Dangerous Goods Seminar 2006

Transportation by Air

Your Safety is on our mind

FedEx Express®
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To prepare your shipment for transportation by air, follow these procedures in order, as they are listed.

Each step of this job aid is referenced directly from the appropriate IATA Subsection, where additional detailed instructions can be found.

1 Identify the Proper Shipping Name for the commodity you wish to ship.
   a. If you know the name of the commodity, go directly to the List of Dangerous Goods (IATA 4.2) found in the blue pages.
      • Proper Shipping Names are shown in bold type.
      • The spelling of the Proper Shipping Name used to identify your commodity (on the outside of the package and on the Shipper’s Declaration) must agree with the spelling found in the IATA manual.
      Alternative spelling, reflecting common usage around the world is acceptable for words such as sulfur for sulphur, etc. (IATA 8.1.3.4).
   b. If you know the UN or ID number for the commodity you wish to ship, but do not know the Proper Shipping Name, use the Numerical Cross-Reference List of Dangerous Goods (IATA 4.3) to identify the Proper Shipping Name.
      If you cannot find the Proper Shipping Name for the commodity you wish to ship in IATA Table 4.2, refer to “Shipping Unlisted Substances” found on pages 9 and 10 of this job aid.

2 Identify other information needed to prepare your commodity for shipment.
   a. The Primary and any Subsidiary Risk classifications associated with transportation of your commodity are listed in IATA 4.2 Columns C and D, respectively.
   b. Hazard Labels that must be applied to the outside of your package are listed in IATA 4.2 Column E.
   c. The UN Packing Group assigned to your commodity is listed in IATA 4.2 Column F.
   d. Special provisions that apply to air transport of your commodity are listed in IATA 4.2 Column M, with the explanation found in IATA 4.4.
a. Packing Instructions are based on Hazard Classification, Packing Group, and quantity. The General Packing Requirements found in IATA 5.0.2 apply to all shipments.
   - Packaging must be of good quality and must remain closed during transport (IATA 5.0.2.4).
   - Packaging must be resistant to any material being shipped inside (IATA 5.0.2.6).
   - Airspace must be left to allow liquids to expand without leaking or permanently distorting the package (IATA 5.0.2.8).
   - Inner packaging must be cushioned to prevent breakage (IATA 5.0.2.12.1).

b. To identify the Packing Instruction to use, first convert all quantities to their Metric equivalent. (Use the tables in IATA Appendix B.3 for assistance.)

c. Next, determine the maximum net quantity of your commodity allowed in each package for transport on a Passenger or Cargo Aircraft. (Refer to IATA 4.2 Columns G - L).

d. Note and comply with additional Packing Instructions that must be followed to ship your commodity. (If appropriate, additional requirements are identified in IATA 4.2 Column M.)

e. Finally, use the chart below to select the specific Packing Instruction you will use.

<table>
<thead>
<tr>
<th>IF...</th>
<th>AND THE QUANTITY YOU ARE SHIPPING...</th>
<th>THEN...</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Specification Packaging is NOT available</td>
<td>CAN be packaged in limited quantities and...</td>
<td>DOES NOT EXCEED the maximum allowed in limited quantity packages</td>
</tr>
<tr>
<td></td>
<td>CANNOT be packaged in limited quantities or EXCEEDS THE MAXIMUM ALLOWED in limited quantity packages</td>
<td></td>
</tr>
<tr>
<td>UN Specification Packaging IS available</td>
<td>DOES NOT exceed the maximum allowed for passenger and cargo aircraft</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EXCEEDS THE MAXIMUM ALLOWED for passenger and cargo aircraft</td>
<td></td>
</tr>
</tbody>
</table>
4 Prepare your shipment in accordance with the Packing Instruction selected.

a. Review State and/or Operator Variations which apply to your shipment. (State and/or Operator Variations are listed at the beginning of each Packing Instruction.)
   - State Variations are listed in IATA 2.9.2.
   - Operator Variations are listed in IATA 2.9.4.

b. Select the packaging option most appropriate for your shipment. (Each Packing Instruction shows acceptable packaging options.)
   - IATA Table 5.0.C contains a list of UN Specification Packaging approved for use in air transportation.
   - For Combination Packaging, tables show acceptable outer packagings and:
     - The inner packaging required with that outer packaging
     - The maximum quantity permitted in each inner packaging

5 Mark your package in accordance with IATA Subsection 7.1.5.

a. All markings must be readily visible, legible, and must not overlap or be partially obscured by labels.

