



**California State University Long Beach**  
1250 Bellflower Blvd., Long Beach, CA 90840 USA

## **CSULB School of Art**

**Ceramics Area**

**Ceramic Arts Program**

**Center for Contemporary Ceramics**

**General Expectations, risks and hazards,  
precautions, Personal Protective  
Equipment (PPE), and Health/Safety  
Considerations for the Ceramics Area**  
(Health/Safety Document)

**Updated 2022-10-10**

**NOTE: All Participants in the Ceramics  
Area must fully familiarize themselves  
with this Health/Safety Document.**

## **TO THE INSTRUCTOR/SUPERVISOR:**

**Please provide the Health/Safety Document for your discipline-specific area to all students in your class, or to all other authorized Participants in the Ceramics Area.**

**It is your responsibility review this Health/Safety Document with your class, and with all other authorized Participants in the Ceramics Area; to review all general expectations, risks and hazards, precautions, personal protective equipment (PPE), and health/safety considerations associated with the area in general; and all those specifically related to facilities, equipment, materials, and processes that will be utilized in your class or by authorized Participants.**

**This must take place within the first two weeks of the semester or upon arrival of other authorized Participants, AND before students or other authorized Participants begin use of any facilities, equipment, materials, and processes in the area.**

**Throughout the semester, it is your responsibility to ensure that the appropriate health and safety measures are followed. Any questions regarding this safety instruction, training, documentation, and enforcement should be directed to the Director of the School of Art in FA4-106, or the SoA Safety Officer.**

## **TO THE STUDENT/PARTICIPANT:**

**It is your responsibility to fully familiarize yourself with the Health/Safety Document provided to you, to be knowledgeable in the safety-related matters associated with this course and area, and to abide by the safety policies and procedures presented by the instructor of your course and/or other faculty and technical staff in the area.**

**NOTE:** This Health/Safety Document is provided to all Participants prior to their access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area, for the purpose of informing Participants of general expectations, risks and hazards, precautions, personal protective equipment (PPE), and health/safety considerations for area-specific facilities, equipment, tools, materials, and processes in the Ceramics Area.

The Ceramics Area is an instructional and working area combining the characteristics of an art studio environment and an industrial environment.

Participants accessing and utilizing facilities and equipment in the Ceramics Area, and utilizing materials and processes in the Ceramics Area, will work with, encounter, be exposed to, and work in the presences of facilities, equipment, materials, and processes that come with associated known and unknown risks and hazards including but not limited to those detailed in this Health/Safety Document.

Risks associated with the Ceramics Area include but are not limited to risks of physical or psychological injury, pain, suffering, illness, disfigurement, temporary or permanent disability (including paralysis), economic or emotional loss, and/or death for the Participant, for anyone who accompanies the Participant in the Ceramics Area, and potentially for the unborn children or future descendants of the Participant.

**NOTE:** This Health/Safety Document is NOT a training or authorizing document for use of any facilities, equipment, processes, or materials described herein.

This Health/Safety Document ONLY provides information on expectations, risks and hazards, precautions, personal protective equipment, and health/safety considerations.

Receipt of this Health/Safety Document in no way implies training or authorization to work in the Ceramics Area or to use any of the facilities, equipment, processes, or materials described herein.

**NOTE:** Direct supervision and assistance from staff and/or faculty are provided routinely in the Ceramics Area only during and in scheduled course meetings, and at all other times and in all other locations and circumstances, Participants cannot expect direct supervision and assistance from staff and/or faculty.

## **Warning – Respiratory Hazards, Silica and Dust, Required Protective Equipment**

Inhalation/respiratory hazards are common in the Ceramics Area as the result of the presence of large quantities of dry powdered materials and dust, as well as fumes that may result from off-gassing materials including solvents, paints, glues, or resins, or from volatilizing materials and gases released during firing. Respiratory hazards include both substances that can damage the lungs and respiratory system, and toxins that can be absorbed via the lungs and respiratory system.

Primary causes of dust in the Ceramics Area are: improper handling of dry powdered materials, grinding and sanding of ceramic objects, and dried clay and glaze that are left on work surfaces and floors and crushed into dust as a result of work and foot traffic.

Generation of and build-up of dust must be minimized by: picking up all scraps and trimmings from work surfaces and floors; grinding and sanding only outside; careful storage, handling, and mixing of dry powdered materials; working with dry powdered materials only outside or in the dry materials area, or inside the building only with direct supervision of faculty; and clean-up of equipment and work areas wherever possible with wet cleaning processes including sponging, mopping, and washing (always the preferred way of cleaning up dust), with a HEPA-filtered vacuum where wet processes will not complete the task, and, only when other means will not complete the task, carefully sweeping or brushing with slow, steady, non-lifting motions to avoid stirring up dust.

Because crystalline silica is so prevalent in formulated ceramic materials, because it is so commonly used in the Ceramics Area, because most ceramic materials pose some degree of respiratory hazard, and because dust buildup in the Ceramics Area contains assorted minerals and compounds including crystalline silica as well as other potentially toxic and respiratory-hazardous materials, all work in the dry materials area, all work with or in the presence of powdered dry materials, all work generating or in the presence of dust, and all clean-up of dust must be done while wearing a proper NIOSH N-95 or P-100 respirator mask, or a respirator fitted with N-95 or P-100 filter cartridges.

## **Warning – Crystalline Silica and Required Protective Equipment**

Crystalline silica (quartz), a major respiratory hazard, is a common material in many ceramic materials and products, particularly clay bodies and glazes, with crystalline silica accounting for up to 50% of total ingredients in some products.

Exposure to silica dust poses a direct and serious threat to health, especially the respiratory system. Inhaling silica can result in silicosis, a disease characterized by scarring in the lungs. Depending on the severity of the condition, silicosis can significantly impair a person's quality of life or be fatal. Crystalline silica is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

Because crystalline silica is so prevalent in formulated ceramic materials, because it is so commonly used in the Ceramics Area, and because dust buildup in the Ceramics Area combines assorted minerals and compounds including crystalline silic, all work in the dry materials area, all work with or in the presence of powdered dry materials, all work generating or in the presence of dust, and all clean-up of dust must be done while wearing a proper NIOSH N-95 or P-100 respirator mask, or a respirator fitted with N-95 or P-100 filter cartridges.

## **WARNING - Skin Absorption, Irritation**

Some materials used in the Ceramics Area pose a risk of toxic absorption through the skin. Most clay bodies do not pose this risk and may be handled directly with the hands; however, some may contain known or potential toxins, and users are advised to understand the potential risks associated with materials in each clay body.

Many materials used in the Ceramics Area tend to dry the skin and may irritate the skin.

Participants should always wear impermeable gloves such as Nitrile gloves when getting glaze on their hands.

## **WARNING – Ingestion Hazards**

Ingestion hazards are common throughout the Ceramics Area. All materials used in the area should be treated as ingestion hazards.

Food and drink are not to be prepared or consumed in the Ceramics Area.

Containers previously used for ceramic materials or other art materials should never be used to contain or serve food or drink.

Containers previously used for other purposes may only be reused in the Ceramics Area if their prior labeling is completely removed or obscured so as to avoid any confusion about contents.

Hands must be thoroughly washed before preparing, handling, or consuming food or drink.

