



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION FOR A
TYPE FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0577/AF-96, REVISION 5**

**REVALIDATION OF FRENCH COMPETENT AUTHORITY
CERTIFICATE F/358/AF-96**

The Competent Authority of the United States certifies that the radioactive material package design described in this certificate satisfies the regulatory requirements for a Type AF package as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - COG-OP-30B.
2. Package Description and Authorized Radioactive Contents - as described in French Certificate of Competent Authority F/358/AF-96, Revision Gt (attached). Contents are restricted to those listed in Appendix 5 and Appendix 7 of the French Certificate of Competent Authority No. F/358/AF-96, Revision Gt (attached).
3. Criticality - The minimum criticality safety index is 5.0 for Appendix 5 contents and 0.0 for Appendix 7 contents. The maximum number of packages per conveyance is determined in accordance with Table 11 of the IAEA regulations cited in this certificate.
4. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.
 - b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Engineering and Research, (PHH-23), Pipeline and Hazardous

¹ "Regulations for the Safe Transport of Radioactive Material, 2012 Edition, No. SSR-6" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/0577/AF-96, REVISION 5

Materials Safety Administration, U.S. Department of
Transportation, Washington D.C. 20590-0001.

- c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.
- d. This certificate provides no relief from the limitations for transportation of plutonium by air in the United States as cited in the regulations of the U.S. Nuclear Regulatory Commission 10 CFR 71.88.
- e. Records of Management System activities required by Paragraph 306 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

5. Special Conditions -

- a. Cylinders used under this certificate must have been designed and manufactured in compliance with the ANSI N14.1 standard in effect at the time of manufacture.
- b. Cylinders used under this certificate must be operated, maintained and handled in accordance with the ANSI N14.1 standard in effect at the time of shipment.
- c. Packages used under this certificate must be compliant with IAEA regulations for Type AF packages and shipped as such. Transport of fissile contents as either Type B(U)F or industrial packages is not authorized. Transport of fissile excepted or non-fissile contents is not authorized.

6. Marking and Labeling - The package shall bear the marking USA/0577/AF-96 in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on May 31, 2022.

CERTIFICATE USA/0577/AF-96, REVISION 5


This certificate is issued in accordance with paragraph(s) 816 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the May 8, 2019 petition by TN Americas LLC, Columbia, MD, and in consideration of other information on file in this Office.

Certified By:



May 17, 2019

(DATE)

 William Schoonover
Associate Administrator for Hazardous
Materials Safety

Revision 5 - Issued to endorse French Certificate of Approval No.
F/358/AF-96 (Gt).



TRANSPORT AND SOURCES DEPARTMENT

**CERTIFICATE OF APPROVAL
OF PACKAGE DESIGN****F/358/AF-96 (Gt)
page 1/3**

The competent French authority,

In view of the application submitted by **TN International** in letter CEX-15-00115358-141 dated December 21, 2015 completed by letter CEX-17-00186360-043 dated April 27, 2017,

In view of TN International safety analysis report DOS-08-00117711 Rev. 6,

Certifies that package design **COG-OP-30B** described hereinafter in Appendix 0 at revision t, comprising a 30B container placed in a COG-OP-30B overpack and filled with uranium hexafluoride or uranium hexafluoride heels enriched to a maximum of 5% U-235 as described in Appendices 5 and 7 at revision t, is compliant as a Type A package design for fissile material,

in compliance with the requirements of the regulations, agreements and recommendations listed below:

- Regulations for the Safe Transport of Radioactive Material, International Atomic Energy Agency Safety Standards Series no. SSR-6, 2012 edition,
- European agreement concerning the international carriage of dangerous goods by road (ADR),
- European agreement concerning the international carriage of dangerous goods by inland waterways (ADN),
- Regulations concerning the international carriage of dangerous goods by rail (RID),
- International Maritime Dangerous Goods Code (IMO IMDG code),
- French ministerial order of May 29, 2009 (amended) concerning the overland carriage of dangerous goods ("TMD order"),
- French ministerial order of November 23, 1987 (amended) concerning the safety of vessels, division 411 of the attached regulations (RSN order).