b. If required (by IATA Subsection 7.1), UN Specification markings must be stamped, printed, or otherwise marked on the package to provide adequate permanency.

c. English must be used in addition to any other language which may be required by the state (country) of origin.

d. Packages containing dangerous goods must be marked, durably and legibly on the outside of the package with each of the following:
   - Proper Shipping Name
   - The UN/ID number (preceded by the letters “UN” or “ID” as appropriate)
   - The full name and address of the shipper
   - The full name and address of the consignee (i.e., the person/destination to which the package is being shipped)
   - Packages shipped under the Limited Quantity provisions of IATA Subsection 2.8 must be marked “Limited Quantity” or “Ltd. Qty.”
   - Additional markings are required for explosives, infectious substances, diagnostic specimens, refrigerated liquefied gases, dry ice, and some overpacks (see IATA 7.1.4.3 and IATA 7.1.5.1).
   - For Classes 2, 3, 4, 5, 6, and 8 the NET QUANTITY of dangerous goods contained in each package must be shown. This requirement only applies to consignments of more than one package; Where the maximum quantity shown in Columns H, J and L in Subsection 4.2 is a gross weight, the GROSS WEIGHT of the package must be shown. This quantity must be marked adjacent to the UN number and Proper Shipping Name required by (a) above. [IATA 7.1.5.1 (d)]
6 Label your packages with the appropriate labels.

a. For each package requiring labelling:
   • Remove or totally obliterate any irrelevant labelling already on the package [IATA 7.1.1(b)].
   • Use only labels of durable quality and correct specification. (See IATA 7.3.)
   • Securely affix labels to your package in the correct location(s).

Ensure that labels are readily visible and not obscured or overlapped at all by any of the packaging or by any other label.

b. Hazard Labels:
   • Labels identifying the primary and subsidiary hazards of the dangerous goods must bear the class or division number (IATA 7.2.3.2).

c. Handling Labels:
   • The Cargo Aircraft Only label must be used on packages containing dangerous goods in quantities not permitted on passenger aircraft. (IATA 7.2.4.2) It must be affixed on the same surface of the package near the hazard label (IATA 7.2.6.3).
   • The Cryogenic Liquid label must be used in addition to the Non-flammable gas (Division 2.2) hazard label on packages containing cryogenic liquids (IATA Subsection 7.2.4.3).
   • The Magnetized Material label must be used on packages containing magnetized material (IATA 7.2.4.1).
   • Either the Package Orientation (This Way Up) label or preprinted package orientation labels that meet IATA specifications must be used on combination packages and overpacks containing liquid dangerous goods.

The labels must be affixed or preprinted on at least two opposite sides so as to show proper package orientation (IATA 7.2.4.4).
   • The “Keep Away From Heat” handling label must be used on packages and overpacks containing self-reactive substances in Division 4.1 and Division 5.2, Organic Peroxides. (IATA 7.2.4.5)

d. Label Location:
   • Labels must be located on the same surface of the package near the Proper Shipping Name marking (IATA 7.2.6.2.1).
   • When labels identifying the primary and subsidiary risk are required, they must be affixed adjacent to each other (IATA 7.2.6.2.3).

7 Complete the Documentation that will accompany your shipment.

a. Follow the detailed instructions for completing the Shipper’s Declaration found in IATA 8.1.6, or refer to “Completing the Shipper’s Declaration” found on pages 5 through 8 of this job aid.

b. The Air Waybill should be prepared as directed by the carrier; however, IATA 8.2 contains additional instructions on how to complete that portion of the Air Waybill concerning the information required for dangerous goods shipments.

Air Waybills accompanying shipments for which a dangerous goods declaration is required must include the following statements, as applicable, in the “Handling Information” box:
   - “Dangerous Goods as per attached Shipper’s Declaration” or “Dangerous Goods as per attached DGD”
   - “Cargo Aircraft Only” or “CAO”

Questions?

Call us at 1-800-Go-FedEx® , (800) 463-3339.
Press the “star” (*) key to speak with a customer service representative.
Ask for the Dangerous Goods Hotline.
or
Press “81” (a silent prompt providing direct access to the Dangerous Goods/Hazardous Materials Hotline).
To manually prepare the documentation that must accompany your shipment, follow the procedures as they are listed in this job aid. Each step is referenced directly to the appropriate IATA Subsection where additional detailed instructions can be found.

**Enter the full name and address of the shipper.**
*This information must be entered by the shipper.*
The name and address which appears on the Shipper’s Declaration may differ from that on the Air Waybill (IATA 8.1.6.1).

