

HI-STAR 330 & HI-STAR 240: A Robust Container for Storage, Transportation & Disposal of Class B/C RadWaste Material



Two new innovative Type B Transport Casks designs, named HI-STAR 330 and HI-STAR 240, are being introduced by Holtec International as a part of the Company's long-term drive to enhance ALARA and protect worker safety in decommissioning programs.

The HI-STAR 330 transport cask is currently undergoing licensing by the U.S. Nuclear Regulatory Commission (NRC) and will be available for use in 2025.

The HI-STAR 330 has been specifically designed to store or transport, via rail or barge, Type B quantities of 10 CFR Part 61.55 Class B and C radioactive waste (i.e., irradiated hardware) to the nuclear industry's various licensed storage and final disposal facilities. For areas where shipments by rail or barge are not possible, or smaller payloads are required, Holtec is evaluating the design of the HI-STAR 240 Type B transportation cask.



**Disposal Liner on Pool Alignment Fixture
(The Disposal Liner will be shipped inside
HI-STAR 330 to a Licensed Disposal Facility)**

The HI-STAR 330 offers significant advantages over existing Type B transport casks. The most beneficial aspect of this cask is the rectangular configuration, which optimizes the cutting and packaging plans and thus time required for segmentation. The HI-STAR 330 is designed to hold up to 122,000 lbs (51,000 kg) of cask content, which includes the liner, liner shield, and radioactive contents. The HI-STAR 330 accommodates four different disposal liners, which are provided with liner shields having variable wall thickness that augment the cask's integral shielding.

Each liner shield is designed with external dimensions of 12'3" x 5'11" x 9'6" (3.74m x 1.80m x 2.90m), compatible with the internal cavity of the HI-STAR 330. The liner shields accommodate higher activity levels while maximizing waste volumes, resulting in a positive impact on the overall cost of transportation and disposal of 10 CFR Part 61.55 Class B and C waste material. Descriptions of each liner shield is provided below and summarized in Table 1:



**Loaded Disposal Liner Inside a
Liner Shield at Holtec's Oyster
Creek Decommissioning Site**

- **The HI-STAR T-50 liner shield** has the largest available cavity that accommodates a disposal liner with high waste volumes. The total internal volume of the T-50 is 302 cubic feet (8.60 cubic meters).
- **The HI-STAR T-100 liner shield** has a large cavity that accommodates a disposal liner with high waste volumes. The total internal volume of the T-100 is 270 cubic feet (7.60 cubic meters).
- **The HI-STAR T-150 liner shield** has greater shielding, which accommodates higher activity waste material. The total internal volume of the T-150 is 237 cubic feet (6.70 cubic meters).
- **The HI-STAR T-200 liner shield** has the greatest shielding, which accommodates very high activity waste material. The total internal volume of the T-200 is 201 cubic feet (5.70 cubic meters).

Table 1 below presents a high-level summary of the four (4) HI-STAR 330 liner options, including dimensions, permissible activity, etc.

As part of the NRC licensing process, the design of the Type B transport casks must demonstrate that “no contents will be released” under accident conditions. This rigorous process ensures the structural integrity of the cask during transportation and its ability to safely transport the waste material under the most severe conditions.

Table 1: HI-STAR 330 Cask and Waste Package Control Parameters

Parameter	T-200 Liner Shield	T-150 Liner Shield	T-100 Liner Shield	T-50 Liner Shield
Permissible Secondary Container Model No.	T-200 Liner Shield	T-150 Liner Shield	T-100 Liner Shield	T-50 Liner Shield
Permissible Waste Basket Model No.	T-200 Disposal Liner	T-150 Disposal Liner	T-100 Disposal Liner	T-50 Disposal Liner
Representative Wall Thickness (mm)	200 mm	150 mm	100 mm	50 mm
Internal Volume (cubic feet)	201 ft ³	237 ft ³	270 ft ³	302 ft ³
Maximum Permissible Co-60 Specific Activity of any Single Waste Item Loaded into Respective BFA Tank (GBq/Kg)	1,400 GBq/Kg	180 GBq/Kg	23 GBq/Kg	3 GBq/Kg
Maximum Permissible Quantity of Fissile Material (Including SNM) (grams)	2 grams	2 grams	2 grams	2 grams
Minimum Cooling Time of Waste (years)	1 year	1 year	1 year	1 year
Maximum Permissible Heat Load (kW)	1.75 kW	1.75 kW	1.75 kW	1.75 kW
Maximum Permissible Waste Material Neutron Source per Unit Mass (n/s/kg)	20 n/s/kg	20 n/s/kg	20 n/s/kg	20 n/s/kg