

# Machine Changes, Metal Wire To Synthetic Wire Conversion

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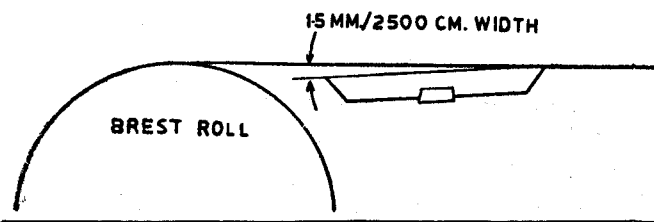
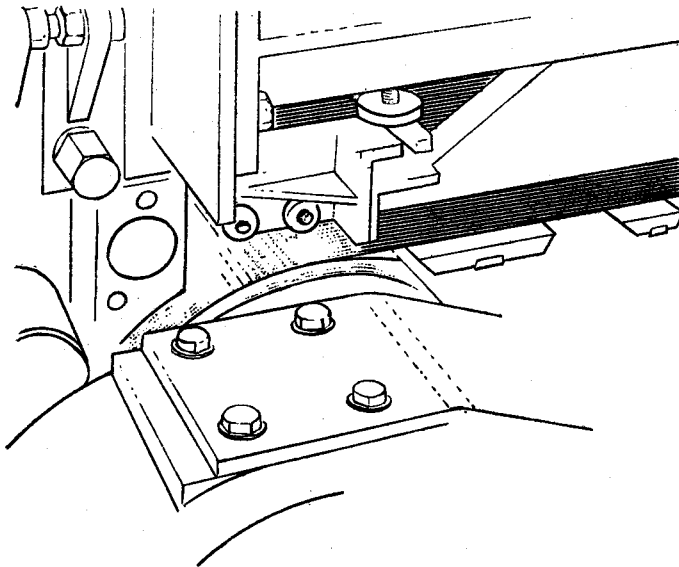
## SUMMARY

The paper describes with illustrations conditions required on paper machines under which a synthetic paper machine wire will give best performance. Out line of wet-end parts which require proper examination and positioning before running fabrics have been discussed. How to fit, run and maintain fabrics have been given.

## MACHINE CONDITIONS

Most machines are suitable for Fabrics but there are certain conditions under which Fabrics will perform best. Below is outlined some of the wet-end parts of the machine which need examination when running Fabrics.

**Forming Board**—The forming board is usually made of ceramic or high-density polythens. Note that it is advisable to have the leading edge of the forming board slightly dipped to prevent wear on the underside of the Fabric.

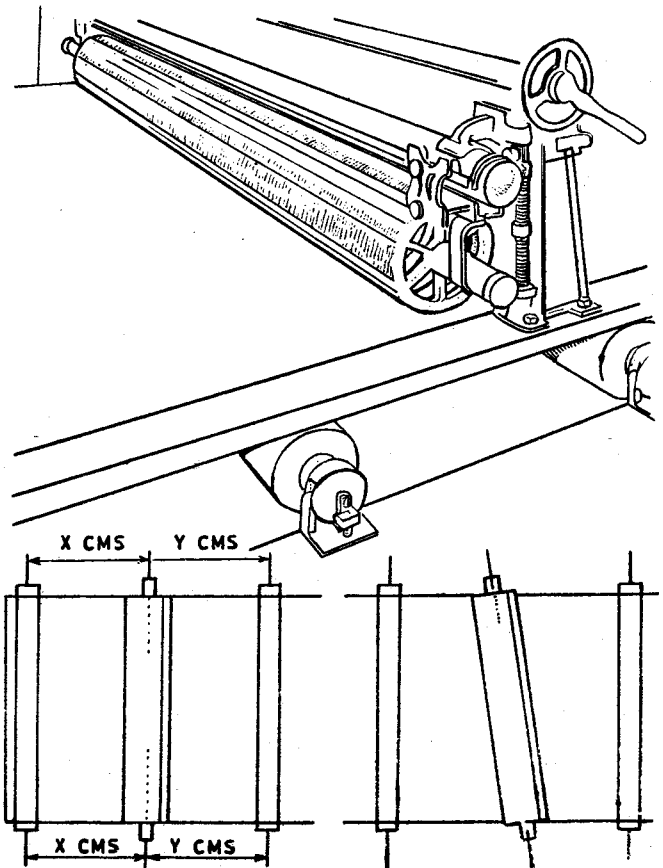


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**Foils**—Foils create no problems when running Fabrics and similar settings for Metal apply to Fabric, the change from Metal to Plastic will not require re-adjustment.

