Transport of Samples on the College Shuttle Bus

Two types of samples may be transported on the shuttle bus

1) Chemical samples for analysis.
   Some chemicals can be taken on the bus if the samples are sufficiently small. These chemicals and quantities are outlined in the table of common solvents in the document "Packaging Chemical Samples for Transportation between Campuses." They must be packaged as described in the aforementioned document, with two sample transport forms filled out, one of which is to be given to the driver. The maximum size for an outer container (including if dry ice is used as a coolant) is 35 x 35 x 35 cm.
2) Biological substances category B.
   These must be packaged in accordance with packing instruction 650, as detailed here. The maximum size for an outer container (including if dry ice is used as a coolant) is 35 x 35 x 35 cm.

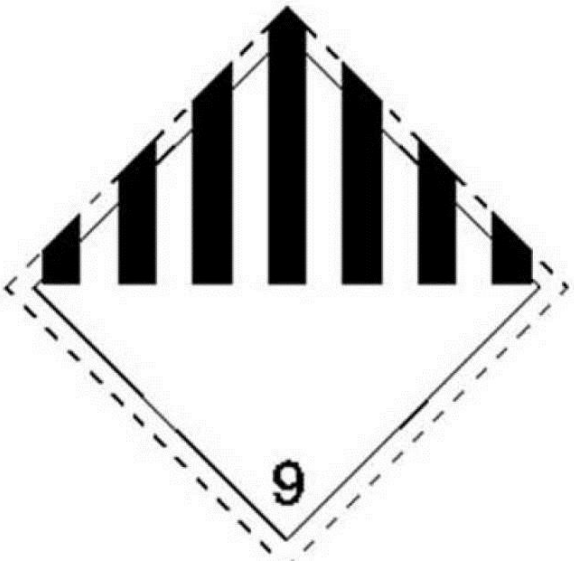
In addition:

- All samples taken onto the shuttle bus will be stored on the lap of the person transporting them, or next to the driver with the responsible person sitting nearby
- All persons wishing to carry samples on boards must make themselves known to the driver
- The maximum capacity for sample packages is 3 per journey, on a first come first served basis
- The driver of the service must fill in their name on the form, and retain their own copy of the form, to be turned in to the Car Park/Vehicle Fleet Administrator at the end of the shift
- The people carrying the package and signing the transport document take joint responsibility for any leakages caused, including the cost of any clean-up that may be required due to a leaking package
- The person transporting the package is responsible for giving emergency directions to other passengers and the driver in the event of any leakage
- Packages will not be transported without a signed transport document, and someone present to carry the package
- Persons carrying packages must sit at the front of the service
- Packages must not be placed on seats
- Packages must not be opened during transport
- The maximum number of chemical samples per package is 100
- Spot checks will be in operation

Transport of Samples on the College Shuttle Bus

For samples transported on dry ice:

- Packing Instruction 954 must also be applied, if you are unsure how to do this, please ask someone who has done the IATA training. This requires that the packaging must be designed and constructed to permit the release of carbon dioxide gas to prevent the possibility of a build-up of pressure that could rupture the packaging. I.e. a polystyrene box outer package
- The net weight of the dry ice must be marked on the outside of the packaging together with 'UN 1845' which is the ID number for dry ice. Packages where dry ice is used as a coolant must also contain the marking: "AS COOLANT" for transport by road
- No more than 1 kg of dry ice must be used per package
- Shipments containing dry ice must bear the Class 9 (miscellaneous dangerous goods) warning diamond (below) with dimensions of 100 x 100 mm.



Packaging Chemical Samples for Transportation between Campuses.

This guidance describes how to package samples containing the solvents indicated in the table of common solvents at the end. Please consult the table to see how each of the substances must be packaged according to the quantity to be sent. A Sample Transportation Form (see bottom of guidance) will also need to be completed, signed off prior to transport, and attached to the package.

Excepted Quantities

Excepted quantities are specific to each substance. Where permitted, the "excepted quantity" is the threshold amount, below which the following rules apply to transport.