NOTE: Ingestion hazards can include particles drawn into the mouth or nasal passages during respiration and then ingested.

## **WARNING – Cancer, Birth Defects and Other Reproductive Harm; Other Known Health Disorders and Diseases**

Some materials and products used in the Ceramics Area, including Crystalline Silica, and products containing Crystalline Silica, are known to the State of California to cause cancer.

Some materials or products used in the Ceramics Area, including Lithium Carbonate and products containing Lithium Carbonate, are known to the State of California to cause birth defects or other reproductive harm.

Some materials and products used in the Ceramics Area are known to the State of California to cause other health disorders and diseases. For more information, visit: [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## **WARNING - Commercially Prepared Materials**

Commercially prepared / manufactured ceramic materials commonly used in the Ceramics Area, such as manufactured clay bodies (often referred to generically as “clay”) and slips, underglazes, and glazes are manufactured using formulated combinations of raw materials.

Most of these products contain Crystalline silica (quartz), a material that poses a direct and serious threat to health, especially the respiratory system. Inhaling silica can result in silicosis, a disease characterized by scarring in the lungs. Depending on the severity of the condition, silicosis can significantly impair a person’s quality of life or be fatal. Crystalline silica is known to the State of California to cause cancer.

Commercially prepared ceramic materials may also contain hazardous materials including but not limited to Barium Carbonate, Cadmium compounds, Iron Chromate, Lead compounds, Lithium Carbonate, Manganese compounds, and Talc.

It is imperative that users of commercially prepared ceramic materials be informed about the materials they are using and their ingredients, potential risks and hazards, and safe use and handling.

## **Lead-bearing Materials Prohibited**

Lead-bearing materials of all kinds—inclusive of raw lead, all lead compounds, fritted lead-bearing materials, and all manufactured glazes and other materials and products containing lead in any form—are not allowed in the Ceramics Area.

CSULB does not provide lead-bearing materials for use on the premises.

Lead-bearing materials may not be brought onto the premises.

Commercially prepared / manufactured underglazes and glazes brought onto the premises should be labeled “leadless” or “lead-free.”



## **Controlled Access to Tools, Equipment, Materials, and Products**

It is imperative that access to tools, equipment, materials, and products used in the Ceramics Area be limited to appropriate authorized and trained users, and that none of these items are stored, transported, or used in circumstances where they may be accessible to children, pets, animals, or unauthorized and untrained users.

## **Similar and Familiar Materials and Products**

Though some materials such as Calcium Carbonate, Bentonite, and Carboxymethyl Cellulose (CMC), which are used in raw form in the Ceramics Area and also are found in formulated products such as glazes and clay bodies used in the Ceramics Area, also are commonly used in products meant for human consumption including antacids, nutritional supplements, food products, cosmetics and skincare products, and other household products considered “safe” for use and consumption, the materials used in the Ceramics Area are “ceramic-grade” and “industrial-grade,” and are not approved as “food-safe,” or “food-grade,” or “pharmaceutical-grade.”

These similar materials are not approved or safe for ingestion, inhalation, topical application, or contact with open cuts or skin abrasions, and in some cases are not safe for skin contact or eye exposure.

All material in the Ceramics Area should be treated as respiratory and ingestion hazards, and as potential eye and contact hazards.

## **Dust Masks and Respirators for Dust and Dry Powdered Materials**

All work with and clean-up of dry powdered materials and dust in the Ceramics Area must be conducted while wearing a NIOSH N-95 or NIOSH P-100 respirator mask, or a respirator fitted with N-95 or P-100 filter cartridges.

When fitted properly, an N95-rated mask/filter captures about 95% of dust particles. P100 filters are rated even higher, capturing 99.9% of particulates. These masks and respirators are only effective when properly fitted.

It is important never to modify or alter a respirator mask or respirator fitted with cartridges from its factory state. Doing so can compromise the amount of protection the equipment offers, putting the user at unnecessary risk.

## Additional Important Notifications

**NOTE:** The term “Participant” is used throughout this Health/Safety Document. A Participant is a person who has an appropriate current status in relation to CSULB, the College of the Arts (COTA), the School of Art (SoA), and the Ceramics Area; who has voluntarily requested access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area; and who has been authorized for such authorization as defined in the five Participant Levels described in this Health/Safety Document, titled “General Expectations, Risks and Hazards, Precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area.”

**NOTE:** The information herein applies to the entirety of the CSULB Ceramics Area inclusive of Ceramic Arts Program spaces, Center for Contemporary Ceramics spaces, graduate and undergraduate studios, and instructional spaces, and inclusive of all first-floor indoor spaces at the east end of building FA2 and adjacent exterior work/kiln yards and pavilions.

**NOTE:** The information herein applies to all individuals accessing the Ceramics Area.

**NOTE:** Access to the Ceramics Area (even just being in the room), and use of facilities, equipment, processes, and materials in the Ceramics Area is strictly limited Ceramic Arts faculty and staff; students currently enrolled in Ceramic Arts courses; Ceramic Arts MFA, BFA, and Minor students currently enrolled and in good standing; guest and resident artists of the Center for Contemporary Ceramics; and authorized personnel or guests.

**NOTE:** This Health/Safety Document addresses expectations, risks and hazards, precautions, personal protective equipment, and health/safety considerations regarding facilities, equipment, processes, and materials, and addresses them ONLY in the context of the CSULB Ceramics Area. This Health/Safety Document does not and cannot serve as informational regarding same or similar facilities, equipment, processes, and materials utilized elsewhere. Additionally, it is very important to understand that the types of facilities, equipment, processes, and materials addressed in this Health/Safety Document may have other and/or additional expectations, risks and hazards, precautions, personal protective equipment, and health/safety considerations attached to them, and may be unsafe and dangerous, when located elsewhere, when taken out of the CSULB Ceramics Area, or if same or similar facilities, equipment, processes, and materials are employed in an off-campus setting, particularly in a domestic setting or other setting accessible to untrained users.

## Ceramics Area Access/Utilization – Participant Levels

Access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area, are limited as follows.

Every person accessing and utilizing facilities and equipment in the Ceramics Area, and utilizing materials and processes in the Ceramics Area, does so voluntarily, either as an employee of the university working in accordance with an employment contract, or by request as a Participant in one of the following five levels.

**Participant Level 1 – Student During Class:** Participant is a student currently enrolled in a course in the Ceramics Area, who requests access to facilities and equipment, and utilization of materials and processes, in the Ceramics Area, directly related to the course and in order to work only during scheduled course-meeting time. Limited specifically to scheduled course meeting times.

This level requires the following for access and utilization in the Ceramics Area:

- Participant has completed General Safety Training for the Ceramics Area inclusive of receiving and reviewing the General Expectations, risks and hazards, precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area document;
- Participant has completed Safety Certification Process and has been authorized for access and utilization within regular weekday hours.

Participant must complete additional training before using any materials, processes, tools, or equipment, and may have to complete intensive training and testing for some materials, processes, tools, and equipment.

This access/utilization may be further limited or revoked at any time by CSULB faculty or staff.

**Participant Level 2 – Student Outside of Class:** Participant is a student currently enrolled in a course in the Ceramics Area, who requests access to facilities and equipment, and utilization of materials and processes, in the Ceramics Area, directly related to the course in order to work outside of scheduled course-meeting time. Limited to the semester/term during which the student is enrolled in the course.

