

## Basic Structure of Wire Thread Inserts

A wire thread insert is a precision elastic element used to enhance the strength of threaded holes. Its basic structure is formed by winding high-precision wire with a diamond cross-section into a helical shape. The wire thread inserts manufactured by Shenzhen Yongjing Precision Technology Co., Ltd. strictly adhere to national standard GB/T 24425, as well as multiple industry standards including aerospace and military, ensuring the formation of high-precision internal threads after installation.

Structurally, a wire thread insert consists of three main parts:

**Guiding Part:** Used for initial alignment and positioning during installation; its design directly affects the smoothness of the assembly.

**Working Part:** Features a complete thread profile and bears the primary mechanical function of engaging with the bolt.

**Tail End:** Contains the installation tang, which is driven by installation tools to screw the insert into place.

The material is typically austenitic stainless steel, such as 1Cr18Ni9Ti, SUS304, or SUS316, providing excellent corrosion resistance and fatigue resistance.

The diamond-shaped cross-section of the wire allows the outer surface to elastically expand radially against the internal thread of the base material after installation, achieving either free-running or locking functionality. While standard inserts are used to repair or reinforce standard threads, locking inserts feature a special structure on the diamond cross-section to create a multi-turn localized friction lock.

From a working principle perspective, wire thread inserts utilize elastic deformation to distribute axial and radial loads evenly across the full length of the base thread. This significantly enhances the load-bearing capacity and impact resistance of the threaded joint. For low-strength materials like aluminum alloys, magnesium alloys, and plastics, they effectively prevent thread stripping, wear, and fatigue failure.

Additionally, the design accommodates post-installation removal. Through properly designed installation tangs and extraction slots, operators can replace or maintain the inserts using standard tools. Overall, despite its simple structure, the wire thread insert integrates mechanics of materials, tribology, and precision manufacturing, making it an irreplaceable reinforcing element in the fastener field.

Shenzhen Yongjing Precision Technology Co., Ltd. employs digital winding control technology in its design to ensure consistency in parameters such as pitch, diameter, and number of coils. Every batch undergoes coordinate measuring machine (CMM) inspection and thread plug gauge testing to eliminate assembly failures caused by structural deviations. This strict control over structural details has earned Yongjing Precision a strong market reputation in wire thread insert manufacturing.