

Water

in fiber optic cable sleeves
- an underestimated risk

What's so bad about humidity in fiber optic cable sleeves?

Water isn't fundamentally harmful to glass. The transmission quality of fiber optic cable isn't affected and water has no mechanical effect on it either.

But in the long term, humidity in sleeves can seriously damage fiber optic cables. Salts, minerals and dirt in water can corrode the glass of the optic fiber. It can become brittle and sustain micro cracks.

All the mechanical components in sleeves are also subject to corrosion. This makes them expand and squeeze or even destroy optic fibers.

This may lead to the characteristics of optic fibers being harmfully affected or even cause total failure of signal transmission.

What can be done to prevent humidity in fiber optic cable sleeves?

Early detection of humidity in such sleeves is important.

LANCIER Monitoring products can be used to constantly monitor fiber optic cable sleeves. Fiber optic cable humidity monitoring can provide information on its transmission quality.

If humidity penetrates a defective sleeve it can then be identified and localised. Economical repair long before any transmission problem arises is then feasible.

**... A further benefit:
is that the installation quality of new
cable can be monitored.**

Whether a sleeve is leakproof or not can be ascertained by measuring humidity immediately after sleeve sealing, for example, and comparing it to that of a few days later. If this value doesn't improve despite the use of a drying medium then the sleeve concerned leaks and its faulty installation can thus be proven and complained of.

Fiber Optic Cable Monitoring is essentially required

Fiber optic cable has unexpectedly turned out to be sensitive to environmental influences. For example penetrating humidity is influencing the transmission quality.

Ruptures due to ground movements, construction works or even theft may cause total loss. Thus fiber optic cables must be monitored as well. The transmission quality over the entire cable is measured using attenuation values in a reference fiber. In this process state-of-the-art sensor technology results in quick and precise fault detection.

The LANCIER Monitoring Fiber Optic Monitoring System offers to you

- permanent preventive monitoring,
- short response time when faults occur = no or only short down times,
- fault location if reflectometer (OTDR) is implemented in the monitoring system,
- monitoring of active and dark fibers,
- monitoring of optical performance,
- monitoring of optical attenuation,
- monitoring using reflectometers (OTDR),
- monitoring for humidity penetration.

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*We develop solutions together:
innovative, reliable, future-proof*

There are two alternative ways of monitoring fiber optic cable, each with automatic alarm

1. An RTU (Remote Testing Unit) with OTDR and optical switch can monitor several fiber optic cables using respective AquaSensors (sleeves) in series.

The integrated OTDR precisely localises faults and identifies faulty sleeves.

