

sigPOD catches defects at the Loctite adhesive dispensing station as they happen, allowing manufacturer to identify and contain numerous quality issues

After numerous leaks and the threat of warranty claims, this manufacturer needed an accurate monitoring solution to catch bubbles causing the leaks at their Loctite adhesive dispense station before the parts moved further down the line. They turned to Sciemetric's sigPOD, which allowed them to detect a variety of issues causing dispense defects as they happen, improving product quality, and drastically decreasing scrap and rework costs, and line downtime.

The adhesive dispensing station can be one of the most important elements on an assembly, meaning the difference between a proper functioning assembly and one that is plagued with quality problems caused by leaks—even making it unsafe for consumers.

This manufacturer identified that the adhesive dispense station was the culprit for their quality problems. The station was equipped with a Loctite adhesive dispenser that applied adhesive glue before a press operation. The parts being assembled at the station required multiple adhesive locations, operated by a robot that would move the part between each dispense operation and then to the press operation. They identified that their quality problems were being caused by bubbles in the adhesive, which led to an imperfect seal, ultimately leading to leaks. Some of these leaks were found during the leak test, but others didn't become a problem until they were in the field—leading to customer complaints and warranty claims.

sigPOD

Without an automated monitoring solution in place, they were manually verifying the dispense operation every 50 parts, which meant launching a quality campaign on the entire batch when a problem was found—or worse, facing a recall for problems that weren't caught during these manual checks. They realized this was hurting productivity and costing them a lot in costly scrap and rework costs, not to mention bad for their brand's reputation for quality. They needed a consistent monitoring solution to effectively catch these defects before they left the station and moved further down the production line. They turned to Sciemetric's sigPOD.

Automated, in-process solution to catch bubbles—and more

Sciemetric enabled effective monitoring and reliable defect detection of their Loctite adhesive dispense application by installing a sigPOD 1204 at each of the three dispense stations in their plant.

A miniature pressure sensor was placed in the Loctite dispensing tool at each station to monitor and report on pressure variations during the dispense operation, feeding this process data into the sigPOD. Being able to place the transducer sensor just inches from the dispensing tip, as opposed to on the pump, was made possible with the use of the sigPOD and made all the difference in delivering the most precise measurements and monitoring during the process.

The sigPOD collects data from each process in the way of digital process signatures. Sciemetric's proprietary processing of the pressure waveform provides a digital record of every millisecond of the operations. By analyzing this data using QualityWorX analytics tools, test engineers were able to identify where and when the problems were occurring. The sigPOD was then set up to monitor a list of feature checks to catch these faulty dispense application scenarios, including: pressure drop, pressure crossing, pressure rise, lower/higher pressure threshold at the beginning or end of the operation, and more.

By measuring and monitoring these metrics, the automated system was able to identify air bubbles in the dispense material (Figure 1 and 2), as well as other failures (Figure 3) leading to quality issues, such as damage to the dispenser hose, damaged caps within the dispenser tool, and more. Now, when a problem is detected, the specific faulty part(s) is identified and rejected, without calling a whole batch of parts into question.



Identify incorrect application due to air bubbles

Identify incorrect application due to air bubbles



Figure 3: Using digital process signatures, this manufacturer was able to identify low dispense pressure during application causing incorrect application during the dispense process—traceable to specific issues, including damage to the dispenser hose, and damage to the dispenser itself.

sigPOD catches numerous dispense defects as they happen, cutting scrap and rework costs without increasing cycle time

Using sigPOD to monitor their Loctite adhesive dispense operation allowed this manufacturer to catch the bubbles that were causing leaks before the parts moved further down the line, and—beyond the initial scope—catch other dispense and tooling issues contributing to quality problems at the station. By applying this in-process solution, these results were attainable without increasing cycle time or adding any additional stations.

Automating the test has made the station more efficient and accurate, no longer relying on manual checks that were subjective and time consuming. This has helped save them not only the time required to launch quality campaigns into problematic batches, but also substantial scrap and rework costs.

Key benefits delivered by sigPOD dispense monitoring solution:

- Automates quality checks, reducing subjective manual checks
- Identifies bubbles and other dispenser machine issues as they happen
- Catches quality problems previously missed
- Reduces amount of quality campaigns

While they considered a few different ways of monitoring and identifying dispense defects, no other option offered the reliability and in-depth insight they needed to ensure quality dispense each time. Other options, like installing machine vision cameras or monitoring the pump, can miss key failures and don't provide the full data analysis capability unique to Sciemetric's solution. The sigPOD's digital process signatures offer more accurate pass/fail verification and an unmatched depth of analysis capability.

The improvements experienced with this manufacturer's Loctite adhesive dispense operation can be applied across various industries and applications. Sciemetric's sigPOD is a flexible, scalable solution for in-process test and monitoring that can be employed to monitor other types of adhesive and dispense applications, as well as other critical-to-quality stations across the production line, including crimp, press-fit, leak test, torque, and more.

Key feature checks sigPOD monitors during the dispense operation:

- Pressure drop
- Pressure crossing
- Pressure rise
- Lower/higher pressure threshold at the beginning or end of operation

With sigPOD, catch the below dispensing failures:

- Air bubbles
- No flow
- Clogged nozzles
- Improper dispense time
- Improper dispense amount
- Debris or semi-cured material
- Missed or incomplete purge following nozzle replacement
- Damage to dispenser tooling

Contact Sciemetric to see how sigPOD could help you improve product quality while saving time and money on your line!

For more information on sigPOD, visit www.sigpod.com or email inquiries@sciemetric.com



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