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

This certificate expires on: **May 31, 2022**

Registration no.: **CODEP-DTS-2017-018552**

Montrouge, **May 23, 2017**

CERTIFICATE ISSUES

Issue	Expiry date	Type of issue and modifications made	Authority	Certificate reference	Revision index												
					Text	t	0	1	2	3	4	5	6	7	8		
24.12.98	31.12.03	Initial approval	DSIN	B(U)F-85	Aa	-	a	a									
11.05.00	31.12.03	Modification of maximum weight of the package	DSIN	B(U)F-85	Ab	-	b	b									
23.03.04	30.11.06	Prolongation	DGSNR	B(U)F-96	Bc	-	c	c	c	c	c	c	c	c	c		
08.10.04	30.11.06	Restriction of certificate F/B(U)F-96 (Bc) to contents no. 7	DGSNR	B(U)F-96	Bd		d									d	
08.10.04	30.11.06	Restriction of certificate F/B(U)F-96 (Bc) to contents no. 4 and no. 5	DGSNR	AF-96	Be	-	e				e	e					
08.10.04	30.11.06	Restriction of certificate F/B(U)F-96 (Bc) to contents no. 2 and no. 3	DGSNR	IF-96	Bf	-	f		f	f							
31.03.06	31.03.09	Modification of maximum allowable weight of UF ₆ heels for contents no. 7	DGSNR	B(U)F-96	Cg		g									g	
31.03.06	31.03.09	Modification of maximum allowable weight of UF ₆ heels for contents no. 5	DGSNR	AF-96	Ch		h				h	h					
31.03.06	31.03.09	Modification of maximum allowable weight of UF ₆ heels for contents no. 3	DGSNR	IF-96	Ci		i		i	i							
06.02.09	31.03.11	Prolongation	ASN	B(U)F-96	Dj	-	j									j	j
06.02.09	31.03.11	Prolongation	ASN	AF-96	Dk	-	k				k	k					
06.02.09	31.03.11	Prolongation	ASN	IF-96	Dl	-	l		l	l							
14.12.10	31.05.12	Prolongation	ASN	B(U)F-96	Em	-	j									j	j
14.12.10	31.05.12	Prolongation	ASN	AF-96	En	-	k				k	k					
14.12.10	31.05.12	Prolongation	ASN	IF-96	Eo	-	l		l	l							
31.01.12	31.05.17	Prolongation	ASN	B(U)F-96	Fp	-	p										
31.01.12	31.05.17	Prolongation	ASN	AF-96	Fq	-	q					q				q	
31.01.12	31.05.17	Prolongation	ASN	IF-96	Fr	-	r	r		r							
23.05.17	31.05.22	Prolongation	ASN	B(U)F-96	Gs	-	s										
23.05.17	31.05.22	Prolongation	ASN	AF-96	Gt	-	t					t				t	
23.05.17	31.05.22	Prolongation	ASN	IF-96	Gu	-	u	u		u							

Revision index			
Text	9	10	11
Aa			
Ab			
Bc			
Bd			
Be			
Bf			
Cg			
Ch			
Ci			
Dj			
Dk			
Dl			
Em			
En			
Eo			
Fp	p	p	p
Fq			
Fr			
Gs	s	s	s
Gt			
Gu			

APPENDIX 0 PACKAGING COG-OP-30B

1. DESCRIPTION OF PACKAGING

The packaging comprises a type 30B cylinder and a protective overpack known as the COG-OP-30B overpack.

In all cases, the maximum weight of the package comprising the COG-OP-30B overpack containing a type 30B cylinder filled with uranium hexafluoride is 4232 kg.

1.1 Description of the COG-OP-30B overpack

The cylindrical overpack is in two halves which close round the 30B cylinder; they are held together by ten latches (Figures 0.1 and 0.2). Each half comprises two stainless steel half-shells, each containing non-corrosive phenolic foam providing thermal protection.

At each end of each half-shell the phenolic foam is replaced by balsa wood and red cedar wood to absorb shocks in normal and accident conditions of transport.

