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# Automated Visual Inspection Tool for Fiber End Face Inspection

A fully Automated Visual Inspection Tool, the miniAVIT automatically locates, images, and inspects the surfaces of fiber end faces to detect scratches, pits, chips, cracks, loose contamination, and other defects.

Optimized for post-polishing, in-process, and final inspection stages of manufacturing, the miniAVIT provides highly reliable, consistent fiber inspection, user flexibility in test specifications with detailed, auditable documentation of results.

The miniAVIT inspects all the fibers without removing them from the polishing plate, significantly reducing labor time to inspect, re-polish and rework any fibers that fail the inspection criteria. For final inspection, custom fixtures may be fitted to the system for testing multiple connectors or small assemblies.

By automatically and precisely inspecting each fiber end face, the miniAVIT enables companies to efficiently ensure the quality of each fiber in all of their products using less labor.

## Ideal for

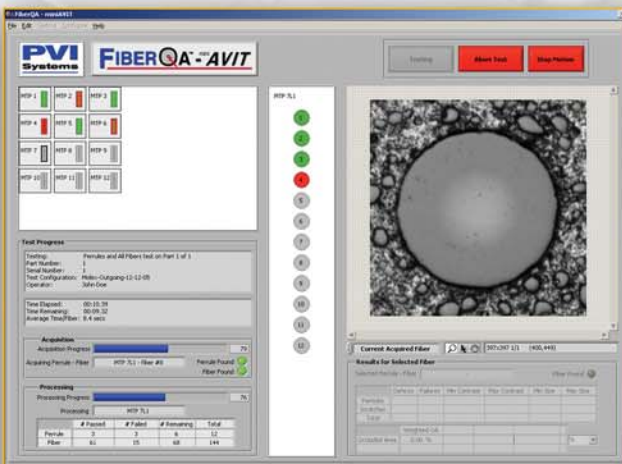
- Final Inspection
- Post Polishing
- In Process Control

## Features

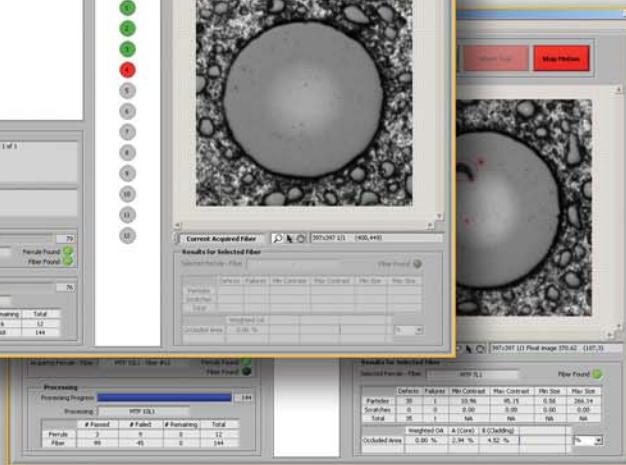
The miniAVIT provides unparalleled functionality to inspect fiber end faces cost-effectively, reliably and accurately providing the following partial list of features:

**Automation** - The three-axis motion system and vision platform are designed to accommodate tolerances in both the fixturing and unit under test (UUT). Dual camera system enables inspection of the fiber, the contact zone, or the entire ferrule.

