

Good Practice Guide By Air - Revision 1

Jan 2018

Transport of UN
3507 By Air



Good Practice Guide By Air - Revision 1

January 2018

Transport of UN 3507 By Air

Transport of UN 3507 By Air

Table of Contents

Introduction	5
Regulations for Reference	5
Packing Instructions, Marking and Labelling, Limitations	6
Transport Documents	11
Information for Forwarders and Operators (Airlines)	12
State and Operations Variations	12
Appendix 1	14
Appendix 2	16

1. Introduction

From 1st January 2017, samples of uranium hexafluoride (UF6) in excepted packages transported under the UN number UN 3507 are classified in Class 6.1, with subsidiary risks of Class 8 and Class 7.

The scope of this good practice guide is to facilitate the understanding of the regulations associated with the transport of UF6 under this new UN number and to harmonise the implementation of the new rules.

2. Regulations For Reference

This guide is based on the 58th Edition of the International Air Transport Association IATA Dangerous Goods Regulations (DGR) manual, applicable as from 1st January 2017, and on the 2017-2018 edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI) of the International Civil Aviation Organization (ICAO). These documents will be referred to as IATA DGR and ICAO-TI in this guide. When paragraph references are indicated, the one within brackets is that of ICAO-TI, the other one is that of IATA-DGR.

This good practice guide has been developed with the support of the IATA.

This guide also includes in Appendix 2 specificities relative to the implementation of the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) – 2017 Edition.

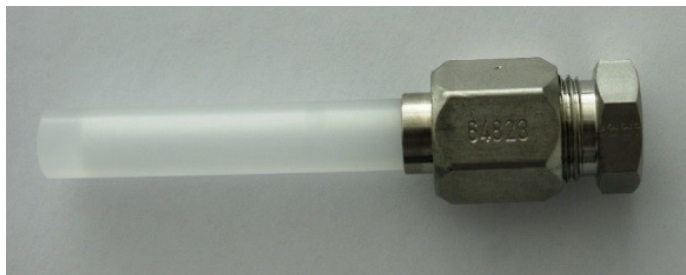
3. Packing Instructions, Marking and Labelling, Limitations

UF6 samples shipped under UN 3507 shall be classified in conformance with 10.3.11.1.5 (2;7.2.4.1.1.5), packed in accordance with packing instruction 603 and special provisions A139 and A194, including references contained within.

Important points of the regulations are listed in the Appendix 1.

Many good practices of packaging and transporting UF6 samples exist. Below is one example of a packaging process for P10 tubes and the related labelling process.

a. Each P10 tube (primary inner receptacle) is to be wrapped individually or packed separately in a way so as to prevent contact to other P10 tubes. This is the case if multiple P10 tubes are placed in a secondary packaging (pot, bottle ...).



b. The wrapped P10 tubes are to be placed into a secondary packaging (pot, bottle...) in a way that under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging (pot, bottle...).

c. If shipping to or within a European Union (EU) Member State, the GHS (Globally Harmonized System of Classification and Labelling of Chemicals) markings should be attached to the secondary packaging (pot, bottle, ...) according to European Regulation (EC) No 1272/2008 (European Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures came into force on 20 January 2009 in all EU Member States, including the UK. It is known by its abbreviated form, 'the CLP Regulation' or just plain 'CLP').



Plastic pot (inner packaging for liquid dangerous goods in combination packaging) with large opening as secondary packaging with GHS markings



Wrapped P10 in the plastic pot before closing of the pot



Other example of possible secondary packaging: plastic bottle UN 1H1 for liquid dangerous goods with large opening

d. The secondary packaging (pot, bottle...) must be placed into an outer packaging (fibreboard box, steel drum...) with suitable cushioning material to prevent movement. If multiple secondary packagings are placed in a single outer packaging, they must be either individually wrapped or separated so as to prevent contact between them.

e. Before sealing the outer packaging (fibreboard box in these examples) with tamper proof sealing place a “Radioactive” mark on top of the cushioning material or on the closure of the secondary packagings. The mark should be immediately visible on opening of the outer packaging (fibreboard box, steel drum...).