Working outwards from the inside, the overpack is closed at the ends by a stainless steel plate followed by the same phenolic foam as in the radial part for thermal protection, and finally by an outer stainless steel plate. The overpack design is as described in Chapter 0 of safety analysis report DOS-08-00117711 Rev. 6; the main dimensions are as follows:

- Overall dimensions:
 - Length: 2420 ± 12 mm
 - Width: 1340 ± 8 mm
 - Height: 1356 ± 8 mm
- Cavity dimensions:
 - Diameter: 780 ± 6 mm
 - Length: 2100 ± 12 mm

The maximum weight of the overpack is 1295 kg.

The overpack is designed, manufactured, inspected, tested, serviced and used in compliance with:

- TN International safety analysis report DOS-08-00117711 Rev. 6,
- Cogema Logistics design drawing 5188-05E rev. J,
- the specifications relating to acceptance tests indicated in Chapter 7A of TN International safety analysis report DOS-08-00117711 Rev. 6,
- the Quality Assurance principles described in Chapter 8A of TN International safety analysis report DOS-08-00117711 Rev. 6.

The package, in case of Option 1, is provided with forklift pockets that are part of the package. In case of Option 2, forklift pockets are part of the cradle. Options 1 and 2 are described in Figure 0.2.

The overpack is stowed on the conveyance in a cradle which is not attached to the overpack.

Handlings of the package with its cradle by using the two shackles and by using the stacking supports are not allowed.

The two shackles attached to the upper part of the overpack are made inoperative during transports.

1.2 Description of the 30B cylinder (see Figure 0.3)

All design, manufacturing, use and servicing operations for 30B cylinders must be or have been carried out as per standard ISO 7195 "Packaging of uranium hexafluoride (UF₆) for transport" or standard ANSI N14.1 "Uranium hexafluoride - Packaging for transport" at the revision applicable at the time of the operation.

In particular, the 30B cylinder is a cylindrical tank with an outside diameter of 762 mm (30"), closed at each end by a dished end of the same thickness (12.7 mm nominal). The orifices for filling and emptying the cylinder comprise a valve on one dished end and a screw plug at the opposite side on the other dished end. A skirt at each end prolongs the cylindrical part and protects the valve and the plug during normal handling. The cylinder (excluding the valve and the plug) is made of carbon steel. The main characteristics of the 30B cylinder as described in international standard ISO 7195 and American standard ANSI N14.1 are as follows:

- total nominal length : 2070 mm (81½")
- nominal outside diameter : 762 mm (30")
- nominal weight of cylinder : 635 kg (1400 lb)
- minimum free volume in cavity : 736 liters (26 ft³)
- test pressure : 2.8x10⁶ Pa (400 psig)

If the 30B cylinder is filled with content as described in appendix 5, it must be equipped of a plug that is consistent with the concept "socket head plug" according to the standard ANSI N14.1-202 or equivalent. In this case, any other types of plug are not allowed.

1.3 Safety functions

The principal safety functions and safety-related features are:

- **containment** provided by the 30B cylinder,
- **radiation protection** provided by the 30B cylinder and the metal envelope of the overpack,
- **criticality-safety protection** provided by the confinement system described in Chapter 0 of the safety analysis report,
- **internal heat dissipation** by the 30B cylinder,
- **protection against impact** provided in particular by the shock absorbing materials in the overpack,
- **protection against fire** provided in particular by the phenolic foam in the overpack.

2. MEASURES TO BE TAKEN BY THE CONSIGNOR PRIOR TO SHIPMENT OF THE PACKAGE

The packaging must be used according to procedures which comply with the instructions for use in Chapter 6A (ref. DOS-08-00117711-600 Rev. 02) of the safety analysis report.

Before sealing the COG-OP-30B packaging, the consignor must ensure that there is no sign of impact or damage on the valve.

3. MAINTENANCE PROGRAM

Packaging maintenance is described in Chapter 7A (ref. DOS-08-00117711-700 Rev. 4) of the safety analysis report.

