

STICK FAILURES

TYPES OF FAILURES

There are several mechanisms that will cause a fiberglass tool to “fail”. By fail, we mean to have an increased leakage current or to flash-over when subjected to test conditions. The track record for fiberglass tools used in this industry has been outstanding. In talking about failures today we are not stating that the tools would have failed in field use, only that it has or would have failed a specified electrical test.

The required OSHA re-test for live line tools is primarily a test of the surface condition of the tool. Because the surface of the live line tools receives the most abuse from daily work, it makes sense to inspect and test it on a regular basis. The surface will be the first to be scratched, to lose its gloss, to be contaminated by dirt, oil, creosote and moisture. Most but not all of these defects can be detected visually. The majority of sticks that will fail the OSHA test will fail due to the lack of gloss on the surface. Moisture will collect on the surface with “sheeting action” the same as on an un-waxed stick and will provide a direct path for leakage current to follow from one electrode to another. Here we see a “glossy” tool. A tool in this condition will usually pass the OSHA test as water will “bead up” on the surface. However, a visual inspection will not always reveal all defects. The opposite end of the same stick “while appearing glossy” does not pass the electrical test. Water does not bead on the surface as it did on the other end. A stick that fails this type of test can be waxed or refinished, depending on its surface condition, to produce a surface finish that will then pass. Obviously, any conductive material on the surface must also be removed to pass the test.

It is possible to have a live line tool that has been over stressed mechanically to the point that it has cracks in the wall of the fiberglass. These cracks will, according to Murphy, fill themselves with whatever will most adversely affect their intended function. In this case it is moisture from the air. This will increase the leakage of a tool prior to the application of water for the OSHA wet test.

It is also possible to have voids in the foam core due to over stressing, poor repair procedures or even manufacturing defects. We prefer to believe that the latter, while theoretically possible, is the most remote of these possibilities. In the manufacture of foam filled fiberglass tools, a great deal of time and effort is spent in making sure the internal core is properly manufactured, as after it is produced, visual inspections and/or repairs are not possible. In this case, there is a puncture in the center of the stick that has been filled with what appears to be an RTV type of sealant. The internal damage is not readily apparent. Any void internal to the tool, regardless of how it got there, tends to fill with moisture and becomes detectable with a sensitive test. While not required by OSHA, a dry test can be utilized first to detect these types of defects. The magnitude of leakage currents during a dry test must be lower than that of a wet test due to the more subtle nature of the defect. Once detected the tool can then be further inspected, repaired or retired. Waxing or refinishing the outside of a tool such as this would be a waste of time. Trying to determine whether the defect is internal or external with only a wet test would be very difficult.