

# Diagnosing press problems through moisture profiles

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Since last 2 decades there has been continuous technological upgradation of paper machine press section as well as of press felts. The clothing manufacturer have kept pace to meet the exacting standards demanded by the modern presses. However, even with the best of felts the overall press performance cannot always be achieved due to various problems which could affect efficient press operation. Fortunately the availability of modern tools and instruments greatly help the paper makers in effectively monitoring the important variables that influence press section performance.

With the help of one such instrument, the Scanpro Moisture Meter, one is able to diagnose various press/felt related problems which would affect the performance. The following case studies will show how the moisture profile has helped in overcoming various problems. The cases are as under :

- (1) Severe felt wear out
- (2) Uneven moisture profile of the parent roll
- (3) Uneven and damaged press roll cover
- (4) Pool formation at Press-Nip
- (5) Press VIBRATION
- (6) Plugged Felt Conditioning shower
- (7) Blocked Suction holes
- (8) Poor Sheet Dewatering
- (9) Misaligned Press rolls

A brief description of Scanpro moisture meter principle and the moisture profile curves follows.

## SCANPRO OPERATING PRINCIPLE

The water content of felts provide more detailed information about the Press dewatering process than the water content of the web alone. Quite often a

streak of moisture in the paper web corresponds closely to a peak in the moisture content profile of one of the felts. Low sheet dryness after the press section can be attributed to unsatisfactory dewatering or poor water transport of one or more felts.

The Scanpro Jet-Mem moisture meter designed specially for felts permits faults to be detected at an early stage thus providing a sound basis for making the desired adjustment to maintain press efficiency.

The Scanpro works on the principle of micro-wave which are generated in the measuring head of the instrument. The micro computer in the Scanpro records these micro-wave in the shape of continuous profiles. The micro-wave profiles are directly influenced by the water content in the felt.

The built-in printer draws curves, plots the chart grid and provides a moisture scale that is automatically adapted to the selected measurement range.

## CONCLUSION

The availability of modern electronic instruments such as Scanpro felt moisture meter and also Air flow meter and Paprican felt permeability tester (PFPT) is a boon to the Paper Makers and felt manufacturer and diagnosing press problems is no longer a guess work. Problems related to press section are now easily identified and corrective measures initiated to keep press performance at optimum level.

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**REFERENCE :** Portable Moisture Meters Boost Paper Machine performance

by Arne Ollas  
Skandinaviska Processinstrument AB  
Stockholm, Sweden.

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**CASE I**

**PROBLEM :** Severe felt-wear out

Complain of felt wear out at the centre was received from a large paper mill. To diagnose the problem Cross Direction moisture profile after the press-nip was obtained and it showed peak moisture at the centre of the felt.

**CONCLUSION :**

Incorrect ROLL CROWNING affected the felt life and moisture profile of the sheet.

**CASE 2**

**PROBLEM :** Uneven moisture profile of the parent roll.

It has been found that due to non-existence of pressure gauges or faulty gauges used for monitoring press loading the moisture in the sheet leaving the press is non-uniform. This results in uneven drying and bad parent-rolls. Cross Direction Moisture profiles after the press-nip helps in correcting the uneven loadings.

**CONCLUSION :**

UNEVEN Press-loadings results in uneven sheet moisture affecting roll quality.

**CASE 3 PROBLEM :**

Uneven & Damaged Press roll cover.

Cross-Direction moisture profile obtained after the press nip has helped in locating uneven press roll surfaces or damaged areas in press roll covers.

**CONCLUSION :**

Damaged and uneven press roll covering contribute to PRESS VIBRATION.

