 LINDE AG Process Engineering and Contracting Division	Specification for the Insulation of Oxygen-Bearing Plant Components Insulation Type OS		LINDE STANDARD 151-07 Part 3
Orig.: CAM/Fürb.;Tro.	Checked: CAM/Kögl.	Appr.: TAN/Hent.	Total 6 Pages

LS-Class: BM

Descriptors: Oxygen, Specification, Insulation, Type OS

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1 Scope

1.1 This standard shall apply to the sound insulation of oxygen-bearing plant components with an oxygen content of $\geq 70\%$ and an operating temperature of $>15\text{ °C}$ to 100 °C .

2 Purpose

2.1 In supplement to Part 1, this part of the standard describes the design criteria for the application of a functionally effective sound insulation using mineral fibre mats.

3 Definitions

3.1 Linde Standard 151-07 Part 1, Section 3 applies analogously.

3.2 **Sound insulation** in the sense of this standard are the measures taken in the form of insulations on plant components, in order to achieve a reduction in the radiated sound which is propagated in the air.

4 Reference Codes and Standards

4.1 LS 151-07 Part 1, Specification for the Insulation of Oxygen-Bearing Plant Components.

5 Identification of the Insulation Types

5.1 In the technical documents, the sound insulation is identified with insulation type OS and the insulation thickness in mm.

6 Materials

6.1 Delivery, Storage and Documentation

See Linde Standard 151-07 Part 1, Section 6.1

6.2 Supporting and Bearing Structures

See Linde Standard 151-07 Part 1, Section 6.2.1

6.3 Insulating Layer

See Linde Standard 151-07 Part 1, Section 6.3.1 and 6.3.2

6.4 Jacketing

See Linde Standard 151-07 Part 1, Section 6.4

6.5 Accessory Materials

Linde Standard 151-07 Part 1, Section 6.5 applies analogously.

7 Performance of the Insulation Work

7.1 General

See Linde Standard 151-07 Part 1, Section 7.1

7.2. Supporting and Bearing Structures

See Linde Standard 151-07 Part 1, Section 7.2.1.

7.3 Insulating Layer

7.3.1 General

The following insertion loss shall be maintained in relation to the insulation thickness and the nominal diameter.

Table 1: Insertion loss

Insulation Thickness	Insertion loss in octave band 2 kHz	Nominal diameter
30 mm	10 dB	≥ DN 50
50 mm	20 dB	≥ DN 100
100 mm	30 dB	≥ DN 200

7.3.2 Design of the Insulating Layer using Mineral Fibre Mats

See Linde Standard 151-07 Part 1, Section 7.3.1 and 7.3.2. In addition, the following shall be observed:

- The arrangement and insulation thicknesses for the sound insulation on piping installed components are shown in Table 2.

Table 2: Insulation Type on Installed Components

Insulation thickness Piping	Control valves	Valves, gate valves, butterfly valves, dirt traps, flange connections	Drains, vents, pipes ≤ DN 50
< 50mm	ON	ON	ON/ OW ¹⁾
50 mm	OS 50	ON	ON/ OW ¹⁾
> 50 mm	OS 50	OS 50	OS 30/ OW ¹⁾
1) If thermal insulation (hot service) is required.			

- The design of the insulating layer on piping and flanged plant components are shown in Figures 1 to 3. The design of the insulating layer on equipment is performed by analogy with Linde Standard 151-07 Part 1, Sections 8.1.1 to 8.1.3, and is not illustrated in this part.

7.4 Jacketing

Linde Standard 151-07 Part 1, Section 7.4 applies analogously. In addition, the following shall be observed:

- The jacketing shall exhibit the following minimum thicknesses:

Table 3: Minimum Thicknesses of Jacketing

Insulation thickness of the sound insulation	Sheet metal thickness of the jacketing
≤ 30 mm	0.8 mm
> 30 mm	1.0 mm

- For weight reasons, a jacketing of aluminium sheet is not used. In exceptional cases, the approval for the use of aluminium sheet shall be obtained in writing from Linde Process Engineering and Contracting Division.
- In order to achieve structure-borne sound insulating properties of the jacketing, a second jacket is installed on straight pipe sections. The inner jacket does not have to be corrugated and sealed, but should lie flush with the surface of the outer jacket.
- The design of the jacketing for piping and flanged plant components are shown in Figures 1 to 3. The design of the jacketing on equipment is performed by analogy with Linde Standard 151-07 Part 1, Sections 8.1.1 to 8.1.3, and is not illustrated in this part.