- Participant has completed General Safety Training for the Ceramics Area inclusive of receiving and reviewing the General Expectations, risks and hazards, precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area document;
- Participant has completed Safety Certification Process and has been authorized for access and utilization within regular weekday hours.
- Participant must not work alone in the Ceramics Area and must log in when using area using process defined by the School of Art and College of the Arts.

Access/utilization during “after hours” such as weekend hours or extended hours in the late night or early morning is subject to further limitation and requires satisfactory completion of a safety test by the Participant.

Participant must complete additional training before using any materials, processes, tools, or equipment, and may have to complete intensive training and testing for some materials, processes, tools, and equipment.

Access/utilization may be limited or revoked at any time by CSULB faculty or staff.

**Participant Level 3 – Ceramics Minor or BFA:** Participant is a student currently enrolled in a Ceramics Minor or BFA Ceramics Option program of study, who requests general access to facilities and equipment, and utilization of materials and processes in the Ceramics Area. Limited to the current semester/term.

- Participant has completed General Safety Training for the Ceramics Area inclusive of receiving and reviewing the General Expectations, risks and hazards, precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area document;
- Participant has completed Safety Certification Process and has been authorized for access and utilization within regular weekday hours.
- Participant must not work alone in the Ceramics Area and must log in when using area using process defined by the School of Art and College of the Arts.

Access/utilization during “after hours” such as weekend hours or extended hours in the late night or early morning is subject to further limitation and requires satisfactory completion of a safety test by the Participant.

Participant must complete additional training before using any materials, processes, tools, or equipment, and may have to complete intensive training and testing for some materials, processes, tools, and equipment.

Access/utilization may be limited or revoked at any time by CSULB faculty or staff.

**Participant Level 4 – Ceramics Track MFA:** Participant is a student currently enrolled in the MFA Ceramics Track program of study, who requests general access to facilities and equipment, and utilization of materials and processes in the Ceramics Area. Limited to the current semester/term.

- Participant has completed General Safety Training for the Ceramics Area inclusive of receiving and reviewing the General Expectations, risks and hazards, precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area document;
- Participant has completed Safety Certification Process and has been authorized for access and utilization within regular weekday hours.
- Participant must not work alone in the Ceramics Area and must log in when using area using process defined by the School of Art and College of the Arts.

Access/utilization during “after hours” such as weekend hours or extended hours in the late night or early morning is subject to further limitation and requires satisfactory completion of a safety test by the Participant.

Participant must complete additional training before using any materials, processes, tools, or equipment, and may have to complete intensive training and testing for some materials, processes, tools, and equipment.

Access/utilization may be limited or revoked at any time by CSULB faculty or staff.

**Participant Level 5 – Other Authorized Participant:** Participant is a person not enrolled in a course or program of study associated with the Ceramics Area, who requests defined/limited access to facilities and equipment, and utilization of materials and processes in the Ceramics Area. Limited to dates and hours defined by written agreement.

Participant may not be enrolled as a student at CSULB, and may be subject to additional agreements defining and limiting the Participant’s status in relation to the University, CSULB, College of the Arts, School of Art, and Ceramics Area.

- Participant has completed General Safety Training for the Ceramics Area inclusive of receiving and reviewing the General Expectations, risks and hazards, precautions, Personal Protective Equipment (PPE), and Health/Safety Considerations for the Ceramics Area document;
- Participant has completed Safety Certification Process and has been authorized for access and utilization within regular weekday hours.
- Participant must not work alone in the Ceramics Area and must log in when using area using process defined by the School of Art and College of the Arts.

Access/utilization during “after hours” such as weekend hours or extended hours in the late night or early morning is subject to further limitation and requires satisfactory completion of a safety test by the Participant.

Participant must complete additional training before using any materials, processes, tools, or equipment, and may have to complete intensive training and testing for some materials, processes, tools, and equipment.

Access/utilization may be limited or revoked at any time by CSULB faculty or staff.

## **General Stipulations/Provisions**

Access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area, is by request of the Participant, must be authorized, requires General Safety Training, may require additional specialized training and/or testing, and is revocable and subject to further limitation.

Some facilities, equipment, materials, and processes will require additional specialized training and/or testing prior to access/utilization.

Access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area, is limited as appropriate to the Participant's status in relation to CSULB, the College of the Arts (COTA), the School of Art (SoA), and the Ceramics Area, and as designated in one of the five Participant Levels defined and limited in this Health/Safety Document, and further defined and limited in additional information, guidelines, and policies issued by CSULB, the College of the Arts (COTA), the School of Art (SoA), and/or the Ceramics Area. Any change in the Participant's status in relation to CSULB, the College of the Arts (COTA), the School of Art (SoA), and/or the Ceramics Area, including but not limited to withdrawal from or completion of a course or program of study, suspension or leave from CSULB, or termination of an agreement defining the Participant's status in relation to CSULB, the College of the Arts (COTA), the School of Art (SoA), and/or the Ceramics Area, VOIDS all access/utilization.

Authorization for access to and utilization of facilities and equipment in the Ceramics Area, and utilization of materials and processes in the Ceramics Area, is granted on an individual basis, to a single Participant, and cannot be extended or transferred by the Participant to other persons.

The University may terminate a Participant's access/utilization at any time.

Conduct by a Participant in violation of the principles defined in this Health/Safety Document may result in further restriction, suspension, or termination of access/utilization, and/or referral for further academic discipline, and or referral to law enforcement, and/or further legal action.

# **General Health, Safety and Conduct Matters for Safe Working in the Ceramics Area**

## **CORE Health and Safety Principles**

No one may use any equipment, tools, materials, or processes in the Ceramics Area if they have not been trained on their use in the CSULB Ceramics Area by CSULB faculty or staff, AND if they have not been specifically authorized to use them. Any exceptions to this policy, which are rare, must be by written agreement with the University.

Participants working in the Ceramics Area may be accompanied by or have appointments with visitors, including vendors and service providers, only with explicit and specific authorization from faculty or staff.

Other than small non-powered and non-heating tools, all tools or equipment brought onto the premises must be reviewed and cleared by Ceramic Arts faculty or staff prior to use. Clearance means that these items appear to be safe for use with proper use, handling, and precautions; it is not an assurance of safety.

Other than manufactured formulated clay bodies purchased elsewhere, all materials brought onto the premises must be reviewed and cleared by Ceramic Arts faculty or staff prior to use. Clearance means that these items appear to be safe for use with proper use, handling, and precautions; it is not an assurance of safety.

## **Right-to-know/Hazard Communications, Containers, and Reuse of Containers**

Containers must be clearly labeled as to their contents, and containers previously used for other purposes may only be reused if their prior labeling is completely removed or obscured so as to avoid any confusion about contents.

You must operate on the assumption that anyone could get ahold of your container and misunderstand its contents if it is not clearly labeled.

Please inform faculty of any containers that are unlabeled or that you believe may be inaccurately labeled.



## **Material Safety Data Sheets (MSDS)**

A Material Safety Data Sheet (MSDS) is a document that lists information relating to occupational safety and health for the use of various substances and materials. Material Safety Data Sheets are maintained on the premises for all materials commonly used in the Ceramics Area, and are available for review upon request. Additionally, the websites listed below, maintained by the two primary ceramic suppliers in the region, are useful resources.

