



VTS – Vacuum Test System

The solution for the test of unshielded cable harnesses

High-voltage cable harnesses, such as those used primarily in the field of e-mobility, require not only high-voltage testing between the individual conductors but also dielectric strength test against the environment. In the case of shielded cables, the use of the sum shield as a counter electrode is permitted, which means that the test can easily be carried out using standard methods.

For unshielded cables, alternative solutions are required for providing a counter-electrode to map the environment. Due to the good insulating properties of air, a metallic electrode must either fit very tightly at any point on the test object or alternative media such as electrically conductive liquids or gases must be used.

With the vacuum test system adaptronic offers a completely new test method, which enables the dielectric strength test even in the medium air with large distances between two potentials: **The dielectric strength test in vacuum.**

TESTING

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The adaptronic method - patent pending

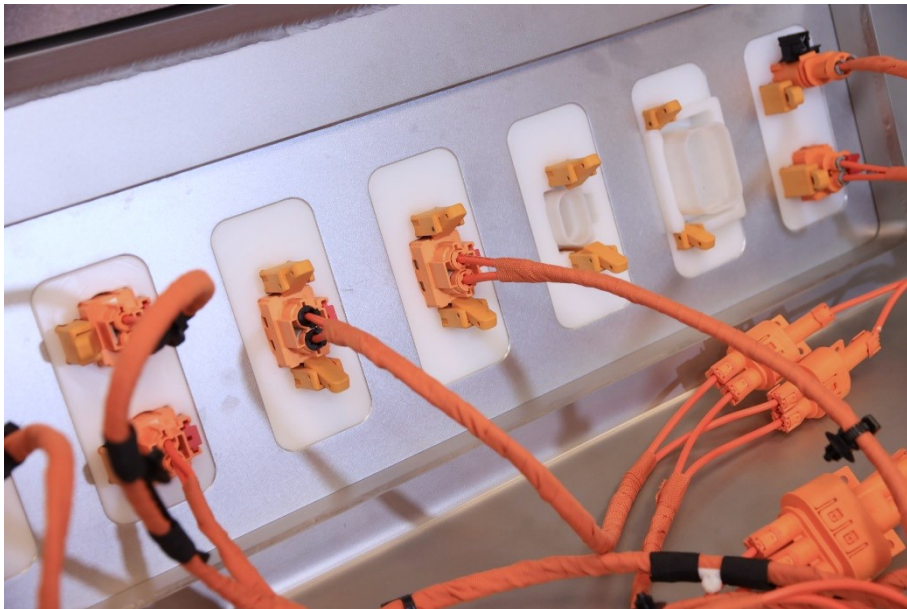
- The cable harness is inserted into a metal chamber that encloses it on all sides.
- All HV lines of the wiring harness are simultaneously connected to the parameterized high voltage potential of the measuring generator by the test point cards (plus potential).
- The chamber is connected to the ground of the measuring generator (minus potential).
- A damaged spot on the insulation leads to an electrical breakdown, visible by arcing.
- The breakdown is detected and indicated by the measurement electronics by monitoring the current and the test voltage.
- In a vacuum, testing is possible at voltages that do not damage the wire harness and where good/bad differentiation can be reliably made.

Advantages of the adaptronic solution:

- No need for fluid or gaseous medium, which is hard to handle
- The minus pole (the missing shield on the cable set) does not have to be reproduced using complex and expensive adapter contours. The metal chamber is used for this purpose.
- With the NT 700-11 the other test types continuity test, short circuit test, insulation test and dielectric strength test are also possible.
- Best practice for complex and 3-dimensional HV-cable harnesses, even with additional components assembled (clips, cable ducts, tapes...)
- Reliable, practical process for use in industrial production environments

Main Components:

- Test table with vacuum chamber and sealed adapters
- High voltage generator
- Vacuum pump (external)
- adaptronic test software NT Control



Software NT Control

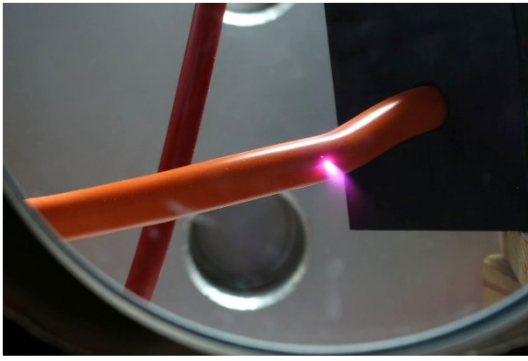
The operation takes place via the proven adaptronic standard software NT Control.

Beside the well-known features of the software like operator-friendly editors and test handling, NT Control offers several possibilities for reporting on paper, label and/or in files.

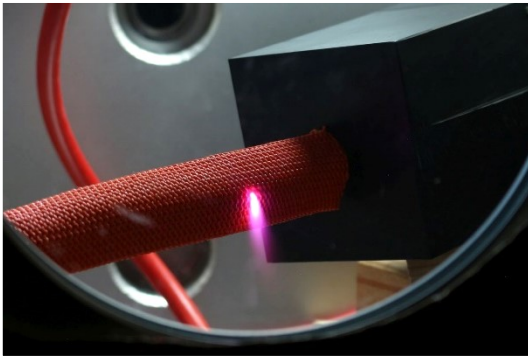
The test system can be easily integrated in a Manufacturing Execution System (MES) via NT Control software interfaces.

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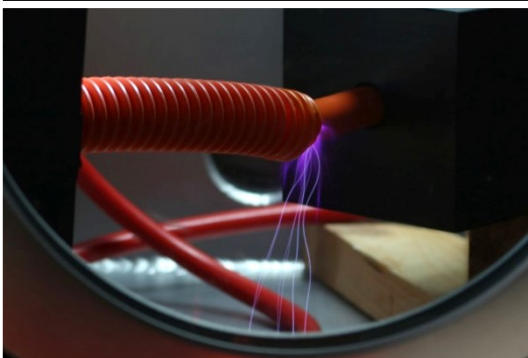
Typical detectable faults



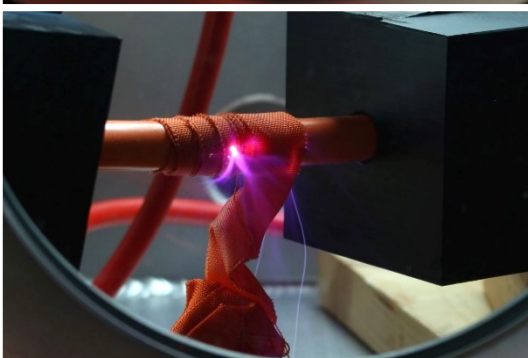
Hole or cut in the in insulation of cable sheath...



...covered by fabric hose



...covered by pipe



...covered by fabric tape



Damage or assembly error on connector housing