



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

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Code for Design of Steel Silo Structures

钢筒仓技术规范

(English Translation)

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Table of Contents

Foreword	
1 General provisions	
2 Terms and symbols	
2.1 Terms	
2.2 Symbols	
3 Basic requirements	
3.1 General requirements	
3.2 Materials	
3.3 Structural layout principles	
3.4 Structural type selection	
4 Loads and load effect combinations	
4.1 General requirements	
4.2 Stored material loads	
4.3 Seismic action	
4.4 Load effect combinations	
5 Circular steel silos	
5.1 General requirements	
5.2 Silo roof	
5.3 Silo wall	
5.4 Silo bottom	
5.5 Detailing	
6 Rectangular steel silos	
6.1 General requirements	
6.2 Structural calculation	
6.3 Detailing	
7 Supporting structure and foundation	
8 Lining and protection	
Appendix A Physical property parameters of common stored materials	
Appendix B Formulae for calculating stored material pressure in shallow circular silos	
Appendix C Calculation coefficients for stored material loads	
Appendix D Membrane internal forces of shells of revolution under symmetrical loads	
Explanation of wording in this code	

List of quoted standards

Addition: Explanation of provisions

Foreword

This code was compiled jointly by China Nerin Engineering Co., Ltd. together with the organizations concerned in accordance with the requirements of the "Notice on Printing and Distributing the Plan for the Formulation and Revision of Engineering Construction Standards and Codes in 2007 (Second Batch)" (JIANBIAO [2007] No. 126) issued by the former Ministry of Construction.

During the compilation of this code, the drafting group carried out extensive investigation and research, conscientiously summarized the experience of steel silo construction, referred to the relevant contents of related domestic and foreign industry standards and, on the basis of widely soliciting opinions, compiled this code.

This code consists of 8 chapters and 4 appendices. The main technical contents include: general provisions; terms and symbols; basic requirements; loads and load effect combinations; circular steel silos; rectangular steel silos; supporting structure and foundation; lining and protection, etc.

The provisions printed in bold type in this code are compulsory provisions and shall be strictly implemented.

The Ministry of Housing and Urban-Rural Development is in charge of the administration of this code and the explanation of the compulsory provisions, the Administration Office of Engineering Construction Standards and Codes of the China Nonferrous Metals Industry is responsible for routine management, and China Nerin Engineering Co., Ltd. is responsible for the explanation of technical contents. If there are any opinions or suggestions during the implementation of this code, please send them to the Technology and Quality Department of China Nerin Engineering Co., Ltd. (address: No. 888 Qianhu Avenue, Hongjiaozhou, Nanchang, Jiangxi Province; postcode: 330031).

Chief development organization and participating development organizations of this code:

Chief development organization: China Nerin Engineering Co., Ltd.

Participating development organizations: Tianjin Cement Industry Design and Research Institute Co., Ltd.; MCC Capital Engineering and Research Incorporation Limited; Xi'an Nonferrous Metallurgical Design and Research Institute; China University of Mining and Technology (Beijing); Fuzhou University; SINOPEC Nanjing Design Institute.

1 General provisions

1.0.1

This code is formulated with a view to implementing the technical and economic policies of the nation in the design of steel silos, so as to achieve advanced technology, economic rationality, safety and applicability, and assured quality.

1.0.2

This code is applicable to the design of steel silos meeting the following conditions:

- 1 in the building materials, coal, metallurgical, chemical and petrochemical industries;
- 2 with a circular or rectangular horizontal plan shape;
- 3 with central filling and discharging;
- 4 storing solid bulk materials.

1.0.3

The design of steel silos shall comply not only with this code but also with the current relevant standards of the nation.

2.1.1 steel silo

Upright steel container for storing bulk materials, circular, square, rectangular, polygonal or of another geometric shape in plan.

2.1.2 top of silo

Structure closing the top surface of the silo body.

2.1.3 barrel

Vertical wall of the silo body which is in direct contact with the stored material and bears the lateral pressure of the stored material.

2.1.4 hopper

Converging part at the bottom of the silo body; container through which the stored material is discharged.

2.1.5 supporting wall

Vertical wall, of the same plan as the silo body, supporting the silo body.

2.1.6 supporting structure of silo bottom

Supporting structure above the foundation of the steel silo and below the silo body.

2.1.7 inclined wall

Inclined silo wall forming the hopper.

2.1.8 deep bin

Steel silo in which the ratio of the calculated height of the stored material h_n to the inner diameter d_n of a circular silo, or to the short side b_n of a rectangular silo, is greater than or equal to 1.5.

2.1.9 shallow bin

Steel silo in which the ratio of the calculated height of the stored material h_n to the inner diameter d_n of a circular silo, or to the short side b_n of a rectangular silo, is less than 1.5.

2.1.10 single silo

Individual steel silo not connected integrally with other buildings or structures.

2.1.11 silos in line

Rectangular steel silos arranged in a single line and connected into an integral whole.

2.1.12 group silos

Three or more rectangular steel silos not arranged in a single line and connected into an integral whole.

2.1.13 filler

Filling material used in the silo bottom to form the discharge slope.

2.1.14 liner

Lining used on the silo bottom, the hopper and part of the silo wall for protection and abrasion resistance and to facilitate the flow of the stored material.

3.1 General requirements

3.1.1

The design working life of steel silo structures shall not be less than 25 years.