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Report of experiments on the prevention and removal of scale by  
using "**Scalewatcher**"<sup>TM</sup>.

**The company.**

With a total production of 448,000 tons of paper and 222,000 tons of sulfite cellulose in 1996, Hannover Papier is a major paper manufacturer. Based in Alfeld, on the River Leine, the company has more than 1200 employees, generated more than DM 750 million in turnover, and was the first German paper manufacturer to be awarded certification under EN ISO 9001 (for quality) and ISO 14001 (by passing the ecology audit). These achievements are all the more remarkable when one considers that paper production is one of the industries with a particularly high demand for water. Accordingly, Hannover Papier mainly uses water from its own wells, and from the River Leine on whose banks the plant stands - the latter can be described as fresh water. For use inside the factory, for instance by the employees themselves but also for certain production areas, water is taken from the mains supply provided by the Alfeld municipal water works.

**The problem.**

Even if human health can withstand a high mineral content and very hard water, this is not so for industrial production. Particularly when high temperatures are involved, a deposit can build up in tanks, boilers, and pipes that is hard to get rid of, and can involve expensive interruptions to production. It is not usually possible to use chemical or osmotic processes with these huge quantities of water, if only for costs reasons, which means that the necessary maintenance work has to be integrated into the operating procedure in many parts of the plant.

A paper works does not need to put up with this problem forever, as can be seen from a number of them in Canada, England and The Netherlands where electro-magnetic **Scalewatcher**<sup>TM</sup> devices are used with great success to treat process water.

**The solution.**

Innovative companies are always willing to blaze new trails, and Mr. Sandor, the plant engineer at Hannover Papier, was responsible for the first installation of a **Scalewatcher**<sup>TM</sup> system in a German paper factory. "I introduced **Scalewatcher**<sup>TM</sup> systems into our plant back in 1992", he says. "The first two units were installed in two humidifiers, and so far I am very satisfied with them. The only sign of calcium encrustation is slurry, which can be rinsed out very easily with a powerful water jet. Now we have no further trouble. See picture 1



"The problem used to be that deposits started to build up after only a short operating time that it was impossible to remove" Mr. Sandor remembers. The expensive result was that the sieve had to be replaced frequently. Nowadays, the slurry is removed at intervals of four to five weeks with a high-pressure cleaning jet, and the sieve does not need to be replaced at all. Chalky deposits can be seen in the humidifier nozzles in the humidification chamber (picture 1)

which are also of a “squashy” consistency and therefore easy to remove. Both applications are operated with drinking water from the municipal water works.

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### **More applications**

Another type of application for electro-physical **Scalewatcher**<sup>™</sup> systems at Hannover Papier is in the compressor area. After the satisfactory experience gained with the humidifying system, water treatment units were installed here in 1995. This is the part of the plant where water from the river is used for cooling; its degree of hardness is 200 PPM (based on its calcium content), which makes it better in this respect than the town's drinking water. The pipe diameter here is mainly 4 “.

“The initial results were good”, the plant engineer remembers. “We had less repair time, and chalk deposits were only in the form of an easily removable slurry - but then the problem reappeared that we had had before.” The obvious thought was that the unit might have broken down, and the manufacturer replaced it and took it back for examination. “The unit was in technical terms perfectly all right,” says Jan de Baat Doelman, owner and inventor of the **Scalewatcher**<sup>™</sup> product line, recalling the results. “We assumed the cause must lie somewhere else, most probably in the fresh water being used.”

Water from a river, being surface water, has a content of foreign bodies that fluctuates enormously according to the time of year. These include organic acids and other matter that forms chemical complexes, or the phosphates, which come from washing powder, and they have a crucial effect on the chemistry of a paper factory. Another factor is the weather, which can cause a higher or lower content of floating and organic matter in water.

“Of course, our system has to work properly in any circumstances, and we therefore installed another unit with adjusted parameters to cope with these fluctuations,” says Mr. de Baat Doelman in defining the job in hand. “After all, everyday production is subject to economic constraints, and it is not a laboratory in which the water quality can be kept constant.” With the wide range of products and units with many different levels of output and for pipe diameters up to 1250 mm, the manufacturer had plenty of possibilities to draw on. “In a few months' time, we will be able to see whether the new unit works properly in this application, and we are already beginning to think about the extent to which fluctuations in the water chemistry can have knock-on effects,” says Mr. Sandor in explaining the future strategy. “If just as good results can be obtained as in the humidifying plant, I will be recommending the use of the **Scalewatcher**<sup>™</sup> in other parts of our works as well.”

### **Conclusion.**

There can hardly be any other industry that needs so much water as the paper industry. As a result, water costs play an important role in profitability, although at the same time stringent demands are made on the quality of the process water for many applications. In order to meet both these requirements at once, units for treating water electro-magnetically has been installed in certain parts of the Hannover Papier plant and has proved its worth over a period of many years

### **Source.**

Hannover Papier, Alfeld, Germany