	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
		Implementation Date	5/4/07
Page #:	1 of 11	Last Reviewed/Update Date:	5/31/2013
SOP Owner:	Emily Ranken	Approval:	Pam Greenley

Shipping Hazardous Chemicals and Miscellaneous Hazardous Materials

1. Purpose / Background

There are detailed regulations pertaining to the shipment of hazardous materials by air, land or sea that require such materials be appropriately classified, properly packaged and clearly labeled by trained personnel for safe shipping. This SOP outlines the program and services provided by the EHS Office to the campus community for the shipping of hazardous chemicals and class 9 miscellaneous dangerous goods in compliance with the US Department of Transportation Hazardous Materials Regulations for Shippers, DOT 49 CFR Part 173, and the International Air Transport Authority (IATA) Dangerous Goods Regulations. This SOP also describes the support needed from DLCs using these services.

The terms hazardous materials (used by DOT) and dangerous goods (used by IATA) are defined as articles or substances which are capable of posing a risk to health, safety, property or the environment. There are specific lists of dangerous goods in both regulations, and there are specific criteria described for classifying the hazards of materials that are not specifically listed in both regulations. The scope of materials is very broad and includes chemicals, dry ice, batteries and articles which may contain these materials such as drug delivery devices, vehicles and electronic equipment. Appendix A contains more information on classes of hazardous materials covered by the regulations.


Shippers of hazardous materials are responsible for compliance with all regulations, including the requirement that trained personnel classify, pack, and label the shipment and prepare required paperwork. The EHS Office assists with compliance by assuring trained staff are available to the campus community to provide advice and assistance with all hazmat shipments.

Failure to properly ship hazardous materials in accordance with regulations can result in serious impacts to people, property and the environment. In addition, significant fines, imprisonment, and/or loss of shipping privileges can result from violations of regulations.

2. Scope

With the exception of Lincoln Laboratory, this SOP applies to all Departments, Labs and Centers at MIT that ship hazardous chemicals and/or miscellaneous dangerous goods. Lincoln Laboratories has a separate program for hazardous materials shipping. Note: Miscellaneous dangerous goods include lithium batteries, and equipment containing lithium batteries, as well as many other things.

- 1.2** This SOP does not specifically cover the shipment of regulated biological materials, a sub-class of hazardous materials. Shipment of regulated biological materials at MIT is covered in "Shipping Biological Materials - EHS-0062".
- 2.2** This SOP does not specifically cover the shipment of radioactive materials, also a sub-class of hazardous materials. Contact the Radiation Protection Program by calling 617-452-3477 or sending an email to environment@mit.edu to arrange for a shipment of radioactive materials.
- 3.2** This SOP does not specifically cover the shipment of hazardous waste, also a sub-class of hazardous materials, which is covered in the SOP "Hazardous Waste Removal and Disposal - EHS-0003".

	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
Page #:	2 of 11	Implementation Date	5/4/07
SOP Owner:	Emily Ranken	Last Reviewed/Update Date:	5/31/2013
		Approval:	Pam Greenley

3. Prerequisites

N/A

4. Program.

The EHS Office provides oversight, information and services to the MIT Campus community for the shipment of hazardous materials at MIT, and maintains records required by regulations pertaining to these shipments.

4.1 Hazardous Materials Shipping Team (HMST): The EHS Office maintains a team of personnel trained to ship hazardous materials, as described below. Members of the team include EHS Office staff and select DLC personnel who are trained to ship hazardous chemicals.

4.2 Trained Staff: The EHS Office maintains staff trained in accordance with regulatory requirements, for properly classifying, packaging, labeling, and completing documentation that may be required for a shipment.

4.2.1 The EHS Office may work with DLCs to establish trained personnel within DLCs making frequent shipments, and works closely with these individuals to assure adequate support and maintenance of training and services.

4.2.2 The EHS Office provides awareness information to personnel in DLCs who indicate they may ship hazardous materials. See training below.

4.3 Recordkeeping:

4.3.1 The EHS Office maintains shipper's declarations for all hazardous materials shipments conducted by EHS Office trained staff or designated DLC shippers. These records are maintained for at least two years, as required by regulation.

4.3.2 The EHS Office maintains records of all personnel trained to ship hazardous materials and their training, to include a certificate of training, outline of course received, and the test associated with the course.

4.4 Oversight:

4.4.1 The EHS Office HMST leader reviews program SOP on annual basis, and updates as needed.

4.4.2 The EHS Office HMST leader reviews records maintained on an annual basis, and updates as needed.

4.4.3 The EHS Office HMST works with the Export Control Officer, OSP, as needed for international shipments of hazardous materials.

