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

NB/T 47018.6-2022

**Technical conditions for ordering welding materials for
pressure equipment - Part 6: Aluminum and aluminum alloy
welding wires and filler wires**

(English Translation)

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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 6 of NB/T 47018 Technical Permission 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 47018.6-2011 Technical Permission of Welding Materials for Pressure Equipment - Part 6: Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods. Compared with NB/T 47018.6-2011, the major technical changes of this Document are

as follows besides the structural adjustments and editorial modifications:

a) Deleted the relevant contents on model classification and model compilation method (see

Clause 3 of the 2011 Edition);

- b) Modify the model representation method of aluminum welding wire and filler wire according to GB/T 10858; delete the uncommon aluminum alloy welding wires SA14009, SA14011, SA14010, SA14145, SA14643, SA15654; and add SA15087 (see Table 1 of this Edition; Table 1 of the 2011 Edition);
- c) Delete the table of chemical composition requirements for aluminum welding wire and filler wire; and implemented it according to GB/T 10858 (see 3.2.1 of this Edition; 4.2.1 and Table 2 of the 2011 Edition);
- d) Add barreled welding wire and specific requirements (see 3.3.2 of this Edition);
- e) Add relaxation diameter and warpage and specific inspection requirements (see 3.5 of this Edition);
- f) Change the designation of the parent materials used for the test (see Table 3 of this Edition;

Table 3 of the 2011 Edition);

Specification of Welding Materials for Pressure Equipment -
Section 6: Bare Aluminum and Aluminum-Alloy Welding
Electrodes and Rods

1 Scope

This Document specifies the technical requirements, test methods, inspection rules and product

identification of aluminum and aluminum alloy welding wires and filler wires.

This Document is applicable to aluminum and aluminum alloy welding wires and filler wires for gas welding, gas tungsten arc welding, gas metal arc welding and plasma arc welding 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 10858-2008 Aluminum and Aluminum Alloy Wires and Rods

GB/T 20975 (all parts) Methods for chemical analysis of aluminum and aluminum alloy

NB/T 47018.1-2011 Technical permission of welding materials for pressure equipment -

Part 1: General rule

NB/T 47013.2-2015 Nondestructive testing of pressure equipment - Part 2: Radiographic testing

3.1 General requirements

Aluminum and aluminum alloy welding wires and filler wires for pressure equipment shall, in addition to complying with the provisions of GB/T 10858, also comply with the provisions of NB/T 47018.1 and this Document.

3.2.1 The physical and chemical inspection items of welding wire and filler wire shall be carried

out in accordance with the provisions of Table 1.

3.2.2 The chemical composition of welding wire and filler wire shall comply with the

provisions of GB/T 10858.

3.2.3 The radiographic test of welding wire deposited metal shall be carried out in accordance

with NB/T 47013.2-2015. The technical level of radiographic test shall be no lower than Level-

AB, and the quality level shall be Level-I.

3.2.4 The filler wire shall be inspected for flat plate overlaying weld bead, requiring good

molten pool fluidity and no spatter. The weld bead shape is regular, the width and height are uniform, the surface is smooth, and there are no cracks or pores.

3.2.5 The deposited metal of welding wire and the overlaying weld metal of filler wire shall be

subjected to bending test. After the bending specimen is bent to the specified angle, there shall

be no single opening defect with a length greater than 3 mm in any direction in the deposited

metal on the tensile surface. The corner opening defect of the deposited metal of the specimen

can be ignored; but the length of the corner opening defect caused by un-fusion, inclusions or

other internal defects shall be included.

3.3.1 The surface of welding wire and filler wire shall be bright and smooth. It can be observed

visually and with a 20x magnifying glass. There shall be no burrs, pits, scratches, oxide scale,

cracks, folds or inclusions. The welding wire shall not have knots, waves, bends and other defects that affect continuous wire feeding. There shall be no obvious difference in the color of

the welding wire; and it should be performed polishing treatment.

3.3.2 Coiled welding wire and barreled welding wire shall be continuous. The coiled welding

wire layer shall be well-wound, neatly and tightly arranged, without pressed wire, without wire

clamping, and without joints on the surface. The barreled welding wire manufacturer shall match the appropriate auxiliary wire feeding device. All welding wires shall be able to ensure

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