[Aardvark Clay and Supplies – Safety Data Sheets](https://www.aardvarkclay.com/sds.php)

<https://www.aardvarkclay.com/sds.php>

[Laguna Clay Company – Safety Data Sheets](https://www.lagunaclay.com/sds-sheets)

<https://www.lagunaclay.com/sds-sheets>

## **Proper Disposal of Art Materials And Chemicals**

All ceramic and mineral-based materials must be disposed of in the mineral waste dumpsters adjacent to the east loading dock. Please DO NOT dispose of such materials in trashcans located throughout the Ceramics Area. For disposal of other materials, please consult faculty or technical staff in the Ceramics Area before disposing.

## **Food and Beverage**

Food and Beverage are not to be prepared or consumed in the Ceramics Area.

## **Smoking, Vaping, Tobacco**

Smoking and vaping of any substance, as well as use of any tobacco product, are not permitted anywhere on the premises.

## **Alcohol, Substance Use**

Alcoholic beverages may only be consumed on Campus in areas that have been permitted by the California Department of Alcoholic Beverage Control, or that have been approved for special events. The Ceramics Area is not so permitted, nor are any events in the Ceramic Area pre-approved for serving or consuming alcohol. Alcoholic beverages are not permitted in the Ceramics Area except on the rare occasion of an event officially sponsored by the CAP, CCC, SoA, COTA, or CSULB and approved for the serving of alcoholic beverages.

With the exception of rare approved special events, which will be announced as such by University Personnel, alcoholic beverages may not be possessed or consumed anywhere in the Ceramics Area.

Anywhere on the CSULB campus, and on property owned or operated by the University, the solicitation, sale, use, or knowing possession of dangerous drugs, restricted dangerous drugs, or narcotics (as these terms are used in California statutes) are prohibited. Excepted are drugs lawfully prescribed or lawfully permitted. However, use of cannabis, whether prescribed or otherwise, is prohibited on Campus grounds and facilities.

CSULB enforces all drug laws in the University community. Violations of any of the above will result in legal sanctions, University sanctions, or both (California Health and Safety Code, Division 10, all, and including, Section 11357 through 11401).

The use, possession or sale of cannabis and any THC derivatives are prohibited at CSULB. Under federal law which supersedes State law, cannabis is still illegal. The campus is held to two federal laws, the Drug-Free Schools and Community Act, and the Drug-Free Workplace Act. These laws say that in order to receive any federal funding (work-study, financial aid, and federal research grants), the university must prohibit all illegal drugs. As for medical cannabis, the Drug-Free Schools and Community Act, and the Drug-Free Workplace Act do not distinguish medical and non-medical use. CSULB, like all public colleges and universities, prohibits any cannabis use, regardless of medical status.

Use or possession of illegal drugs on Campus, including drugs that may be considered legal by the state of California but remain prohibited under federal law and/or by CSULB, is strictly prohibited.

No one is to work in the Ceramics Area, come to the Ceramics Area, be present in the Ceramics Area, be in or operating University vehicles, be in or operating personal vehicles while engaged in University activities, or in any way otherwise engaged in University activities while “under the influence” of a controlled substance, alcohol, illegal drugs, cannabis, THC derivatives or any substance which could compromise performance or safety. This includes the use of prescription and over-the-counter drugs not used in accordance with the prescription directions.

## Common Physical Environmental Hazards and Safety Considerations in the Ceramics Area

Please be mindful of the following.

1. **Shock Hazards** are a matter of concern with all electric-powered tools, particularly when they are used near water, as is common in the Ceramics Area, and when they are used in conjunction with water as in with potter's wheels, clay mixers, and other mixing tools. Electric kilns pose hazards particularly due to their exposed elements. Electrical cords that can become damaged, or can be introduced into wet conditions also are a concern.
2. **Moving Mechanical Parts** on both manually powered and electrically powered equipment pose the risk of catching fingers, hands, jewelry, clothing, hair, beard, etc.
3. **Sharp Point/Blade – Laceration/abrasion Hazards** are common with hand tools such as knives and chisels, and with power tools such as grinders and drills.
4. **Crush/Pinch Hazards** are associated with equipment that moves or has moving parts, and particularly equipment that exerts significant force or pressure such as clay mixers, or has significant weight such as kiln doors.
5. **Hot Surface/Fire/Burn Hazards** are common in the Ceramics Area, particularly as associated with torches, heat-guns, and kilns that can reach temperatures in excess of 2000 degrees Fahrenheit. Some materials such as plaster and resins also emit heat sufficient to cause serious skin burns during catalyzing processes.
6. **Appropriate Attire Caution:** Appropriate attire as detailed in this health/safety document should be worn at all times in the Ceramics Area and is of particular concern when working with equipment with moving parts, and with equipment or processes that generate heat or combustion.
7. **Surrounding Awareness Caution** is essential to the Ceramics Area where many Participants often are working in close proximity, and involves consideration of how Participants can avoid causing risk or harm to or being subject to risk or harm from others working nearby.

Example: a Participant grinding in close proximity to others who are not properly protected against multiple hazards associated with grinding, or a Participant moving unknowingly and/or unprotected into an area where another Participant is grinding.

8. **Path/Direction of Force Caution** is required to avoid any of the following: injury as the result of moving a tool or object in the direction of one's own body, causing or suffering injury as the result of one Participant being in the path of another Participant's tool, injury as the result of navigating space with an object of mass and momentum such as a ware cart without visibility or awareness of other Participants in one's path, or injury as a result of unknowingly stepping into the path of another Participant in motion.
9. **Trip/Slip/Fall Hazards** are common as a result of frequent presence of water or wet products containing a slippery mix of water and fine particulates, cords outstretched temporarily in work areas, and low-slung and often location-changing objects such as push carts that might not be visible to Participant's carrying objects, backing up, or navigating spaces with presumed familiarity despite shifting arrangements of obstacles.
10. **Splash/Splatter/Spill Hazards** are common in the Ceramics Area as the result of common use of liquid products as well as liquid as a byproduct of processes such as wheel-throwing.
11. **Projectile Hazards** are common in the form of flying debris that can result from processes such as grinding, accidental projectiles such as chips flying off of ceramic objects when heated, or projectiles resulting from processes such as overspray from the spray booth.
12. **Ingestion Hazards** are common throughout the Ceramics Area. All materials used in the area should be treated as ingestion hazards. Food and drink are not to be prepared or consumed in the area, containers previously used for ceramic materials or other art materials should never be used to contain or serve food or drink, and hands must be thoroughly washed before preparing, handling, or consuming food or drink.
13. **Inhalation/Respiratory Hazards** are common in the Ceramics Area as the result of the presence of large quantities of dry powdered materials and dust, as well as fumes that may result from off-gassing materials including solvents, paints, glues, or resins, or from volatilizing

materials and gases released during firing. Respiratory hazards include both substances that can damage the lungs and respiratory system, and toxins that can be absorbed via the lungs and respiratory system..

