

UL 498 Figure 94.1 Improper Insertion Test Blades

UL 498 Improper Insertion Test Gauge



Standards: UL 498 Figure 94.1 (Improper Insertion Test)

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Product Overview

The KingPo UL 498 Figure 94.1 Improper Insertion Test Blades are precision test fixtures used to evaluate whether plugs and receptacles comply with the improper insertion requirements specified in UL 498. They help determine if the product design adequately prevents unsafe or unintended plug engagement that could lead to electrical hazards.

Manufactured from high-grade hardened steel, these test blades accurately simulate the test conditions defined in Figure 94.1. They are suitable for plug and receptacle manufacturers during product development, as well as for testing laboratories and certification bodies conducting compliance verification for the North American market. The blades are available individually or as part of complete UL 498 gauge sets.

Key Advantages

- **Precision Simulation of Improper Insertion Conditions**

Engineering: Accurately replicates the blade geometry and dimensions specified in UL 498 Figure 94.1 to simulate unintended insertion scenarios.

Benefit: Enables reliable detection of design weaknesses that could allow unsafe electrical contact, supporting proactive safety improvements.

- **High-Grade Hardened Steel Construction**

Engineering: Manufactured from premium hardened steel with excellent dimensional stability and wear resistance for long-term laboratory use.

Benefit: Maintains geometric integrity and measurement repeatability even after repeated testing cycles, reducing replacement frequency.

- **Standardized Safety Evaluation Tool**

Engineering: Directly supports UL 498 improper insertion testing requirements to assess protection against foreseeable misuse.

Benefit: Helps manufacturers and laboratories demonstrate compliance with critical safety provisions, facilitating smoother UL listing and certification processes.

- **Flexible Supply Options**

Engineering: Available as individual blades (typically Blade 1 & Blade 2) or as part of complete UL 498 gauge sets.

Benefit: Provides cost-effective flexibility for laboratories that need specific figures or full sets, optimizing procurement efficiency.

- **Traceable Quality Assurance**

Engineering: Each blade set undergoes factory inspection for dimensional accuracy and surface condition prior to shipment.

Benefit: Supports laboratory traceability, audit readiness, and consistent test results with documentation available upon request.

Technical Specifications

3.1 General Parameters

Parameter	Specification	Remark / Notes
Applicable Standard	UL 498 Figure 94.1	Improper Insertion Test Blades
Material	High-grade hardened steel	Excellent dimensional stability and wear resistance
Configuration	Set of test blades (typically Blade 1 & Blade 2)	Specific to UL 498 Figure 94.1
Manufacturing Process	Precision machining	Maintains geometric integrity per standard
Dimensional Verification	Factory inspection provided	Documentation available upon request
Supply Options	Individual blades or complete sets	Can be integrated into full UL 498 gauge sets
Typical Use	Improper insertion testing & safety evaluation	Quality control, compliance testing, certification

Testing Principle

UL 498 specifies requirements to evaluate the risk of improper insertion between plugs and receptacles. The Figure 94.1 Improper Insertion Test Blades are used to simulate unintended insertion conditions and assess whether the receptacle design effectively prevents unsafe electrical contact or incorrect engagement.

This test helps manufacturers and testing laboratories determine whether a product provides adequate protection against foreseeable misuse, thereby supporting both product safety evaluation and compliance with UL 498 requirements for the North American market.

Best Practices & Common Error Mitigation

1. Confirm that the selected test blades correspond exactly to UL 498 Figure 94.1 before performing the test.
2. Inspect the blades for any damage, deformation, or surface contamination prior to each use.
3. Apply the blades steadily and maintain the correct orientation as defined by the test procedure.
4. Ensure proper alignment between the test blades and the product under test.
5. Record all test parameters and results clearly to support traceability and compliance documentation.
6. Perform regular inspection of the blades, especially when used frequently in laboratory or production environments.

Typical Applications

- Plug and receptacle manufacturers — Design validation and production quality control
- Electrical safety testing laboratories — Pre-certification and routine compliance testing
- Certification bodies — Supporting UL listing and safety evaluation
- Quality assurance departments — Incoming inspection and process monitoring
- R&D teams — Safety assessment of new plug and receptacle designs

Supply Options & Models

Available individually (typically as a set of Blade 1 & Blade 2) or as part of complete UL 498 gauge sets. Custom configurations and integration with other UL 498 figures are supported upon request.

Compliance & Manufacturer

These test blades are designed to support the improper insertion testing requirements specified in UL 498 for attachment plugs and receptacles. They provide laboratories and manufacturers with a standardized tool to perform safety evaluations in accordance with the standard.

Factory inspection for dimensional accuracy and surface condition is performed before delivery. Dimensional verification documentation is available upon request. The product is manufactured under controlled quality management procedures (ISO 9001, ISO 14001, ISO 45001).

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