

Fig. 1: Glass fibers are non-aging, flexible, weather resistant, chemically resistant and non-flammable.

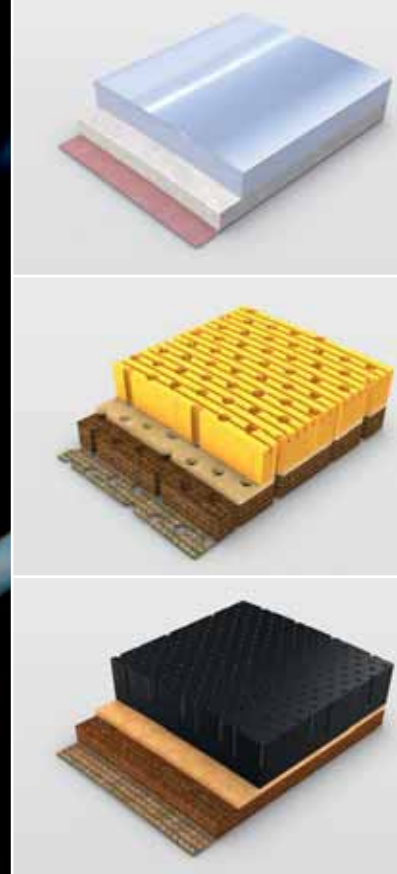


Fig. 2: NipVision can be integrated into all roll covers, regardless of material or surface quality.

NipVision – for nip measurements while the paper machine is running

## Making the invisible visible

**The exact processes in a nip cannot be detected when a paper machine is running and until now also could not be measured. However, these processes are extremely important for producing high-quality paper. This is exactly where NipVision comes into play. Glass fibers embedded in roll covers make the invisible visible for the very first time and thus measurable as well.**

The glass fibers allow online measurement of nip conditions while the paper machine is running. The fibers are very sensitive and can be integrated in the roll covers to whatever depth is desired, regardless of their material or surface quality. In contrast to piezo-sensors with which researchers have experimented so far, the glass fibers can also be used in the wet section of the paper machine, which is so

important for paper quality. Misalignments and over or under load of one or two rolls are directly detected with NipVision, and a multitude of resulting problems are prevented. Examples include:

- Paper web breaks
- Production interruption
- Quality problems
- Unplanned paper machine downtimes
- Detachment of roll cover

Depending on the cover material and the area where the roll is used, glass fibers are embedded at various depths in the roll cover. Due to the specific arrangement of the fibers, the processes in the nip are shown simultaneously and synchronously. This is a definite advantage compared to piezo-sensors, which are arranged around the roll in spiral form and thus do not pass the nip simultaneously. Due to the lack of synchronization,

the interpretation of the data is noticeably more difficult.

### Continuous data flow

The data obtained with NipVision is wirelessly transmitted to a computer equipped with customized software. The effect of setting changes on the paper machine can be checked live and if necessary corrected. However, NipVision does not just transmit information regarding the nip pressure, but also information about the roll cover itself. The continuous temperature measurements improve safety by giving an early warning about possible roll cover problems, so that sudden roll cover failures due to cover detachment are minimized.

NipVision is wirelessly and continuously supplied with power, and is always available and does not have to be pre-activated. Valuable knowledge can thus be immediately obtained, particularly with changes in the ongoing paper production process. An intelligent storage facility attached in the enclosure

supplies NipVision with power even during a machine stoppage.

The thickness of the roll cover does not have to be changed due to the thin glass fibers. The glass fibers do not interfere with the structure of the roll, so that detachment of the cover in the area of the sensor is almost impossible.

### Successful applications

Until recently, nip measurements could only be taken during a machine stoppage. A very experienced engineer was needed to analyze the results. The consequences of setting changes that were undertaken on the basis of the results could only be checked later, while the paper machine was running.

So as to facilitate nip measurements even while the paper machine is running, since the early 1990s development engineers have repeatedly tried to integrate piezo-sensors in the roll covers. Unfortunately the results obtained were not satisfactory, since the

piezo-sensors are not sufficiently sensitive. Furthermore, due to continuous corrosion problems, applications in the wet area of the paper machine were not possible. Therefore, development projects using piezo-sensors were never concluded in the form of a marketable product.

NipVision, by contrast, has already been tested very successfully on the Voith test paper machine at the Paper Technology Center in Heidenheim. The first tests at customers' locations started during March 2011 in the Pacific region. From the very beginning, NipVision has reliably delivered valuable data for these applications and since then has been continuously available to the papermaker. The launch to all customers is scheduled for the last quarter of 2011.

### NipVision can ...

... be embedded in the following roll cover materials:  
rubber, polyurethane and fiber-reinforced composite.

... be integrated in the following surface qualities:  
plain, grooved, blind drilled, grooved and blind drilled.

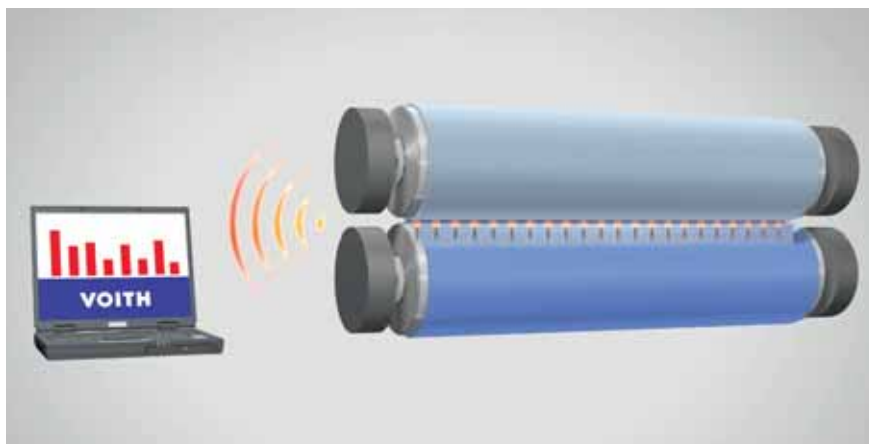


Fig. 3: A schematic diagram of the NipVision sensors.

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