

OCDEM, Churchill Hospital, Oxford OX3 7LE

**SOP number: OCDEM S7**

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## **Transporting Biological Substances, Category B (non hazardous) on Dry ice within Europe**

### Contents

Transporting Biological Substances, Category B (non hazardous) on Dry ice within Europe ..	1
1. Introduction .....	2
2. Risk Assessment .....	2
3. Supplies .....	3
4. Packing Requirements .....	4
5. Labelling and Marking .....	4
6. Reagents and equipment required.....	4
7. Procedure .....	5

## 1. Introduction

In order to transport specimens of human or animal origin between institutions, either locally, nationally and internationally, strict packing requirements have to be adhered to. The packaging requirements are virtually the same whether specimens are to be transported by road or air but some of the labelling requirements are slightly different. Air transport regulations take precedence over road transport regulations, therefore if you cannot be absolutely certain that a package is going to only be transported by road then the package must be packed and labelled according to air transport regulations.

All persons packing specimens for transport must receive training from a member of staff who has passed the examination for the 'Carriage of Infectious Substances by Air' and the training must be recorded in their training manual.

Specimens that are to be sent to countries outside Europe often require extra legislation for transport and it is usually easier to use a specialist courier for this purpose (World Courier (UK) Ltd, Davis International and Fourdale Export Services are examples of companies that will provide this service).

The instructions below are all relating to biological substances category B (previously named diagnostic specimens) that are to be transported by air and packed according to IATA PI650 unless stated differently.

If samples classified as 'Infectious Substances' are to be transported advice must be sought from the DSO.

## 2. Risk Assessment

The risks associated with this procedure arise from dry ice, specimens of human origin and manual handling.

The following SOP and risk assessments must be used in conjunction with this SOP:

- OCDEM S1: Laboratory Rules for the Safe Handling of Blood, Body Fluids and other Human Tissues: Containment Level 2.
- Risk assessment RA 16: Risks associated with Transport of Human Blood, Body Fluids and Tissue
- Risk Assessment OCDEM RA2: Use and Handling of Dry Ice (Solid Carbon Dioxide).

Most packages of specimens for transport in dry ice are greater than 5 kg in weight. If you cannot easily lift the bags of dry ice to enable tipping of the contents, place the bag(s) on a bench and use an ice scoop to transfer the dry ice to the insulated box. Parcels should be packed on a low bench or preferably on a trolley to minimise the number of lifting manoeuvres. Consider whether you are capable of picking up the box and carrying it safely without damaging yourself: obtain help to lift the package if required and transport on a trolley if necessary. Aim to keep the total weight below 20 Kg for large packages.

### 3. Supplies

All the relevant safety stickers and UN approved packaging can be purchased from several suppliers, the following are the most popular:													
<p>Air Sea Containers Limited 318 New Chester Road Birkenhead CH42 1LE UK</p> <p>Tel: 0151 645 0636 Fax: 0151 644 9268 email: <a href="mailto:sales@air-sea.co.uk">sales@air-sea.co.uk</a></p>	Packaging, labels, secondary packaging, safety bags												
<p>Laminar Medica Limited Unit 4 Tring Industrial Estate Icknield Way Tring Hertfordshire HP23 4JX UK Tel: 01442 828664 Fax: 01442 827056 e-mail: <a href="mailto:enquiries@laminarmedica.co.uk">enquiries@laminarmedica.co.uk</a></p>	Packaging and secondary packaging												
<p>Daklapack Building 3 Chiswick Park 566 Chiswick High Road Chiswick London W4 5YA <b>Telephone:</b> 020 88 49 8410 <b>Fax:</b> 020 88 99 6001 <b>E-mail:</b> <a href="mailto:info@daklapack.com">info@daklapack.com</a></p>	<p>Safety bags, absorbent sheets, limited selection of labels</p> <table> <thead> <tr> <th>Description</th> <th>Catalogue number:</th> </tr> </thead> <tbody> <tr> <td>Safetybag 165 x 170</td> <td>460909</td> </tr> <tr> <td>Safetybag 165 x 275</td> <td>460915</td> </tr> <tr> <td>Safetybag 255 x385</td> <td>460905</td> </tr> <tr> <td>Safetybag 385 x 580</td> <td>460910</td> </tr> <tr> <td>Absorbing sheet 200 x 300</td> <td>460583</td> </tr> </tbody> </table>	Description	Catalogue number:	Safetybag 165 x 170	460909	Safetybag 165 x 275	460915	Safetybag 255 x385	460905	Safetybag 385 x 580	460910	Absorbing sheet 200 x 300	460583
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<p>BOC Customer Service Centre PO Box 12 Priestley Road Worsley Manchester M28 2UT Tel: 0800 111333 Fax: 0800 111555 Account number: 2212546</p>	Dry ice												