4.4.4 The EHS Office HMST works with Mail Services, as needed, for training and concerns pertaining to the receipt of hazardous materials sent to MIT.

4.5 Other organizations at MIT with a role with respect to shipping.

4.5.1 **Export Control Officer, OSP:** The Export Control Officer provides guidance and support services for exports from MIT. For more details about exports, visit: <http://osp.mit.edu/compliance/export-controls>. All international shipments of hazardous materials are exports, and must involve the Export Control Officer.


4.5.2 **Mail Services, Department of Facilities:** Mail Services refers any request for hazardous materials shipping services to the EHS Office. Mail Services may receive shipments of hazardous materials and maintains staff trained to manage the receipt of these materials.

4.5.3 **Purchasing Department:** Purchasing Department maintains contracts with carriers, such as FedEx, for shipping services. Questions about services providers can be directed to them.

5. Hazardous chemical shipping procedures

An official hardcopy of this document exists in the EHS Office or on the EHS website.

See Legal Disclaimer at: <http://ehs.mit.edu/site/content/legal-disclaimer>

	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
Page #:	3 of 11	Implementation Date	5/4/07
SOP Owner:	Emily Ranken	Last Reviewed/Update Date:	5/31/2013
		Approval:	Pam Greenley

Campus personnel who wish to ship materials that may be hazardous must:

- Contact the EHS Office with any questions concerning appropriate procedures for shipping those materials.
- If the Shipment is international, , must also contact the Export Control Officer with OSP.
- EHS staff trained for shipping will determine specific requirements for proper shipment of materials in question.
- The shipper will be notified if the material in question is not considered hazardous.
- **Samples for testing or other small quantity shipments are not necessarily exempt from regulations. The EHS Office must be contacted if the material is potentially hazardous.**

5.1 Request for shipping service:

To request services for the shipment of hazardous chemicals the shipper must:

- Submit a fully completed “Intent to Ship Form” (Appendix B) to the EHS Office by email to environment@mit.edu, or by fax to (617)-258-6831, **at least 3 business days prior** to the date the shipping service is needed.
 - This form is also available on the shipping website at: <http://ehs.mit.edu/site/content/hazardous-materials-shipping-mit>.
 - Shipping services may also be requested by calling 617-452-3477, but the caller should have all the information required on the form.
- Contact the Export Control Officer with OSP for international shipments, as detailed at: <http://osp.mit.edu/compliance/export-controls>. More time may be needed.

5.2 EHS Office shipping service


The shipping service provided by the EHS Office is as follows:

- Review of the “Intent to Ship” form to classify the shipment, as appropriate, based on information submitted. If it is determined the material is non-hazardous, the shipper will be notified. If the material is determined to be a “forbidden dangerous good” for aircraft transportation, the requestor will be notified.
- Contact the shipper to arrange for a time to package the shipment.
- Package and label the materials being shipped, in compliance with all regulatory requirements. The EHS Office provides packaging and labeling, but will charge back for these supplies.
- Prepare and sign the shipper’s declaration for the shipment, when this document is needed.
- Assist, as requested, with other documentation for the shipment.
- Notify ChemTrec of the shipment, as required for emergency response purposes. (This is required by regulation for shipments requiring a “Shipper’s Declaration for Dangerous Goods”.)
- Maintain a copy of the shipper’s declaration associated with a shipment for the required two year period.

5.3 Shipper responsibilities for a shipment, once packaged and labeled.

The shipper or their designated DLC support staff must:

- Complete additional documentation, e.g. the airway bill and for international shipments, the commercial invoice, associated with the shipment. EHS staff will provide assistance, as requested.
- Arrange with fed ex for collection of the shipment, unless alternative arrangements have been made with EHS staff. Generally, the shipment should go out the same day as packaged, unless other specific arrangements are made with EHS Staff assisting with the shipment.

	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
Page #:	4 of 11	Implementation Date	5/4/07
SOP Owner:	Emily Ranken	Last Reviewed/Update Date:	5/31/2013
		Approval:	Pam Greenley

- Retain package in a secure location until it is picked up by a Carrier such as FedEx. (Note: Never leave a package containing hazardous materials at a FedEx drop box, a violation of the DOT regulations pertaining to security requirements for such shipments.)
- Notify EHS staff immediately if there are any problems with the shipment.
- Reimburse EHS Office for packaging materials.
- For international shipments, the shipper is responsible for preparing the commercial invoice for the shipment. The Export control officer will provide appropriate information for classification of the shipment for tariff purposes.
(<http://osp.mit.edu/compliance/export-controls>) EHS shipping staff will assist, as requested, but the shipper is also responsible for contacting the Export Control Officer for international shipments.