1) Packages

Inner packaging must be plastic (minimum 2 mm thickness), glass, porcelain, stoneware, earthenware, or metal. The closure of each inner package shall be held securely in place with wire, tape, or other positive means; any receptacle having a neck with moulded screw threads shall have a leak-proof threaded type cap. The sealing method must not be detrimentally affected by the contents.

Each inner packaging must be securely packed in an intermediate packaging with cushioning material in such a way that, under normal conditions of carriage they cannot break, be punctured, or leak their contents. For liquid dangerous goods, the intermediate or outer packaging shall contain sufficient absorbent material to absorb the entire contents of the inner packagings. When placed in the intermediate packaging the absorbent material may be the cushioning material. Any material used must be compatible with the contents of the package. The package must remain leak free regardless of orientation.

The intermediate packaging must be securely packed into a rigid outer packaging (wood, fibreboard or other equally strong material).

Each package must be large enough to fit all of the required markings on.

2) Tests for Packages

In accordance with the regulations the packages require testing. To ensure that the outer packages conform to the relevant standards, you will need to purchase them from an approved supplier.

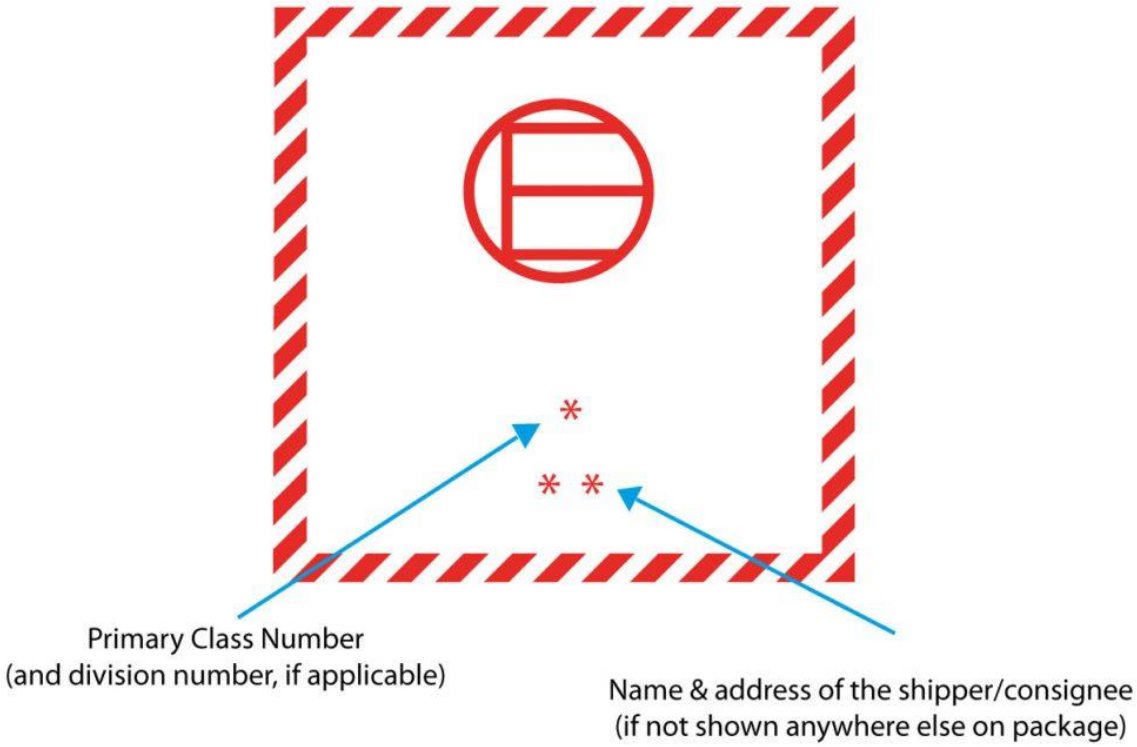
Containers bought from a company such as Air Sea Containers have already been tested and are UN approved. To ensure the samples are firmly in place in these boxes, the samples can be stored in their samples racks, with the absorbent material wrapped around the racks to prevent movement.