**Enter the full name and address of the consignee.**
*This information must be entered by the shipper.*
For shipments of infectious substances, enter the name and telephone number of a responsible person for contact in an emergency (IATA 8.1.6.2).

**Enter the number of the Air Waybill to which the Shipper’s Declaration will be attached.**
*This information may be entered or changed by the shipper, the shipper’s agent, the airline, or the airline’s handling agent* (IATA 8.1.6.3).

**Enter the page number and total number of pages.**
*This information must be entered by the shipper.*
If there is no extension list, enter “Page 1 of 1” (IATA 8.1.6.4).

**Indicate whether the shipment is packed to comply with limitations for passenger aircraft.**
*This information must be entered by the shipper.*
Delete either “Passenger and Cargo Aircraft” or “Cargo Aircraft Only” to indicate whether or not the shipment can be carried on passenger aircraft, or must be carried only on cargo aircraft (IATA 8.1.6.5).

**Enter the full name of the airport or city of departure.**
*This information may be entered or changed by the shipper, the shipper’s agent, the airline, or the airline’s handling agent* (IATA 8.1.6.6).
## COMPLETING THE SHIPPER’S DECLARATION

*(Manual Form)*

### Enter the full name of the airport or city of destination.

This information may be entered or changed by the shipper, shipper’s agent, the airline, or the airline’s handling agent. (IATA 8.1.6.7)

### Delete “Radioactive” to indicate the shipment does not contain radioactive material.

*This information must be entered by the shipper.*

Radioactive material must not be included on the same Declaration form as other dangerous goods, except as authorized in IATA 8.1.6.8.

### Enter the required information strictly in accordance with IATA 8.1.6.9.

*This information must be entered by the shipper.*

**NOTE:** Columns indicated are those in the List of Dangerous Goods (IATA 4.2).

<table>
<thead>
<tr>
<th>UN or ID No.</th>
<th>Proper Shipping Name</th>
<th>Class or Division (Subsidiary Risk)</th>
<th>Packing Group</th>
<th>Quantity and type of packaging</th>
<th>Packing Inst.</th>
<th>Authorization</th>
</tr>
</thead>
</table>

| 9a | 9b | 9c | 9d | 9e | 9f | 9g |

### e. Number of packages

(of the same packaging type and content) and their type of packaging (either spelled out in full, or using the UN Packing Specification Code) **and the net quantity** (as specified in IATA 8.1.6.9 Step #5).

When two or more different dangerous goods items are packed in the same outer package, the words “All Packed in One” must immediately follow the relevant entries.

When an overpack is used, the wording “Overpack Used” must be inserted on the declaration form immediately after all relevant entries relating to the packages within the overpack.

### f. Number of the Packing Instruction or of the Limited Quantity Packing Instruction

(Column G, I, or K as appropriate).

### g. Authorizations

as applicable (in accordance with IATA 8.1.6.9 Step #8).

- The word(s) “Limited Quantity” or “Ltd. Qty.” if using limited quantity provisions.
- The Special Provision Number if the special provision is A1, A2, A51, A81, or A109 [IATA 8.1.6.9.4(b)].
- Authorizations and/or exemptions which must accompany your shipment must either be in English, or be accompanied by an accurate translation in English.
COMPLETING THE SHIPPER’S DECLARATION

(Manual Form)

Enter any special handling information relevant to your shipment. This information must be entered by the shipper.

a. All dangerous goods shipments to, from, within, or transiting through the U.S. must include a 24-hour emergency response telephone number (IATA 2.9.2, USG-12). Magnetized material (UN 2807), dangerous goods for which no Shipper’s Declaration is required, and Other Regulated Materials (ORM-D) as defined in 49 CFR 173.144 are exempt from this requirement.

b. When shipping Division 4.1 self-reactive substances, other substances having similar properties, and Division 5.2 organic peroxides with Special Provision A20, the shipper must indicate that the packages containing such substances must be protected from direct sunlight and stored away from all heat sources in a well ventilated area (IATA 8.1.6.11.1). When a sample of a self-reactive substance or an organic peroxide is transported, a statement to this effect must be included in the “Additional Handling Information” box.

c. The statement “I declare that all of the applicable air transport requirements have been met” must either be after the certification statement or in the Additional Handling section.

Enter the name and title of the person actually signing the Declaration. This information which must be entered by the shipper, may be printed or stamped (IATA 8.1.6.13).