8 Drawings and Sketches

8.1 Piping

8.1.1 Insulation of Horizontal Piping

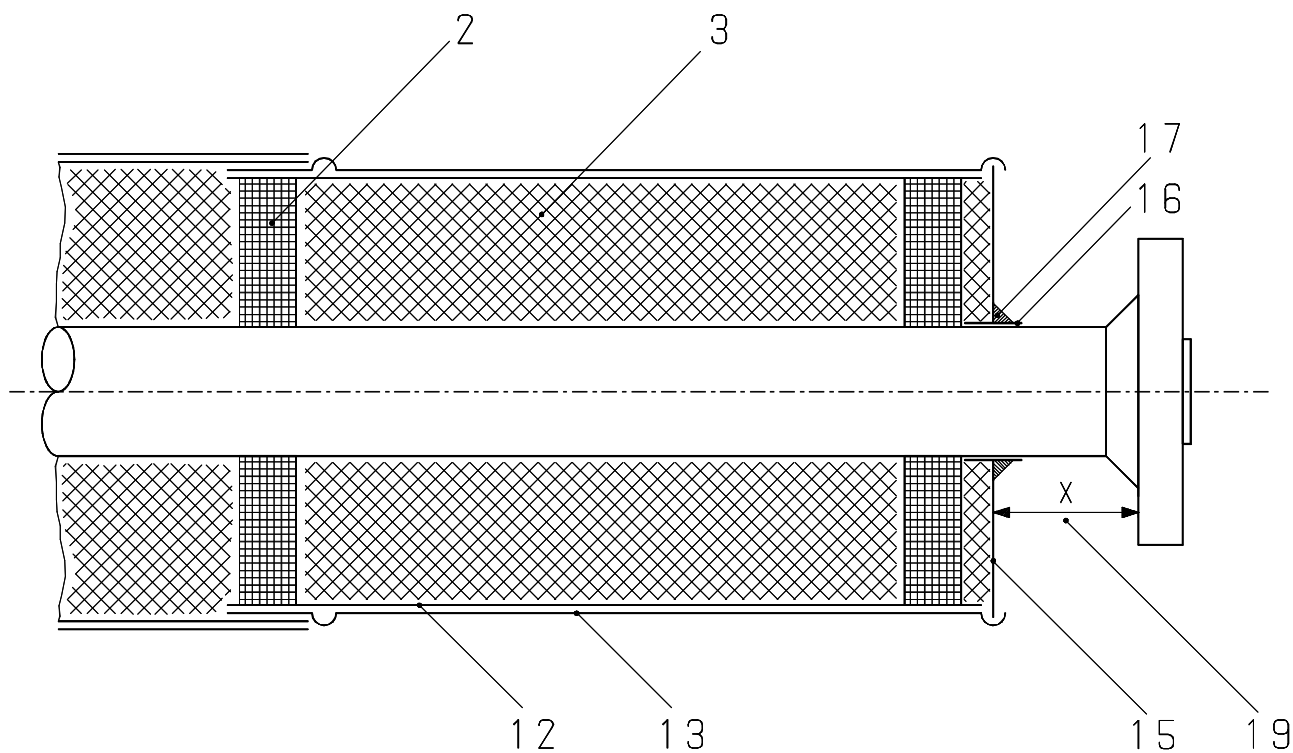


Figure 1

- 2 Jacketing of supporting structure
- 3 Mineral fibre mats
- 12 Inner jacket
- 13 Outer jacket
- 15 Insulation end section
- 16 Glassfibre tape
- 17 Gun-grade sealing compound
- 19 $x = \text{Bolt length} + 20 \text{ mm}$