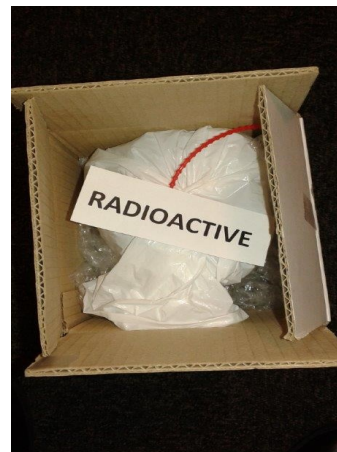
RADIOACTIVE



Fireboard box
UN 4GV/X4/S as
outer packaging



Bottle UN 1H1/Y1.3/150
as secondary
packaging



Secondary packaging
wrapped in the outer
packaging with the
mark "RADIOACTIVE"



2 secondary packagings wrapped in a UN 4/GV/X
fibreboard box as outer packaging with the mark
“RADIOACTIVE”

f. Please mark and label the outer packaging (fibreboard box) as described below:

i. For the marking and labelling requirements associated with “UN3507 URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE” the requirements for Class 6.1 apply according to Special Provision A194 (IATA DGR 4.4).

- Apply the markings: UN number, proper shipping name, name and address of shipper and consignee and net quantity
N.B.: Although the indication of net quantity is only mandatory when IATA-DGR is applicable, it is recommended to mark it on the package at all times.
- Hazard Label Specification – Class 6.1 – Toxic and Class 8 - Corrosives, a Class 7 hazard label is not required, see Special Provision A194.
- Marking of UN specification outer packaging (fibreboard box) including the complete code of the package

Examples of labels:



Label No 6.1

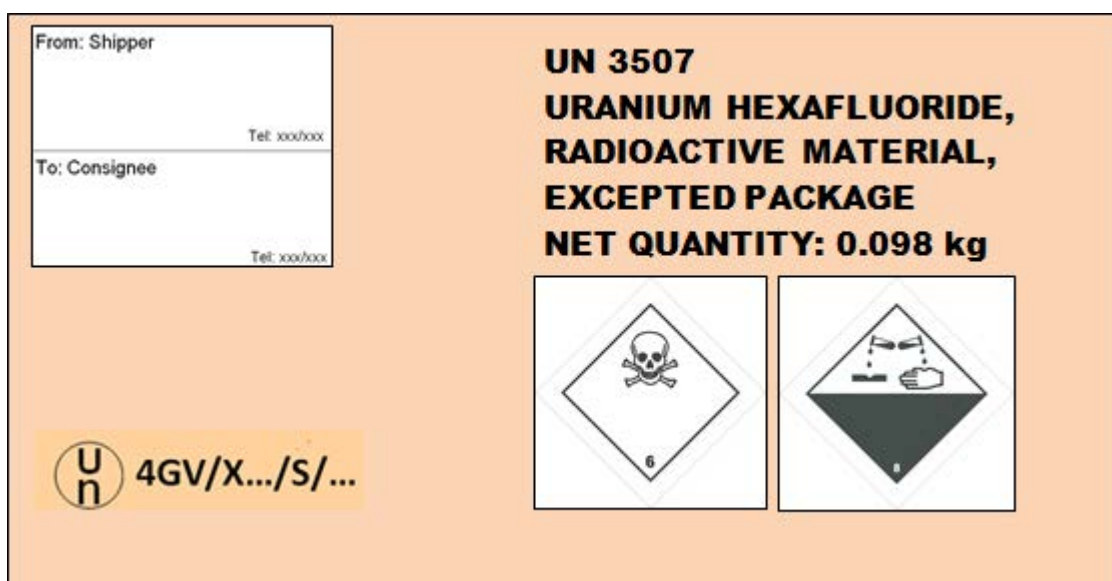


Label No 8



Cargo Aircraft Only
Label (only when
required by a specific
Country or Airline)

1st example of marking and labelling on a package having a large side (UN number, proper shipping name and labels shall be gathered on a same surface of the package, labels are affixed on the tip)



N.B.: The label for Radioactive Material-Excepted Package in 10.7.8.1 – Figure 10.7.8.A (Figure 5-33) shall not be used as per in the note of 10.7.4.4.3.1 and section 7.2.4.6.

2nd example of marking and labelling on a small package (UN number, proper shipping name and labels shall be gathered on a same surface of the package, and in the case the size of the package does not allow to affix the labels on the tip, labels may be laid horizontally, rotated by 45 °).



Sides 1 and 2




Sides 3 and 4

4. Transport Documents

The requirements for the transport document are described in Section 8 of the IATA DGR (chapter 4 of Part 5 in ICAO-TI). The shipment type shall be “NON-RADIOACTIVE” as per para. 8.1.6.8. Paragraph 10.8.8.3 (5;1.2.4.2) exempts Class 7 excepted packages from the shipper’s declaration, therefore the requirements for completion of the shipper’s declaration are only those stated in Section 8 (as per 10.8.8.3.4) (requirement of 5;4.1 except those required for radioactive material in 5;4.1.5.7).

