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Global Broken Tool Detector Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Broken Tool Detector market size is expected to reach $ 1002 million by 2032, rising at a market growth of 5.2% CAGR during the forecast period (2026-2032). In 2025, the production volume of broken tool detectors reached 200,000 units, with an average selling price of $3,400 per unit.
To address the problems of traditional tool condition inspection, which relies on manual observation, is inefficient, has a high false alarm rate, and cannot adapt to the real-time monitoring needs of automated production lines, easily leading to increased scrap rates, equipment damage, and production safety hazards, broken tool detectors have emerged. Since the deep integration of machine vision technology and industrial automation in the early 21st century, broken tool detectors have achieved a leapfrog development from contact inspection to non-contact inspection, and from single-dimensional inspection to multi-dimensional intelligent analysis. Currently, they encompass various types, including optical, electromagnetic, and image recognition types, and are widely used in machining, automotive manufacturing, aerospace component processing, and precision electronics manufacturing, capable of accurately identifying defects such as tool chipping, wear, and breakage, and providing lifespan warnings.
In the global broken tool detector market in 2025, the average price of basic civilian models (suitable for small-scale machining) is $1800-$2500 per unit, while the average price of high-precision industrial models (suitable for precision parts machining) and related testing systems can reach $3200-$4500 per unit. In terms of production capacity, the average annual capacity of a single production line is generally 6500-7500 units. The industry average capacity utilization rate is approximately 58%, which can rise to 72% during peak upgrading periods in the automotive and aerospace manufacturing industries. Gross profit margins vary significantly depending on product positioning: approximately 15%-20% for basic civilian models, and 22%-28% for high-

precision industrial models and related testing systems.
Typical Transaction Case: In the third quarter of 2024, DENSO, a major Japanese automotive parts manufacturer, purchased 280 Keyence high-precision image recognition-based broken tool detectors (IV2 series) for approximately US$952,000. The purchase requirements included: 'support for 0.01mm-level defect recognition, real-time integration with CNC machining centers, detection response time ?10ms, stable operation in workshop environments ranging from -10? to 50?, and a false positive rate ?0.1%.' These tools will be used for real-time monitoring of tool status on precision parts machining production lines such as engine blocks and transmission gears at its global production bases, reducing scrap rates due to tool breakage.
The upstream of the broken tool detector industry chain encompasses core materials (Asahi Glass high-definition optical lenses from Japan, Siemens electromagnetic induction coils from Germany, and DuPont engineering plastics from the United States), key components (Sony industrial cameras from Japan, SICK laser sensors from Germany, Qualcomm signal processing chips from the United States, and Chi Mei Optoelectronics protective housings from Taiwan), and technical support (image recognition algorithm service providers, Trumpf precision calibration equipment from Germany, and industrial control software developers). Downstream applications focus on automotive manufacturing (38%, with a 10% annual increase driving precision parts processing monitoring), general machining (27%, with a 12% annual domestic increase supporting routine testing), aerospace (15%, with high technical barriers ensuring testing in high-end processing scenarios), and other fields (20%, covering tool testing needs in electronics, medical, and woodworking, forming a complete industry chain layout from core materials to multi-field applications).
Industry Trends and Challenges: The broken tool detector market exhibits three major development trends: intelligent upgrading (AI image recognition algorithm penetration rate increases by 12% annually, enabling accurate identification and lifespan warning of micro-cracks and fatigue wear), integrated linkage (deeply integrated into the Industrial Internet, supporting multi-device collaborative monitoring and real-time linkage management with MES systems throughout the tool's lifecycle), and multi-parameter fusion (integrating parameters such as temperature and vibration to build a multi-dimensional analysis system). Market opportunities include increased global industrial automation penetration and precision upgrades in industries such as automotive and aerospace driving annual demand growth exceeding 11% (particularly prominent in emerging Asia-Pacific markets); increasingly stringent quality control regulations in manufacturing (such as the EU's Machinery Safety Directive) driving the replacement of existing equipment; and a surge in demand for precision parts processing in new energy vehicles creating a global market gap of approximately 60,000 units. Core challenges include reliance on imports for high-end industrial cameras/laser sensors (with a failure

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rate 18% higher than Keyence's in high-temperature, high-dust environments in China), long international technical standard certification cycles (CE/UL certifications require 8-18 months), and homogeneous price wars in the low-to-mid-end market leading to gross margins compressed to below 20%.

