

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1 a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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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

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. ISSUED TO (<i>Name and Address</i>)
Daher Nuclear Technologies GmbH
Margarete-von-Wrangell-Straße 7
D-63457 Hanau – GERMANY | b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Safety Analysis Report of the DN30 Package
0023-BSH-2016-002-Rev 1, dated July 12, 2019, as supplemented. |
|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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
- (2) Description

The DN30 packaging consists of the protective structural packaging (PSP) and the 30B uranium hexafluoride (UF₆) cylinder as specified in ANSI N14.1.

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 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 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 inleakage 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 Cylinder, described in ANSI N14.1, is 2,070 mm long with a nominal diameter of 760 mm and a nominal wall thickness of 13 mm.

(3) Drawings

The Model No. DN30 packaging is fabricated in accordance with

Drawing No. 0023-ZFZ-1000-000, Rev. 2 – 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
Part List No. 0023-STL-1000-000, Rev. 7

(b) Contents

(1) Type and form of material

Unirradiated commercial grade uranium, in the form of UF_6 , with natural isotopic composition, and a U-235 mass percentage not to exceed 5 weight percent.

(2) Maximum quantity of material per package

2,277 kg UF_6 contained in an ANSI Standard N14.1 30B cylinder.
The maximum H/U atomic ratio for UF_6 is 0.088.

(c) Criticality Safety Index (CSI)

0.0

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6. The ANSI standard 30B, 30-inch diameter UF₆ cylinder, must be fabricated, inspected, tested and maintained in accordance with a) American National Standard N14.1-2012 or an earlier version of ANSI N14.1 in effect at the time of fabrication or b) American National Standard N14.1-2012 or an earlier version of ANSI N14.1 in effect at the time of fabrication and ISO 7195:2005 or an earlier version of ISO 7195 in effect at the time of fabrication. Cylinders 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. Revision No. 2 of this certificate may be used until August 31, 2022.
12. Expiration date: July 31, 2024.

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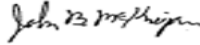
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REFERENCES

Safety Analysis Report of the DN30 Package, 0023-BSH-2016-002-Rev.1, dated July 12, 2019.

Supplements dated September 6, and October 17, 2019; and July 8, 2021.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Signed by McKirgan, John
on 08/31/21

John McKirgan, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: August 31, 2021





UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT
Model No. DN30 Package
Certificate of Compliance No. 9362
Revision No. 3

SUMMARY

By letter dated July 8, 2021, Daher Nuclear Technologies, GmbH, (DNT, or the applicant) submitted an amendment request for Certificate of Compliance (CoC) No. 9362 for the Model No. DN30 package (ADAMS Accession No. ML21189A184)

The applicant proposed to reduce the number of dose rate measurement points for commercial grade UF6 because dose rate distribution is well known by experience after decades of transports and would therefore reduce personnel exposure.

The applicant also proposed to include, in the procedures, test radiation sources to calibrate the contamination measuring instruments other than Am-241 for α -emitters and Cs-137 or Sr/Y-90 for β -emitters because not every site uses those sources and to exchange one thermal plug on each half shell of the PSP by a thermal pressure relief valve in order to avoid a pressure increase inside the half shells.

The applicant revised (i) the Parts List 0023-STL-1000-000 to Revision 7 and (ii) the test instructions 0023-PA-2015-017 to Revision 3.

Based on the statements and representations in the application, and the conditions listed in the CoC, the staff concludes that the package meets the requirements of 10 CFR Part 71.

EVALUATION

The applicant proposed the following three changes:

1. Acceptance of test radiation sources to calibrate the contamination measuring instruments other than Am-241 for α -emitters and Cs-137 or Sr/Y-90 for β -emitters.
2. Reduction of the number of dose rate measurement points at the surface of the DN30 package to respect ALARA.
3. Possibility to exchange one thermal plug on each half shell by a thermal pressure relief valve in order to avoid a pressure increase inside the half shells.

The staff reviewed the proposed changes to verify that the package continues to meet regulatory requirements for shielding performance and complies with regulatory dose rate limits. There is no change to the contents of the package or the shielding material.

In the operating procedures in Chapter 1.7 of the application, as referenced by the CoC, the applicant references the report "Contamination and Dose Rate Measurement at the DN30

Package, Test Instruction No. 0023 PA-2015-017.” This report provides a description and the basis for the first two proposed changes.

Regarding proposed change 1., the applicant updated the test instruction and has identified DIN ISO 7503 Part 3 “Measurement of Radioactivity – Measurement and evaluation of surface contamination – Part 3: Apparatus Calibration” or an equivalent standard to qualify test radiation sources. The staff found this standard, based on NUREG 1507 Rev.1, acceptable for calibration and as such has reasonable assurance that calibration sources different from Am-124, Cs-137 or Sr/Y-90 will not adversely affect the radiation protection as it relates to the package.

Regarding proposed change 2., the applicant updated the test instruction with a reduced number of measurement points, based on the type of contents loaded.

For contents where there is data available on dose rates at various measurement points, the applicant reduced the number of measurement points.

For contents where there is no data available on the dose rates, the applicant did not change the number of measurement points.

For contents where there is limited data available, the applicant will measure at all locations at the beginning of transportation and reduce the number of measurement points if it is determined that shielding safety will be maintained.

The staff found this approach reasonable for determining the number of measurement points for the Type A(F) DN30 package and, therefore, acceptable.

The staff has therefore determined that the updated test instruction, with proposed changes 1 and 2, continues to demonstrate that a user of the package would meet the requirements of 10 CFR 71.0(d)(3) and 71.81, which requires any licensee transporting licensed material to comply with operating control requirements to measure radiation and contamination level, as stated in 10 CFR 71.87(i) and (j).

Regarding proposed change 3, the staff reviewed the revised Part List No. 0023-STL-1000-000, Rev. 7 and determined that shielding is effectively the same as the previously approved cask, and therefore the staff has reasonable assurance that, with the proposed change, the package will continue to meet the regulatory dose requirements in 10 CFR 71.47 and 10 CFR 71.51(2)(2).

Based on these determinations, the staff concludes that the applicant’s proposed changes will not impact the shielding capability of the package and therefore continues to meet dose and radiation protection requirements of 10 CFR Part 71.

CONDITIONS

The following changes were made to the CoC:

Item No. 3(b) identifies the application as supplemented.

Condition No. 5(a)(3) has been modified to include the new revision of the Parts List 0023-STL-1000-000.

Condition No. 11 has been modified to extend the previous revision of the certificate for approximately one year.

The expiration date of the certificate was not modified.

The References section of the certificate was updated to reference the supplemental information provided for this amendment request.

CONCLUSION

Based on the statements and representations in the application, the staff finds that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9362, Revision No. 3.