

AOE DEPARTMENT SAFETY REVIEW FORM FOR **EXPERIMENTAL WORKSPACES**

Before experimental activities can begin in any room in the Department of Aerospace and Ocean Engineering, and **at least once per year** thereafter, a copy of this form must be completed, signed and submitted by the responsible faculty/staff member (usually the principal investigator). Completed forms should be submitted to the AOE Assistant Department Head for Facilities (Michael Philen) and should also be made available to other faculty/staff with relevant expertise, or with direct involvement in the space. Any advice resulting from this interaction should be copied to the Assistant Department Head, as well as being transmitted back to the responsible faculty/staff member. Once the responsible faculty/staff member is satisfied that all safety concerns have been met the final version of the form should be signed and submitted and a copy prominently displayed on the door to the space and on the department safety website. The responsible faculty/staff member may then authorize experimental activities.

Date of form..... [Aug 15, 2023](#)..... Form expires (no more than 1 year after form date):... [Aug 15, 2024](#)....

Name and location of workspace..... **140 Goodwin Hall**.....

Faculty/staff member responsible for Experimental Workspace and its safety[Aurelien Borgoltz](#)

Office Address..... [660D McBryde Hall](#)..... Phone..... [231-1959](#)..... Email..... aurelien@vt.edu.....

GENERAL SAFETY REVIEW

1. *The workspace houses the following potentially hazardous experimental rigs. An 'Experimental Rig Safety Form' has been completed, posted, and is current for each of these.*

Open jet wind tunnel

3D Printer

2. *An evaluation of the above experimental workspace has been performed and the following safety risks have been identified, in addition to those associated with the above facilities (append details where necessary)*

Users of the lab are subject to risks from electrical hazards associated with normal operation of electrically operated equipment, chemical hazards due to chemicals used or stored in this laboratory, and mechanical hazards due to tripping or operation of the experimental rigs identified in section 1.

3. *The following actions have been taken to minimize those risks (append details where necessary)*

Chemical Hazards: All users of this lab are required to have completed and have current EHS Hazcom RTK training. A chemical inventory has been compiled, is attached to this form, and available on the EHS Chemical Registration site at: https://secure.hosting.vt.edu/www.ehss.vt.edu/programs/LMS/inventory_entry.php and is also listed at the end of this form. Chemicals in this lab, maybe stored only in the marked chemical storage cabinet and Safety Data Sheets for all chemicals may be found in the yellow MSDS cabinet attached to the lab wall, behind the open jet wind tunnel test-section. Chemicals may not be stored in unmarked secondary containers.

Electrical Hazards: All users of this lab are required to have completed and have current EHS Electrical Awareness and EHS Lockout/Tagout Awareness training. Use of electrical equipment, lights, power strips and extension cords are required to be consistent with OSHA standards.

Mechanical Hazards: Safety requirements associated with the experimental rigs in section 1 are detailed on those safety forms

General Rules for Working in Goodwin 140:

- 1. All lab users must obtain the advance approval of Aurelien Borgoltz before beginning work.**
- 2. While working in the lab it is your responsibility to know**
 - a. the location of first aid and emergency equipment, fire extinguishers and emergency exits**
 - b. how to call the fire fighters, police or rescue squad (dial 911 from any campus or non-campus telephone).
If you don't know, ASK before beginning work.**
- 3. If in doubt about the safety of performing any test, of using any piece of instrumentation, or of undertaking any other operation in the lab, DO NOT proceed. No experimental result or setup is worth an injury.**
- 4. Maintain, organize, and clean work area. Access paths should be kept clear. Cables should not be draped across passages. Approved covers must be used for any cables on the floor.**
- 5. Do not dispose of any chemical substance (down the sink, in the trash can or anywhere else). Disposal of such materials are to be handled in coordination with the AOE Machine Shop Supervisor, Mr. James Lambert (jalamber@vt.edu, 231 6752)**
- 6. It is your responsibility to immediately report to the lab director any injuries, accidents and "near-misses" that you are aware of, any chemical spills, however small (e.g. mercury from a thermometer), any faulty equipment that poses a safety risk**

4. All users of this workspace have been registered and are listed on the EHS training website at <https://www.ehss.vt.edu/training/>. Users have taken all appropriate safety training courses from Environmental Health and Safety. Their training is current and is recorded on the EHS website, under the workspace name Goodwin Hall, 140 - Access

The appropriate safety courses are (list here):

