

ICS 71.010
CCS P 72



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

GB 51019-2014

**Code for design of pipe racks and pipe sleepers in chemical
industry**

化工工程管架管墩设计规范

(English Translation)

Issued on: July 13, 2014

Implemented on: May 1, 2015

**Issued by: Ministry of Housing and Urban-Rural Development of the
People's Republic of China;**

**General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

- 1 General
- 2 Terms and symbols
 - 2.1 Terminology
 - 2.2 Symbols
- 3 Basic Regulations
 - 3.1 Classification of pipe racks and pipe piers
 - 3.2 Layout of pipe racks and pipe piers
 - 3.3 Structure selection

1 General

1.0.1

This code is formulated in order to implement the national technical and economic policies in the design of pipe racks and pipe piers in chemical and petrochemical engineering, to achieve advanced technology, safety and reliability, economical rationality, and quality assurance.

1.0.2

This code is applicable to the design of pipe racks and pipe piers in chemical and petrochemical engineering. This code does not apply to the design of the pipeline itself as a stressed structure and other large-scale spanning pipe frames across rivers.

1.0.3

The design of pipe racks and pipe piers in chemical engineering shall not only conform to this specification, but also comply with the current relevant national standards.

2.1.1 Pipe support

The general term for various structures supporting overhead pipelines or cable trays.

2.1.2 Pipe sleeper

A pier structure supporting lower pipelines with a height less than or equal to 1m from the ground.

2.1.3 Pipeline

The general term for the process of pipe rack or pipe pier support, public engineering pipeline, etc.

2.1.4 Sliding pipe support

The connection between the pipe support and the pipe frame can slide and roll, allowing relative displacement of the pipe frame, including rigid movable pipe frame and flexible movable pipe frame. Also known as the middle pipe rack or the middle movable pipe rack.

2.1.5 Rigid pipe support

The movable pipe frame (column) has a relatively high rigidity. When the pipe is displaced, the horizontal displacement of the pipe frame is smaller than the pipe displacement. Therefore, there is a relative displacement between the pipe and the pipe frame, and the pipe frame is a pipe frame that bears the friction generated during the pipe displacement. Also known as rigid pipe frame.

2.1.6 Flexible pipe support flexible pipe support

The rigidity of the movable pipe frame (column) is small. When the pipe is displaced, the horizontal displacement of the pipe frame can meet the needs of the pipe displacement. There is no relative displacement between the pipe and the pipe frame, and the pipe frame can bear the horizontal thrust generated by the displacement of the column top.. Also known as flexible pipe rack.

2.1.7 Anchor pipe support

The pipe support and the pipe frame are fixedly connected, no relative displacement is allowed between the pipe and the pipe frame, and the pipe frame bears all the longitudinal and horizontal thrust generated between the sections.

2.1.8 P shaped compensator pipe support P shaped compensator pipe support it is located in the interval between the two fixed pipe racks in the longitudinal direction of the pipeline, generally in the middle, to support the movable pipe rack of the P-shaped compensator pipe.

2.1.9 Independent pipe rack single-post pipe support

Pipe racks without longitudinal connection members between adjacent pipe racks are called independent pipe racks, which are suitable for pipelines that can span by themselves.

2.1.10 Fram pipe support

Vertical connection members, such as longitudinal beams or trusses, are arranged between adjacent pipe racks to form a space structure system called pipe gallery pipe racks, which are mostly installed in the installation area and between installations, and can be single-layer, double-layer, or multi-layer. According to the area and function, it can be divided into the whole plant pipe gallery, the installation pipe gallery, the block pipe gallery, the public works pipe gallery, the furnace front pipe gallery, and the air cooler pipe gallery. Also known as pipe gallery.

2.1.11 Lower pipe support

The pipe rack with a net distance of 0.5m to 2.5m from the outer edge of the insulation layer of the lowest layer of pipes to the ground.

2.1.12 Medium pipe support

The pipe frame with a net distance of 2.5m to 5.0m from the outer edge of the bottom pipe insulation layer to the ground.

2.1.13 Higher pipe support

The pipe frame with a net distance of more than 5.0m from the outer edge of the insulation layer of the lowest layer of pipes to the ground.

2.1.14 Cross-over pipe support

When the pipeline needs to cross railways and roads, the pipelines are raised and supported on the high-rise racks on both sides of the railways and roads to form the high-rise racks of P-shaped pipelines.

2.1.15 Suspension pipe support

The pipe frame composed of independent pipe frame, inclined slings, horizontal tie rods, steel beams, and end cable stays generally has a spacing of 9m to 12m.

2.1.16 Long-arm pipe support

According to the requirements of the allowable span of the pipeline, the independent pipe frame is stretched out of the long arm in the longitudinal direction, and the pipe frame supporting the pipe is installed on it.

2.1.17 Special pipe support

The supported pipes have a diameter greater than or equal to 500mm, the number of pipes is less than or equal to 3, and the pipe rack height is greater than 10m.

2.1.18 Pipe support with vibration pipes

Vibrating pipes are laid on the pipe rack, and the weight of the vibrating pipes accounts for more than 30% of the total weight of the pipes.

2.1.19 Longitudinal beam pipe support

Along the axial direction of the pipeline, longitudinal beams are arranged between the pipe frame columns, and a certain number of beams are arranged on the longitudinal beams or under the beams according to the allowable spacing of the pipelines to lay pipes with small diameters.

2.1.20 Truss pipe support

Along the axial direction of the pipeline, a truss with a large span is set between the pipe frame columns, and a beam is set (or suspended) on the upper and lower chords according to the distance allowed by the pipeline support to lay the pipeline with a smaller diameter.

2.1.21 Mixture structure pipe support

The bottom beam column is a reinforced concrete structure, and the upper pipe frame is a steel structure, or the horizontal beam column is a reinforced concrete structure, and the vertical steel structure is a pipe frame structure.

2.1.22 Transversal beam in the middle

In the longitudinal connection structure of pipe frames such as longitudinal beams and trusses, the supporting members are set up to support pipes with small diameters.

2.1.23 Anchor pipe support bracing

On the fixed pipe frame, the inter-column support is set up in order to withstand a large horizontal thrust.

2.1.24 Pipeline compensator expansion joint

The components installed on the pipeline to absorb the thermal expansion, cold contraction and other displacements of the pipeline.