Please see further an example of the shipper’s declaration for dangerous goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS						
Shipper Who ever Company Where ever street 21 Somewhere in the World XYZ			Air Waybill No. Page 1 of 1 Pages Shipper's Reference Number (optional)			
Consignee Who ever Ltd Where ever road 75 Somewhere in the World ZYX			<i>For optional use for Company logo name and address</i>			
<i>Two completed and signed copies of this Declaration must be handed to the operator.</i>			WARNING Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.			
TRANSPORT DETAILS This shipment is within the limitations prescribed for: (delete non-applicable)			Airport of Departure: ABC			
<div style="border: 1px solid black; padding: 2px;"> PASSENGER AND CARGO AIRCRAFT </div>			<div style="border: 1px solid black; padding: 2px;"> CARGO AIRCRAFT ONLY </div>			
Airport of Destination: BCA			Shipment type: (delete non-applicable) <div style="border: 1px solid black; padding: 2px;"> NON-RADIOACTIVE </div>			
NATURE AND QUANTITY OF DANGEROUS GOODS						
Dangerous Goods Identification						
UN or ID No.	Proper Shipping Name	Class (or Division) (Subsidiary Risk)	Pack- ing Group	Quantity and type of packing	Packing Inst.	Authorization
UN3507	URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE	6.1 (7,8)	I	1 fibreboard box x 0.098 kg	603	
Additional Handling Information 24-hour-phone-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 Max Mustermann Place and Date Somewhere, 1st January 2017 Signature <i>(see warning above)</i> 		

N.B.: The same shipper's declaration can also be used for other modes of transport with additional information to be provided (Tunnel Restriction Code (D) and the statement "carriage in accordance with 1.1.4.2.1" when the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) applies).

5. Information For Forwarders and Operators (Airlines)

There is no specific limit on the number of packages or consignments per aircraft as the radioactive properties are classified as excepted package, and exclusive use shipment not required.

6. Checklist

An acceptance checklist (non-radioactive) must be performed prior to acceptance;

The per package net quantity limit is indicated in Packing Instruction 603;

The Class 7 hazard label is not required (SP A194)

The radioactive material, excepted package label is not required (10.7.4.4.3.1, Note)

7. State and Operations Variations

State and Operator variations need to be checked against toxic, radioactive and corrosive properties.

NB.

Whilst the WNTI will use all reasonable efforts to ensure that the information in this good practice guide is accurate, we cannot guarantee the accuracy of all information and we will accept no liability for any loss or damages incurred, howsoever caused, and cannot be held liable for any use or reliance you may make of or put on it. The WNTI also cannot be held liable for your use or inability to use the site or the information or services that it contains. Errors and Omissions Excepted.

The WNTI offers the use of this good practice guide freely to members and non-members of the transport community; the agents and authorities responsible for ensuring compliance of labelling and documentation of transports of radioactive materials presented for air shipments. Where any interpretation of the information has been made, it has been done so with the interests of the wider transport community. Although the good practice guide has been extensively reviewed by industry experts, if you have any issues in use or content, please contact the WNTI so we can rectify the issues and conflicts in systems etc.

Appendix 1

Specific detailed requirements for carriage by air (IATA)