14. **Skin Irritation/Damage Hazards** may result from materials that can dry, irritate, burn, or damage skin, and equipment that can burn or abrade skin.
15. **Eye Irritation/Injury Hazards** are present in the Ceramics area as the result of projectiles, dust and airborne particulates, potential splatters of liquids and chemicals, tools that can injure eyes, pressurized air, and light and heat from torches, heat guns, and kilns.
16. **Ear Injury / Hearing Damage Hazards** are present in the Ceramics Area primarily in the form of pressurized air and loud equipment.
17. **Bodily Injury Hazards** are present throughout the Ceramics Area, particularly as associated with hand tools, power tools, heavy equipment, and kilns.
18. **Repetitive Stress Injuries** can occur when working in ceramics due to repetitive motions and positions involved in ceramic processes and techniques. These injuries are common in the hands, wrists, elbows, and shoulders; however, they also can affect other areas including but not limited to the neck, back, knees, and ankles. Indications of a potential repetitive stress injury include pain, tingling, numbness, stiffness, or weakness in the affected area, as well as possible swelling and redness, and clicking or popping in a joint when moved. Contributing factors include repeated motions or tasks, awkward positions, forceful exertion, contact stress (such as resting wrists on the edge of a table), incorrect posture, vibration (such as from power tools), muscle fatigue, and lack of recovery time.
19. **Musculoskeletal Sprains and Strains** are common as a result of awkward or heavy lifting or moving of materials or objects, such as lifting/carrying bags of clay (twenty-five pounds per bag, fifty pounds per box), lifting/carrying bags of dry ceramic materials (commonly in fifty-pound bags), lifting/carrying equipment or ware, pushing carts laden with materials or ware, or transferring work in and out of kilns.



## **PPE (Personal Protective Equipment) Commonly Used in the Ceramics Area to Address Physical Environmental Hazards and Safety Considerations in the Ceramics Area**

- a. NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters, or P-100 filters
- b. Safety Glasses
- c. Hearing Protection
- d. Leather Gloves
- e. Nitrile or other material-appropriate gloves
- f. Protective Footwear
- g. Full Face Protection
- h. Respirator appropriate to vapors/fumes associated with material or process
- i. Kiln Safety Glasses with 3.0 to 5.0 IR rating



## Conduct

All those present in the Ceramics Area are expected to conduct themselves in a respectful, responsible, and considerate manner towards all people present on Campus and in the Ceramics Area learning and making community. Classroom-appropriate behavior is expected at all times. We are here to have fun working, but we are here to work effectively and to contribute to an environment that allows others to work effectively. Respect for all those working in the area is a must.

All those present in the Ceramics Area must operate at all times according to safety rules and safe practices as discussed, demonstrated, and documented in courses, instruction, training, and daily operations.

All those present in the Ceramics Area must clean up thoroughly at the end of any work session in or outside of course times wherever they may have worked in the lab.

All those present in the Ceramics Area must use the common areas in the Ceramics Area respectfully help keep them clean and ready for use by others.

All those present in the Ceramics Area must maintain regular, open and responsive communication with CSULB faculty and staff, including responding promptly to email, text, and phone messages regarding university-related matters.

Wherever you are working, and whatever you are working with, take appropriate precautionary steps for yourself and your neighbors, use the material in a safe and appropriate way, protect the area where you're working, clean up your mess, and dispose of material waste properly.

If someone else tells you that you are operating in a way that negatively impacts them, then you **MUST** stop what you are doing until you can consult with faculty and resolve the matter.

## **Compliance with Law and Policy**

All persons present in the Ceramics Area must at all time while in the area comply with all university, CSULB, COTA, SoA, CCC, and CAP policies and directives including but not limited to the following.

CSULB General Policies and Regulations:

<http://catalog.csulb.edu/content.php?catoid=6&navoid=640>

CSULB Campus Standards of Conduct:

<http://catalog.csulb.edu/content.php?catoid=6&navoid=640#campus-standards-of-conduct>

All persons present in the Ceramics Area must at all time while in the area comply with all laws and University policies applicable to their presence on Campus, work in the Ceramics Area, and all business and conduct with and within the University.

All persons present in the Ceramics Area must at all time while in the area comply with all laws and University policies applicable to use of the Ceramics Area and Campus including, without limitation, laws relating to fire safety and materials use.

## **Reporting Of Accidents, Exposures, and Injuries**

All accidents, exposures or potential exposures to hazardous substances, or injuries must be reported promptly to supervising faculty or staff in the area.

In the event of an emergency, call 911.

## **Fire Extinguishers and Smoke/Fire Detection, Alarm, Emergency Lighting, and Fire Suppression Equipment**

Fire extinguishers are located throughout the Ceramics Area in all key areas. Please note their location.

No one may remove, disable, disconnect, or inhibit any smoke/fire detection, alarm, emergency lighting, or fire suppression equipment. This includes blocking access to this equipment or blocking visibility of this equipment.

## General Studio Attire Required at All Times

- Closed-toe shoes with non-slip soles.
- Clothing made of comfortable, durable, breathable, fabrics you can comfortably move in, and that you don't mind getting messy or possibly ruining.
- Please avoid clothing made of materials that are highly flammable, or that melt when heated.
- NO excessively loose-fitting, or dangling clothing.
- NO dangling jewelry or accessories.
- NO jewelry or accessories on hands or wrists.
- Hair longer than chin/shoulder-length should be tied back or contained within a hat or hairnet so as to prevent it from falling forward.
- Long beards must be contained within a beard net.

## Emergency Evacuation Route

Exit routes are clearly marked with signs. In the event of an evacuation due to an actual emergency or drill, please follow exit signs and proceed to central green area on the west side of buildings FA2 and FA3.

## Emergency Phone/Contact Procedure

There is a direct line to the University Police Dispatch in the hallway by the drinking fountain near where the two corridors cross in the Ceramic Area.

**For non-emergency police contact, please call (562) 985-4101.**

**For emergencies, use 911: call if you can; text if you can't.**

## **No Working Alone, Working in the Ceramics Area Outside of Scheduled Class Time**

At almost all hours when the building is open, there are other people in the building; however, if you find yourself alone in the building, we ask that you leave or coordinate with another person to join you. No Participants may work alone in the building. If you're working in the building at night or on weekends, take note of who else is in the building. Let them know you're working in the building and how long you plan to stay, and ask them how long they plan to stay. Let others know when you are leaving, and don't work alone in the building after everyone else has left. Simply put, there should be no "last person out." The last two people should leave together.

Quiet times on campus are great times to work in the Ceramics Area, but they're also times when we need to be mindful of best practices for safety and security. Be aware of your surroundings and who is in the building. Don't leave valuables unattended. Don't be out of reach of a phone, and keep your phone charged.

Please keep the building and kiln yards looking as buttoned up as possible. There is no clearer advertisement of our permeability and vulnerability than to have gates and exterior doors standing open. At all hours, the loading dock gate should be opened only when needed for a specific task, and then immediately closed as soon as the task is complete.

If something or someone seems suspicious to you, even if you're unsure, just call the University Police and let them check it out and sort it out.

There is a direct line to the University Police Dispatch in the hallway by the drinking fountain near where the two corridors cross in the Ceramic Area.

**For non-emergency police contact, please call (562) 985-4101.  
For emergencies, use 911: call if you can; text if you can't.**

Understand that when the campus is quiet, activity of any kind seems more out of the ordinary, so whether they've been called or not, the University Police may come through the building just to see what's going on, and because they're generally not expecting to see people in our work areas at odd hours, they might ask who you are and ask a question or two. Keep your cool, show them your ID if they ask (please keep it handy) and let them know why you're on campus. If you're a student, provide the name of your instructor and your course information. If you're here by other arrangement, explain clearly and provide the name of your faculty or staff contact.