#### 4. Packing Requirements

The packaging must be of good quality and strong enough to withstand the shocks and loadings normally encountered during transport.

The packaging must consist of three components:

- A primary receptacle: this is normally a sample tube and must be leak proof, preferably with a screw cap; if a push cap is used the top should be taped. Tissue samples must be placed inside a leak proof vessel. For liquid substances, the primary receptacle must not contain more than one litre.
- Secondary packaging: this can be either rigid or a soft safety bag and should be leak proof and able to withstand 95Kpa pressure. The secondary packaging must contain sufficient absorbent material to soak up all fluid released should a primary receptacle break in abnormal circumstances in transit.
- Outer packaging: this must be rigid for air transport and must be of adequate strength for its capacity, weight and intended use. This is usually a polystyrene box when dry ice is to be used, which is then placed inside a fibreboard outer box. For road transport either the secondary or the outer packaging must be rigid.  
The maximum capacity for the outer packaging is 4 litres or 4kg, not including the dry ice.
- No shipper's declaration is required for Biological Substances, Category B.

#### 5. Labelling and Marking

All packaging must show:

- The proper shipping names: 'Biological Substance, Category B' and 'Dry Ice'
- UN number(s): UN 3373 (relates to the samples) and UN 1845 (relates to the dry ice).
- Net weight for dry ice.
- Primary hazard label: class 9. The class 9 hazard label for the dry ice is not required if road transport only is to be used.
- The name and full address of both the sender (consignor) and the recipient (consignee). It is advisable, but not a legal requirement to add telephone numbers.
- Orientation labels on combination packages containing more than 50 ml of liquid.
- It is good practice to place a list of contents between the secondary and outer packaging.

#### 6. Reagents and equipment required

- Dry ice
- Polystyrene box (preferably with fibreboard outer box)
- Parcel tape
- UN3373 sticker
- UN1845 sticker
- Class 9 sticker
- Biological Substance Category B Sticker
- Waybill (consignment note) from the courier to be used; within Europe most Groups use DHL or TNT

- Safety Bag (small, medium or large) or combination secondary pressure vessel consisting of outer Tyvek envelope (capable of withstanding an internal pressure of 95kPa) and inner poly bag.  
Other types of secondary container can be used but they must be capable of withstanding 95kPa.
- Absorbent material
- Cryogloves
- Scoop

## 7. Procedure

- Before ordering dry ice speak with the Oxlip and McCarthy/Gloyn Groups, who receive a delivery of dry ice once a fortnight, to check if they have any surplus; if they do not, dry ice will need to be purchased. If more than 10 kg of dry ice is required all groups will need to place an order; BOC do not deliver every day so plan ahead and order a few days before.
- A purchase order number is required; raise this in advance if possible; if this cannot be arranged then the grant code and your initials can be used as a reference.
- Fill out the way bill for the courier (see example for DHL below: appendix A); remember to put the UN numbers in the description: UN3373 Biological Substance, Category B, plus the weight or volume for the specimens and UN1845 Dry Ice, Class 9, (net weight), for the dry ice. This can be entered online if you have a DHL account.
- Pack the specimens in a rack if there are several of them; if there are only a small number of specimens there are bubble wrap pockets available. Ensure all tube lids have been tightened.
- Place the specimens in a Safety Bag with sufficient absorbent material to soak up all the contents. Remove as much air as possible from the bag and seal.
- If using the Saf-T-Pak system place the specimens in a Saf-T-Pak inner poly bag with sufficient absorbent material to soak up all the contents. Remove as much air as possible from the bag and seal then place the poly bag inside a matching sized Saf-T-Pak Tyvek bag; remove excess air and seal.
- Place the polystyrene box inside the fibreboard outer (if using).
- Add some dry ice to the bottom of the polystyrene box; pack the samples into the box and top up with dry ice. Dry Ice must **NOT** be placed inside the secondary container. Do not tape the polystyrene box unless it has no fibreboard outer.
- Place a list of contents between the polystyrene box and the fibreboard outer, plus an A4 sheet containing contact details (the details are not a legal requirement but it is advisable to include them). A4 headed templates for contact details can be found at: *Shared\OCDEM Documents\Safety\OCDEM Safety\Laboratory\Sample Transport\air transport internal label.docx*. There is also a version for transport by road
- Seal the box with one strip of tape.
- Ensure all the correct labels are attached to the box, see appendix B. A4 headed templates for the external of the box can be found at: *Shared\OCDEM Documents\Safety\OCDEM Safety\Laboratory\Sample Transport\air*