Demand and Opportunity Analysis: Driven by the essential need for industrial quality control, high-precision machining industries such as automotive and aerospace regard broken tool detectors as a core competitive advantage. This equipment can reduce the scrap rate of defective tools to below 0.3%, and in the machinery manufacturing sector, real-time monitoring reduces equipment damage and downtime losses by over 55%. In terms of production efficiency, the inspection time for a single tool in automated production lines is reduced from 3 minutes to less than 10 seconds, supporting simultaneous inspection at multiple workstations, and reducing unit costs to 1/5 of manual inspection. On the policy front, over 25 countries worldwide are promoting manufacturing quality improvement initiatives, and China's '14th Five-Year Plan for Intelligent Manufacturing Development' explicitly requires strengthening the construction of key process inspection capabilities, with local subsidies further promoting enterprise procurement. Regarding technological adaptability, the equipment is compatible with machining processes such as turning, milling, drilling, and grinding, as well as materials such as carbon steel, high-speed steel, and cemented carbide. It covers special environments such as high temperature, high dust, and strong vibration, with an adaptability rate of 85%. High-end models support cloud data storage and remote monitoring, and can be integrated into MES/ERP systems to achieve production and quality data linkage, becoming a core supporting equipment for intelligent manufacturing upgrades.

This report studies the global Broken Tool Detector production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Broken Tool Detector and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Broken Tool Detector that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Broken Tool Detector total production and demand, 2021-2032, (K Units)

Global Broken Tool Detector total production value, 2021-2032, (USD Million)

Global Broken Tool Detector production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Broken Tool Detector consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Broken Tool Detector domestic production, consumption, key domestic

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manufacturers and share
Global Broken Tool Detector production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)
Global Broken Tool Detector production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)
Global Broken Tool Detector production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)
This report profiles key players in the global Broken Tool Detector market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Keyence, Hexagon, Banner, Renishaw, Marposs, Makino, BK Mikro, Metrol, Haff & Schneider, FEM, etc.
This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.
Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Broken Tool Detector market
Detailed Segmentation:
Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (K Units) and average price (US$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.
Global Broken Tool Detector Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

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Global Broken Tool Detector Market, Segmentation by Type:

Optical

Electromagnetic Induction

Laser

Global Broken Tool Detector Market, Segmentation by Defect Recognition Accuracy:

Accuracy 0.1-0.5mm

Accuracy 0.01-0.1mm

Accuracy ?0.01mm

Global Broken Tool Detector Market, Segmentation by Installation Method:

In-line

Off-line

Portable

Global Broken Tool Detector Market, Segmentation by Application:

Automotive Manufacturing

General Machining

Aerospace

Other

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Companies Profiled:

Keyence

Hexagon

Banner

Renishaw

Marposs

Makino

BK Mikro

Metrol

Haff & Schneider

FEM

Middex

Bixbay Industries

Detector France

Haas Automation

Heidenhain Corp

SPC Innovations

Allora International

DETECTOOL

METROL

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Greenline Precision Technology

Xinde Technology

MURAKAMI GIKEN

Key Questions Answered:

1. How big is the global Broken Tool Detector market?
2. What is the demand of the global Broken Tool Detector market?
3. What is the year over year growth of the global Broken Tool Detector market?
4. What is the production and production value of the global Broken Tool Detector market?
5. Who are the key producers in the global Broken Tool Detector market?
6. What are the growth factors driving the market demand?

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Contents

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5 MARKET ANALYSIS BY TYPE

6 MARKET ANALYSIS BY DEFECT RECOGNITION ACCURACY

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List Of Tables

LIST OF TABLES

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List Of Figures

LIST OF FIGURES

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