## **Awareness of Health Risks, Working While Pregnant**

Users should be aware of the health risks that come with the equipment, materials and processes they are using.

Users also should consider their own specific ability, health, and exposure concerns and follow a line of consultation as follows.

You are encouraged to inform faculty and staff of any ability concerns or limitations, health concerns or limitations, or exposure concerns or limitations, and indicate any needed accommodation. Users may be referred to the CSULB Bob Murphy Access Center for further consultation and/or may be asked to seek further medical consultation and documentation.

If you are not comfortable discussing such personal information with faculty and staff, please contact the Bob Murphy Access Center and/or a licensed medical doctor and ask them to provide information and instructions about how faculty and staff may try to accommodate you without revealing your underlying concerns.

If you are pregnant, please understand that your condition comes with unique concerns about ability, about maintaining health, and about exposure. In addition to any consultation regarding your pregnancy you wish to engage in with faculty or staff, please contact the Bob Murphy Access Center AND a licensed medical doctor and ask them to provide information and instructions about how faculty and staff may try to accommodate you.

Some materials products used in the Ceramics Area, including Lithium Carbonate and products containing Lithium Carbonate, are known to the State of California to cause birth defects or other reproductive harm. For more information, visit: [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## **General Principles and Expectations**

From wearing proper eye protection, to dust masks and respirators, to handling material and operating equipment properly, if you think you might be doing something in an unsafe way, or don't know what is safe or unsafe when it comes to what you're doing, stop and don't proceed until you know how to do it safely and are able to do so.

If you know you're doing something you shouldn't, then you shouldn't.  
If you think you might be doing something you shouldn't, then you shouldn't.

If you're doing something you know would really be easier and safer if you had a couple of other people to help you or just be nearby in case you get into a pinch, don't try to do it by yourself. Wait until you can get assistance.

Whenever in doubt, consult first.

Not being able to consult because faculty or staff are unavailable at the moment does not mean that you just get to go ahead with what you want to do. It means you have to wait until you can consult. Plan ahead.

## **Course-Specific Health and Safety**

For any students, regardless of major or minor status, students enrolled in 200-level or 300-level courses may not under any circumstance use any equipment, tools, or supplies in the classroom or anywhere else in the Building FA2 Ceramic Arts area that they have not been trained on (in the course in which they are enrolled) or otherwise explicitly authorized to use. Students enrolled in 200-level or 300-level courses categorically may not use any equipment in the Ceramic Arts area outside of the room in which the course is scheduled and any other spaces indicated as authorized for use by the instructor.

## **Clay Mixers and Other Mixers, Dry Materials Area**

Use of Clay Mixers is limited to Ceramics MFA, BFA, and Minor students, with any exceptions to be authorized by faculty. Use of clay mixers requires special prior training and testing, at CSULB, on use of the equipment.

Use of all wet or dry mixers, and access to the dry materials area, must be cleared with faculty or staff.

## **Firing Kilns**

To fire kilns, you must:

1. have gone through special training,
2. have passed a kiln safety test,
3. have first “shadowed” a faculty member or staff member in firing a kiln,
4. have been specifically authorized to fire during the current term, and
5. be equipped with heavy leather gloves and Kiln Safety Glasses with 3.0 to 5.0 IR rating.

You may be asked to retrain. Do not assume that because you were previously authorized to fire kilns your authorization has carried over.

Firing by students is generally limited to BFA Ceramic Arts majors enrolled in ART 451A/B or 491A and Ceramic Arts MFA students.

Each time you fire a kiln, you must first sign up for it with faculty approval.

# Personal Protective Equipment, and Health/Safety Considerations (Condensed List)

## Stationary Power Equipment

Potter’s Wheel: 1, 2, 6  
 Rotary Clay Mixer: a, b, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17  
 Ball Mill/Jars on Rollers: 1, 2, 4,  
 Spray Booth (for ceramic materials only): a, b, 11, 13, 14, 15  
 Abrasive Blast Cabinet (Sand Blaster): a, 11, 13  
 Bench Grinder: a, b, c, d, g, 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17  
 Countertop “Milkshake” Mixer for Glaze Test Batches: a, b, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15  
 “Lightnin” Motor-driven Agitator/Mixer: a, b, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17  
 Slip Mixer: a, b, 1, 2, 3, 4, 5, 6, 7, 9, 10, 12, 13, 14, 15, 17  
 Hot Box Cabinet: 5  
 Track Lighting: 1, 9  
 Commercial Scale: 4

## Stationary Equipment

Compressed Air: a, b, 7, 8, 11, 13, 14, 15, 11  
 Slab Roller: 2, 4, 7, 8  
 Extruder: 2, 4, 7  
 Heavy Gates: 4, 7, 17  
 Hand-cranked “Chipmunk” Mineral Crusher: a, b, 2, 4, 6, 8, 11, 13, 14, 15, 17

## Portable Power Tools

Mixing Drill: a, b, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17  
 Cordless Drill: b, 2, 3, 7, 8, 11, 15, 17  
 Angle Grinder: a, b, c, d, f, g, 1, 2, 3, 6, 7, 11, 13, 14, 15, 16, 17  
 Tile/Brick/Masonry Saw: a, b, c, d, f, 1, 2, 3, 6, 7, 9, 11, 13, 14, 15, 16, 17  
 Electric winch: b, 1, 2, 4, 7, 8, 9, 11, 15, 17  
 Extension Cords and Power Strips: 1, 9  
 Box Fan: 1, 2, 3, 9  
 Industrial Fan: 1, 2, 3, 9  
 Shop Vac: a, 1, 9, 13  
 Temporary Lighting: 1, 5  
 Motor-driven Mineral Grinder/Powderizer: a, b, 1, 2, 3, 6, 7, 11, 13, 15, 17

### PPE (Personal Protective Equipment) Required

- a. NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- b. Safety Glasses
- c. Hearing Protection
- d. Leather Gloves
- e. Nitrile or other material-appropriate gloves required
- f. Protective Footwear
- g. Full Face Protection Recommended
- h. Respirator appropriate to vapors/fumes associated with material or process
- i. Kiln Safety Glasses with 3.0 to 5.0 IR rating

### Safety Considerations

- 1. Shock Hazard
- 2. Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- 3. Sharp Point/Blade – Laceration/abrasion Hazard
- 4. Crush/Pinch Hazard
- 5. Hot Surface/Fire/Burn Hazard
- 6. Appropriate Attire Caution
- 7. Surrounding Awareness Caution
- 8. Path/Direction of Force Caution
- 9. Trip/Slip/Fall Hazard
- 10. Splash/Splatter/Spill Hazard
- 11. Projectile Hazard
- 12. Ingestion Hazard
- 13. Inhalation/Respiratory Hazard
- 14. Skin Irritation/Damage Hazard
- 15. Eye Irritation/Injury Hazard
- 16. Ear Injury / Hearing Damage Hazard
- 17. Bodily Injury Hazard



## Heat Tools

Heat Gun: b, h, 1, 5, 6, 7, 8, 11, 13, 14, 15, 17  
 Soldering Torch: b, h, 5, 6, 7, 8, 11, 13, 14, 15, 17  
 Rose Bud Torch: b, h, 5, 6, 7, 8, 11, 13, 14, 15, 17