### During Test



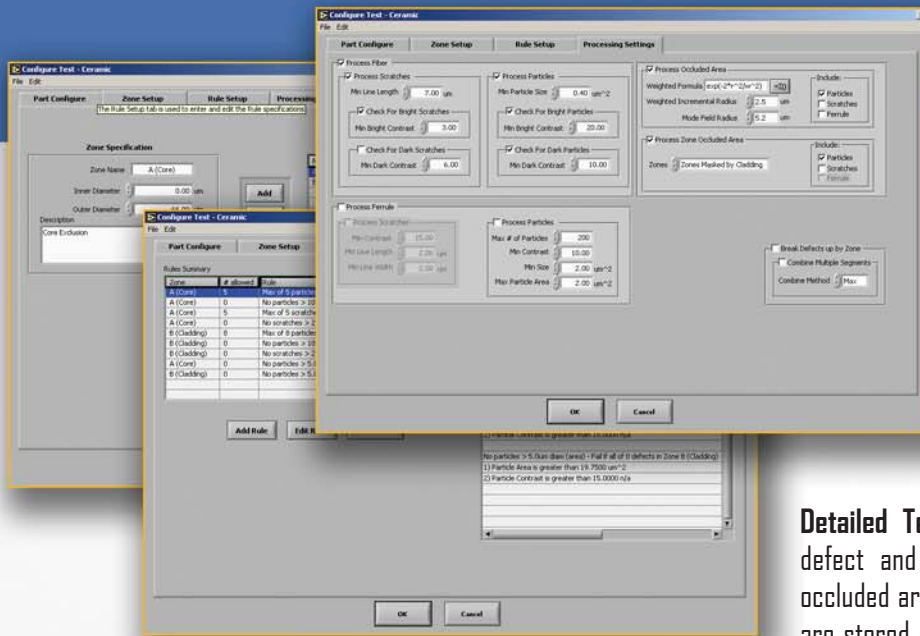
### After Test



**Ease of Use** - Software ease of use is provided by the panels for monitoring, configuring and viewing the results of the inspection. The Main Panel (Figure 1), for example, provides a graphical presentation of the overall test status for all parts and fibers currently under test, as well as ferrule and fiber images. Hardware ease of use is provided by simple mechanical interfaces between the miniAVIT and the user's polishing plates or fixtures.

**Hardware Compatibility**- The miniAVIT accepts commercial polishing plates eliminating the requirement to remove ferrules from the polishing plate for inspection. The system also accommodates custom fixtures for customer specific subassemblies, inspecting as many fibers as fit within the inspection area.

Figure 1: Main Panel During and After a Test



**Figure 2: Inspection Criteria Panels**

**Inspection Criteria** - The software has predefined industry standard test parameters, such as IPC 8497-1 and enables customers to implement company-specific testing parameters. Test parameters, defined using the Test Configuration panel (Figure 2), determine which defects are detected and what constitutes pass or fail.

**Detailed Test Data** - Pass/fail statistics and detailed defect and failure properties (such as size, location, occluded area, and contrast of each scratch and particle) are stored in an SQL-compliant database. Intuitive review using defect overlay on the image using the stored images and results.

**Data Management - AVIT Reports** is an optional application that provides a rich set of post-processing and reporting tools aimed at reducing engineering and production management time, while maximizing visibility into the process data. Provides access to the data and images stored by all AVIT systems accessible via the company's network.

**Occluded Area Metric** - PVI Systems pioneered the metric of Occluded Area, which computes the total area of defects on the fiber end face. Studies show that the total occluded area is directly correlated to the optical properties, such as insertion loss, of a mated connector.

## Benefits

**Cost Savings** - Customers save direct costs by reducing the required number of inspectors by automating testing on the polishing plate.

**Reduced Handling** - Handling is minimized since the connectors are inspected on the polishing plate.

**Accurate, Quantitative Results** - miniAVIT inspection is more accurate and repeatable than human inspection. Quantitative defect and failure data and images are stored for review and process analysis.

**Reduced Supply Chain Friction** - Supply chain friction is minimized by documenting fiber quality at each point in the supply chain, using a repeatable and reproducible inspection process.

The miniAVIT can inspect fibers faster than typical polishing operations.

12 single fiber -- 3 minutes

12 MT-12 ferrules -- 10 minutes

One inspection station per polisher helps manufacturers maintain production throughput while reducing costs.

Physical Size	About 420 x 420 x 310 mm. Varies by model. Not including computer, keyboard and mouse.
Mounting Options	On or below work surface. Mounting below reduces footprint to about 125 x 125 mm
Inspection Area	100 mm x 100 mm
Throughput	Up to 4 seconds/fiber
Working Distance	12.5mm - 33 mm
Power Requirements	110 VAC, 10 A
Weight (Table Top Model)	Approx. 45 lbs.
Ferrule Camera Resolution	Ceramic Specific Unit: 5 $\mu\text{m}/\text{pixel}$ MT Capable Unit: 15 $\mu\text{m}$
Fiber Camera Resolution	0.4 $\mu\text{m}/\text{pixel}$
Cleanroom Specification	Class 1000
Warranty	1 year on parts & labor

## About PVI

PVI Systems is an engineering design group who solves our clients' toughest problems in test and automation, from R&D to Production. We accomplish this through consulting and design services and development of custom instrumentation solutions, which include vision inspection systems, automated test and measurement equipment, data acquisition systems, and factory automation.

Our staff has provided cost effective, well-designed systems to both large and small companies. Our creative solutions, using cutting edge test and measurement hardware development and software has enabled our customers to build better products, conduct faster research and reduce the cost of test.

PVI Systems is a well-respected member of the National Instruments Alliance Program at the Certified Alliance Member level.

*Manufacturing engineers look to PVI Systems for reliable, accurate, and flexible custom test solutions.*

For more information on the miniAVIT, PVI Systems' other products, or services, please contact us:

PVI Systems, Inc. · 16 Liberty Way · Niantic, CT 06357-1030 USA

Phone: 860-739-8044 · [www.pvisys.com](http://www.pvisys.com) · [AVIT@pvisys.com](mailto:AVIT@pvisys.com)

