Definition, Function, Structural Components, Application Scenarios, Maintenance, Troubleshooting and Performance Characteristics of Trapezoidal Thread Ring Gauge Definition

The trapezoidal thread ring gauge is a precision measuring tool used to detect the dimensional accuracy of external trapezoidal threads. It is manufactured according to specific trapezoidal thread standards (such as national standards, international standards, etc.). By fitting with the measured external trapezoidal threads, it determines whether the external threads meet the specified dimensional tolerances and shape requirements. Function

Dimensional Detection: Precisely measure key dimensions of external trapezoidal threads, including major diameter, minor diameter, pitch diameter, pitch, and thread profile angle, ensuring that these dimensions are within the specified tolerance range.

Quality Control: During the production process, conduct quality inspection on the processed external trapezoidal threads, preventing unqualified threads from proceeding to the next process and ensuring the quality and interchangeability of products.

Assembly Verification: Used to verify the fitting condition between the external trapezoidal thread and the corresponding internal thread, ensuring the accuracy and reliability of the assembly and the normal operation of the mechanical system.

Structural Components

Ring Gauge Body: Usually made of high-quality alloy steel or carbon tool steel, it has high hardness and wear resistance. The ring gauge body is in a ring shape, and the inner hole is processed with a thread profile consistent with the standard trapezoidal thread.

Measuring Thread Profile: The thread profile of the inner hole is the core part of the ring gauge, and its dimensional accuracy and shape accuracy directly affect the measurement results. The processing accuracy of the thread profile is very high, and it is manufactured strictly according to the corresponding trapezoidal thread standards.

Handle (Optional): For the convenience of operation, some trapezoidal thread ring gauges of larger sizes are equipped with handles. The handle is designed ergonomically, allowing operators to easily put the ring gauge on the measured thread for measurement.

**Application Scenarios** 

Mechanical Processing Industry: In the production of various mechanical parts, such as lead screws, nuts, and transmission components, measure and inspect the external trapezoidal threads after processing to ensure that the thread accuracy meets the design requirements.

Automobile Manufacturing: In components of the automobile's steering system, transmission system, etc., trapezoidal thread connections are involved. Use trapezoidal thread ring gauges to ensure the processing quality of the threads, improving the safety and reliability of the automobile.

Aerospace Field: The detection of high-precision trapezoidal threads in aerospace equipment is of great importance. Since aerospace products have extremely high requirements for accuracy and reliability, trapezoidal thread ring gauges play a key role in ensuring thread quality.

Mold Manufacturing: The threaded connection parts in molds require precise dimensional control. Trapezoidal thread ring gauges are used to detect the accuracy of external trapezoidal threads in molds, ensuring the normal opening and closing of the mold and the

## forming quality of the parts.

Maintenance

Cleaning: After each use, wipe the ring gauge with a clean soft cloth to remove surface contaminants such as oil stains, iron filings, and dust. If necessary, special cleaning agents can be used for cleaning, but avoid using cleaning agents with strong corrosiveness.

Anti-rust: After cleaning, apply an appropriate amount of anti-rust oil to the surface of the ring gauge to prevent rusting. When storing, place the ring gauge in a dry and well-ventilated place to avoid contact with a humid environment.

Regular Calibration: According to the specified calibration cycle, send the trapezoidal thread ring gauge to a professional metrology institution for calibration. Calibration can ensure the measurement accuracy of the ring gauge and promptly detect and correct any possible errors. Proper Storage: Store the ring gauge in a dedicated measuring tool box to avoid collisions with other tools or parts, preventing damage to the measuring thread profile of the ring gauge.

## Troubleshooting

Inaccurate Measurement: Check whether the ring gauge is worn, deformed, or damaged. If the thread profile is severely worn, it will affect the accuracy of the measurement, and the ring gauge needs to be replaced at this time. At the same time, confirm whether the measurement method is correct, such as whether it is vertically placed on the measured thread and whether the measurement position is appropriate.

Ring Gauge Sticking: If the ring gauge gets stuck on the measured thread, check whether there are burrs, impurities, or other foreign objects on the thread surface. After removing the foreign objects, check whether the thread profile of the ring gauge is deformed. If it is deformed, it needs to be repaired or replaced.

Failed Calibration: During the calibration process, if it is found that the measured value of the ring gauge exceeds the allowable error range, analyze the cause. It may be a problem with the ring gauge itself, such as wear and deformation; it may also be a problem with the calibration equipment or method, and corresponding adjustments and repairs are required. Performance Characteristics

High Precision: It can achieve high-precision measurement of external trapezoidal threads, with an accuracy that can reach the micron level, meeting the requirements of high-precision machining and assembly.

Good Stability: Made of high-quality materials and using precision manufacturing processes, the structure of the ring gauge is stable and is not easy to deform during the measurement process, providing reliable measurement results.

Strong Durability: Due to the use of materials with high hardness and wear resistance, the trapezoidal thread ring gauge has a long service life and can withstand multiple repeated measurements.

Easy to Operate: With a reasonable design, it is easy to operate. Even operators with limited experience can quickly master the usage method, improving measurement efficiency.