5.4 Guidance regarding specific shipping concerns.

- 5.4.1 **Dry Ice shipments:** Shipments where dry ice is the only hazardous material do not require a shipper's declaration. The EHS Office provides training for those who routinely use dry ice for shipping. This training qualifies the shipper only for dry ice shipments, or in some cases, Category B infectious materials shipments and dry ice shipments. Contact the EHS office for Dry Ice Shipping Training.
- 5.4.2 **Lithium metal or lithium ion batteries:** There are detailed regulations specific to shipments of lithium batteries and/or equipment containing lithium batteries. Lithium batteries and equipment containing them are classified as miscellaneous dangerous goods.
- Services and packaging for shipping a single lap top or small equipment item containing a Lithium battery can be obtained from a FedEx store. Those on the main campus can go to the FedEx Store at 600 Technology Square, Cambridge, MA.
 - The EHS Office must be contacted for all other shipments of lithium batteries or equipment containing lithium batteries, including prototype, non-standard equipment shipments.


Note: Other types of batteries may also be considered a dangerous good. Please contact EHS with questions re: battery shipments.

- 5.4.3 **Re-shipping of hazardous materials:** Re-shipping refers to ordering materials for receipt at MIT, and then sending them to another location. Re-shipping of hazardous chemicals and miscellaneous dangerous goods is strongly discouraged. When hazardous chemical or dangerous goods are needed at a separate location, either domestic or international, due to a collaboration or fieldwork, departments should arrange for direct shipping by the vendor to the location needed. This reduces the hazard of such shipments, as well as overall shipping costs.

6. Roles & Responsibilities

6.1 The EHS Office is responsible for:

- Oversight of the program and services for the shipment of hazardous chemicals and miscellaneous dangerous goods at MIT.
- Maintaining trained, qualified staff in the EHS Office, and where needed, at the DLC. The EHS Office will maintain a list of all qualified people.
- Assisting DLCs in the classification, packaging, labeling, and preparation of required documentation for the shipment of hazardous chemicals and miscellaneous dangerous goods.
- Providing, at cost, a proper shipping package or assisting the shipper with procuring proper packaging.

	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
		Implementation Date	5/4/07
Page #:	5 of 11	Last Reviewed/Update Date:	5/31/2013
SOP Owner:	Emily Ranken	Approval:	Pam Greenley

- Maintaining up to date guidance pertaining to shipping dangerous goods.
- Maintaining computer software or access to web services for generating Shipper's declarations, as required by FedEx.
- Addressing questions or concerns pertaining to shipping dangerous goods.
- Retention of both training records and shipper's declarations required by regulation.
- Reviewing this SOP and records associated with shipping on an annual basis.
- Maintaining a contract with Chemtrec for emergency response requirements.

6.2 DLC leadership (Department Heads, Chairs, and Supervisors) is responsible for:

- Ensuring that DLC personnel who ship hazardous materials contact the EHS Office.
- Payment of fines associated with regulatory violations for which their department personnel are cited when the EHS Office was not contacted for assistance with a shipment.

6.3 The DLC EHS Coordinator* is responsible for:


- Referring any questions or concerns regarding shipping hazardous materials to the EHS Office.
- Referring individuals who wish to ship hazardous materials to the EHS Office*.
- Disseminating information to the DLC, regarding services and procedures for shipping hazardous materials.
- Alerting the EHS Office of any concerns with respect to hazardous materials shipments from the DLC they support.

*Some EHS Coordinators have been trained to ship hazardous materials and work closely with EHS in providing a hazardous materials shipping service for their DLC.

6.4 DLC personnel that ship hazardous materials are responsible for:

- Completing awareness training informing them of the services available at MIT for hazardous materials shipping.
- Completing the Intent to ship form and contacting the EHS office sufficiently in advance, e.g. at least 3 business days, prior to any planned shipment of hazardous materials. If the shipment is international, they should provide as much advance notice as possible, since special licenses and paperwork might be needed.
- Knowing and following the guidance that pertains to them with respect to their responsibilities as outlined in this SOP, and with any shipment specific instructions provided at the time of a shipment.
- Contacting the Export Control Office for international shipments.
- Completing shipping papers, such as the air waybill and, for international shipments, the commercial invoice.
- Ensuring the oversight and security of a hazardous materials shipment awaiting pick-up by the carrier.
- Reporting any incidents, problems or concerns with hazardous materials shipments to their supervisor and the EHS Office.

