

# A Case Study of in House Repairing the Soft Rubber Covering of Swimming Roll Soft-Nip Calender Stack

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## ABSTRACT

**Emami Paper Mills Limited** is one of the largest waste paper based paper mills in India with a high speed paper machine operating at 1100 MPM (average speed)

Emami paper is the only newsprint machine in India having Back to Back softnip calendar stack to deliver the world class quality newsprint to the customers.

This softnip calender was originally designed by Voith Sulzer and Emami has got it refurbished with Gapcon Germany and also have done the covering of TITAN HT (Composite Type) of Stowe Woodward, which is highly suitable covering impervious to barring.

Recently in an incident, the Titan HT covering (Composite type) of the swimming roll at 2<sup>nd</sup> stack got damaged and the same was repaired with in-house technique and till date the swimming roll is running with out any failure.

Gapcon gmbh Germany has recommended the recovering of the swimming roll with of Euro 43,000 plus transportation etc.

Finally Emami paper mill has decided to repair the roll in-house and succeeded to save an appreciable amount and set a new bench mark.

## Introduction

Emami Paper Mill is the only newsprint mill in India, installed with back to back softnip calender to produce a high quality news print paper.

The softnip calender was originally designed by Voith Sulzer and swimming rolls were previously covered with TOP TEC-4. At the project stage, the calender stack was refurbished by Gapcon gmbh Germany and swimming roll covering of TITAN HT (Composite Type) was also done considering the fact that in high speed machines, the barring is a common problem and it lead damage of roll covering.

TITAN HT (Composite Type) is an advanced covering suitable for modern high speed softnip calender swimming roll. TITAN HT covers, with more particles per square inch, are the toughest covers in the market. They resist abrasion and are typically impervious to barring and impact damage.

## Concept of installing the Back to Back Soft Nip Calendar:

Soft nip calendaring is one of the hottest technologies in the papermaking industry today. Development of the soft cover design allows for extended nip

loading--a higher loading on the sheet for a longer period of time--and higher temperatures in the nip to make the sheet more susceptible to calendaring forces. Soft nip technology also allows mills to produce a high quality paper finish using a calender stack configuration online with the paper machine.

Steel shell rolls covered with polymer are paired with hard steel rolls to create what is called a soft calender. It is usual to have two such pairs and one after the other with the second being inverted to allow both side to contact the polished roll to achieve the similar finish on both side of the paper.

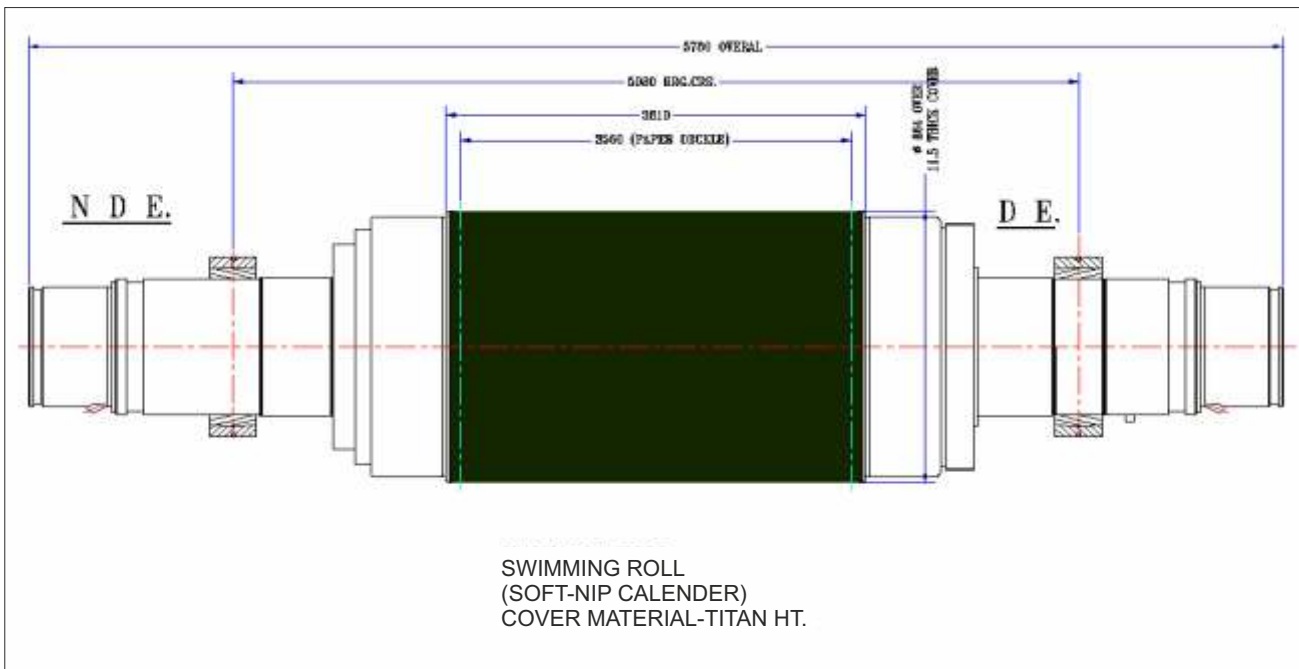
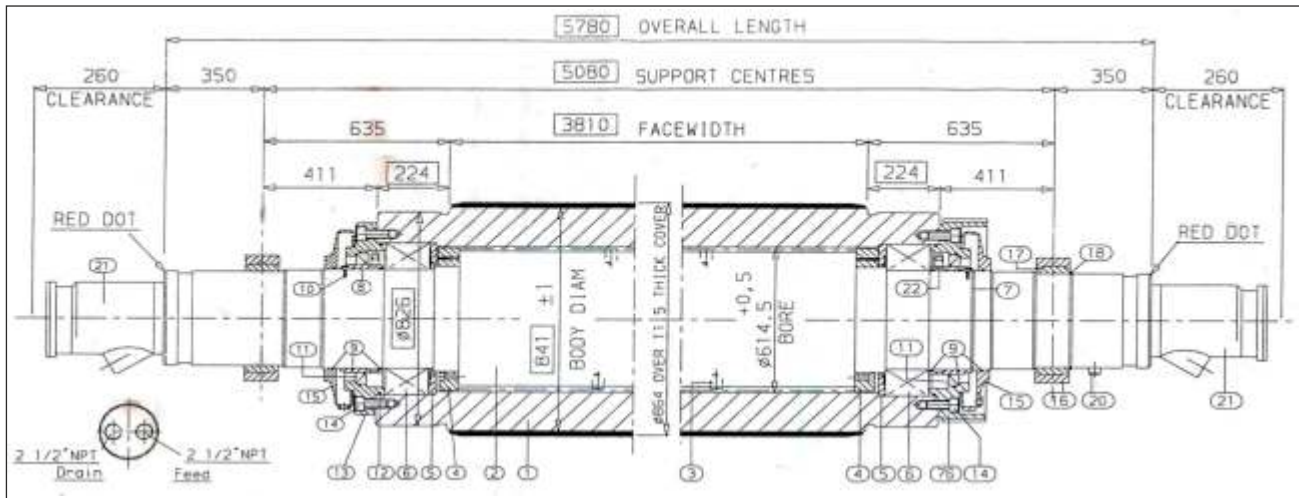
Modern technique of soft nip calendaring can apply less pressure for a longer period and improve the surface finish without the densification produced by traditional hard roll machine calender. This difference leads to lower loss of strength because the structure sustains less damage.