- Special provision “A139 (317) “Fissile-excepted” applies only to those packages complying with 10.3.7.2”.
- Mass of UF₆ shall be less than 100g per package (see 10.3.11.1.5 (a) and 10.3.11.5.2 (a)),
- Mass of U-235 shall not exceed (for enrichments in U-235 higher than 1%):
 - o 3.5 g per package and 45 g per consignment in case of uranium with a maximum enrichment of 5% by mass of U-235 (see 10.3.7.2.3);
 - o 2 g per package and 15 g per consignment in other cases (see 10.3.7.2.4);
 - o 2 g per package for transport to or from the USA (consequence of USG-1 variation, fissile-excepted material shall comply with the provisions specified in 49 CFR §173.453).
- UF₆ shall be contained in one or several metal or plastic primary inner receptacles that comply to 10.3.11.5.2.(b) and (c) (ullage of at least 5% at maximum temperature specified for the plant system, UF₆ in solid form and pressure not above atmospheric pressure when presented for transport) and which should be able to be withstand ambient conditions of 55°C and atmospheric pressure at sea level without loss of UF₆;
- Evidence of the compatibility between material of the primary receptacle and UF₆ shall be made available to the competent authority on request (see 5.0.2.6).
- The combination packaging used (outer packaging with secondary packagings) shall be of a type design as allowed in the packing instruction 603, successfully tested for solid or liquid Packing Group I dangerous goods, marked as required in 6.0.4;
- The primary inner receptacle (P10 tubes for example), the outer packaging, or the secondary packaging, shall be capable of withstanding a pressure differential of not less the maximum normal operating pressure (MNOP) + 95kPa without loss or dispersal of radioactive content taking account of the maximum ambient temperature of 55°C (see 10.6.1.3) (MNOP should at least correspond to the increase of inner pressure due to increase of temperature of the package between the ambient temperature at which the package has been prepared and closed and 55°C);
- The packer shall be in possession of the manufacturer information of the outer and inner packagings regarding procedures to be followed (see 6.0.1.4) and shall conform to them when preparing the consignment;
- Primary (outer surface), secondary (outer and inner surfaces) and outer packaging (outer and inner surfaces) shall be free from non-fixed contamination (definition in Appendix A of IATA-DGR);

- The primary inner receptacles shall be packed in secondary packagings in a way that, under normal conditions of transport, they cannot break, be punctured or leak their content into secondary packagings (see PI 603);
- The secondary packagings shall be properly secured in the outer packaging with suitable cushioning material (see PI 603);
- Before closing the outer package, the marking “RADIOACTIVE” shall be placed in a manner that it will be visible at opening of the outer packaging (see 10.3.11.1.5 (d));
- Radiation level at any point on the external surface of the package shall not exceed 5 $\mu\text{Sv/h}$ (see 10.3.11.1.2.).
- UN number, proper shipping name, net quantity of UF6 content and the labels of Class 6.1 and Class 8, shall be placed next to each other on the same surface of the package;
- “Radioactive Material – Excepted Package” label shall not be used for UN3507;
- Full name and address of the shipper and consignee, shall be placed on the same surface of UN number and proper shipping name if the package dimensions are adequate;
- Markings and labels added at the time of shipment shall not obliterate packaging marks required in 6.0.4.
- Other irrelevant marking already on the package shall be removed or obliterated (see 7.1.1 (b))
- Package marking character size and label design shall conform to 7.1.4.4 and 7.2.2.3 respectively.
- Language for markings shall be English in addition to the language that may be required by the state of origin (see 7.1.3.3).
- See Package Labelling Example in Figure 7.2.A of IATA DGR.

Appendix 2

Specific detailed requirements when carried by road in European countries (ADR).

When road carriage in EU Countries and/or between ADR Contracting Parties is part of a transport chain including air carriage:

- The packaging, labelling, marking and documentation shall conform to the ICAO-TI (or IATA DGR);
- Either a specific transport document complying with 5.4.1.1.1 of ADR is provided to the road carrier in addition to the air transport document, or the following information is added in the air transport document which, then, may be used as transport document for road carriage:

- o **“ADR: Carriage in accordance with 1.1.4.2.1, tunnel restriction code (D)”;**

- UN3507 is assigned to transport category 1 for the purposes of exemption related to quantities carried per transport unit, and as such, up to 20 kg of UF6 per transport unit (more than 200 packages) may benefit of all the exemptions listed in 1.1.3.6.2 of the ADR.

When carriage is only performed by road in EU Countries and/or between ADR Contracting Parties:

- The packaging, labelling, marking and documentation shall conform to the ADR;
- Package design: in comparison to what is required for a package transported by air for the only difference is that the package is not required be capable of withstanding a pressure differential of 95kPa + MNOP;
- Labelling: in comparison to what is required for a package transported by air for the only difference is that “cargo only” label does not exist in ADR;
- Marking: in comparison to what is required for a package transported by air: the proper shipping name is not required to be marked on the package;
- Transport document: the transport document shall contain the information required in 5.4.1.1.1 of ADR;
- UN3507 is assigned to transport category 1 for the purposes of exemption related to quantities carried per transport unit, and as such, up to 20 kg of UF6 per transport unit (more than 200 packages) may benefit of all the exemptions listed in 1.1.3.6.2 of the ADR.



Remo House
310-312 Regent Street
London W1B 3AX United
Kingdom
Tel: +44 (0)20 7580 1144
Fax: +44 (0)20 7580 5365
Web: www.wnti.co.uk
Email: wnti@wnti.co.uk