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NB

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

NB/T 47065.3-2018

Replacing JB/T 4712.3-2007

Vessel support - Part 3: Lug support

容器支座 第3部分：耳式支座

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Foreword

This document was issued on 3 April 2018 by the National Energy Administration of the PRC and takes effect on 1 July 2018.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 23, Chinese classification J 74.

It replaces JB/T 4712.3-2007, which is superseded.

NB/T 47065-2018 Vessel supports is divided into the following five parts:

- Part 1: Saddle support (NB/T 47065.1-2018);
- Part 2: Leg support (NB/T 47065.2-2018);
- Part 3: Lug support (NB/T 47065.3-2018);
- Part 4: Supporting-type support (NB/T 47065.4-2018);
- Part 5: Rigid ring support (NB/T 47065.5-2018).

This document is Part 3 of NB/T 47065-2018: Lug support.

This part was drafted in accordance with the rules given in GB/T 1.1-2009 Directives for standardization - Part 1: Structure and drafting of standards.

This part replaces JB/T 4712.3-2007 Vessel supports - Part 3: Lug support. Compared with JB/T 4712.3-2007, the main technical changes are as follows:

- the materials adopted for the main body of the lug support are Q235B, S30408 and 15CrMoR;
- the permissible service temperature range of the lug support is given as minus 100 degrees Celsius to 300 degrees Celsius;
- the allowable bending moment [ML] of the shell at the support is given for allowable stresses of the equipment cylinder of $[\sigma] = 120 \text{ MPa}$, 140 MPa , 167 MPa and 185 MPa ;
- a requirement has been added for the superposition of the loads arising from pipe thrust and from vertical seismic force.

This part was proposed by and is under the jurisdiction of the National Technical Committee on Boilers and Pressure Vessels of Standardization Administration of China (SAC/TC 262).

The drafting of this part was organized by the Design Sub-committee of the National Technical Committee on Boilers and Pressure Vessels of Standardization Administration of China.

Drafting organization of this part: East China Engineering Science and Technology Co., Ltd.

Main drafters of this part: Liu Jixiang, Meng Yongxiang and Liu Xiaolin.

SAC/TC 262 is responsible for the interpretation of this part.

The previous editions of the standard replaced by this part are as follows:

- JB/T 4725-1992;
- JB/T 4712.3-2007.

1 Scope

NB/T 47065.3-2018 standardises lug supports for pressure vessels, replacing JB/T 4712.3-2007. A lug support is the bracket welded to the shell of a vertical vessel so that the vessel can rest on a structural steel frame or on a concrete platform, and because the load passes through a small welded attachment into a thin curved shell, its geometry and its allowable load cannot be left to the designer's judgement. The standard fixes the types of lug support and their designation, the range of vessel diameters each type serves, and the complete dimensions of every size: the gusset plates, the base plate, the pad plate that spreads the load into the shell, the bolt holes and the weld sizes. Tables of allowable load are given for each type and size, distinguishing the load the support itself can carry from the load the shell can accept, with the reinforcing pad and without it. The materials

permitted for each component are listed with the temperature range over which they may be used, and the fabrication requirements cover cutting, forming, weld preparation, welding and the flatness and squareness of the finished assembly. A calculation appendix sets out how the pressure and load combination on the shell at the attachment is determined. Anyone designing, fabricating or checking vertical pressure vessels to Chinese practice uses this part to select and verify the supports.

1.1 This part specifies the structural types, the series parameters and dimensions, the materials, the marking, the technical requirements for manufacture and the selection instructions of lug supports.

1.2 This part is applicable to:

- a) vertical cylindrical vessels with a nominal diameter not greater than 4 000 mm;
- b) a permissible service temperature of minus 100 degrees Celsius to 300 degrees Celsius.

2 Normative references

The following 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 985.1 Recommended joint preparation for gas welding, manual metal arc welding, gas shielded arc welding and beam welding.

GB/T 1804 General tolerances - Tolerances for linear and angular dimensions without individual tolerance indications.

NB/T 47013.1 Nondestructive testing of pressure equipment - Part 1: General requirements.

NB/T 47013.4 Nondestructive testing of pressure equipment - Part 4: Magnetic particle testing.

NB/T 47013.5 Nondestructive testing of pressure equipment - Part 5: Penetrant testing.

NB/T 47015 Welding specification for pressure vessels.

3 Type characteristics

The type characteristics of lug supports are given in Table 1.

Table 1 - Type characteristics. The columns of the table are: type; support number; pad plate; cover plate; applicable nominal diameter DN in mm; support dimensions (see figure and table).

Short arm, type A, support numbers 1 to 5: a pad plate is provided; no cover plate is

provided; applicable nominal diameter DN 300 mm to 2 600 mm; dimensions according to Figure 1 and Table 2.

Short arm, type A, support numbers 6 to 8: a pad plate is provided; a cover plate is provided; applicable nominal diameter DN 1 500 mm to 4 000 mm; dimensions according to Figure 2 and Table 2.

Long arm, type B, support numbers 1 to 5: a pad plate is provided; no cover plate is provided; applicable nominal diameter DN 300 mm to 2 600 mm; dimensions according to Figure 3 and Table 3.

Long arm, type B, support numbers 6 to 8: a pad plate is provided; a cover plate is provided; applicable nominal diameter DN 1 500 mm to 4 000 mm; dimensions according to Figure 4 and Table 3.

Extended long arm, type C, support numbers 1 to 3: a pad plate is provided; a cover plate is provided; applicable nominal diameter DN 300 mm to 1 400 mm; dimensions according to Figure 5 and Table 4.

Extended long arm, type C, support numbers 4 to 8: a pad plate is provided; a cover plate is provided; applicable nominal diameter DN 1 000 mm to 4 000 mm; dimensions according to Figure 6 and Table 4.

4 Series parameters and dimensions

4.1 Type A lug supports shall comply with Figure 1, Figure 2 and Table 2; type B lug supports shall comply with Figure 3, Figure 4 and Table 3; type C lug supports shall comply with Figure 5, Figure 6 and Table 4.

4.2 The thickness of the pad plate of the support shall meet the requirements of this part; in general it should be equal to the thickness of the shell course, and it may also be increased according to actual needs.

Figure 1 - Type A (support numbers 1 to 5). The views show the base plate of length l_1 and width b_1 and thickness δ_1 , the rib plate of width b_2 and thickness δ_2 and projection b_4 , the overall height H and the pad plate length l_3 , the eccentricity e , a vent hole of diameter 8 mm in the pad plate, the pad plate corner radius R equal to three times δ_3 , the bolt hole of diameter d at the distance s_1 with a fixed 30 mm dimension, and in view A the pad plate of width b_3 and thickness δ_3 shaped to fit the outside profile of the shell, with the pad plate height l_2 .

Figure 2 - Type A (support numbers 6 to 8). Same arrangement as Figure 1, with the addition of a cover plate of thickness δ_4 laid over the rib plates.

Figure 3 - Type B (support numbers 1 to 5). Long arm configuration without cover plate; the rib plate projects further from the shell than in type A.