Enter the place and date of signing the form. This information must be entered by the shipper (IATA 8.1.6.14).

Sign the Shipper’s Declaration. This information must be entered by the shipper (IATA 8.1.6.15).

a. The signature should be written by hand; however, facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures (IATA 8.1.4.1).

b. Typewritten signatures are not acceptable.

c. The Shipper’s Declaration must be completed and signed by the shipper.

NOTE: When shipping with FedEx Express, Shipper’s Declarations must be typewritten or computer generated. FedEx Express does not accept handwritten forms. See IATA Variation FX-12 for more details and exceptions to this FedEx Express requirement (IATA 2.9.4).
# Completing the Shipper's Declaration

(Manual Form)

## Shipper's Declaration for Dangerous Goods

<table>
<thead>
<tr>
<th>Field</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipper</td>
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<tr>
<td>Consignee</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Air Waybill No.</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Page of Pages</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Shipper's Reference Number (optional)</td>
<td>[Blank]</td>
</tr>
</tbody>
</table>

**Transport Details**

<table>
<thead>
<tr>
<th>Field</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport of Departure</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Airport of Destination</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Shipment type (delete non-applicable)</td>
<td>Radioactive</td>
</tr>
</tbody>
</table>

## Nature and Quantity of Dangerous Goods

<table>
<thead>
<tr>
<th>Field</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN or ID No.</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Proper Shipping Name</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Class or Division (Radionuclide NRC)</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Packing Group</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Quantity and type of packaging</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Packing Inst.</td>
<td>[Blank]</td>
</tr>
<tr>
<td>Authorization</td>
<td>[Blank]</td>
</tr>
</tbody>
</table>

### Additional Handling Information

**Emergency Telephone Number**

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable International and National Governmental Regulations. I declare that all of the applicable air transport requirements have been met.

**Name/Title of Signatory**

**Place and Date**

**Signature (see warning above)**

FOR RADIOACTIVE MATERIAL, SHIPMENT ACCEPTABLE FOR PASSENGER AIRCRAFT, THE SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN OR INCIDENT TO RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.
To prepare your shipment for transportation by air, follow these procedures in order, as they are listed.

Each step of this job aid is referenced directly from the appropriate IATA Subsection, where additional detailed instructions can be found.

1 Determine that the substance is not forbidden for air transportation.
   a. If your substance meets any of the criteria found in IATA Subsection 2.1.1, it must not be carried on aircraft under any circumstance.
   b. If it is listed in 4.2 List of Dangerous Goods as Forbidden for both Passenger and Cargo Aircraft Only.

2 Classify the substance by comparing its properties, as described on the MSDS with the classification criteria described in IATA Section 3.
   a. Obtain a copy of the Material Safety Data Sheet (MSDS) for your substance. (Note: OSHA requires manufacturers/importers to produce an MSDS for each hazardous substance they manufacture/import.)
   b. Use the MSDS to obtain a description of the physical characteristics associated with your substance. Among other information required by law, each MSDS includes the following:
      • The identity of substance (chemical and common names)
      • Physical/chemical characteristics of the substance
      • Physical hazards (potential for fire, explosion, etc.)
      • Information on exposure limits
      • Precautions for safe handling
      • Date of MSDS preparation, or most recent change
   c. Use the decision table on the next page to determine the proper UN Hazard Classification and appropriate Packing Group.

3 Select the generic or n.o.s. Proper Shipping Name that most accurately describes the article or substance and prepare your commodity for shipment.
   a. Using IATA Table 4.1.A, find the UN Hazard Classification selected in Step 2 and select the most appropriate generic chemical name (preferred) or hazard description.
      Generic or n.o.s. (not otherwise specified) Proper Shipping Names that require the addition of the technical chemical name in parentheses immediately following the proper shipping name are marked with the symbol “★” in the List of Dangerous Goods (IATA 4.2).
   b. Using the “Basic Dangerous Goods Shipping Instructions” found on pages 1 through 4 of this job aid, refer to Step #2 and continue processing your commodity for shipment.
### Shipping Unlisted Substances