*transport external label.docx*. There is also a road version; only use this version if you can be certain the samples will be transported by road.

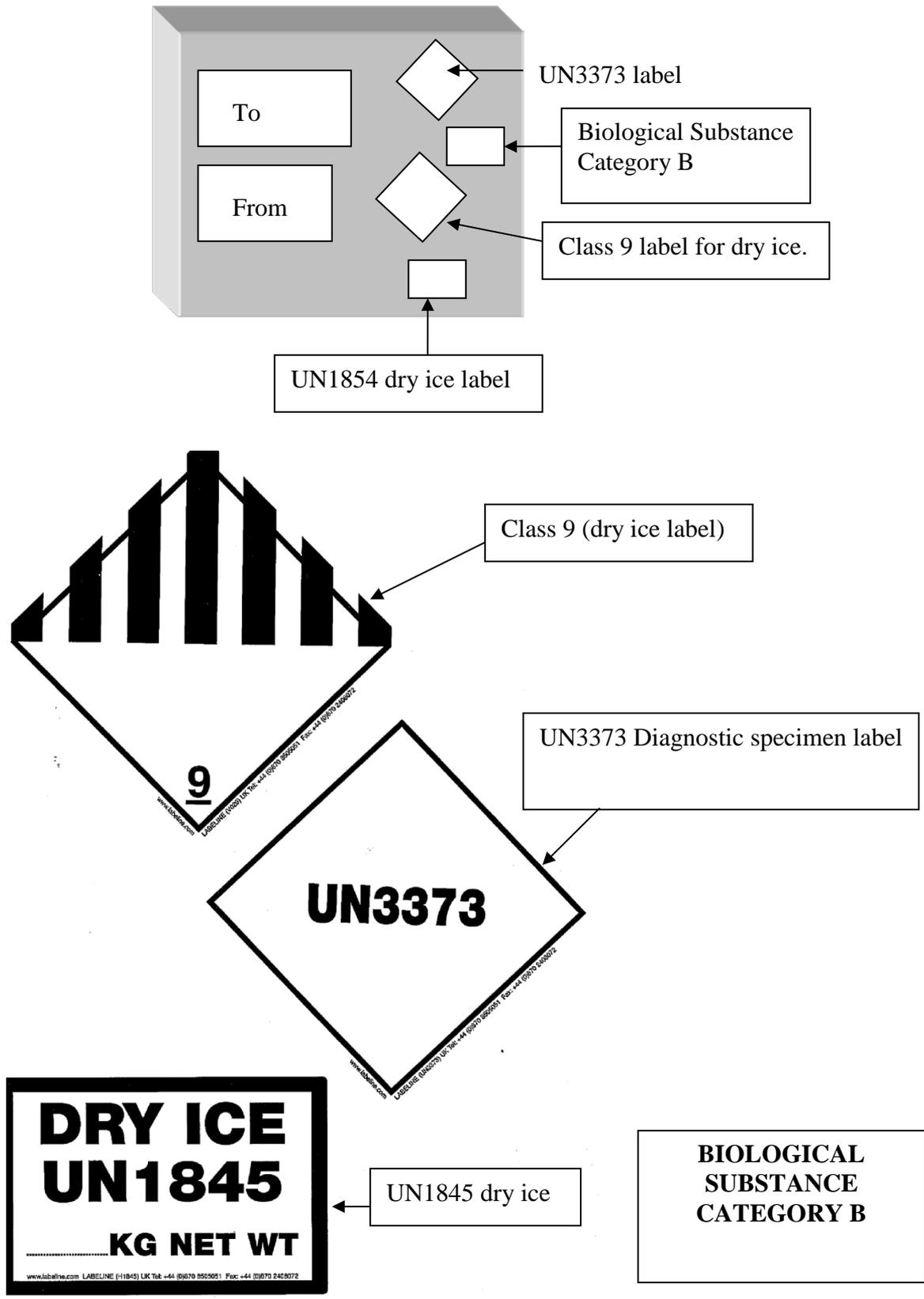
- This A4 sheet can replace 'to' and 'from' labels and must be taped to the box.
- Weigh the parcel (there are scales in CRU and the centrifuge room F21) and add this information to the waybill.
- Enter the dimension of the parcel(s) if the waybill requires it.
- Ensure the weight of dry ice is included in the 'description of contents' box on the waybill; this must be less than the total weight declared.
- Phone the courier to arrange collection or book an on-line collection. You will need to speak to an advisor as they need to know that it is a dry ice shipment in order to book the shipment onto the correct pickup car/van.
- Keep records of the shipment and tracking if the samples are subject to Human Tissue Authority Regulations; electronic records are acceptable.
- If the samples are going outside the EU and you are not using a specialist courier you will need to fill out a Pro Forma invoice. This contains information about the contents of the package on headed paper, plus the names and addresses of the shipper and receiver and emergency contact numbers. The original and four copies need to go with the parcel. A copy of this can be found at: *Shared\OCDEM Documents\Safety\OCDEM Safety\Laboratory\Sample Transport\commercial invoice.doc*.
- Place these into a clear pocket and attach this to the parcel.
- Take the parcel down to reception and leave near to the post out basket.

