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

MT/T 681-1997

**Reducer for belt conveyor for coal mining. Technical condition
(English Translation)**

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Foreword

This standard mainly references ZBJ19009-88 "General technical conditions for cylindrical gear reducers" and MT 101-90 "for scraper conveyors Reducer Inspection Specifications.

This standard is proposed by the Department of Science, Technology and Education of the Ministry of Coal Industry.

This standard is under the jurisdiction of the Standardization Technical Committee for Special Equipment for Coal Mine of the Ministry of Coal Industry.

This standard was drafted. Coal Research Institute Shanghai Branch.

1 Scope

This standard specifies the technical requirements and inspection contents, requirements, and methods of belt conveyor reducers for coal mines.

This standard applies to reducers for belt conveyors used in coal mines.

2 Reference standards

The following standards contain provisions that, through reference in this standard, constitute provisions of this standard. When this standard was published, the editions shown were all is effective. All standards will be revised, and all parties using this standard should explore the possibility of using the latest versions of the following standards.

GB/T 3077-88 Technical conditions for alloy structural steel GB/T 3323-87 Radiography and quality classification of steel fusion welded butt joints GB/T 3768-83 Simple method for determination of sound power level of noise sources GB/T 9439-88 gray cast iron GB/T 10095-88 involute cylindrical gear accuracy GB/T 11365-89 Accuracy of bevel gears and hypoid gears GB/* 11368-89 Cleanliness of gear transmission MT/T 101-93 Inspection

Specification for Reducer for Scraper Conveyor ZBJ19004-88 cylindrical gear reducer
ZBJ19005-88 Cylindrical gear reducer loading test method ZBJ19009-88 general technical
requirements of cylindrical gear reducer ZBJ19026-90 reducer for transportation machinery
Coal Mine Safety Regulations (92 edition)

3.1 Conditions of use

3.1.1

The reducer shall meet the requirements of this standard and be manufactured in accordance with the drawings and documents approved by the prescribed procedures.

3.1.2

The working environment temperature of the reducer is $-10 \sim 40\text{ }^{\circ}\text{C}$; when the ambient temperature is lower than $0\text{ }^{\circ}\text{C}$, the lubricating oil should be preheated accordingly.

3.1.3

The working conditions of the reducer shall comply with the provisions of the "Coal Mine Safety Regulations".

3.2 Service life

The service life of the reducer must not be less than 20000h, and the service life of the bearing must not be less than 5000h.

3.3 Sealing performance

The reducer must be free from oil leakage or oil leakage, and dirt and water must not be allowed to penetrate into the body.

3.4 Mechanical efficiency

Under rated load, the oil temperature of the reducer reaches the thermal equilibrium temperature, or the oil temperature of the reducer using internal water cooling is $75\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ when the reducer is a hard toothed surface transmission, the efficiency of each stage is not less than 0.98; soft toothed surface transmission. the efficiency of each stage is not less than 0.965.

3.5 Body and cover

3.5.1

The box can be cast or welded. When casting, its mechanical properties must not be lower than HT200 in GB/T 9439.

3.5.2

The casting body and cover must not have casting defects such as slag inclusion, shrinkage, looseness, cracks, etc.

3.5.3

Weldments of weldments shall meet the requirements of Class I welds in GB/T 3323.

3.5.4

The casting body and cover need to be aged, and the welding body and cover need to be annealed.

3.5.5

The kerosene leakage test should be performed before the box assembly, and the box must not have oil leakage or oil leakage.

3.5.6

When the bonding surface of the machine body and the cover is in a free bonding state, the contact tightness of the bonding surface should be checked.

Stuffed.

3.5.7

After the body and the cover are closed, the edges should be flush, and the displacement of each side should not be greater than 2mm.

3.6 Gears and gear shafts

3.6.1

The main transmission parts shall be forgings, and the materials used shall comply with the requirements of GB/T 3077, and all shall have the manufacturer's certificate or the right Inspection Qualification Form for the operation.

3.6.2

When the power of the reducer is less than 90kW, the accuracy of the three tolerance groups of the gear must not be lower than the level 8 specified in GB/T 10095 when the power is greater than or equal to 90kW, the accuracy of the third tolerance group of the gear must not be lower than level 7, and the accuracy of the first and second tolerance groups must not be lower than level 8.

3.6.3

Cylindrical gear inspection items shall comply with the requirements of Table 1, and other equivalent inspection item combinations are allowed.

Table 1

Tolerance group I Tolerance group II Tolerance group III Fr and Fw ff and fpt Fbeta

1 When one of them is out of tolerance, the gear accuracy should be checked and accepted according to Fp.

2 Each inspection accuracy value is selected in accordance with GB/T 10095.

3.6.4

The contact spots on the tooth surface of the spur gear shall meet the requirements in Table 2.

Table 2

Contact spots, %

Accuracy class

Press height is not less than 65 65 65 65 55 (45) 50 (40) 45 (35) 40 (30) not less than 95 95 95 90 80 70 60 50

1 The values in parentheses are used for helical gears with axial coincidence epsilon 0.8.

2 The accuracy of each inspection shall be selected in accordance with GB/T 10095.

3.6.5

The minimum normal backlash of a spur gear shall meet the requirements in Table 3.

table 3

Center distance/mm	Minimum normal limit backlash/ μm	Center distance/mm	Minimum normal limit backlash/ μm
≤ 80	120	315 ~ 400	230
80 ~ 125	140	400 ~ 500	250
125 ~ 180	160	500 ~ 630	280
180 ~ 250	185	630 ~ 800	320
250 ~ 315	210	800 ~ 1000	360

3.6.6

The inspection items of the bevel gear shall comply with the requirements in Table 4, and other equivalent inspection item combinations are allowed.

Table 4

Tolerance group I Tolerance group II Tolerance group III Gear gear pair gear gear pair gear gear pair Fp and Fpk Fic Fpt and Fck Fskc Contact spots

3.6.7

The minimum normal limit backlash of the bevel gear is selected from class b specified in GB/T 11365, the maximum normal limit backlash and the minimum normal limit.

The value of backlash should meet the requirements of GB/T 11365.