OTDR with RTU and optical switches



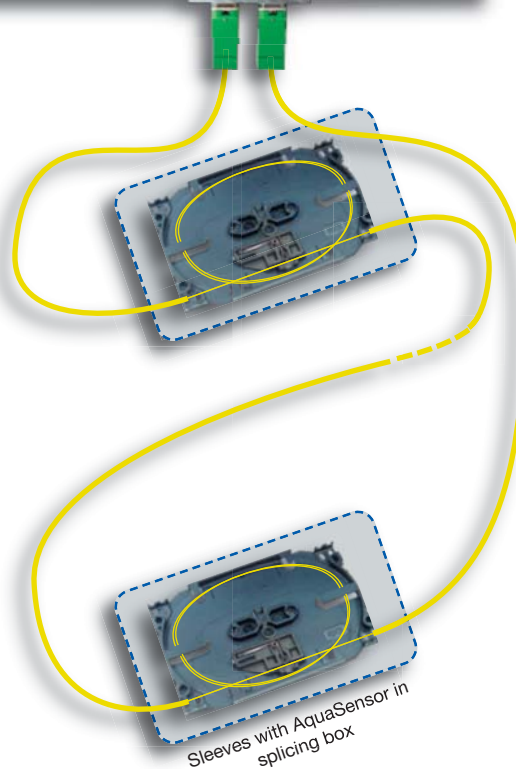
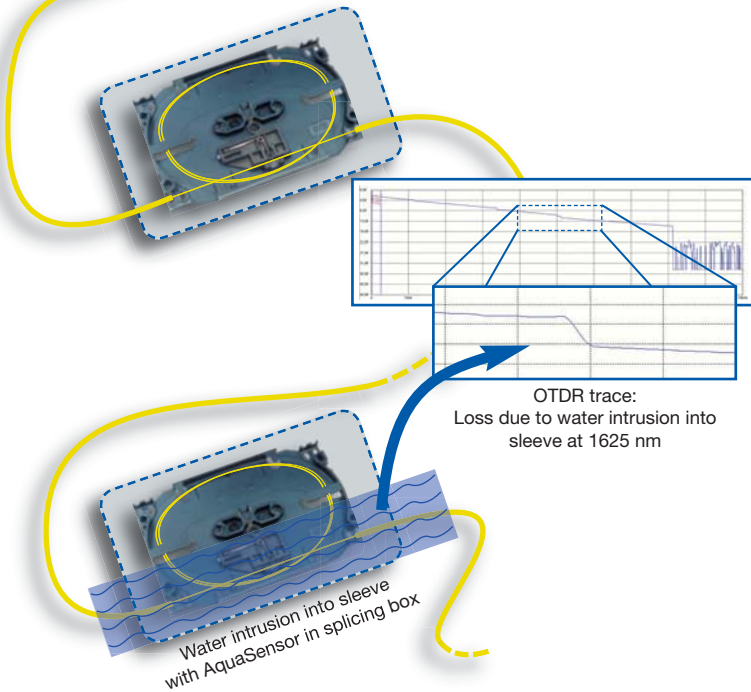
further fiber optic routes

2. RM-Fiber and FiberTxA-Mk2 (without illustration) optical attenuation sensors can be used to monitor optical fiber cable using several AquaSensors (sleeves) in series.

Measuring may employ looping or be in one direction with light source at the other end.

If a fault must be localised then this must be done using OTDR handheld measuring devices.

Measuring module RM-Fiber



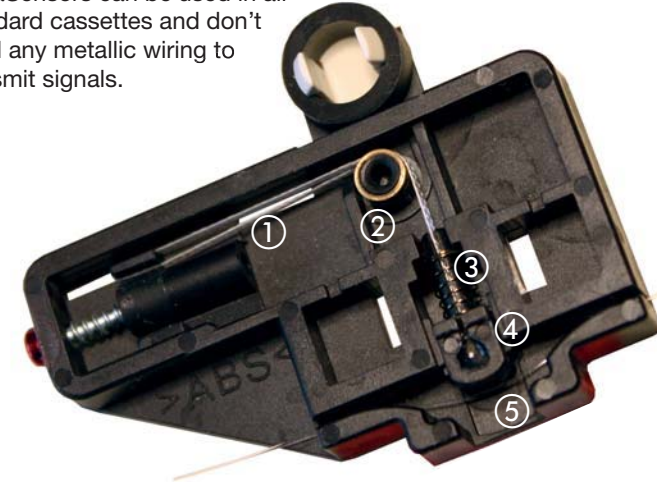
Aquasensor function

LANCIER AquaSensors were specially developed to locate water and humidity in fiber optic cable splicing with standard single mode fibers to ITU-T G.652 standards.

If the **expansion element** ① of an AquaSensor - a hygroscopic tape - contacts humidity it expands longitudinally. It is connected by a **guide roller** ② with a **stamp** ④ via a **pressure spring** ③. This is pressed by tape extension and spring force against the **optic fiber** ⑤ and bends same in a controlled manner.

This generates a quantifiable humidity increase that can be measured by the LANCIER Monitoring System and graphically displayed.

AquaSensors can be used in all standard cassettes and don't need any metallic wiring to transmit signals.



The LANCIER AquaSensor

- Reports of humidity or water in sleeves of fiber optic cables.
- Allows for a quick and exact localisation of faulty sleeves by remote read-out of the measured values using the LANCIER Monitoring System.
- Can be reused as the expansion element's function is reversible after troubleshooting.
- Is a test tool, e.g. when checking the tightness of sleeves after installing new cable routes.