8.2 Flanged Plant Components

8.2.1 Insulation of flanges

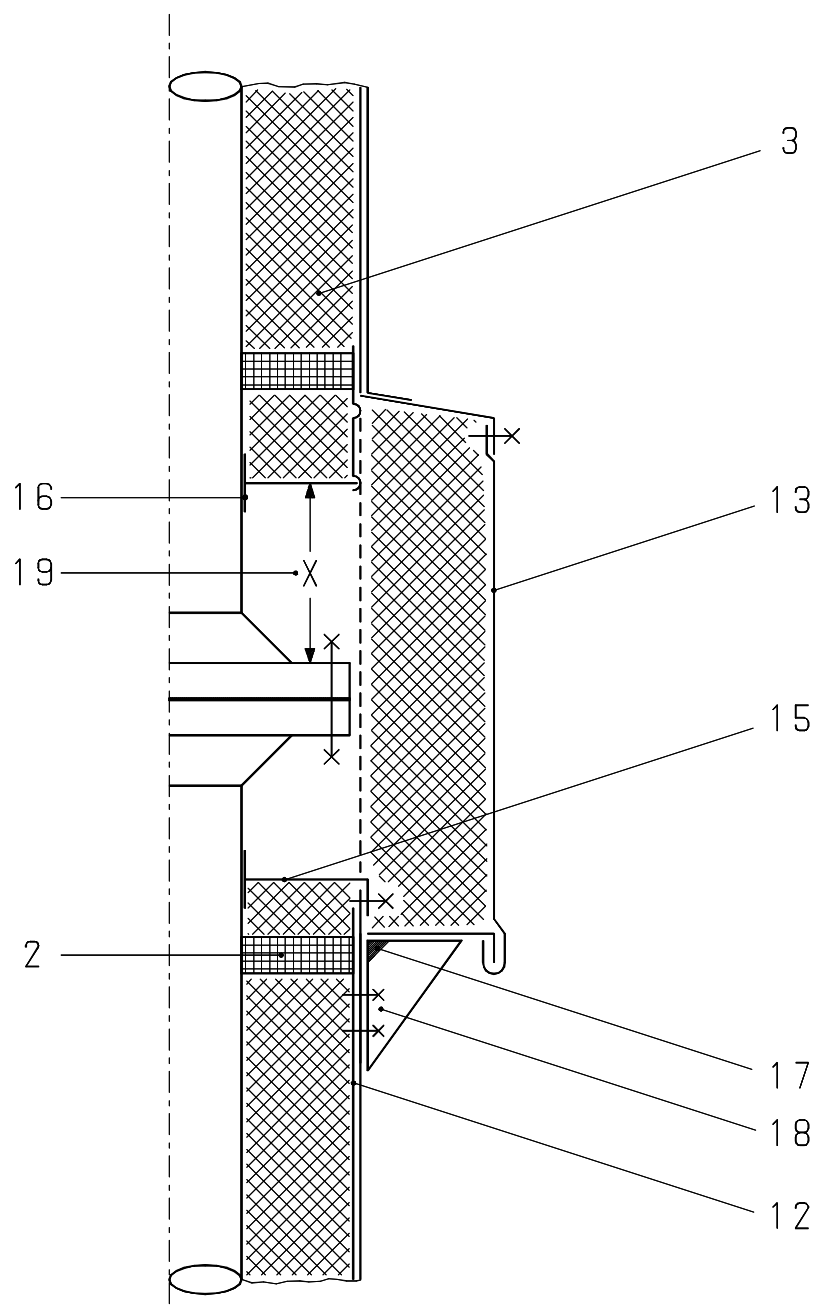


Figure 2

- 2 Jacketing of supporting structure
- 3 Mineral fibre mats
- 12 Inner jacket
- 13 Outer jacket
- 15 Insulation end section
- 16 Glassfibre tape
- 17 Gun-grade sealing compound
- 18 Cap support
- 19 $x = \text{Bolt length} + 20 \text{ mm}$