4. **NOTIFICATION AND RECORDING OF SERIAL NUMBERS**

Whenever a packaging is taken out of service or changes hands, the competent authorities must be notified. The owner relinquishing the packaging shall communicate the name of the new owner.

5. **QUALITY ASSURANCE**

The quality assurance principles to be applied for the design, manufacture, inspection, testing, servicing and use of the package shall comply with those described in Chapter 8A (ref. DOS-08-00117711-800 Rev. 1) of the safety analysis report.

FIGURE 0.1
COG-OP-30B OVERPACK

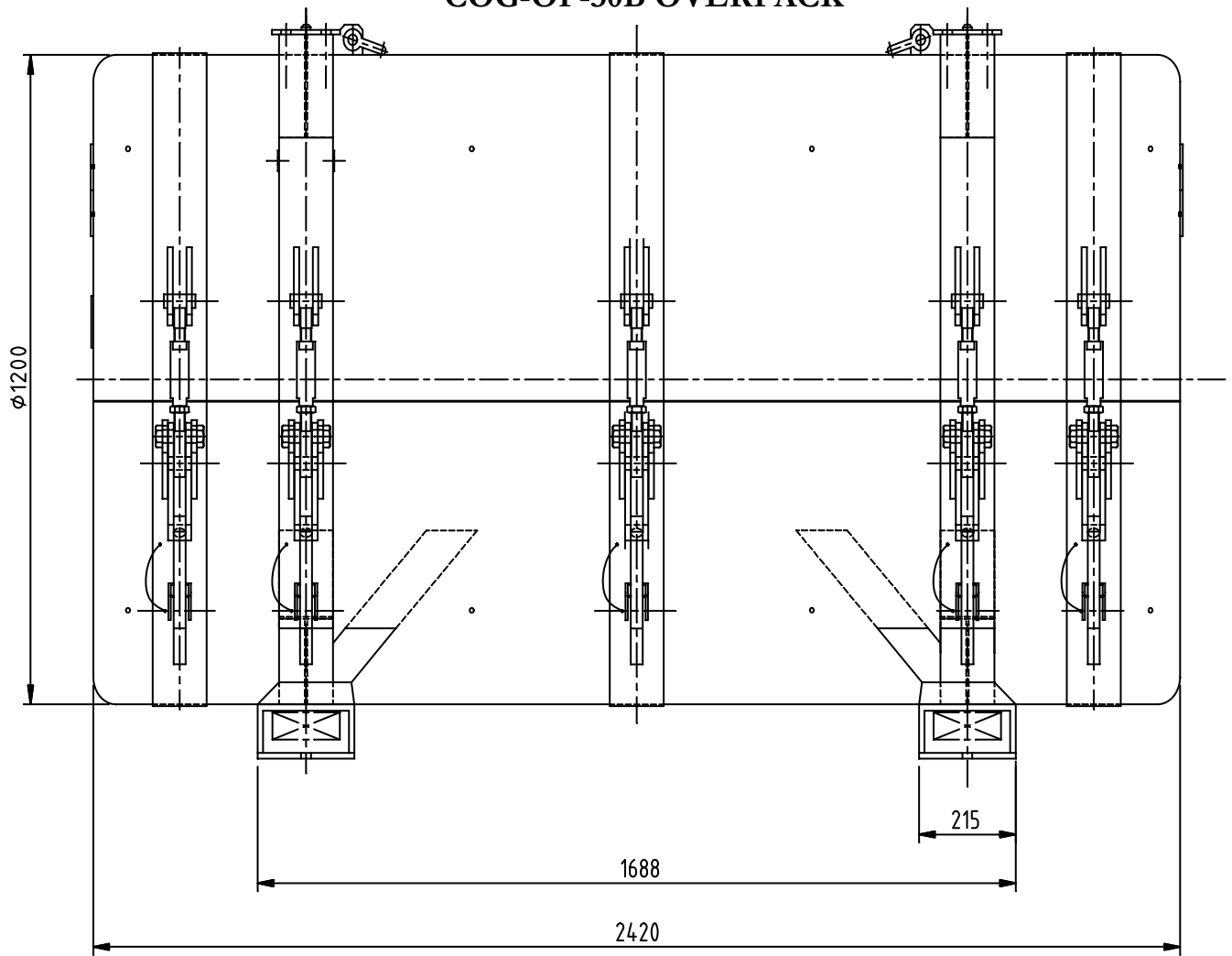