## Lift/Transport Equipment

Chain Winch: b, d, f, 2, 4, 7, 8, 9, 11, 15, 17  
 Pallet Jacks: f, 2, 4, 7, 8, 9, 17  
 Pallet Stacker: f, 2, 4, 7, 8, 9, 17  
 Scissor Lift Cart: f, 2, 4, 7, 8, 9, 17  
 Push Cart: f, 4, 7, 8, 9, 17  
 Ladder: 4, 7, 9, 17  
 Hand Truck/Dolly: f, 4, 7, 8, 9, 17  
 Tables on Casters: f, 4, 7, 8, 9, 17  
 Sculpture Platforms: f, 4, 7, 8, 9, 17

## Kilns

Gas Kiln: a, b, d, f, i, 3, 4, 5, 6, 7, 11, 13, 14, 15, 16, 17  
 Electric Kiln: a, b, d, f, i, 1, 3, 4, 5, 6, 7, 11, 13, 14, 15, 16, 17

## Hand Tools

Hammer: b, 4, 7, 8, 11, 15, 17  
 Chisel: b, 3, 4, 7, 8, 11, 15, 17  
 Grinding Stone: a, b, 3, 8, 11, 13, 15, 17  
 Hand saw: b, d, 3, 8, 11, 15, 17  
 Screw driver: 3, 8  
 Pliers: 3, 4  
 File: a, b, 3, 8, 11, 13, 15, 17  
 Snips: 3, 4  
 Scissors: 3, 4, 15  
 Surform: a, 3, 8, 11, 15, 17  
 Box Knife: 3, 8, 17  
 Clay Trimming Tool: 3  
 Needle Tool: 3, 15  
 Metal Rib: 3  
 Wire Clay Cutter: 3, 17  
 Fettling Knife: 3, 8, 15, 17  
 Putty Knife: 3, 8  
 Rolling Pin: 4, 8

## PPE (Personal Protective Equipment) Required

- a. NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- b. Safety Glasses
- c. Hearing Protection
- d. Leather Gloves
- e. Nitrile or other material-appropriate gloves required
- f. Protective Footwear
- g. Full Face Protection Recommended
- h. Respirator appropriate to vapors/fumes associated with material or process
- i. Kiln Safety Glasses with 3.0 to 5.0 IR rating

## Safety Considerations

1. Shock Hazard
2. Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
3. Sharp Point/Blade – Laceration/abrasion Hazard
4. Crush/Pinch Hazard
5. Hot Surface/Fire/Burn Hazard
6. Appropriate Attire Caution
7. Surrounding Awareness Caution
8. Path/Direction of Force Caution
9. Trip/Slip/Fall Hazard
10. Splash/Splatter/Spill Hazard
11. Projectile Hazard
12. Ingestion Hazard
13. Inhalation/Respiratory Hazard
14. Skin Irritation/Damage Hazard
15. Eye Irritation/Injury Hazard
16. Ear Injury / Hearing Damage Hazard
17. Bodily Injury Hazard

## Commonly Used Materials

Clay/Clay Dust: a, 7, 12, 13, 15

Glaze/Glaze Dust: a, b, e, 7, 10, 12, 13, 14, 15

Ceramic Dry Powdered Materials: a, 7, 12, 13, 14, 15

Plaster: a, 7, 12, 13, 14, 15

Mortar: a, 7, 12, 13, 14, 15

Paints: b, e, h, 7, 12, 13, 14, 15

Wax Resist: a, b, e, 7, 12, 14, 15

Lusters and China Paints: b, e, h, 7, 12, 13, 14, 15

Solvents: b, e, h, 7, 12, 13, 14, 15

Glues and Resins: b, e, h, 7, 12, 13, 14, 15

## PPE (Personal Protective Equipment) Required

- a. NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- b. Safety Glasses
- c. Hearing Protection
- d. Leather Gloves
- e. Nitrile or other material-appropriate gloves required
- f. Protective Footwear
- g. Full Face Protection Recommended
- h. Respirator appropriate to vapors/fumes associated with material or process
- i. Kiln Safety Glasses with 3.0 to 5.0 IR rating

## Safety Considerations

1. Shock Hazard
2. Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
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6. Appropriate Attire Caution
7. Surrounding Awareness Caution
8. Path/Direction of Force Caution
9. Trip/Slip/Fall Hazard
10. Splash/Splatter/Spill Hazard
11. Projectile Hazard
12. Ingestion Hazard
13. Inhalation/Respiratory Hazard
14. Skin Irritation/Damage Hazard
15. Eye Irritation/Injury Hazard
16. Ear Injury / Hearing Damage Hazard
17. Bodily Injury Hazard

# **Personal Protective Equipment, and Health/Safety Considerations (Extended List)**

## **Stationary Power Equipment**

### **Potter's Wheel**

- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Appropriate Attire Caution

### **Rotary Clay Mixer**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Trip/Slip/Fall Hazard
- Splash/Splatter/Spill Hazard
- Projectile Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Ball Mill/Jars on Rollers**

- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard

## **Spray Booth**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Projectile Hazard
- Inhalation /Respiratory Hazard

## **Abrasive Blast Cabinet (Sand Blaster)**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Projectile Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard

## **Bench Grinder**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Hearing Protection
- Leather Gloves
- Full Face Protection Recommended
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Splash/Splatter/Spill Hazard
- Projectile Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Ear Injury/Hearing Damage Hazard
- Bodily Injury Hazard

## **Countertop “Milkshake” Mixer for Test Glaze Batches**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Trip/Slip/Fall Hazard
- Splash/Splatter/Spill Hazard
- Projectile Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard

## **“Lightnin” Motor-driven Agitator/Mixer**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Trip/Slip/Fall Hazard
- Splash/Splatter/Spill Hazard
- Projectile Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Slip Mixer**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Trip/Slip/Fall Hazard
- Splash/Splatter/Spill Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Hot Box Cabinet**

- Hot Surface/Fire/Burn Hazard

## **Track Lighting**

- Shock Hazard
- Trip/Slip/Fall Hazard

## **Commercial Scale**

- Crush/Pinch Hazard

## **Stationary Equipment**

### **Compressed Air**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Surrounding Awareness Caution
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Slab Roller**

- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness Caution
- Path/Direction of Force Caution

### **Extruder**

- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness Caution

### **Heavy Gates**

- Crush/Pinch Hazard
- Surrounding Awareness
- Bodily Injury Hazard

## **Hand-cranked “Chipmunk” Mineral Crusher**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Appropriate Attire Caution
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard



## **Portable Power Tools**

### **Mixing Drill**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Appropriate Attire Caution
- Surrounding Awareness Caution
- Trip/Slip/Fall Hazard
- Splash/Splatter/Spill Hazard
- Projectile Hazard
- Ingestion Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Cordless Drill**

- Safety Glasses
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Eye Irritation /Injury Hazard
- Bodily Injury Hazard

## **Angle Grinder**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Hearing Protection
- Leather Gloves
- Protective Footwear
- Full Face Protection Recommended
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation /Respiratory Hazard
- Eye Irritation /Injury Hazard
- Ear Injury/Hearing Damage Hazard
- Bodily Injury Hazard