<table>
<thead>
<tr>
<th>Substance Category</th>
<th>Then, to determine UN Hazard Class, refer to</th>
<th>Then, to determine Packing Group, refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explosive</strong></td>
<td>IATA 3.1.1 Table 3.1.A</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>Prior to transport, the classification of</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>all new explosive devices, together with</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>compatibility group assignment and</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>the proper shipping name, must be approved</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>by the appropriate authority of the State of</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>manufacture.</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Within the United States, this is the</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Department of Transportation, Bureau of</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Explosives - DOT, BOE.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Gas</strong></td>
<td>IATA 3.2</td>
<td>-</td>
</tr>
<tr>
<td><strong>Flammable Liquid</strong></td>
<td>IATA 3.3.1 Table 3.3.A</td>
<td>IATA 3.3.2 Table 3.3.B</td>
</tr>
<tr>
<td></td>
<td><strong>Figure 3.4.A</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Figure 3.4.C</strong></td>
<td>IATA 3.4.2.4</td>
</tr>
<tr>
<td><strong>Flammable Solids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oxidizing Substances or Organic Peroxide</strong></td>
<td>IATA 3.5</td>
<td>IATA 3.5.1.4</td>
</tr>
<tr>
<td><strong>Toxic and Infectious Substance</strong></td>
<td>IATA Subsection 3.6 Table 3.6.A</td>
<td>IATA 3.6.1.3 Table 3.6.B Figure 3.6.C</td>
</tr>
<tr>
<td><strong>Radioactive Material</strong></td>
<td>IATA 3.7 IATA Section 10</td>
<td>-</td>
</tr>
<tr>
<td><strong>Corrosives</strong></td>
<td>IATA 3.8</td>
<td>IATA 3.8.2 Table 3.8.A</td>
</tr>
<tr>
<td><strong>Miscellaneous Dangerous Goods</strong></td>
<td>IATA 3.9</td>
<td>-</td>
</tr>
<tr>
<td><strong>Articles and Substances with Multiple Hazards</strong></td>
<td>IATA 3.10 Table 3.10.A</td>
<td>-</td>
</tr>
</tbody>
</table>
BASIC DANGEROUS GOODS SHIPPING INSTRUCTIONS

SHIPPING VARIATIONS

In most situations, preparing your dangerous goods packages in accordance with basic shipping instructions will be adequate; however, certain types of shipments will require additional processing.

Each step of this job aid (which is designed to assist you in identifying when additional shipping information is required) is referenced directly to the appropriate IATA Subsection, where detailed instructions can be found.

Mixtures and Solutions not listed by name (IATA 4.1.3)

a. Classify your substance by comparing its properties, as described on the MSDS, with the classification criteria in IATA Section 3 and determine the Proper Shipping Name.

b. Ensure your mixture or solution is described (on the package and Shipper’s Declaration) by the most appropriate Proper Shipping Name.
   • A mixture or solution containing a substance listed by name in the IATA List of Dangerous Goods, together with one or more substances not subject to regulation, must be identified by the Proper Shipping Name of the listed substance, followed by the qualifying word “mixture” or “solution” (IATA 4.1.3.1).
   • A mixture or solution containing two or more dangerous goods, whether listed or not, should be described by the appropriate n.o.s. Proper Shipping Name followed (in parentheses) by the technical names of at least two of the constituents which most predominantly contribute to the hazard(s). Include (in the technical name) any component which requires the use of subsidiary label(s). Qualifying words such as “mixture” and “solution” should be added where appropriate (IATA 4.1.3.2).

Overpacks (IATA 5.0.1.5)

a. Ensure that each package contained in the overpack has been properly packaged, marked, and labeled and that the overpack does not contain packages of different substances which might react dangerously with each other or of dangerous goods which require segregation according to IATA Table 9.3.A.

b. Prepare the overpack for shipment in accordance with IATA 7.1.4.
   • Unless all markings and labels are clearly visible of all dangerous goods in the “overpack”, then the word “OVERPACK” and all required markings and labels on the inner packages MUST be reproduced on the outside of the overpack.
   • When your complete shipment consists of more than one overpack, the total quantity of dangerous goods contained in each overpack, as described on the Shipper’s Declaration, must be indicated on the overpack.
   To facilitate identification, loading, and notification, an identification mark (which can be any alpha-numeric format) should be indicated on the Shipper’s Declaration.

c. Ensure that all labels required on packages in the overpack are clearly visible on the outside of the overpack (IATA 7.2.7).

d. List individual package information on the Shipper’s Declaration (in the Nature And Quantity of Dangerous Goods section) first and include the wording “Overpack Used” immediately after all relevant entries related to the packages within the overpack (IATA 8.1.6.9.2 Step 6). Multiple overpacks with identical contents should be identified as “Overpack Used X (number of identical overpacks),” while multiple overpacks with different contents should be listed separately (IATA 8.1.6.9.2 Step 6).
SHIPPING VARIATIONS