7. Training

	Environment, Health & Safety Office	SOP #:	EHS-0065
		Revision #	1.5
Page #:	6 of 11	Implementation Date	5/4/07
SOP Owner:	Emily Ranken	Last Reviewed/Update Date:	5/31/2013
		Approval:	Pam Greenley

Personnel that ship DOT or IATA regulated hazardous materials must receive training in the requirements commensurate with their responsibilities every two years (IATA) (three years if shipments are all ground transport regulated only by DOT) . IATA regulations require the administration of a test to verify understanding of the regulations. A certificate must be issued confirming successful completion.

7.1 Training must include the following:

- General awareness/familiarization with the regulations.
- Function specific training that provides detailed training in the requirements applicable to the function for which the person is responsible.
- Safety training that covers hazards presented by dangerous goods, safe handling and emergency response procedures.
- Security awareness training that addresses the nature of security risks, recognition of security risks, methods to address and reduce such risks and actions to be taken in the event of a security breach.

7.2 Mail Services Staff who may receive hazardous material shipments must:

- Receive training to recognize hazard of shipment based on labeling
- Receive training to properly manage shipments that are damaged.

7.3 Dry Ice

- Some shippers of dry ice may receive shipment specific instruction, or training if shipping dry ice routinely. Contact the EHS Office for training for Dry Ice shipping.

7.4 Dangerous Goods Awareness Information:

Members of the campus community who complete the EHS Training Needs Assessment and check the box "Ship or prepare to ship potentially hazardous chemicals", will be contacted by an EHS or DLC staff member trained to ship hazardous materials, and will be provided:

- General information about shipping hazardous materials, the regulatory requirements, and penalties and fines for improper shipping.
- Information about hazardous materials shipping services at MIT, and where to access forms and information on the web.
- General information about export concerns and where to get additional information.
- Information about security requirements with regards to packages of hazardous materials being shipped.

Information will be documented about the contact and about what the trainee may ship and maintained in an electronic file at the EHS Office. The individual will be given credit for "Hazardous Chemical Shipping Awareness Training". The purpose of the training is to assure they know to contact the EHS Office for hazardous materials shipments. It does not qualify them to make these shipments.

8. Monitoring Requirements

The Hazardous Materials Shipping Program will be reviewed on an annual basis by the HMST Leader or designated trained individual. A written report will be compiled documenting review and action taken to correct problems, and maintained for two years.

9. Record Management

Summary of DOT record retention requirements:

- Shippers Declaration of Dangerous Goods: 2 years for shippers;



**Environment, Health &
Safety Office**

SOP #:	EHS-0065
Revision #	1.5
Implementation Date	5/4/07
Last Reviewed/Update Date:	5/31/2013
Approval:	Pam Greenley

Page #:	7 of 11
SOP Owner:	Emily Ranken

- Training records for trained staff: 3 years, and up to 90 days after a trained employee leaves MIT service or no longer performs a shipping function. Training records must include name; date; instructor; description, copy or location of training materials used; and certification that the employee was trained and tested as required.
- Hazardous materials incident reports: 2 years.

Records must be maintained according to the MIT Records Retention SOP.

9. References

The following references are available through the EHS Office:

9.1. Standards

DOT 49 CFR Part 173 -

IATA Dangerous Goods Regulations, Current Edition. (This Regulation is updated annually, and the current edition for the year must be used.)

9.2. Other SOP/SOGs

Record Retention SOP

Lab Specific Chemical Hygiene Plan

Shipping Biological Materials - EHS-0062

Hazardous Waste Removal and Disposal - EHS-0003

RPP Manual

9.3. Supplementary Documents

MIT Environment, Health and Safety Policy

9.4 Appendix

Appendix A - Hazardous Material Definition, Classifications, and Examples.

Appendix B - Intent To Ship Hazardous Materials form

Appendix A

Hazardous Materials Definition, Hazard Classes, and Examples

DOT Definition of Hazardous Material



The DOT definition of a hazardous material: *Hazardous material* means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter.

The IATA Dangerous Goods Regulations call hazardous materials “dangerous goods”, and define dangerous goods as follows:











Dangerous goods are articles or substances which are capable of posing a risk to health, safety, property, or the environment and which are shown in the list of dangerous goods in these Regulations or which are classified according to these Regulations.