## **Electric Winch**

- Safety Glasses
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness
- Trip/Slip/Fall Hazard
- Projectile Hazard
- Path/Direction of Force Caution
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Extension Cords and Power Strips**

- Shock Hazard
- Trip/Slip/Fall Hazard

## **Tile/Brick/Masonry Saw**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Hearing Protection
- Leather Gloves
- Protective Footwear
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Trip/Slip/Fall Hazard
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Ear Injury/Hearing Damage Hazard
- Bodily Injury Hazard

## **Box Fan**

- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Trip/Slip/Fall Hazard

## **Industrial Fan**

- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Trip/Slip/Fall Hazard

## **Shop Vac**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Shock Hazard
- Trip/Slip/Fall Hazard
- Inhalation/Respiratory Hazard

## **Temporary Lighting**

- Shock Hazard
- Hot Surface/Fire/Burn Hazard

## **Motor-driven Mineral Grinder/Powderizer**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Shock Hazard
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation /Respiratory Hazard
- Eye Irritation /Injury Hazard
- Bodily Injury Hazard

## **Heat Tools**

### **Heat Gun**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Shock Hazard
- Hot Surface/Fire/Burn Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Soldering Torch**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Hot Surface/Fire/Burn Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Rosebud Torch**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Hot Surface/Fire/Burn Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Lift/Transport Equipment**

### **Chain Winch**

- Leather Gloves
- Protective Footwear
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness
- Trip/Slip/Fall Hazard
- Projectile Hazard
- Path/Direction of Force Caution
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Pallet Jacks**

- Protective Footwear
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

### **Pallet Stacker**

- Protective Footwear
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Scissor Lift Cart**

- Protective Footwear
- Moving Mechanical Parts (risk of catching fingers, hands, jewelry, clothing, hair, beard)
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Push Cart**

- Protective Footwear
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Ladder**

- Crush/Pinch Hazard
- Surrounding Awareness
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Hand Truck/Dolly**

- Protective Footwear
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard



## **Tables on Casters**

- Protective Footwear
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Sculpture Platforms**

- Protective Footwear
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Trip/Slip/Fall Hazard
- Bodily Injury Hazard

## **Kilns**

### **Gas Kiln**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Leather Gloves
- Protective Footwear
- Kiln Safety Glasses with 3.0 to 5.0 IR rating
- Shock Hazard
- Crush/Pinch Hazard
- Hot Surface/Fire/Burn Hazard
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Electric Kiln**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Leather Gloves
- Protective Footwear
- Kiln Safety Glasses with 3.0 to 5.0 IR rating
- Shock Hazard
- Crush/Pinch Hazard
- Hot Surface/Fire/Burn Hazard
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Appropriate Attire Caution
- Surrounding Awareness
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Skin Irritation/Damage Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Hand Tools**

### **Hammer**

- Safety Glasses
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Chisel**

- Safety Glasses
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Surrounding Awareness
- Path/Direction of Force Caution
- Projectile Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

### **Grinding Stone**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Leather Gloves
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Hand Saw**

- Safety Glasses
- Leather Gloves
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution
- Projectile Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard
- Bodily Injury Hazard

## **Screwdriver**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution

## **Pliers**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard

## **File**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Safety Glasses
- Leather Gloves
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Projectile Hazard
- Inhalation/Respiratory Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Snips**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard

## **Scissors**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Eye Irritation/Injury Hazard

## **Surform**

- Safety Glasses
- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution
- Projectile Hazard
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Box Knife**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution
- Bodily Injury Hazard

## **Clay Trimming Tool**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Crush/Pinch Hazard
- Eye Irritation/Injury Hazard

## **Needle Tool**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Eye Irritation/Injury Hazard

## **Metal Rib**

- Sharp Point/Blade – Laceration/Abrasion Hazard

## **Wire Clay Cutter**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Bodily Injury Hazard

## **Fettling Knife**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution
- Eye Irritation/Injury Hazard
- Bodily Injury Hazard

## **Putty Knife**

- Sharp Point/Blade – Laceration/Abrasion Hazard
- Path/Direction of Force Caution

## **Rolling Pin**

- Crush/Pinch Hazard
- Path/Direction of Force Caution

## **Commonly Used Materials**

### **Clay/Clay Dust**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

### **Glaze/Glaze Dust**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Splash/Splatter/Spill Hazard
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

### **Ceramic Dry Powdered Raw Materials**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Plaster**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Mortar**

- NIOSH N-95 or P-100 Respirator Mask, or Respirator with N-95 filters or P-100 filters required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Paints**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Wax Resist**

- Safety Glasses
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Ingestion Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard



## **Lusters and China Paints**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Solvents**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

## **Glues and Resins**

- Safety Glasses
- Respirator appropriate to vapors/fumes associated with material or process
- Nitrile or other material-appropriate gloves required
- Surrounding Awareness
- Ingestion Hazard
- Inhalation /Respiratory Hazard
- Skin Irritation / Damage Hazard
- Eye Irritation /Injury Hazard

**Occasionally to Commonly Used Raw Materials in the Ceramics Area**

Alumina Hydrate	
Barium Carbonate	Used only with faculty consultation and supervision.
Bentonite	
Black Copper Oxide	
Bone Ash	
Borax	
Boric Acid	Used only with faculty consultation and supervision.
Burnt Umber	
Ceramic Stains / Colorants	
Chrome Oxide	
Clays of various kinds	
CMC Gum (Carboxymethyl Cellulose)	
Cobalt Carbonate	
Cobalt Oxide	
Cobalt Sulfate	
Copper Carbonate	
Copper Oxide (Black)	
Cornwall Stone	or formulated Cornwall Stone substitute
Darvan (deflocculant)	
Dolomite (calcium magnesium carbonate)	
Feldspars of various kinds	both Potash and Soda Feldspars
Fire Clays	
Gerstley Borate	
Grogs of various mesh sizes	
Ilmenite	
Iron Chromate	Used only with faculty consultation and supervision.
Iron Oxide (Black)	
Iron Oxide (Red))	
Iron Oxide (Yellow)	
Iron-bearing Clays	
Kaolin - Calcined	
Kaolins	
Kiln Wash	
Kryolite	
Leadless Calcium-Borate Frits	
Lithium Carbonate	Used only with faculty consultation and supervision.
Macaloid	
Magnesium Carbonate	
Magnesium Sulfate	
Magnetite	

Manganese Carbonate	Used only with faculty consultation and supervision.
Manganese Dioxide	Used only with faculty consultation and supervision.
Nepheline Syenite	
Nickel Carbonate	
Nickel Oxide	
P.V. (Plastic Vitrox) Clay	or formulated PV Clay substitute
Petalite	
Pottery Plaster	
Pumice	
Pyrax (pyrophyllite)	
Raw Umber	
Rutile	
Sairbond refractory mortar	
Silica - 200, 400, 800 mesh	
Silica Sand	
Silicon Carbide	
Soda Ash	
Sodium Silicate	
Spodumene	or formulated Spodumene substitute
Strontium Carbonate	
Talc (Magnesium Silicate)	Used only with faculty consultation and supervision.
Tin Oxide	
Titanium Dioxide	
Whiting / Limestone / Calcium Carbonate	
Wollastonite	
Yellow Ochre	
Zinc Oxide	
Zirconium Silicate	