FIGURE 0.2
COG-OP-30B OVERPACK

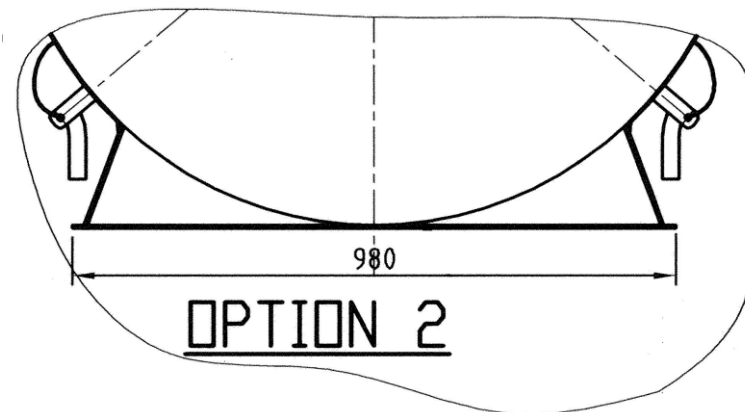
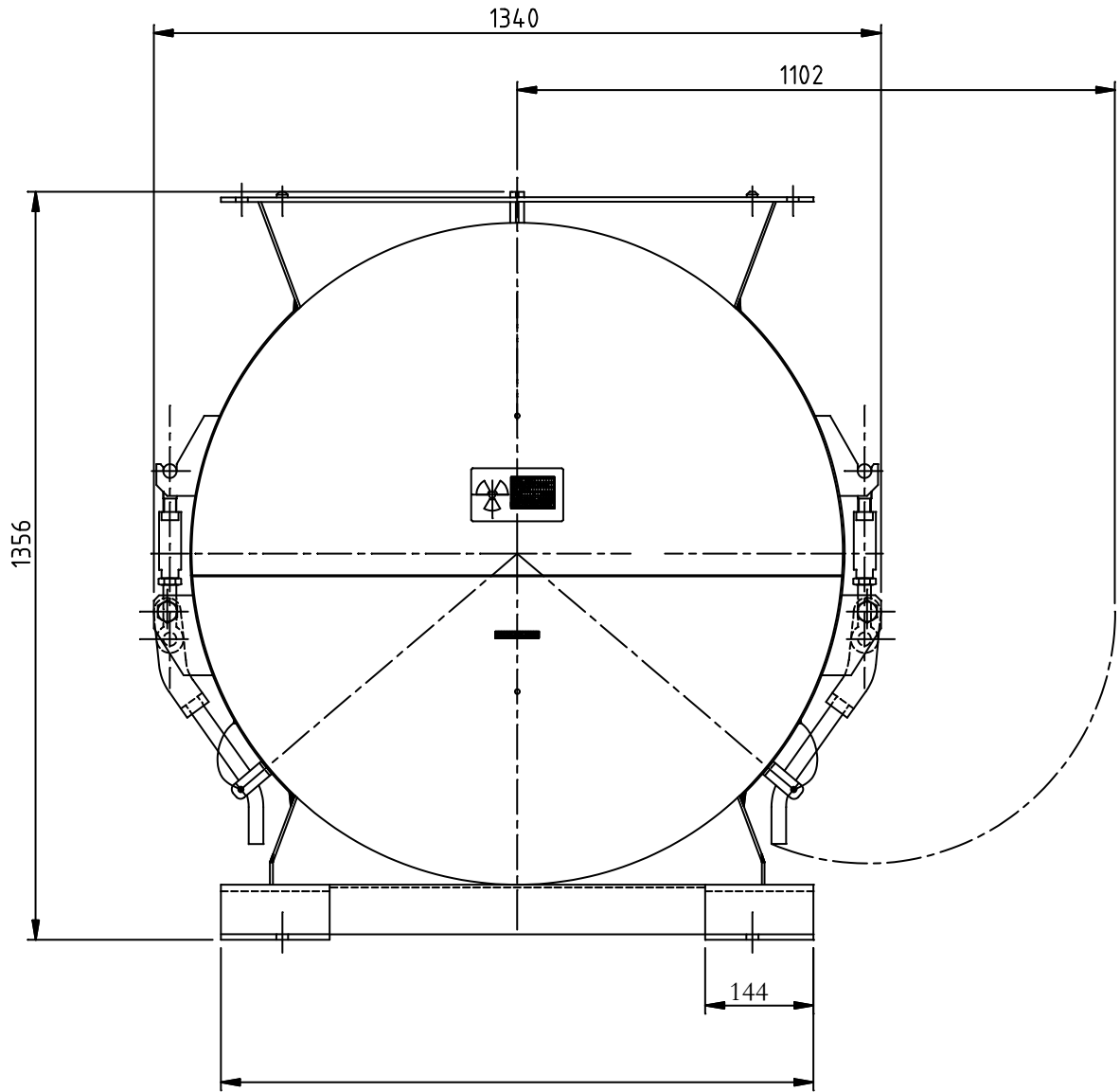
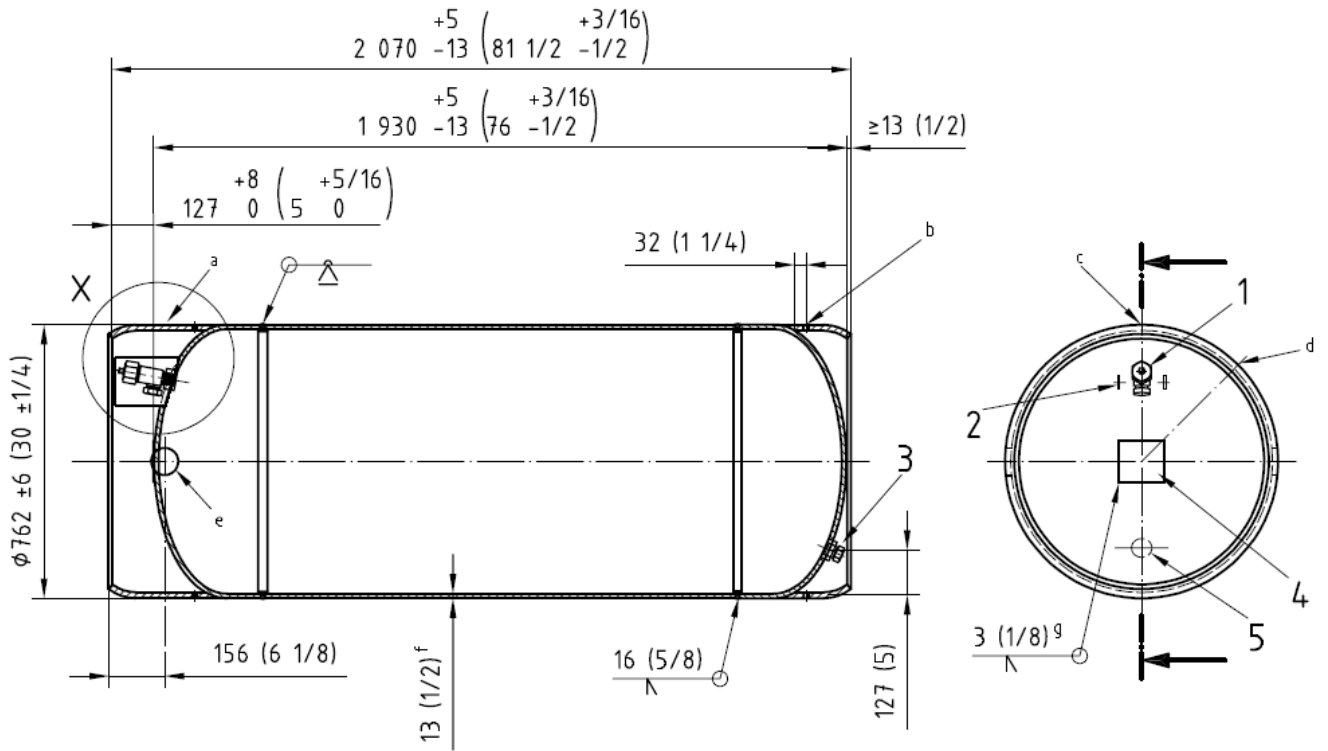


FIGURE 0.3
30B CYLINDER



This figure is taken from standard ISO 7195: 2005. It is given for information only.