Packaging Chemical Samples for Transportation between Campuses.

3) Marking requirements

Each package of samples in excepted quantities require the following markings on the outer container:

The Excepted quantities mark in dimensions of at least 100 x 100 mm:



The consignee is the person sending (carrying) the samples.

The primary class number can be found in column 2 of the table of commonly used solvents below. If different chemicals with different primary hazards are being sent, then more than one label is required.

The name and contact phone number of an alternative contact are also required, so there is an alternate source of information in the event of an emergency.

If you only need to transport a small number of samples, please speak with another group to see if they can be combined with someone else's in a single package. This will make better use of the available capacity.

Table one - follow the sections above that are indicated in the relevant quantity field

			Quantity Transported		
Chemical	Primary Hazard Class	UN Number	0 - 1 mL	1 - 30 mL	> 30 mL
Methanol	3	UN1230	Sections 1 + 2. Intermediate packaging described in section 1 is not required, providing the package is securely packed, and the outer packaging contains sufficient absorbent to also cushion the package. Maximum net quantity per package 100 ml/g.	Sections 1, 2, and 3	Contact: e.hartrick@imperial.ac.uk
Ethanol	3	UN1170			
Acetonitrile	3	UN1648			
Dichloromethane	6.1	UN1593			
Chloroform	6.1	UN1888			
Tetrahydrofuran	3	UN2056			
Toluene	3	UN1294			
Benzene	3	UN1114			
Ethyl Acetate	3	UN1173			
Acetone	3	UN1090			
Tetrachloroethane	6.1	UN1702			
Pyridine	3	UN1282			
Pentane	3	UN1265			
2-Propanol	3	UN1219			
Diethyl Ether	3	UN1155			

For all other chemical substances please contact e.hartrick@imperial.ac.uk for further guidance.

Packing Instruction 650 – For Packing Category B Biological Substances.

Full details available on the College website (log-in required)

Packing complying with PI 650 should be purchased, not 'home made'. A number of commercial suppliers are able to provide compliant packaging. The following web addresses may be of use:

- Air Sea Containers Ltd
- Laminar Medica
- Inmark
- Hilton Instruments Ltd

(These are hyperlinks on the web pages)

PI 650 requires:

- Leak-proof primary receptacle(s). Maximum volume 1Litre (1Kg solid).
- Leak-proof secondary container that satisfies 95kPa pressure test. Maximum volume 4 Litres in total (4Kg solid).
- Absorbent material between primary receptacle(s) and secondary container (not required for solid samples). Must be sufficient to absorb contents of all primary receptacles. Primary receptacles must be individually wrapped or separated to prevent contact between them.
- Rigid outer packaging of adequate strength for its capacity, weight and intended use. Must be capable of passing 1.2 m drop test.
- Itemised list of contents to be enclosed between secondary container and outer packaging.

Marking and Labelling

Name, address and telephone number of a responsible person.

Hazard diamond:

Plus text: 'BIOLOGICAL SUBSTANCE, CATEGORY B '

Transport of Category B Biological Samples via the College Shuttle Bus Service

Date		Campus From	
Time of Sample Drop-off		Campus To	
Name of Sender		Contact Phone Number	
Name of Driver			
Alternative Contact		Contact Phone Number	
Name of sample/ quantity per inner package/ total net quantity	UN3373 (+UN1845 if on Dry Ice)		
All samples must be packed in accordance with IATA/ADR packing instruction 650			
Packaging method must be signed off by someone with a valid "IATA - Carriage of Infectious Substances by Air" certificate			
Authorised By			

Transport of Chemical Samples via the College Shuttle Bus Service

Date		Campus From	
Scheduled Time of Departure		Campus To	
Name of Carrier		Contact Phone Number	
Name of Driver			
Alternative Contact		Contact Phone Number	
Name + UN number of sample/ quantity per inner package/ total quantity	+UN1845 if on dry ice		
All samples must be packed in accordance with the 'Packaging Samples for Transportation between Campuses' section			
Packaging method must be signed off by line manager / lab manager / PI			
Authorised By			