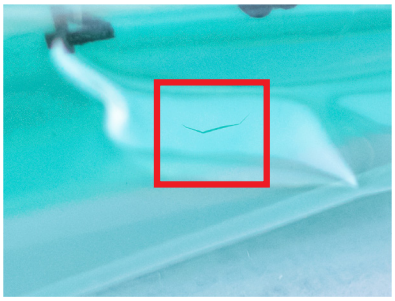
LANDING AI™

Improve Medical-Device Inspection Accuracy with Deep Learning

Medical-device manufacturers face strict regulations and guidelines that leave no room for error when it comes to identifying defects. A failure to catch defective parts or products can create serious problems, which include shorter product life spans, safety concerns, recalls, additional costs, or worse. As a result, most medical-device manufacturers deploy some form of machine-vision technology for automated inspection and verification. By adding deep-learning software into the process, these companies create an added layer of protection while still increasing productivity, throughput, and the bottom line.



Considerable Consequences

Extreme defects may occur during the manufacturing process that present extreme risks. For example, sharp edges or burrs on certain medical devices can result in improper care or injury to patients. Parts like these escaping the factory floor present a high possibility for legal repercussions as well as risks to customer relationships and reputation.

Even further, rejected parts and subsequent reworks can cost companies exorbitant amounts of money. According to a 2017 McKinsey report, the medical-device industry's cost of quality represents between 6.8% and 9.4% of industry sales, or $26 billion to $36 billion annually. Rejected parts and reworks typically represent 20% or less of this cost for small devices and capital equipment but more than 50% for implants and disposables, according to the report. All of this highlights the importance of accurate visual inspection of defects.

*"The platform allows us to generate **accurate and consistent datasets** that we can iterate over time to **continuously improve our existing AI systems**."*

Ligand Pharmaceuticals

sales@landing.ai

Augment Your Machine-Vision System

While machine-vision systems help medical-device manufacturers with various inspection tasks for quality control purposes, traditional, rules-based algorithms may not work as well in certain scenarios. Printed circuit boards (PCBs) used in medical devices, for instance, must be thoroughly inspected, but performing mode and effects analyses for each wafer, pin, joint, and environment change proves to be difficult. Traditional machine-vision software can have issues with defining defects such as tilts, burns, foreign-material presence, voids, and chips.

Items such as surgical tools, heart valves, ventilators, or stents must be sealed into sterile packaging before shipping them off to the customer. Machine-vision technology has provided an automated means for inspection for years, but deep-learning software that is programmed using images of defective and non-defective images increases inspection accuracy. This is especially important in scenarios where defective products that escape the manufacturing plant floor can produce drastic outcomes.

Simplify Deep-Learning Development

LandingLens deep-learning software helps improve inspection accuracy in applications where rules-based machine vision can fall short. It does so by taking an industry-first, data-centric approach to deep learning, which involves feeding the model with clean, high-quality data. Our end-to-end platform simplifies the deep-learning development process and offers an efficient, intuitive method for continually improving your models for long-term success. LandingLens also offers a standardized deep-learning solution platform that reduces development time and allows companies to easily scale projects to multiple facilities.

The software's digital Defect Book also allows medical-device manufacturers to easily define defects while the agreement-based Labeling Tool empowers users to improve the Defect Book over time by reaching an internal consensus on defects. Furthermore, the LandingLens Smart Tagging Tool delivers cross-functional collaboration capabilities for accurate labeling, no matter the location.

Training tools also allow users to test and evaluate models and execute many training environments simultaneously, using a variety of model architectures to fit any machine-vision application. The software also provides an error analysis report for evaluating existing models, removing the need to start each model anew.

In a setting such as medical-device manufacturing where accurate inspection is of critical importance, companies can deploy deep-learning software to a machine-vision system to learn based on trained images and improve over time, similarly to how an operator learns a process. In doing so, medical-device manufacturers ultimately improve automated quality control measures.

sales@landing.ai
Part Number: 10004-01-EN