Consumer Commodities (IATA Packing Instruction 910)

a. Ensure your commodities are packaged in a form intended or suitable for retail sale for purposes of personal care or household use.

b. Prepare your commodity for shipment in accordance with Packing Instruction 910. Although items prepared under this instruction are exempt from the General Packing Requirements of IATA 5.0, they must meet the requirements listed in the instruction, including:
   • Passing a 4-foot drop test
   • Sufficient outage to prevent leakage
   • Closures held securely in place
   • Sufficient cushioning and absorbent materials

c. Mark and label your package as:
   • Consumer Commodity (which is the Proper Shipping Name found in IATA 4.2)
   • ID 8000 (note the letters “ID”)
   • Miscellaneous (Class 9) label

d. Ensure the gross weight of your shipment is shown on the Shipper’s Declaration:
   • For a single package, use the actual gross weight of the package.
   • For more than one package, use either the actual gross weight of each package or the average weight of the packages.

e. Consumer Commodity shipments are exempt from the USG-12 requirement to provide a 24-hour emergency telephone number.

Dangerous Goods in Excepted Quantities

Dangerous goods in Excepted Quantities are exempt from normal dangerous goods marking, labelling, documentation, and loading requirements; however, they must be shipped in accordance with IATA 2.7.

a. Use IATA Table 2.7.A to determine the maximum authorized quantity and the appropriate amount of your commodity which should be placed in each inner container.

b. Ensure your packaging complies with IATA 2.7.8 and IATA 2.7.9:
   • Strong, rigid, well-constructed outer package
   • Passing drop and stacking tests
   • Watertight intermediate packaging for each inner container
   • Closures held securely in place
   • Sufficient cushioning and absorbent materials

c. Complete and apply the Excepted Quantities label (IATA Figure 2.7.B) to your package. (IATA 2.7.6) A Shipper’s Declaration is not required for Dangerous Goods in Excepted Quantities (IATA 2.7.7.1).

d. Enter the words “Dangerous Goods in Excepted Quantities” in the Nature and Quantity of Goods section of your Air Waybill (IATA 2.7.7.2).
Infectious substances are substances containing micro-organisms that are known or reasonably expected to cause disease in humans or animals.

a. Determine the Proper Shipping Name:
   - Infectious substance, affecting humans UN2814
   - Infectious substance, affecting animals only UN2900

   **Special Provision 140** requires the technical name of the hazard to be entered in brackets on the Declaration form, following the PSN, but not on the package.

b. Use IATA Packing Instruction 602.
   - Ensure your packaging complies with IATA 5.0.2, meets the testing requirements outlined in IATA 6.6, and includes:
     - A watertight primary receptacle with sufficient room for expansion of liquids
     - A watertight secondary receptacle
     - Absorbent material between the primary and secondary receptacle (must be sufficient to absorb the entire contents of all primary receptacles)
     - An outer packaging
   - Place an itemized list of the package contents between the secondary and outer packaging.

c. Ensure that, in addition to other marking and labeling requirements (see IATA Table 6.0.E), **THE NAME AND TELEPHONE NUMBER OF A PERSON RESPONSIBLE FOR THE SHIPMENT** is included in the package markings [IATA 7.1.5.1(f)].

d. Contact the consignee before turning the shipment over to a carrier for transport to verify that the substance may be legally delivered to their location.

e. Ensure the Shipper’s Declaration includes:
   - The name and telephone number of a responsible person to be contacted in an emergency.

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**Dry Ice (UN 1845) Shipped by Itself or Used as a Refrigerant**

a. Use IATA Packing Instruction 904.

b. Ensure your packaging complies with IATA 5.0.2 and is designed to permit the release of carbon dioxide gas (to prevent build-up of pressure that could rupture the package).

c. Ensure that, in addition to other marking and labeling (Class 9 - Miscellaneous) requirements, the net weight (in kilograms) of dry ice within the shipment is marked on the outside of the package. Refer to individual airline loading procedures for dry ice quantity limitations.

