

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

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2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, *Code of Federal Regulations*, Part 71, "Packaging and Transportation of Radioactive Material."
 - b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.
3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

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| a. ISSUED TO (<i>Name and Address</i>)
Orano NCS GmbH
Margarete-von-Wrangell-Straße 7
D-63457 Hanau – GERMANY | b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Safety Analysis Report for the DN30-X Package
0045-BSH-2020-001-Rev.3, dated November 2022, as
supplemented. |
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4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

- (1) Model No.: DN30-X
- (2) Description

The DN30-X packaging consists of the DN30 protective structural packaging (PSP) and the 30B-X uranium hexafluoride (UF₆) cylinder.

The DN30 PSP is a right circular cylinder constructed of two austenitic stainless steel shells: (i) the bottom half with integrated feet, a valve protecting device, a plug protecting device, two rotation preventing devices, lower part of the closure system (consisting of six devices), and handling attachment points, and (ii) the top half with the upper part of the closure system and integrated handling attachment points for the top half.

For both the bottom and top halves of the PSP, the cavity between the inner and outer shells and the flange is filled with a polyisocyanurate rigid (PIR) foam with a layer of 10 mm thermal insulation between the inner shell and the foam. All the surfaces of the inner shell of both the top and bottom halves are covered with a layer of intumescent material.

The valve protecting device, enclosing the valve of the 30B-X cylinder, and connected to the bottom half of the DN30 PSP by two hinges, consists of a casing of stainless steel filled with PIR foam and a protective housing with its inner walls covered with an intumescent material.

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5.(a) Packaging (continued)

The two rotation protecting devices, welded at the sides of the inner flange of the bottom half of the PSP, are identical and consist of a pin, withdrawn into the flange during loading, and inserted, during transport, into the two holes in the skirt of the 30B-X cylinder.

The plug protecting device is welded to the inner shell of the bottom half of the PSP and allows the plug to move in the axial direction without making contact with any part of the PSP. An elastomeric gasket, installed in the flange of the top half, prevents water in leakage during normal conditions of transport.

The PSP has a nominal length of 2,437 mm, a nominal external diameter of 1,216 mm, and a nominal height of 1,329 mm. The nominal gross weight of the package is 4,012 kg.

The 30B-X Cylinder contains an interior criticality control system (CCS) that consists of criticality control rods (CCRs), filled with neutron poison material in the form of boron carbide (B_4C), and lattice holders to keep each CCR in place. Longitudinal stiffeners between the lattice holders help to keep the lattice holders separated from each other. The length of the CCRs is fitted to the elliptical heads of the 30B-X cylinder. The two CCRs that end in front of the valve are shortened by 40 mm to facilitate filling and emptying of the cylinder.

The 30B-10 cylinder (with a maximum enrichment of 10 wt.% ^{235}U) includes 33 CCRs while the 30B-20 cylinder (with a maximum enrichment of 20 wt.% ^{235}U) includes 43 CCRs. Apart from the B_4C filling, the CCS is made of carbon steel for low-temperature service, like the pressure envelope of the cylinder.

Both cylinders have a nominal length of 2,070 mm, a nominal diameter of 762 mm, a nominal wall thickness of 13 mm, and an identical nominal gross weight of 2,912 kg: the 30B-10 has a nominal tare weight of 1,452 kg and the 30B-20 has a nominal tare weight of 1,641 kg.

(3) Drawings

The DN30 PSP is fabricated in accordance with:

- Drawing No. 0023-ZFZ-1000-000, Rev. 3 – DN30 PSP
- Drawing No. 0023-ZFZ-1000-100, Rev. 0 – Closure Device
- Drawing No. 0023-ZFZ-1100-000, Rev. 4 – Bottom Half
- Drawing No. 0023-ZFZ-1200-000, Rev. 3 – Top Half
- Drawing No. 0023-ZFZ-1120-400, Rev. 0 – Rotation Preventing Device
- Drawing No. 0023-ZFZ-1140-000, Rev. 3 – Valve Protecting Device

The 30B-10 Cylinder is fabricated in accordance with:

- Drawing No. 0045-ZFZ-1000-000, Rev. 2 – 30B-10 Cylinder
- Drawing No. 0045-ZFZ-1100-000, Rev. 1 – 30B Cylinder modified

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5(a)(3) Drawings (Continued)

Drawing No. 0045-ZFZ-1200-000, Rev. 2 – CCS

The 30B-20 Cylinder is fabricated in accordance with:

Drawing No. 0045-ZFZ-2000-000, Rev. 2 – 30B-20 Cylinder

Drawing No. 0045-ZFZ-1100-000, Rev. 1 – 30B Cylinder modified

Drawing No. 0045-ZFZ-2200-000, Rev. 2 – CCS

(b) Contents

(1) Type and form of material

HALEU 10 and HALEU 20 shall be enriched from commercial natural UF₆ and comply with the isotopic limits below. The isotopic composition shall not exceed a Type A quantity.

Isotopic limits of UF₆ HALEU 10 and HALEU 20
Maximal concentration in wt.-% in uranium

Nuclide	HALEU 10	HALEU 20
²³² U	3x10 ⁻⁸	7x10 ⁻⁸
²³⁴ U	1.2x10 ⁻¹	2.6x10 ⁻¹
²³⁵ U	10	20
²³⁶ U	5x10 ⁻²	10 ⁻¹
²³⁸ U	balance	balance
⁹⁹ Tc	10 ⁻⁶	10 ⁻⁶

(2) Maximum quantity of material per package

Package	Enrichment limit wt% ²³⁵ U	Mass UF ₆ (kg)	Fissile material (kg)	Maximum heel quantity (kg)
DN30-10	10	1460	98	11.3
DN30-20	20	1271	170	11.3

The maximum H/U atomic ratio for UF₆ is 0.088.

(3) The UF₆ concentration shall not be less than 99.5g UF₆ per 100 g of sample to limit hydrogen content. The total hydrocarbon, chlorocarbon, and partially substituted halohydrocarbon content shall not exceed 0.01 mole % of UF₆. Total absolute vapor pressure of content shall not exceed UF₆ industry standard values to prevent overpressure when heating.

(4) Decay heat shall not exceed 3 W.

(c) Criticality Safety Index (CSI): 0.0

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6. The 30B-X cylinder must be fabricated in accordance with Section VIII, Division I, of the ASME (American Society of Mechanical Engineers) Boiler and Pressure Vessel Code and be ASME Code stamped.
7. In addition to the requirements of Subpart G of 10 CFR Part 71:
 - (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures of chapter 1.7 of the application.
 - (b) Each packaging must meet the Acceptance Tests and Maintenance Program of chapter 1.8 of the application.
 - (c) Packagings in which stainless steel components show pitting, corrosion, cracking, or pinholes are not authorized for transport.
8. The 30-inch diameter UF₆ cylinder valve and plug threads may be tinned with ASTM B32, alloy 50A or Sn50 solder material, or a mixture of alloy 50A or Sn50 with alloy 40A or Sn40A material, provided the mixture has a minimum tin content of 45 percent.
9. Transport by air is not authorized.
10. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
11. Expiration date: March 31, 2028.

REFERENCES

Safety Analysis Report for the DN30-X Package, 0045-BSH-2020-001-Rev. 3, dated November 2022, as supplemented on February 9, 2023.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Yoira K Diaz-Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: March 27, 2023