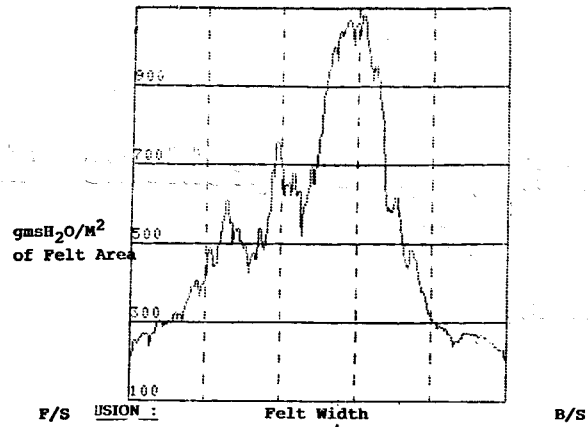


Fig. 1  
Moisture Profile

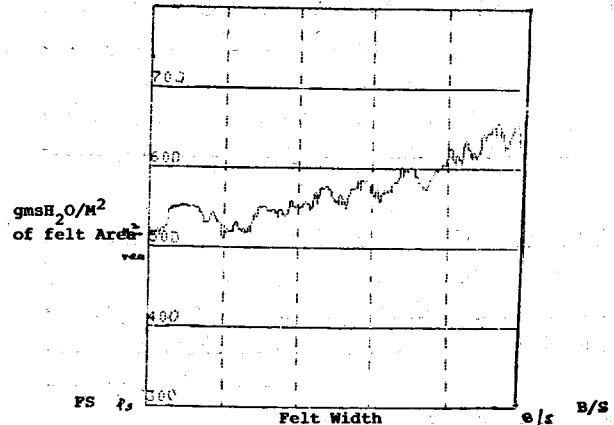
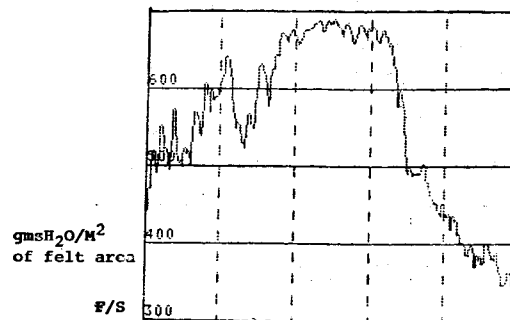


Fig. 2  
Moisture Profile



Felt Width  
Fig. 3  
Moisture Profile

## CASE 4 PROBLEM

### POOL FORMATION at Press-Nip

One of the paper mills having a double-felted suction press was facing problem of pool formation at the press-nip. It was initially blamed on the felt quality and attempts were made to overcome this problem by changing the felt qualities.

Cross Direction moisture profile before and after the suction tube (Uhle box) was obtained. The profiles revealed that the suction tube is not able to dewater the felt at the centre portion. The suction tube surface was checked for evenness. However it was subsequently discovered that the thin tube of the Uhle box was deflecting under vacuum during machine operation affecting the dewatering efficiency and thereby resulting in Pool formation.

### CONCLUSION :

UNEVEN SUCTION TUBE Surface affects felt conditioning and Press problem.

## CASE 5

### PROBLEM : PRESS VIBRATION

A potential contributor to press section vibration is the press felt. One of the main cause of felt vibration is base fabric joins, poor batt splice application, heavy bar line and batt non-uniformity. These problems are normally identified as occurring at one, two or even three times the fundamental frequency of the press felt.

Most common cause of felt vibration is the improper application of Batt. The batt is applied through a grouping of successive web layers which create overlaps in the felt and are known as lapper streaks.

Machine Direction Moisture profile of the felt taken after the press nip for a few revolution of the felt will reveal the frequency of such vibration and this can be then correlated to the press felt frequency.