## Advantages of back to back softnip calendar:

- Two sidedness is significantly eliminated
- Superior paper finish on both sides
- Uniform density of the paper



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resulting in minimum hills and valleys and gives much better printability at par with International Newsprint quality.

**Details of swimming roll installed in Emami paper mills Ltd.:**

- Roll diameter: 864 mm.
- Roll Cover: Titan HT(Composite Type)
- Cover hardness: 92 Shd +/- 1 Shd
- Surface finish : 0.4 +/- 0.1 micro m Ra
- Nip Load (Normal Operation: 75 117 N/mm)
- Temperature (Normal Operation: 70-80 degree Celsius)

**Drawing Swimming Roll:**

**Case study:**

- On Nov.29, 2008, during the plant operation, the soft nip cover of calender 2nd stack swimming roll has partially peeled off at drive end due to paper wrapping on roll surface.
- In double Stack Softnip calendar, the Voith has earlier recommended the doctoring system at both swimming rolls.
- From the practical experience, Emami has decided to remove the

doctoring system as it is not suitable for the softnip swimming rolls. During the machine start up, paper remains moist and has a tendency to wrap around the roll and by virtue of it the doctor caused damage to the roll covering twice.

After the incident, 2<sup>nd</sup> calender stack we made bypassed without stopping the machine and in the next opportunity shut, the same roll was taken out of the machine and installed spare one.

Roll was inspected and found covering peeled out in the working face of the roll. The peeled off surface was around 530 mm long, 65 mm wide, 7 mm deep. Since the extent of damage was more

and it was a special covering so Emami has decided to repair the roll through some renowned roll manufacturing company.

Since the calander stack was refurbished by Gapcon gmbh Germany so they were asked to quote for repairing the roll covering. Gapcon gmbh-Germany has not agreed for repairing and proposed that recovering is the only solution.

Gapcon gmbh-Germany has quoted Euro 43,000(Excl. Transportation, customs duty etc.) for recovering the roll with a delivery lead time of 04-05 months.

Considering the fact that roll covering is new and recently roll was refurbished from Gapcon gmbh Germany, the Emami has decided to carry out the repairing job in house with a full confidence on its skills.

Finally the roll was repaired and

grounded in House and installed on the machine in the next opportunity shut.

The same repaired roll is running till date and Emami has succeed to save an appreciable amount which was going to be incurred on the roll recovering also Emami has set a bench mark with a successful operation of repaired swimming roll

### Swimming Roll- After the Repairing:

#### Conclusion:

- 1) Emami Paper mill is India's first news print machine installed with back to back softnip calender and delivering world class newsprint to its esteemed customers.
- 2) Emami has succeeded to repair the highly special covering of swimming roll while Gapcon

gmbh-Germany/ Stowewoodward has not recommended for the same with a doubt on the successful operation of the repaired roll and they have suggested for recovering the roll.

- 3) In the repairing of the peeled off rubber, no cost has worn in terms of down time and repairing method.
- 4) Emami has saved an appreciable amount which was going to be incurred on Titan HT re-covering of swimming roll

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