   **A Shipper’s Declaration is not required when shipping Dry Ice with no other hazard class in the package or when shipping ONLY Dry Ice.**

d. Enter the following in the **Nature and Quantity of Goods** section of the air waybill:

<table>
<thead>
<tr>
<th>Nature and Quantity of Goods (Incl. Dimensions of Volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, solid</td>
</tr>
<tr>
<td>9 UN1845</td>
</tr>
<tr>
<td>2 X 25 kg</td>
</tr>
</tbody>
</table>
### Q Value Calculation

<table>
<thead>
<tr>
<th>Substance Proper Shipping Name</th>
<th>Net Quantity per package to be Shipped ($n_1$)</th>
<th>Q Value Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Passenger or Cargo Aircraft</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Packing Instruction</td>
</tr>
<tr>
<td>Ferrosilicon (with 50% silicon)</td>
<td>10 kgs</td>
<td>422</td>
</tr>
<tr>
<td>Ethyl Formate</td>
<td>4 L</td>
<td>305</td>
</tr>
</tbody>
</table>

**Total Q Value of Shipment**

(Cannot combine - Q Value greater than 1.0) **Total Q Value of Shipment**

(Can combine - Q Value less than 1.0) **Total Q Value of Shipment** .17
To prepare shipments of multiple items in one box for transportation by air, follow the procedures in order, as they are listed.

Each step of this job aid is referenced directly from the appropriate IATA Subsection, where additional detailed instructions can be found.

**1 Identify the Proper Shipping Name for each commodity you wish to ship.**

a. If you know the name of the commodities, go directly to the List of Dangerous Goods found in the blue pages (IATA 4.2).
   - Proper Shipping Names are **shown in bold type**.
   - The spelling of the Proper Shipping Name used to identify your commodity (on the outside of the package and on the Shipper’s Declaration) must agree with the spelling found in the IATA manual.

b. If you know the UN or ID number for the commodities you wish to ship, but do not know the Proper Shipping Names, use IATA 4.3 - Numerical Cross-Reference List of Dangerous Goods to identify the Proper Shipping Name. If you cannot find the Proper Shipping Name for the commodities in IATA Table 4.2, refer to “Shipping Unlisted Substances” found on pages 9 and 10 of this job aid.

**2 Identify the other information needed to prepare each commodity for shipment.**

a. The Primary and any Subsidiary Risk classifications associated with transportation of your commodity are listed in IATA 4.2 Columns C and D, respectively.

b. Hazard Label(s) that must be applied to the outside of your package are listed in IATA 4.2 Column E.

c. The UN Packing Group assigned to each commodity is listed in IATA 4.2 Column F.

d. Special provisions that apply to air transport of your commodities are listed in IATA 4.2 Column M.

**3 Determine if the items are compatible.**

Dangerous goods that might react dangerously with each other must not be shipped in the same outer packaging or in a position that would allow interaction between them in the event of leakage (IATA Table 9.3.A).

**NOTE:** Division 4.1, Class 6, Class 7, and Class 9 do not require segregation from other classes of dangerous goods.
1. Packing Instructions are based on Hazard Classification, Packaging Group and quantity. The General Packaging Requirements found in IATA 5.0.2 apply to all shipments:
   - Packagings must be of good quality and must remain closed during transport.
   - Packagings must be resistant to any material being shipped inside.
   - Airspace must be left to allow liquids to expand without leaking or permanently distorting the package.
   - Inner packagings must be cushioned to prevent breakage.

b. To identify the Packaging Instruction to use, first convert all quantities to their metric equivalents. (Use the tables in IATA Appendix B.3 for assistance.)

c. Next, determine the maximum net quantity of each commodity allowed in one package for transport on a passenger or cargo aircraft (IATA 4.2 Columns G-L).

d. Use the chart below to select the specific Packing Instruction that applies to each item:

<table>
<thead>
<tr>
<th>If...</th>
<th>And the quantity you are shipping...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Specification Packaging is NOT available</td>
<td>CAN be packaged in limited quantities and...</td>
<td>Select the “Y” Packing Instruction</td>
</tr>
<tr>
<td></td>
<td>DOES NOT EXCEED the maximum allowed in limited quantity packages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CANNOT be packaged in limited quantities or EXCEEDS THE MAXIMUM ALLOWED in limited quantity packages</td>
<td>Select either the “Passenger and Cargo Aircraft” or the “Cargo Aircraft Only” Packing Instruction</td>
</tr>
<tr>
<td>UN Specification Packaging IS available</td>
<td>DOES NOT exceed the maximum allowed for passenger and cargo aircraft</td>
<td>Select the “Passenger and Cargo Aircraft” Packing Instruction</td>
</tr>
<tr>
<td></td>
<td>EXCEEDS THE MAXIMUM ALLOWED for passenger and cargo aircraft</td>
<td>Select the “Cargo Aircraft Only” Packing Instruction</td>
</tr>
</tbody>
</table>

