to the health hazards, you must use this [OESO SOP template](https://www.safety.duke.edu/sites/default/files/SOP_Template.docx) to create a separate lab-specific SOP.  For **Action A (high risk) chemicals**, use the [OESO SOP template](https://www.safety.duke.edu/sites/default/files/SOP_Template.docx) to create a lab-specific SOP – it must be approved by the PI and, in many cases, by OESO. | | | | | | |
| **Lab-Specific Hazard Controls** | **Chemical Information** | Chemical Name | **Chemical 1**  Enter Chemical Name | **Chemical 2**  Enter Chemical Name | **Chemical 3**  Enter Chemical Name | |
| CAS Number | Enter CAS Number | Enter CAS Number | Enter CAS Number | |
| GHS Hazard Classes and Categories  *If the powder is corrosive or oxidizing, or dissolved in a flammable liquid, check the appropriate box(es) at right and refer to the relevant guideline(s) as well.* | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Corrosive Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Oxidizer Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Flammable Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesFlammableLiquids.pdf&clen=218668&chunk=true) | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Corrosive Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Oxidizer Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Flammable Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesFlammableLiquids.pdf&clen=218668&chunk=true) | Enter All GHS Hazard Classes and their Category (e.g. Carcinogenicity, Category 1A)  Particularly Hazardous  [Corrosive Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Oxidizer Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesCorrosives.pdf&clen=269863&chunk=true)  [Flammable Guideline](chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fwww.safety.duke.edu%2Fsites%2Fdefault%2Ffiles%2FGuidelinesFlammableLiquids.pdf&clen=218668&chunk=true) | |
| **Purchase**  **Details** | 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 | Enter specific storage location | Enter specific storage location | Enter specific storage location | |
| Special storage requirements | Enter any special storage requirements | Enter any special storage requirements | Enter any special storage requirements | |
| **Use Information** | Designated work area *(specific room(s) and area(s)) if particularly hazardous*  **LABEL WORK AREA** | Enter rooms, fume hoods, BSCs, or other areas designated for use | Enter rooms, fume hoods, BSCs, or other areas designated for use | Enter rooms, fume hoods, BSCs, or other areas designated for use | |
| Maximum quantity | Enter maximum quantity to be used at a time | Enter maximum quantity to be used at a time | Enter maximum quantity to be used at a time | |
| Typical concentration used | Enter typical concentration used | Enter typical concentration used | Enter typical concentration used | |
| Solvent to be used | If a solvent other than water is used, also state type of gloves to be used | If a solvent other than water is used, also state type of gloves to be used | If a solvent other than water is used, also state type of gloves to be used | |
| Specific Glove Information | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  Specify type(s) of gloves if not nitrile | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  Specify type(s) of gloves if not nitrile | **1** pair of 4 mil **Nitrile** gloves  **2** pairs of 4 mil **Nitrile** gloves  Specify type(s) of gloves if not nitrile | |
| Other Required PPE | Standard Lab Coat  Safety Glasses  Chemical Splash Goggles  Other PPE Needed | Standard Lab Coat  Safety Glasses  Chemical Splash Goggles  Other PPE Needed | Standard Lab Coat  Safety Glasses  Chemical Splash Goggles  Other PPE Needed | |
| PPE Storage Location | Specific PPE storage location | Specific PPE storage location | Specific PPE storage location | |
| Work Area Decontamination  *(must be completed for Particularly Hazardous chemicals)* | Work area decontamination supply type and location. Include any special PPE needed. | Work area decontamination supply type and location. Include any special PPE needed. | Work area decontamination supply type and location. Include any special PPE needed. | |
| Location & type of spill clean-up supplies | Spill supply type and location. | Spill supply type and location. | Spill supply type and location. | |
| **Waste Disposal** | Chemical Waste Information | Enter location of waste container, type of container used. | Enter location of waste container, type of container used. | Enter location of waste container, type of container used. | |
| **Details of Process for Chemical 1** | 1. Click or tap here to enter details specific to your lab’s process with Chemical 1. | | | | |
|  | **Details of Process for Chemical 2** | 1. Click or tap here to enter details specific to your lab’s process with Chemical 2. | | | | |
|  | **Details of Process for Chemical 3** | 1. Click or tap here to enter details specific to your lab’s process with Chemical 3. | | | | |