Both regulations have extensive lists of hazardous materials, to include many generic categories, e.g. flammable, toxic liquid n.o.c. Both regulations have defined hazard classes and these are the same, in keeping with “Global Harmonization Requirements.” All the listed materials fall into one or more of the hazard classes, but an unlisted material that meets the definition for the hazard class is regulated for shipping. When hazardous materials fall into more than one hazard class, there is a criteria for determining which hazard takes precedence.






The hazard classes and sub-divisions in the US DOT Regulation 49CFR173.2 are as follows:

Class	Subdivision	Category	Example label
1		Explosives	
	1.1	Explosives with a mass explosion hazard	Various labels, depending on compatibility groups
	1.2	Explosives with a projection hazard	Various labels, depending on compatibility groups
	1.3	Explosives with predominately a fire hazard	Various labels, depending on compatibility groups
	1.4	Explosives with no significant blast hazard	Various labels, depending on compatibility groups
	1.5	Very insensitive explosives, blasting agents	

Appendix A

Class	Subdivision	Category	Example label
	1.6	Extremely insensitive detonating substances	
2		Gases	
	2.1	Flammable Gas	
	2.2	Non-Flammable Gas	
	2.3	Poisonous Gas	
3		Flammable and Combustible Liquids	
			
4		Flammable solids	
	4.1	Flammable solid	
	4.2	Spontaneously combustible	
	4.3	Dangerous when wet material	
5		Oxidizing Substances and Organic Peroxides	
	5.1	Oxidizer	
	5.2	Organic peroxide	

Appendix A

Class	Subdivision	Category	Example label
6		Toxic or Infectious substances	
	6.1	Toxic/poisonous substances International term is “toxic”. US DOT still uses term “poisonous”.	
	6.2	Infectious Substances	
7		Radioactive Materials	
8		Corrosive Materials	
9*		Miscellaneous hazardous materials (DOT) or Miscellaneous dangerous goods (IATA)	

*Items in hazard class 9, for IATA, include, but are not limited to:

- Material which have narcotic, noxious, irritating or other properties that , in the event of spillage, could cause extreme annoyance or discomfort that do not meet any of the properties in the other 8 categories.
- Environmentally hazardous substances
- Genetically Modified Micro organisms
- Dry ice, also called carbon dioxide, solid
- Asbestos
- Internal combustion engines
- Flammable liquid or gas powered vehicles
- Battery powered equipment or vehicles (some batteries fall under class 8, corrosive.)
- Strong magnets or magnetized materials
- Lithium metal or lithium ion batteries and/or equipment containing these batteries
- Chemical and first aid kits
- Life-saving appliances
- Polymeric beads
- Zinc dithionite
- Elevated temperature substances (equal to or greater than 100C)

Appendix B

MIT EHS Office

Intent to Ship Hazardous Materials Form (5/2013)

For assistance with shipping hazardous materials, submit this form to EHS Shipping Team(N52-496) or attach to an email sent to environment@mit.edu at least **3 business days** prior to when you want material shipped. EHS will determine if your shipment is regulated and will assist you in properly preparing your material for shipment. Please include any Material Safety Data Sheets if available. You can also request assistance by phone at 617-452-3477, but be prepared to provide information below.

Name of Shipper:	Date:
Department:	Phone #:
PI/Supervisor:	Account number ² :
Your MIT Shipping Address: (Please provide complete shipper address that you would put on the air waybill.)	
Material Name/ or hazardous item to be shipped.	
Form of Material (i.e. liquid, solid, gas) or hazard of item.	
Quantity (by weight or volume) and type of container material is in (glass bottle, plastic bottle, metal can, etc.)	
CAS number (if any)	
Manufacturer/distributor	
Product number (if any)	
Shipping destination (Provide name and complete address, including country, and phone number for recipient) ¹	
Special shipping requirement, e.g. cold packs or dry ice. ²	
Preferred shipping method, time period, shipping company, your shipping account number.	

¹International shipments of hazardous materials may require special approvals and additional paperwork, and in addition to the EHS Office, will require the involvement of the Office of Sponsored Programs with staff who oversee exports, and that will take a lot of time. Plan accordingly. Link to export information: http://web.mit.edu/osp/www/Export_Controls/index_files/resources.htm)

² EHS provides packaging materials and packs shipment, but charges back for the materials cost. Shipper must provide cold packs or dry ice, when required.

³Assure you meet regulatory requirements when you personally transport hazardous materials by contacting the EHS Office.