Personal Protective Equipment (PPE) Awareness

HAZCOM RTK

Electrical Awareness

Lockout/Tagout Awareness

Portable Fire Extinguishers

Users of this workplace who need to operate the Time-resolved Stereoscopic Particle Image Velocimetry System also need to take the following safety course:

Laser Safety

HAZARD COMMUNICATION PLAN

1. A Chemical Hygiene Plan (CHP) is required for this work space. (The responsible faculty/staff member is required to contact EHS to make this determination before answering this question)

No Continue to step 2

Yes Sign below to certify that a current and complete Chemical Hygiene Plan has been completed for this space. Provide the location of the CHP in the workspace

2. In signing below I am acknowledging that I am responsible for managing the Hazard Communication Plan for this workspace, specifically, it is my responsibility to ensure:

- a) that all workspace users (include students, staff, other faculty) understand and follow this plan through Scheduled HazCom training, all necessary EHS training, and disciplinary action.
- b) that a hazardous chemical inventory is compiled and maintained, using the EHS Chemical Registration System at <https://www.ehss.vt.edu/sms/index.php>. A list of hazardous chemicals, downloaded from that site, is appended to the paper copy of this form to be posted on the door to the space. Note that consumer products intended for household use, and used in a manner consistent with that intent need not be listed.
- c) that all containers of classified hazardous chemicals associated with or stored in the workspace are clearly and prominently labeled, in English, with the original manufacturers label. If that label is not available then a label based on information from the Safety Data Sheet (product name, danger/warning indication, pictogram...) that clearly communicates the hazard to the user will be used.
- d) that procedures are reviewed at least annually, on or about the expiration/renewal date of this form.
- e) that Safety Data Sheets (SDS) are available for all chemicals in the attached list are available to lab users at (give location)
- f) that EHS has been consulted on all other training requirements, and these training requirements have been met and are properly recorded on the EHS training website.
- g) that meetings to communicate health hazards associated with the use of all hazardous chemicals and the use of proper PPE will be held
 - o with all new workspace users before they begin work,
 - o with all workspace users when a new chemical or other hazard is added to the workspace (and at least annually)
- h) that all HazCom information and training of employees will at a minimum meet the requirements of OSHA 29 CFR 1910.1200(h), see below .

Signature of faculty/staff member responsible for workspace and its safety

.....  Date..... **Aug. 15, 2023**.....

LIST OF HAZARDOUS CHEMICALS

List of chemicals registered on (updated 2023/08/15)

<https://www.ehss.vt.edu/sms/index.php>

Flammable Liquid

Acetone: 2 Gallons

Isopropyl alcohol: 16 32-oz bottles

Combustible liquid

RGD5160-DM material fabricated from RGD515, RGD535, and RGD705 Digital ABS material for the Objet 500 and CONNEX 3D printers. No more than 20 canisters (each canister weighs 3.6 kg) stored in the lab.

Water Reactives/Corrosives

Sodium Hydroxide Powder: 5000 grams

Other research hazard

Other Research Hazards		Progress:	1	2	3	4	5	6
Please indicate below if you have the equipment, materials or perform the research that is described.								
Other Research Hazards								
Radioactive Materials:	Do Not Have							
X-ray Producing Equipment:	Do Not Have							
Human Tissue or Cell Lines:	Do Not Have							
Nanomaterials:	Do Not Have							
Known Human Carcinogen:	Do Not Have							
Bioinfectious Agents:	Do Not Have							
Class 3b, 3r or 4 Laser Systems:	Do have Class 3b, 3r or 4 laser system(s)							
Electrical Research:	Do not perform electrical research							

OSHA CFR 29 1910.1200(h)

1910.1200(h)

Employee information and training.

1910.1200(h)(1)

Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and safety data sheets.

1910.1200(h)(2)

Information. Employees shall be informed of:

1910.1200(h)(2)(i)

The requirements of this section;

1910.1200(h)(2)(ii)

Any operations in their work area where hazardous chemicals are present; and,

1910.1200(h)(2)(iii)

The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and safety data sheets required by this section.

1910.1200(h)(3)

Training. Employee training shall include at least:

1910.1200(h)(3)(i)

Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1200(h)(3)(ii)

The physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area;

1910.1200(h)(3)(iii)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,

1910.1200(h)(3)(iv)

The details of the hazard communication program developed by the employer, including an explanation of the labels received on shipped containers and the workplace labeling system used by their employer; the safety data sheet, including the order of information and how employees can obtain and use the appropriate hazard information.