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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 18241.1-2014

Replacing GB 18241.1-2001

Rubber lining - Part 1: Anticorrosion lining for equipment

橡胶衬里 第1部分：设备防腐衬里

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Foreword

Clauses 5 and 8 of this Standard are mandatory; the rest are recommendatory. GB 18241 Rubber lining consists of five parts. - Part 1. Anticorrosion lining for equipment; - Part 2. Lining for grinding mills; - Part 3. Lining for floatation machine; - Part 4. Anti-corrosion lining for flue gas desulfurization; - Part 5. Anti-corrosion lining with high temperature resistance for equipment. This Part is the first part of GB 18241. This Part was drafted in accordance with the rules given in GB/T 1.1-2009. This Part replaces GB 18241.1-2001 Rubber lining - Part

1 Anticorrosion lining for equipment. Compared with GB 18241.1-2001, the main differences are as follows: - modified the terms and definition of lining (see Clause 3 of this Edition, Clause 3 of Edition 2001); - modified the classification method of lining (see

4.1 of this Edition, Clause 4 of Edition 2001); - modified the marking method of lining (see

4.2 of this Edition, Clause 5 of Edition 2001); - adjusted the technical requirements and performance indicators of lining (see Clause 5 of this Edition, Clause 6 of Edition 2001); - modified the inspection rules for lining (see Clause 7 of this Edition, Clause 8 of Edition 2001); - modified the detection method for integrity of rubber lining (see Annex A of this Edition, Annex B of Edition 2001); - modified the construction and acceptance requirements for rubber anticorrosion lining (see Annex B of this Edition, Annex C of Edition 2001); - deleted Annex A of Edition 2001. Rubber lining - Part 1. Anticorrosion lining for equipment

1 Scope

China's mandatory standard for rubber anticorrosion lining of equipment. It is Part 1 of GB 18241 and specifies the terms and definitions, the classification and product marking, the requirements, the test methods, the inspection rules and the marks, packaging, transport and storage of rubber anticorrosion lining. Rubber lining is how a steel vessel is made to hold something that would otherwise eat it. Hydrochloric acid, dilute sulfuric acid, chloride brines, wet slurries and pickling liquors destroy carbon steel and are too aggressive or too abrasive for many coatings, and a corrosion-resistant alloy vessel costs many times what a lined steel one does. A few millimetres of bonded rubber gives the chemical resistance of the elastomer with the strength of the steel behind it, and where the service is also abrasive - a slurry pipe, a flotation cell, a pickling tank - the rubber outlasts a hard lining because it absorbs the impact instead of chipping. The lining is only as good as its bond and its continuity, and that is what the standard is written around. An unbonded area is a blister that will grow; a pinhole is a path straight to the steel, where corrosion then spreads under the lining and lifts it. So the requirements cover the rubber compounds and their classification by service, the thickness and its uniformity, the hardness, the adhesion to the substrate, the absence of discontinuity, verified by spark testing across the whole surface, and the resistance to the intended medium and temperature. The rules for surface preparation, application and vulcanisation, the inspection regime and the marking complete it. Issued on 24 July 2014 and in force since 1 May 2015, it replaces GB 18241.1-2001.

This Part specifies the terms and definitions, classification and product marking, requirements, test methods, inspection rules as well as marks, packaging, transport and storage of rubber anti-corrosion lining (hereinafter referred to as the lining). This Part is applicable to the rubber lining fit in the lining equipment to prevent equipment from being corroded by media.

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/T 528, Rubber, vulcanized or thermoplastic--Determination of tensile stress-strain properties

GB/T 531.1, Rubber vulcanized or thermoplastic - Determination of indentation hardness - Part 1. Durometer method (Shore hardness)

GB/T 1690, Rubber vulcanized or thermoplastic - Determination of the effect of liquids

GB/T 7760, Rubber, vulcanized or thermoplastic--Determination of adhesion to a rigid substrate--90 degrees peel method

GB/T 11211, Rubber vulcanized or thermoplastic - Determination of adhesion to metal - Two - Plate method

HG/T 3845, Ebonite - Determination of impact strength

HG/T 3849, Ebonite - Determination of tensile strength and elongation at break

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 heat-vulcanized rubber lining heat-vulcanized rubber lining refers to an un-vulcanized rubber sheet which is pasted on the lining equipment by adhesive to form a vulcanized lining

3.2 pre-vulcanized rubber lining pre-vulcanized rubber lining refers to a pre-heated vulcanized rubber sheet which is pasted on the lining equipment by adhesive to form a lining

3.3 self-curing rubber lining self-curing rubber lining refers to an un-vulcanized rubber sheet which is pasted on the lining equipment by adhesive to complete the vulcanization process under natural conditions

4.1 Classification

4.1.1 Lining, according to the need for heating vulcanization, is classified into two categories.

- a) heat-vulcanized rubber lining, expressed as J;
- b) non-heat-vulcanized rubber lining. 1) pre-vulcanized rubber lining, expressed as Y; 2) self-curing rubber lining, expressed as Z.

4.1.2 The lining is classified into two categories according to the hardness after vulcanization.

- a) hard adhesive, expressed as Y;
- b) soft adhesive, expressed as R.

4.1.3 The classification of the lining is shown in Table 1. Table

1 Classification of rubber lining
Classification Heat-vulcanized hard adhesive
Heat-vulcanized soft adhesive Pre-vulcanized soft adhesive Self-curing soft adhesive All
technical requirements listed in this section are type inspection items. Usually, the type inspection should be conducted in one of the following cases.

- a) test stereotypes identification of new product or old product conversion production;
- b) after the formal production, for example, when the structure, material, process,

production equipment, regulatory agencies have significant changes that may affect product performance;

c) during formal production, for annual inspection;

d) when production is resumed after the production has been discontinued for more than six months;

e) when the results of the exit-factory inspection and the previous type inspection are quite different;

f) when state quality supervision agencies require to carry out the type inspection.

7.3 Determination rules

7.3.1 If one item of specification and surface quality fails, this roll shall be determined as unqualified.

7.3.2 If one item of physical properties listed in Table 3 and resistance to chemical media properties listed in Table 4 fails to meet requirements, it shall take double test specimens from the same batch of products for the re- inspection of this item. If the results of the re-inspection are still unqualified, this batch of products shall be unqualified.

7.3.3 Lining rubber sheet integrity detection, if one part of the selected roll fails, this roll shall be determined as unqualified, it shall take double rolls from the same batch of products for the re-inspection of this item. If the results of the re-inspection are still unqualified, it shall detect each roll. Determine whether each roll is qualified based on the test results.

7.3.4 If specifications, surface quality, physical properties, resistance to chemical media properties and lining integrity are all qualified, this batch of products shall be determined as qualified.

8 Marks, packaging, transport and storage

8.1 The heated vulcanized rubber sheet and the self-curing rubber sheet may be covered with a plastic film or pad as a spacer on the mandrel and suspended in the box. The pre-vulcanized sheet can be placed directly in the box.