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## Standards, Specs, Common Problems and Solutions of Flange Gaskets

Standards, Specifications, Common Problems, Solutions, and Industry Application Characteristics of Flange Gaskets  
Domestic standard GB/T 9126-2020 "Non-metallic Flat Gaskets for Pipe Flanges"; GB/T 13403-2013 "Gaskets for Large Diameter Carbon Steel Pipe Flanges"; HG/T 20610-2009 (Ministry of Chemical Industry Standard), SH/T 3407-2018 (Petroleum Standard). There is a certain difference in flange gasket size between the American standard (ASME B16.20) and the national standard (GB/T 9126) when comparing size standards at home and abroad. Taking DN100 flange gasket as an example, the outer diameter of the American standard gasket may be 152mm, while the national standard is 155mm. In international trade or foreign-related projects, it is necessary to strictly check the standards to avoid installation problems caused by size discrepancies. The European standard (EN 1514-3) has clear requirements for the compression and rebound testing methods of non-metallic gaskets, requiring a compression rate of 10% -30% and a rebound rate of  $\geq 40\%$ . The national standard has similar requirements for some indicators, but the testing details are slightly different. When selecting gaskets, it is necessary to follow the corresponding standards for quality control based on the project location or customer requirements. In a multinational petrochemical project, the selection of pipeline flange gaskets must meet both ASME B16.20 (American standard) and HG/T 20610-2009 (Ministry of Chemical Industry standard). For high-temperature hydrogen pipelines, 316L stainless steel flexible graphite wrapped gaskets were ultimately selected, and their dimensions and performance parameters were strictly designed, manufactured, and inspected according to dual standards to ensure the smooth implementation of the project. International standard ASME B16.20 (American standard metal gasket), EN 1514-3 (European standard non-metallic gaskets); JIS B2404 (Japanese standard gasket). Common problems and solutions  
Improper selection of gaskets for leakage reasons (such as choosing rubber gaskets that harden at low temperatures). Insufficient or uneven pre-tightening force of bolts. Flange deformation (large temperature difference or installation stress). Gasket aging, corrosion, and wear.  
Leakage detection method: visual inspection: Regularly check whether there are any traces of medium leakage at the flange connection. If liquid leakage occurs, droplets or flow marks may form on the flange surface, and gas leakage may be accompanied by white mist (condensation of water vapor). Ultrasonic testing: using an ultrasonic leak detector to detect high-frequency sound waves generated by leaks, the leak point can be quickly located without touching the flange, especially suitable for high-pressure and toxic gas pipelines.  
Pressure drop detection: for closed systems, the presence of leaks is determined by monitoring changes in system pressure. If the pressure drops beyond the specified value within a certain period of time, there may be a leak.  
Temporary plugging method for minor leakage: injection of glue under pressure (requires professional tools).  
Emergency situation: temporary replacement of higher specification gaskets (such as using metal wrapped gaskets instead of rubber gaskets).  
Principle of pressure sealing technology: inject sealing agent into the flange gap through a dedicated fixture to form a new sealing structure. Sealing agents are generally polymer materials with good plasticity and sealing properties.  
Application scenario: it is suitable for temporary treatment of medium leaks with a pressure not exceeding 2.5MPa and a temperature not exceeding 200 °C, such as when the pipeline has a slight leak but cannot be shut down for maintenance.  
For metal gaskets with minor damage (such as surface scratches), repair and reuse can be achieved through grinding and polishing. If non-metallic gaskets are partially damaged, they can be cut and spliced without affecting the overall sealing performance, but the repaired gaskets must undergo strict sealing performance testing before use.  
Visual inspection of gasket replacement timing: When the gasket shows obvious corrosion, cracks, deformation, or severe wear on the sealing surface, it needs to be replaced immediately.

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