

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

HJ 1202-2021

**General technical requirements for the manufacture of steel
spent fuel transportation containers**
(English Translation)

Issued on: January 1, 1970

Implemented on: January 1, 1970

Issued by: Ministry of Ecology and Environment

Table of Contents

Foreword
1 Scope
2 Normative references
3 Terms and Definitions
4 General
5 Material re-inspection, segmentation and logo transplantation
6 Forming and Assembly
7 Soldering
8 Experiments
9 Container Factory Requirements
Appendix A (Informative Appendix) Typical Steel Spent Fuel Transport Container

1 Scope of application

This standard specifies the material, forming and assembling, welding and non-destructive testing, and inspection, and manufacturing requirements such as container delivery.

This standard applies to the manufacture of steel spent fuel transport containers.

2 Normative references

This standard refers to the following documents or clauses thereof. For dated references, only the dated version applies to this standard.

For undated references, the latest edition (including all amendments) applies to this standard.

GB/T 1184-1996 Shape and position tolerances are not marked with tolerance values GB/T 1804-2000 General Tolerances Unmarked Tolerances of Linear and Angular Dimensions GB/T 15219 Quality Assurance of Radioactive Material Transport Packaging GB/T 17230 Leak Inspection of Packages for Safe Transport of Radioactive Materials GB/T 25778-2010 Welding consumables procurement guide NB/T.20001-2010 Specification for the manufacture of nuclear island machinery and equipment for pressurized water reactor nuclear power plants NB/T 20450-2017 Another specification for welding of nuclear island machinery and equipment in pressurized water reactor nuclear power plants HAF602 Regulations on the Qualification Management of Nondestructive Examiners of Civilian Nuclear Safety Equipment HAF603 Regulations on the Qualification Management of

Welding Personnel of Civilian Nuclear Safety Equipment NNSA-HAJ-0002-2019 Skill evaluation of welders and welding operators for civil nuclear safety equipment

3 Terms and Definitions

The following terms and definitions apply to this standard.

containment boundary the assembly of packaging components designated by the designer to contain the radioactive material is a physical barrier to prevent the loss or dispersion of the radioactive material.

criticality safety components Components specified by the designer that may affect the criticality safety of the vessel.

4.1 General Requirements

The manufacturing unit shall prepare the manufacturing process documents according to the container design documents and the requirements of the relevant standards before the start of the manufacturing activities, and strictly implement them.

For special processes involved in the manufacturing process (such as lead filling, neutron shielding filling, etc.), process tests or process evaluations shall be carried out. Typical container structure parameters See Appendix A.

4.2 Change application and material substitution

Changes to the original design documents by the manufacturing unit and material substitution for all parts and components shall be submitted in writing, and the original design unit's written approval shall be obtained.

Permit and record in detail on as-built drawings.

4.3 Quality Assurance

4.3.1

The quality assurance related content of the container shall meet the relevant requirements of GB/T 15219.

4.3.2

The quality assurance program should be formulated and implemented effectively.

4.3.3

Before the container is manufactured, the manufacturer shall prepare a quality plan for the container, which shall include quality control points, quality inspection and control methods and tests to be completed.

4.3.4

The manufacturing unit shall manage all non-conformities by classification and classification, and handle the non-conformities according to the procedures reviewed and approved by the design unit to be processed.

4.3.5

The manufacturing unit shall code each container.

5.1 Material re-inspection

5.1.1

The following materials should be re-tested.

- 1) Materials for containment boundary components;
- 2) Structural materials for critical safety-related components;
- 3) Other materials required for re-inspection in the design documents.

5.1.2

The re-inspection requirements and results of materials shall meet the requirements of the design documents (such as steel, neutron absorption, neutron shielding materials, etc.).

5.2 Material segmentation

The material can be divided by cold cutting or hot cutting method. When thermal cutting is used to divide material, surface dross and effects on manufacturing should be removed quality surface layer.

5.3 Material logo migration

For the materials used for components that have traceability requirements in the design documents, during the manufacturing process, such as when the original logo is cut off or the material is divided into several pieces, the manufacturing unit shall specify the expression of the logo and complete the transplantation of the logo before the material is divided.

For stainless steel plates, hard stamping should not be used.

6.1 Cold and hot forming

6.1.1

The cold and hot forming processes that have been tested or evaluated shall be used.

6.1.2

The manufacturing unit shall determine the machining allowance according to the manufacturing process, and shall comply with the dimensions and tolerances (including geometric tolerances) specified in the design documents.

Process and manufacture to ensure that the actual thickness of the important parts of the container after forming is not less than the minimum forming thickness marked on the design drawings.

6.1.3

Limit deviation of linear dimensions without tolerances. machined dimensions are performed in accordance with the m-level accuracy of GB/T 1804-2000, non-machined the size of the work is carried out according to the C-level precision. The tolerance of uninjected shape and position is in accordance with the provisions of GB/T 1184-1996, the machining is in accordance with the K-level precision, and the welding is in accordance with the L-level precision.

6.1.4

The main body shape, welding groove, welding seam, etc. of main parts such as cylinder body and head (end, bottom) shall be fully formed.

meet the relevant requirements of the design documents.

6.1.5

Take measures to prevent contamination of stainless steel materials during the forming process. Pickling and passivation of the surface of austenitic stainless steel parts the parts that need to be welded should be pickled and passivated after welding.

6.1.6

The processed parts should be properly protected to avoid surface damage such as scratches and bruises on the machined surface.

6.1.7

The surface roughness of all exposed surfaces of containers for wet loading shall not be greater than Ra3.2. For containers with painted surfaces such as carbon steel and low-alloy steel, its surface coating shall meet the relevant requirements for long-term corrosion-resistant coatings in relevant nuclear facilities.

6.2 Component assembly

6.2.1

During the assembly process of the container parts, the centering and leveling shall not be carried out by force.