Inner packagings used must comply with the Packing Instruction for each item. The outer packaging used must meet the specification performance tests for the most restrictive Packing Group of each substance contained in the package.
**SHIPPING MULTIPLE ITEMS (IN ONE PACKAGE)**

**5 Calculate the Q Value for the commodities you have selected (IATA 5.0.2.11).**

a. To calculate the **Q Value**, use the following formula:

\[
Q = \frac{n_1}{M_1} + \frac{n_2}{M_2} + \frac{n_3}{M_3}
\]

- \( n_1 \) represents the quantity of the first commodity that you wish to ship
- \( M_1 \) represents the maximum quantity of your first commodity which can be shipped in accordance with the applicable Packing Instruction.
- \( n_2 \) represents the quantity of the second commodity that you wish to ship
- \( M_2 \) represents the maximum quantity of your second commodity which can be shipped in accordance with the applicable Packing Instruction.

b. The Q Value calculated must not exceed 1.0. If the Q Value you calculate exceeds 1.0:
   - Try calculating the Q Value using “Cargo Aircraft Only” Packing Instructions, or
   - Ship the items in separate packages.

**6 Prepare your shipment using the Packing Instructions selected.**

a. Review State and/or Operator Variations which apply to the Packing Instruction applicable to each commodity in your shipment.
   (State and/or Operator Variations are listed at the beginning of each Packing Instruction.)
   - State Variations are listed in IATA 2.9.2.
   - Operator Variations are listed in IATA 2.9.4.

b. Compare packing options available for individual shipments of each of your commodities and select a packaging option which ensures both inner and outer requirements for the most restrictive Packing Group are met. (Each Packing Instruction shows acceptable packaging options.)
   - IATA Table 5.0.C contains a list of approved UN Specification Packagings.
   - For Combination Packagings, tables show acceptable outer packagings and:
     - The inner packagings required with that outer packaging
     - The maximum quantity permitted in each inner packaging

c. Ensure that the package, as prepared for shipment, meets the specification performance tests for the most restrictive Packing Group of any substance contained in the package.
SHIPPING MULTIPLE ITEMS (IN ONE PACKAGE)

7 Mark your package in accordance with IATA 7.1.5.

a. All markings must be readily visible, legible, and must not overlap or be partially obscured by labels.

b. If required (by IATA 7.1.2.1), UN Specification markings are normally applied by the packaging manufacturer, but are still ultimately the responsibility of the shipper.

c. English must be used in addition to any other language which may be required by the state (country) of origin.

d. Packages containing dangerous goods must be marked, durably and legibly on the outside of the package with each of the following:
   • Proper Shipping Name for each commodity contained in the shipment
   • The UN/ID number for each item contained in the shipment (preceded by the letters “UN” or “ID” as appropriate)
   • The full name and address of the shipper
   • The full name and address of the consignee (i.e., the person/destination to which the package is being shipped)
   • If any item in the shipment is shipped under the Limited Quantity provisions of IATA 2.8, the package must be marked “Limited Quantity” or “Ltd. Qty.”
   • The marking of the net or gross quantity on the package or overpack is mandatory (IATA 7.1.5.1).

e. Packages containing diagnostic specimens must be marked with: The proper shipping name “Diagnostic specimens” or “Clinical specimens” on the outer package adjacent to the diamond-shaped mark. (Packing Instruction 650)

f. Additional markings are required for explosives, infectious substances, refrigerated liquefied gases, dry ice, and some overpacks (IATA 7.1.4.3 and IATA 7.1.5.1).

8 Label your package with the appropriate labels.

a. For each package requiring labelling:
   • Remove or totally obliterate any irrelevant labelling already on the package.
   • Use only labels of durable quality and correct specification (IATA 7.2.1).
   • Securely affix labels to your package in the correct location(s). Labels must be located on the same surface of the package near the Proper Shipping Name marking if the package dimensions are adequate (IATA 7.2.6.2.1). Ensure that labels are readily visible and not obscured or overlapped at all by any of the packaging or by any other label.

b. Hazard Labels
   • Labels identifying the primary and subsidiary hazards of the dangerous goods must bear the class or division number as required in IATA 7.3.

Questions?

Call us at 1-800-Go-FedEx®, (800) 463-3339. Press the “star” key to speak with a customer service representative. Ask for the Dangerous Goods Hotline.

or

Press “81” (which is a silent prompt providing direct access to the Dangerous Goods/Hazardous Materials Hotline).