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Anti-corrosion technical conditions for equipment lined with polyolefine (PO)

耐蚀聚烯烃（PO）塑料衬里技术条件

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Anti-Corrosion technical conditions for equipment lined with polyolefine (PO)

1 Scope

This Standard specifies the terms and definitions, classification and application conditions, technical requirements, test methods as well as inspection rules and marks, packaging, transport, storage of anti-corrosion polyolefin (Polyolefine, hereinafter referred to as PO) plastic-lined steel piping and equipment.

This Standard is applicable to PO rotational casting lining steel (hereinafter referred to as C.S) piping and equipment of which the nominal pressure PN is 0.098MPa ~ 1.6MPa, temperature for use is 20°C ~ 100°C, nominal diameter is DN25mm ~ DN8000mm.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 150, *Steel pressure vessel*

GB/T 700, *Carbon structural steels*

GB/T 1047, *Pipework components - Definition and selection of DN (nominal size)*

GB/T 1048, *Nominal pressure for pipe components*

GB/T 1804, *General Tolerances - Tolerances for Linear and Angular Dimensions without Individual Tolerance Indications*

GB/T 5117, *Carbon Steel Covered Electrodes*

GB/T 7122, *Adhesives-Determination of peel resistance of high-strength adhesive bonds - Floating roller method*

GB/T 8163, *Seamless steel tubes for liquid service*

GB/T 8923, *Preparation of steel substrates before application of paints and*

5.2 Materials

5.2.1 PO material is made of polyolefin resin such as high-quality polyethylene (PE) and polypropylene (PP) as the main raw materials, and is mixed with a reasonable ratio. Its performance indicators shall meet the requirements of Table 2. Polyethylene (PE) resin shall meet the requirements of GB/T 11115. Polypropylene (PP) resin shall meet the requirements of GB 12670.

Table 2 -- Performance indicators of PO material

Item	Melting temperature / °C	Tensile strength / MPa	Elongation at break / %
Performance indicator	180~220	10~18	300~500

5.2.2 Shell seamless steel pipe, flange, steel plate material is 20, Q235 or equivalent material. And, the seamless steel pipe shall comply with the provisions of GB/T 8163; the flange shall comply with the provisions of HG/T 20592; Q235 shall comply with the provisions of GB/T 700.

5.2.3 The selection of welding materials and their requirements shall comply with the provisions of Annex D of GB 50236-1998 and GB 5117, respectively.

5.3 Shell

5.3.1 When the nominal diameter $DN \leq 300$, the shell uses seamless steel pipe.

5.3.2 All welds of shell manufacturing must be completed before lining construction.

5.3.3 Shell thickness, welding process and technical requirements shall comply with the provisions of JB/T 4735, GB 150, GB 50316 and HG/T 20678.

5.3.4 The surface to be lined shall be a smooth surface or plane. The corners of the structure and the fillet welds must adopt a circular transition. The fillet radius shall be no less than 5 mm.

5.3.5 The plane to be lined must be rusted. The treated surface shall meet the St2 or BFI requirements of GB/T 8923.

5.4 Structure size

5.4.1 The nominal diameter of the piping is selected in accordance with GB/T 1047.

5.4.2 The nominal diameter of the equipment is selected in accordance with the provisions of GB/T 9019.

5.4.3 The connection flange selects HG/ T 20592 plate flat welding flange. Other flange types in HG/T 20592 series, other flange standards (such as GB, JB, SY, ANSI, JIS, DIN, etc.) or special ones can also be selected according to

Table 5 -- PO lining composite indicator

Item	PO lining composite indicator
Peel strength / (N/cm-50 mm/min)	≥60
NOTE: The unit in the table indicates the force used to peel the unit width (cm) sample at the peeling speed (50 mm/min).	

5.5.6 Hygienic quality

If the product is used in a place where drinking water is safe, the sanitary quality of the PO lining shall comply with the provisions of GB/T 17219.

5.6 Pressure resistance

For the conditions for use of PO lining products, positive pressure test and negative pressure test shall be taken separately or simultaneously. The nominal pressure and test pressure shall meet the requirements of GB 1048.

6 Test methods

6.1 Appearance

Observe with the naked eye, in accordance with the provisions of 5.1.

6.2 Size measurement

Measurements of length and thickness with qualified measuring instruments shall comply with the requirements of 5.4.5 and 5.5.1.

6.3 Electric spark detection

The spark detection is carried out according to the regulations of HG/T 4090.

6.4 Pressure test

6.4.1 Shell test

For the liquid test, the test pressure is 1.5 times the design pressure. After the dwell time is reached, the casing (before the lining) shall not leak or cause structural damage. About compress time, the piping is not less than 2 min, the equipment is not less than 30 min.

6.4.2 Seal test

For the liquid test, the test pressure is 1.1 times the design pressure. The test pressure shall remain unchanged during the holding and testing, no visible dripping. About compress time, the piping is not less than 2 min, the equipment is not less than 30 min.

7.2 Type inspection

7.2.1 Type inspection shall be performed in one of the following situations:

- a) trial model identification for new product;
- b) great changes in structure, material, technique after official production which may affect product performances;
- c) once of every two years in normal production;
- d) production resumed after long-term discontinued production;
- e) required by national quality supervision organization.

7.2.2 Sample for type inspection shall be randomly selected from the products that have passed the exit-factory inspection items. The number of samples is 3. The items for type inspection are all items except sub-clause 6.8 in Clause 6.

8 Marks, packaging, transport, storage

8.1 Marks

There shall be obvious marks on the product: product name, nominal diameter (DN), nominal pressure (PN) and manufacturer trademark, etc.

8.2 Packaging

It shall comply with the provisions of JB/T 4711. And protect the joint pipe and flange surface of the lining pipe and equipment to avoid damage.

8.3 Transport

The product shall not be subjected to violent collision, throwing, or exposure during transport.

8.4 Storage

Products shall be kept in a safe place and stored in a clean room. The stacking site shall be leveled, the stacking height shall not exceed 2m, and the stacking site shall be 1 m away from the heat source. Flange flanging surface protection material shall not be removed, damaged or peeled off when not installed.

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