8.2.2 Insulation of Valves

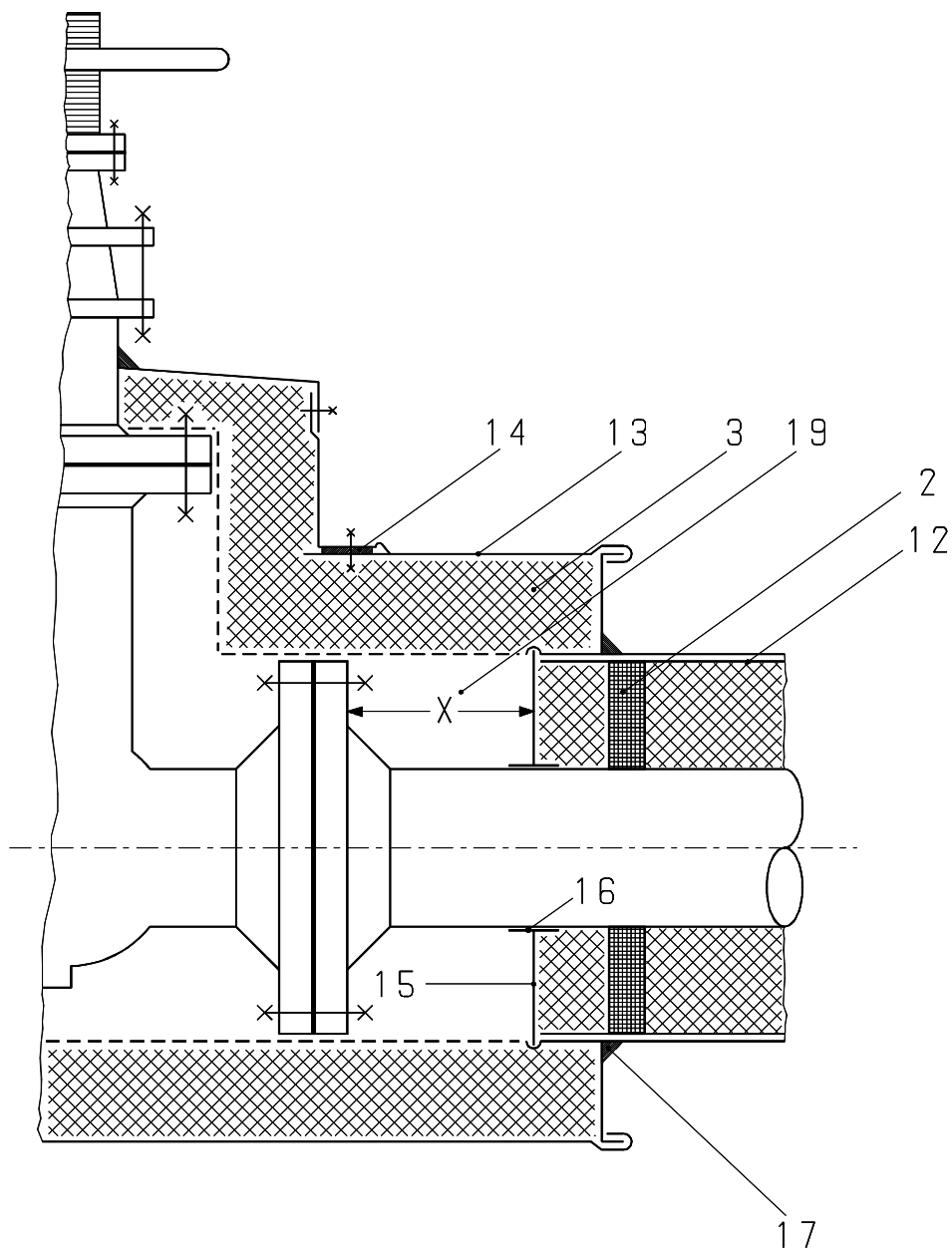


Figure 3

- 2 Jacketing of supporting structure
- 3 Mineral fibre mats
- 12 Inner jacket
- 13 Outer jacket
- 14 Sealing tape
- 15 Insulation end section
- 16 Glassfibre tape
- 17 Gun-grade sealing compound
- 19 $x = \text{Bolt length} + 20 \text{ mm}$