### CONCLUSION : VARIATION IN FELT DENSITY RESULTS IN PRESS VIBRATION

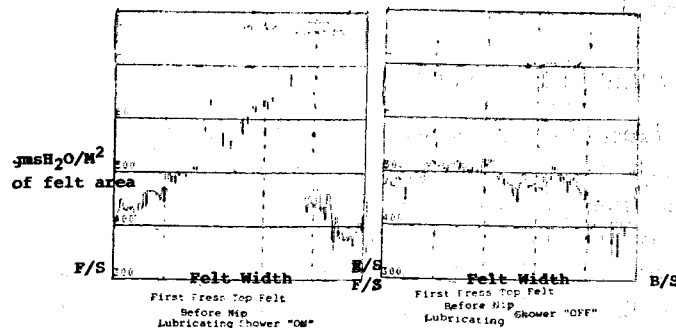


Fig. 4  
Moisture Profile

Fig. 4  
Moisture Profile

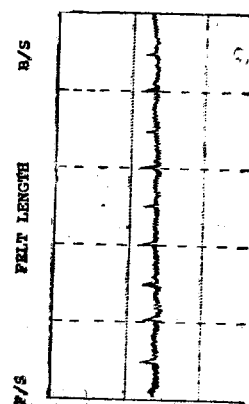
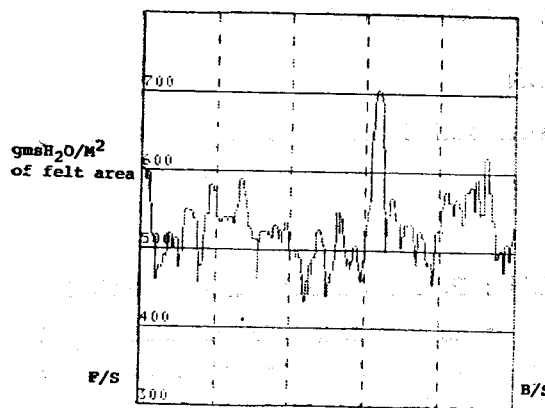


Fig. 5  
Moisture in Felt



Felt Width  
Fig. 6  
Moisture Profile

## CASE 6

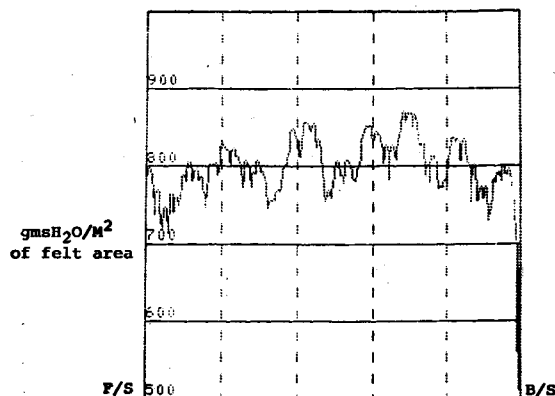
### PROBLEM : Plugged felt conditioning shower

Most of the paper machine press sections H.P. & L.P. showers are either poorly located or are inaccessible for routine observation. The blocked shower jets usually go unnoticed for days together affecting the felt conditioning and results in premature clogging of the felt in the affected portion. In two such mills, initially it was blamed on the felt for poor needling which the mill assumed was the reason for bad sheet dewatering at the affected area across the machine direction.

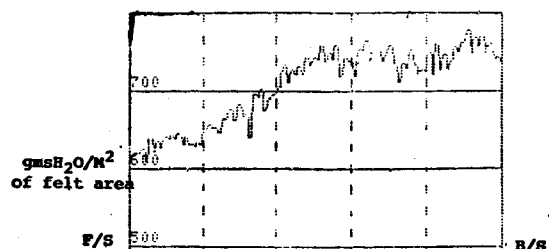
Cross Direction moisture profiles of the press felt revealed a wet streak in the profile. The inspection of the H.P. Shower nozzles at the affected area confirmed that a nozzle is blocked.

### CONCLUSION :

A cross-machine profile such as above could be mistaken for uneven filling, although the shower caused the variation.



Felt Width  
Fig. 7  
Moisture Profile



Felt Width  
Fig. 8  
Moisture Profile

## CASE 7

### PROBLEM : BLOCKED SUCTION HOLES

In few mills having suction press rolls moisture profile obtained before the suction tube revealed relatively uniform moisture over a wide area of the width followed by highly uneven profile over the rest of the felt width. Further investigation confirmed that the suction press roll shell was having blocked holes and required fresh drilling to clean the holes.

### CONCLUSION

Blocked suction roll holes cause uneven moisture profile.

## CASE 8

### PROBLEM : POOR SHEET DEWATERING

In some mills the papermakers complained against poor water holding capability of the press felts. They were unable to apply designed load on the press and as a result the sheet dryness was affected and consequently they had to reduce the machine speed.

Moisture profiles were obtained before and after the suction tube to check its dewatering efficiency. It was observed that the felt instead of losing moisture at the suction tube was gaining moisture from the tube. As a result more moisture was going in to the press nip than coming out of it. The hydraulic load on the sheet was, therefore, increased which caused sheet crushing and problem of press loading.

It was on investigation discovered that due to faulty piping the water from another suction tube located at a height was getting in to this suction tube located at a lower level. The piping was corrected and the problem disappeared immediately.

### CONCLUSION

Moisture survey serve as a very useful method to check press section moisture balances.

## CASE 9

### PROBLEM : Misaligned press rolls

The cross-Machine moisture profile helps in checking alignment of press rolls. The profile shown in the figure 8 is caused by a scissored nip - i.e. mis-alignment of press rolls.