

ICS 25.160.10

NB

**ENERGY INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

NB/T 47018.4-2022

**Technical conditions for ordering welding materials for
pressure equipment - Part 4: Submerged arc welding wire and
flux**

(English Translation)

Issued on: November 4, 2022

Implemented on: December 31, 2022

Issued by: National Energy Administration

Table of Contents

Foreword...	3
1 Scope...	6
2 Normative References...	6
3 Technical Requirements...	7
4 Test Methods...	12
5 Product Identification...	14

Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part 1: Rules for the Structure and Drafting of Standardizing Documents.

This Document is Part 4 of NB/T 47018 Technical Specification of Welding Materials for Pressure Equipment. NB/T 47018 consists of the following parts:

- Part 1: General Rules of Procurement;
- Part 2: Electrodes for Steel;
- Part 3: Steel Electrodes and Rods for Gas Shielded Arc Welding;
- Part 4: Electrodes and Fluxes for Submerged Arc Welding;
- Part 5: Stainless-Steel Strip Electrodes and Fluxes for Overlay Welding;
- Part 6: Aluminum and Aluminum Alloy Welding Wires and Filler Wires;
- Part 7: Titanium and Titanium Alloy Welding Wires and Filler Wires;

This Document replaced NB/T 47018.4-2017 Technical Specification of Welding Materials for Pressure Equipment - Section 4: Electrodes and Fluxes for Submerged Arc Welding. Compared

with NB/T 47018.4-2017, the major technical changes of this Document are as follows besides

structural adjustments and editorial modifications:

- a) In the normative references, the original GB/T 5293 Carbon Steel Electrodes and Fluxes for Submerged Arc Welding was renamed as Solid Wire Electrodes, Tubular Cored

Electrodes and Electrode/Flux Combinations for Submerged Arc Welding of Non-Alloy And Fine Grain Steels; the original GB/T 12470 Low-Alloy Steel Electrodes and Fluxes for Submerged Arc Welding was renamed as Solid Wire Electrodes, Tubular Cored Electrodes and Electrode/Flux Combinations for Submerged Arc Welding of Creep-Resisting Steels; the original GB/T 17854 Stainless Steel Electrodes and Fluxes for Submerged Arc Welding was renamed as Solid Wire Electrodes/Flux Combinations for Submerged Arc Welding of Stainless Steels; and two standards, GB/T 36034 Solid Wire Electrodes, Tubular Cored Electrodes and Electrode/Flux Combinations for Submerged Arc Welding of High Strength Steels and GB/T 36037 Fluxes for Submerged Arc Welding and Electroslag Welding were added (see the Clause 2 of this Edition);

b) Change the contents of the quality certificate [see b) in 3.1.2 of this Edition; b) in 3.1.2 of the 2017 Edition];

c) Change the specific provisions on the interchangeability of flux batch numbers and electrode batch numbers in the welding material quality certificate (see 3.1.3, 3.1.4 of this Edition; 3.1.3 of the 2017 Edition);

Specification of Welding Materials for Pressure Equipment -

Section 4: Electrodes and Fluxes for Submerged Arc Welding

1 Scope

This Document specifies the technical requirements, test methods and product identification of

submerged arc welding steel electrodes, fluxes and electrode-flux combinations.

This Document is applicable to non-alloy steel and fine-grained steel solid electrodes and electrode-flux combinations for submerged arc welding, heat-resistant steel solid electrodes and

electrode-flux combinations, high-strength steel solid electrodes and electrode-flux combinations, and stainless-steel solid electrodes and electrode-flux combinations of pressure equipment.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates

indicated are applicable to this Document; for the undated documents, only the latest version

(including all the amendments) is applicable to this Document.

GB/T 2653 Bend test methods on welded joints

GB/T 3965 Methods for determination of diffusible hydrogen in deposited metal

GB/T 5293 Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of non-alloy and fine grain steels

GB/T 12470 Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of creep-resisting steels

GB/T 17854 Solid wire electrodes/flux combinations for submerged arc welding of stainless steels

GB/T 29713 Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels

GB/T 36034 Solid wire electrodes, tubular cored electrodes and electrode/flux combinations for submerged arc welding of high strength steels

GB/T 36037 Fluxes for submerged arc welding and electroslag welding

NB/T 47013.2 Nondestructive testing of pressure equipment - Part 2: Radiographic testing

NB/T 47013.11 Nondestructive testing of pressure equipment - Part 11: X-ray computed radiographic testing

NB/T 47014 Welding procedure qualification for pressure equipment

NB/T 47018.1 Technical permission of welding materials for pressure equipment - Part 1: General rule

3.1.1 In addition to complying with the provisions of GB/T 5293, GB/T 12470, GB/T 17854,

GB/T 36034, GB/T 36037, GB/T 29713, the steel electrodes and fluxes for submerged arc welding of non-alloy steel and fine-grained steel, heat-resistant steel, high-strength steel and

stainless steel for pressure equipment shall also comply with the provisions of NB/T 47018.1 and this Document.

3.1.2 The quality certificate of submerged arc welding materials for pressure equipment shall

include the following contents:

a) The batch number of the flux and the batch number of the combined electrode, as well as

the inspection results of the electrode, flux and the deposited metal after the welding of the combination;

b) The impurity elements S and P contents of the flux for non-alloy steel, fine-grained steel, heat-resistant steel, high strength steel and stainless steel, and the metallurgical property code shall be indicated.

3.1.3 For heat-resistant steel with standard tensile strength of deposited metal no less than 620

MPa, fine-grained steel with standard impact test temperature lower than -70°C, high-strength

steel welding materials with standard impact test temperature lower than -20°C, or at the request

of the purchaser, the batch number of electrode and flux for submerged arc welding shall be the

same as the content of the quality certificate in accordance with 3.1.2. In addition, the batch number of the same type of electrode and flux supplied by the same welding material manufacturer can be interchangeable and shall be indicated in the quality certificate.