### Appendix A

EXPRESS		Shipment Air Waybill <small>(Non negotiable)</small>		4 1 2 4 8 8 1 5 3 0		DXF																																			
<b>1 Payer account number and insurance details</b> Charge to <input type="checkbox"/> Shipper <input type="checkbox"/> Receiver <input type="checkbox"/> 3rd party <input type="checkbox"/> Cash Payer Account No. _____ <input type="checkbox"/> Cheque <input type="checkbox"/> Credit Card Shipment Insurance see reverse <input type="checkbox"/> Yes Insured value (in local currency) _____ <small>Not all payment options are available in all countries.</small>								<b>8 Services</b> Domestic <input type="checkbox"/> International <input type="checkbox"/> International <input type="checkbox"/> European <input type="checkbox"/> Document <input type="checkbox"/> Non-Documents <input type="checkbox"/> Unions <input type="checkbox"/> <small>Not all Services are available to and from all locations</small> <input type="checkbox"/> Express 9 (10.30 to the USA) <input type="checkbox"/> Express 12 <input type="checkbox"/> Express / Worldwide <input type="checkbox"/> Express Envelopes <input type="checkbox"/> Other _____ Optional Services (extra charges may apply) <input type="checkbox"/> Saturday Delivery <input type="checkbox"/> Special Pick-Up <input type="checkbox"/> Delivery Notification <input type="checkbox"/> Other _____ DHL Global Mail <input type="checkbox"/> GMB Priority <input type="checkbox"/> GMB Standard <input type="checkbox"/> Other _____																																	
<b>2 From (Shipper)</b> Shipper's account number _____ Contact name _____ Shipper's reference (up to 32 characters but only first 12 will be shown on invoice) Order number or grant code _____ Company name _____ UNIVERSITY OF OXFORD Address _____ (ODEM) CHURCHILL HOSPITAL OLD ROAD HEADINGTON OXFORD Postcode/Zip Code (required) _____ Phone, Fax or E-mail (required) _____ OX3 7LJ								<b>4 Shipment details</b> <table border="1"> <thead> <tr> <th>Total number of packages</th> <th>Total Weight</th> <th>Pieces</th> <th colspan="3">Dimensions in cm</th> </tr> <tr> <th></th> <th></th> <th></th> <th>Length</th> <th>Width</th> <th>Height</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>X kg</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </tbody> </table>		Total number of packages	Total Weight	Pieces	Dimensions in cm						Length	Width	Height	X	X kg	X	X	X	X	<table border="1"> <thead> <tr> <th colspan="2">DIMENSIONAL/CHARGEABLE WEIGHT</th> </tr> <tr> <th>kg</th> <th>gr</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>		DIMENSIONAL/CHARGEABLE WEIGHT		kg	gr								
