

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1 a. CERTIFICATE NUMBER 9284	b. REVISION NUMBER 5	c. DOCKET NUMBER 71-9284	d. PACKAGE IDENTIFICATION NUMBER USA/9284/B(U)F-85	PAGE 1 OF 4	PAGES 4
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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 (*Name and Address*)
Columbiana Hi Tech, LLC
1802 Fairfax Road
Greensboro, NC 27407
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Eco-Pak Specialty Packaging application dated
June 19, 1998, 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.: ESP-30X Protective Shipping Package for 30-inch UF₆ Cylinders
- (2) Description

An overpack for the transport of 30-inch enriched uranium hexafluoride (UF₆) cylinders. The shape of the overpack is a right circular cylinder constructed of two 11 gauge carbon steel shells. The area between the shells is filled with fire retardant, phenolic foam per ESP specification ESP-PF-1. The volume between the 1/2" inch thick end plates of the two shells is also filled with phenolic foam. A stepped horizontal joint permits the top half of the overpack to be removed from the base. The horizontal joint of each half of the overpack is covered with steel and a 5/8" thick silicone gasket seals the joint. The overpack halves are secured with ten 3/4" diameter steel bolts and nuts.

The approximate dimensions and weights of the package are as follows:

Outer shell inside diameter	43"
Outer shell length	96"
Inner shell inside diameter	30 7/8"
Inner shell length	82 5/8"
Overpack weight	2,955 pounds
30B Cylinder weight	1,390 pounds
UF ₆ maximum load	5,020 pounds
Maximum package gross weight (including contents)	9,365 pounds

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(3) Drawings

The packaging is constructed and assembled in accordance with ESP Drawing Nos.:

30X-1 SAR, Rev. 2, Sheets 1-4

5.(b) Contents

(1) Type and form of material

The UF₆ must be packaged in Model 30B UF₆ cylinders which have been fabricated, inspected, tested and maintained in accordance with the requirements of ANSI N14.1. The UF₆, which may contain either virgin or recycled uranium, must not contain more than the following maximum quantities of radionuclides and impurities:

U ²³²	5.0E-09 g/gU
U ²³⁴	2.0E-03 g/gU
U ²³⁵	5.0E-02 g/gU
U ²³⁶	2.5E-02 g/gU
U ²³⁸	balance of total uranium content

Pu and Np Alpha activity not exceed 3.3 Bq/gU

Tc⁹⁹ 5.0E-06 g/gU

Th²²⁸ 1.17E-09 g/gU

Fission Products 4.4 X 10⁵ Mev Bq/d kgU (total contribution from gamma emitting fission products); this results in the following individual maximum activities:

Ru ¹⁰⁶ /Rh ¹⁰⁶	2095 Bq/gU
Ru ¹⁰³ /Rh ¹⁰³	885 Bq/gU
Ce ¹⁴⁴ /Pr ¹⁴⁴ /Pr ¹⁴⁴	8349 Bq/gU
Sb ¹²⁵	1030 Bq/gU
Cs ¹³⁴	283 Bq/gU
Cs ¹³⁷ /Ba ¹³⁷	778 Bq/gU
Zr ⁹⁵	598 Bq/gU
Nb ⁹⁵	574 Bq/gU

The total concentration of elements that form non-volatile fluorides (including Al, Ba, Bi, Cd, Co, Cr, Cu, Fe, Pb, Li, Mg, Mn, Ni, K, Ag, Na, Sr, Th, Sn, Zn, and Zr) must not exceed 3.0E-03 g/gU.

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The contents of other elements must not exceed the following concentrations in g/gU.

Sb<1	As<3	B<1	Bi<5	Cl<100
Cr<10	Nb<1	P<50	Ru<1	Si<100
Ta<1	Ti<1	Mo<1.4	W<1.4	V<1.4

Additionally, for reprocessed UF₆, the maximum total activity present in the package is limited to 957 mixture A₂ values.

- (2) Maximum quantity of material per package

The package contents are limited to a maximum of 5,020 pounds of UF₆ enriched to not more than 5 wt%U²³⁵. The maximum H/U atomic ratio for the UF₆ is 0.088.

5. (c) Criticality Safety Index 5.0

6. In addition to the requirements of Subpart G of 10 CFR Part 71:

- (2) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Chapter 7 of the application.
- (3) The package shall be maintained in accordance with the Maintenance Program of Chapter 8 of the application.

7. The 30-inch diameter UF₆ cylinder must be inspected, tested and maintained in accordance with American National Standard N14.1-1995 or latest revision.
8. The 30-inch diameter UF₆ cylinder valve stem and plug 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. The leak tightness of the 30B UF₆ cylinder shall be verified using a test having a sensitivity of at least 1×10^{-3} std-cc/sec per ANSI Standard N14.5-1997 prior to loading into the ESP-30X overpack.
10. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
11. Fabrication of new packaging is not authorized.
12. Revision No. 4 of this certificate may be used until May 31, 2011.

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13. Expiration date: May 31, 2015.

REFERENCES

ESP application dated June 19, 1998.

Supplements dated: August 27, 1999; March 22, May 12, and May 18, 2000; April 11, 2002; January 28, and April 12, 2005; March 24, 2010.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/

Eric J. Benner, Chief
Licensing Branch
Division of Spent Fuel Storage & Transportation
Office of Nuclear Material Safety
and Safeguards

Date April 6, 2010.