APPENDIX 5

URANIUM HEXAFLUORIDE (UF₆) ENRICHED TO A MAXIMUM 5% URANIUM-235

1. DESCRIPTION OF RADIOACTIVE CONTENTS

The radioactive content of the 30B cylinder comprises uranium hexafluoride (UF₆) produced from natural uranium, with a maximum enrichment of 5% ²³⁵U.

The fill UF₆ complies with the definition of Enriched Commercial Grade UF₆ as given in standard ASTM C 996.

The essential safety parameters for the contents are as follows:

- Authorized weight of UF₆ in the cylinder: between 455 kg and 2277 kg
- Maximum ²³⁵U enrichment: 5%
- Minimum purity of transported UF₆: 99.5%

The maximum contents for fill UF₆ are:

Radioactive elements	Maximum content for UF ₆
U ₂₃₂	1x10 ⁻⁴ µg/gU
U ₂₃₄	11x10 ³ µg/g ²³⁵ U
U ₂₃₅	5x10 ⁴ µg/gU (5%)
U ₂₃₆	500 µg/gU
Tc ₉₉	1x10 ⁻² µg/gU

The consignor must ensure that the total activity of the material being shipped is less than 1 A throughout the shipment duration.

The consignor must be in possession of fill UF₆ analyses.

2. SAFETY ANALYSIS REPORT

The safety analysis report justifying these contents is TN International document DOS-08-00117711 Rev. 6.

3. CRITICALITY STUDY

This study is described in Chapter 5A of TN International safety analysis report DOS-08-00117711 Rev. 6.

The confinement system considered is described in Chapter 0 of TN International safety analysis report DOS-08-00117711 Rev. 6.

Criticality safety index (CSI): 0

APPENDIX 7

URANIUM HEXAFLUORIDE (UF₆) HEELS

4. DESCRIPTION OF RADIOACTIVE CONTENTS

The radioactive contents of the 30B cylinder comprise heels of uranium hexafluoride UF₆ and its daughter products in various chemical forms e.g. UO₂F₂, in whatever proportions remain after emptying, with a maximum enrichment of 5% ²³⁵U.

The fill UF₆ complies with the definition of Enriched Commercial Grade UF₆ as given in standard ASTM C 996.

The essential safety parameters for the contents are as follows:

- Authorized weight of contents in the cylinder: ≤ 11.34 kg
- Maximum ²³⁵U enrichment: 5%

The maximum contents for fill UF₆ are:

Radioactive elements	Maximum content for UF ₆
U ₂₃₂	1x10 ⁻⁴ µg/gU
U ₂₃₄	11x10 ³ µg/g ²³⁵ U
U ₂₃₅	5x10 ⁴ µg/gU (5%)
U ₂₃₆	500 µg/gU
Tc ₉₉	1x10 ⁻² µg/gU

The consignor must ensure that the total activity of the material being shipped is less than 1 A throughout the shipment duration.

The consignor must be in possession of fill UF₆ analyses.

5. SAFETY ANALYSIS REPORT

The safety analysis report justifying these contents is TN International document DOS-08-00117711 Rev. 6.

6. CRITICALITY STUDY

This study is described in Chapter 5A of TN International safety analysis report DOS-08-00117711 Rev. 6.

The confinement system considered is described in Chapter 0 of TN International safety analysis report DOS-08-00117711 Rev. 6.

Criticality safety index (CSI): 0.



U.S. Department of
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**Pipeline and
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CERTIFICATE NUMBER: USA/0577/AF-96

ORIGINAL REGISTRANT(S) :

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