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<b>3 To (Receiver)</b> Company name _____ COMPANY OR RECEIVER'S NAME Delivery address _____ <small>DHL cannot deliver to a PO Box</small> THEIR ADDRESS Postcode/Zip Code (required) _____ Country _____ Contact person _____ Phone, Fax or E-mail (required) _____ THEIR NAME THEIR PHONE NUMBER				<b>5 Full description of contents</b> Give content and quantity UN 3373, BIOLOGICAL SUBSTANCE CATEGORY B, 2ml or grams UN 1845, DRY ICE, CLASS 9 X kg		<table border="1"> <thead> <tr> <th colspan="2">CHARGES</th> </tr> <tr> <th>Services</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <th colspan="2">INSURANCE</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <th colspan="2">VAT</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <th>CURRENCY</th> <th>TOTAL</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <th colspan="2">TRANSPORT COLLECT STICKER No.</th> </tr> <tr> <td></td> <td></td> </tr> <tr> <th colspan="2">PAYMENT DETAILS (Cheque, Card No.)</th> </tr> <tr> <td>No.:</td> <td></td> </tr> <tr> <td>Type:</td> <td>Expires</td> </tr> <tr> <td>Picked up by:</td> <td></td> </tr> <tr> <td>Route No.:</td> <td></td> </tr> <tr> <td>Time:</td> <td>Date</td> </tr> </tbody> </table>		CHARGES		Services	Other			INSURANCE				VAT				CURRENCY	TOTAL			TRANSPORT COLLECT STICKER No.				PAYMENT DETAILS (Cheque, Card No.)		No.:		Type:	Expires	Picked up by:		Route No.:		Time:	Date
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<b>6 Non-Document Shipments Only (Customs Requirement)</b> Attach the original and four copies of a Proforma or Commercial invoice Shipper's VAT/GST number _____ Receiver's VAT/GST or Shipper's EIN/SSN _____ Declared Value for Customs (as on commercial/proforma invoice) _____ Harmonised Commodity Code if applicable _____ TYPE OF EXPORT <input type="checkbox"/> Permanent <input type="checkbox"/> Repair / Return <input type="checkbox"/> Temporary Destination duties/taxes if left blank receiver pays duties/taxes <input type="checkbox"/> Receiver <input type="checkbox"/> Shipper <input type="checkbox"/> Other _____ <small>specify approved account number</small>				<b>7 Shipper's agreement (Signature required)</b> <small>Unless otherwise agreed in writing, I/we agree that DHL's Terms and Conditions of Carriage are all the terms of the contract between me/us and DHL and (1) such Terms and Conditions and, where applicable, the Warsaw Convention limits and/or excludes DHL's liability for loss, damage or delay and (2) this shipment does not contain cash or dangerous goods (see reverse).</small> Signature <u>Sign here</u> Date <u>X / X / X</u>																																					
PT03/08 F16 GB MP																																									

### Appendix B

#### Labels and marking



**Review History**

SOP S7		Transport of biological Substances		
<b>Version</b>	<b>Date</b>	<b>Reason for update</b>	<b>Updated/reviewed by :</b>	<b>Date next review due</b>
1	29 Jan 2009	New SOP	Author: SMH	Jan 2011
1	August 2011	Review – no changes	SMH	August 2013
1.1	4 Nov 2014	Updated header and suppliers, minor changes to text, added TOC...	SMH	Nov 2016
1.2	25/07/2016	Updated HoD., minor changes to text in risk assessment	SMH	July 2018