2K Rod Meter – Never Fails in Battery Application

This customer conducted a 2K material lab test to determine the failure mode for a Positive Rod Displacement Meter-Mix Dispense System

A manufacturer of battery packs planned to acquire a new, two-part (2K) material from Henkel, a material supplier. Henkel already supplied Loctite 3414, a two-component acrylic adhesive that is metered, mixed and dispensed at a ratio of 1-to-1.

After considering the new process requirements, both Henkel and the manufacturer decided to utilize another Henkel product, formula H3500. Before using the new material in production, it need to be tested and qualified for use on the production dispensing equipment.

**Test #1**
A shipment of the new product was ordered. The Nordson Sealant Equipment System was thoroughly cleaned and the Henkel test material primed with the new product. After many fixes and adjustments, the new product failed to perform and the production dispensing system was reverted to the Loctite 3414 and original material test.

**Test #2**
The customer ordered a 2K material test to be performed at the Nordson Sealant Equipment lab to determine if the Henkel material could be made to fail in the same way as occurred in production. The Henkel material was shipped to the lab, and a Rod Displacement 2K Dispensing System was set up exactly as in production.

The failure conditions of test #1 are defined as:

a) Higher viscosity material
b) Cured material in dispensing tip
c) Air in the material

These conditions could cause incorrect pressure or volume, as well as off-ratio issues leading to a failed test.

**Conclusion**
After two days of failure mode testing, it was determined to the customer’s satisfaction that the Positive Rod Displacement Metering System would not fail in mixing and changing ratio by varying volume, flow or pressure conditions. This is an attribute of all our rod displacement systems.

Test #2 was designed to “make the system fail.” Negative adjustments were made to the dispensing system prior to shot mass testing, ratio check and cure testing. John Britcher of the Sealant Equipment technical service department then collected lab test results:

1. Air was injected into the material supply container. Air was then dispensed through the system and bled normally on the line. **Result:** Shot mass and ratio check tests were within normal ranges of +/- 2 percent.

2. Hardened, cured material was placed into the dispensing hoses to simulate blockage, resulting in a change of flow rate and pressure. **Result:** Significant pressure changes occurred and were noted. Shot mass and ratio check tests were within normal ranges of +/- 2 percent.

3. The fluid valves were cycled on and off before, during and after dispensing. **Result:** Significant pressure changes occurred and were recorded. Shot mass and ratio check tests were within normal ranges of +/- 2 percent.

Nordson Sealant Equipment is a major supplier of precision dispensing systems for battery manufacturers. Our systems provide reliable, long-life equipment for difficult production applications. Our partnerships include material suppliers and integrators who utilize dispensing equipment in their automation lines.

Nordson Sealant Equipment manufactures precision meter-mix dispense systems for processing 1- and 2-part adhesives, sealants and lubricating materials such as epoxy, polyurethane, silicone, acrylic, PVC and more in manual, automated and robotic metering, mixing and dispensing applications including bonding, encapsulating, gasketing, molding, potting and sealing for small to Fortune 500 companies since 1967 and is ISO 9001:2008 certified.