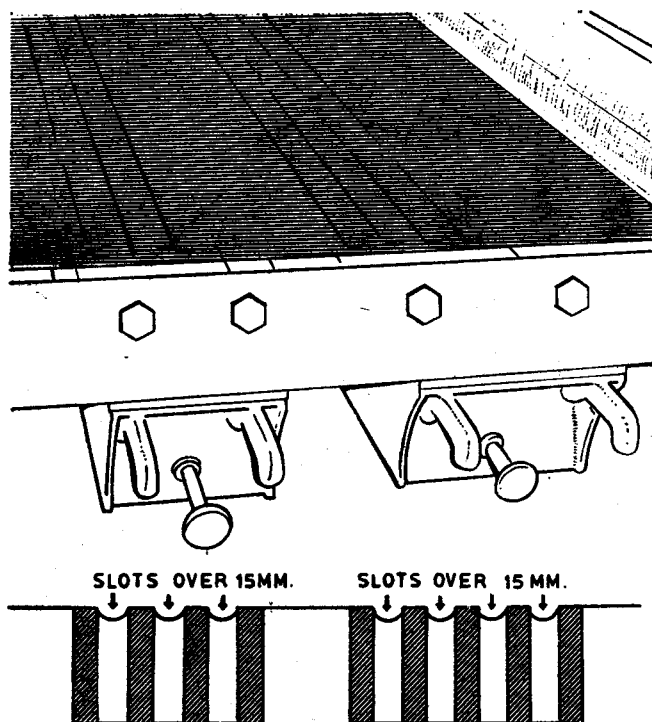
**Table Rolls**—It is important that all table rolls are free running no other adjustment should be required.

**Dandy Roll**—A dandy roll running off square will effect the Fabric guiding.



**Suction Boxes**—A ceramic or high-density polythene suction box gives the best results since wood and reclaimed material can cause rapid Fabric wear. When recycled material is used for the box tops it has been known for grit and other hard particles to come to the surface and cut the underside of the Fabric.

Wide slots on the box tops can cause “bunching” or “shoving” (distortion of the weave) and wear takes place at the lip of the trailing edge. This occurs when the slots are in excess of 25 mm.

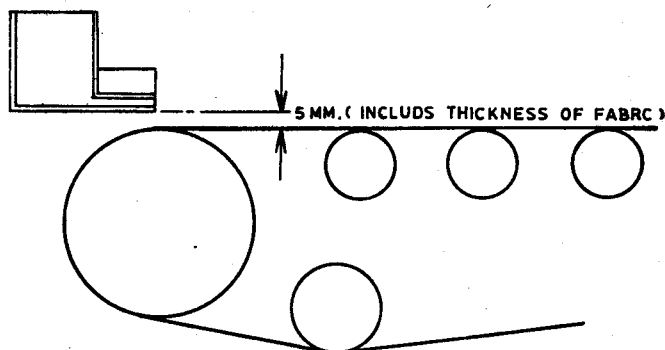
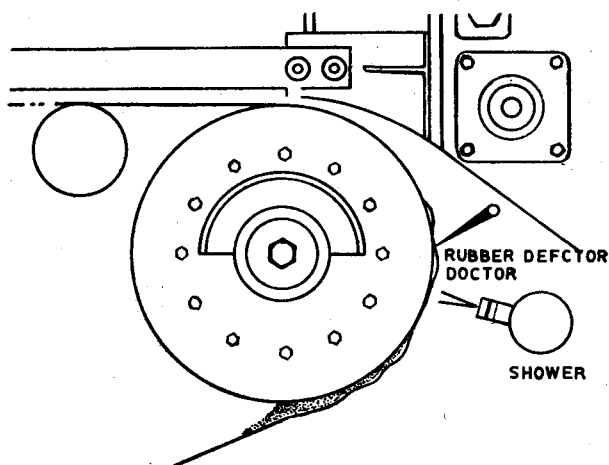


**Last Return Roll**—If a shake is applied to the Fabric it is preferable that the last return roll is free to oscillate with the Fabric.

**Breast Roll**—The coefficient of friction between the breast roll and the Fabric should be at maximum. Both water and pulp are often carried round on the inside of the Fabric and it is helpful to have either a rubber deflector apron and or a shower (see diagram).

It is also important that the slice has a sufficient clearance above the Fabric to prevent damage caused

by returning pulp lumps.



#### Shake

(a) **Breast Roll Shake**—No problem is encountered with Fabrics but it should be noted that the shake will be transmitted further down the table if foils are used. It is important however, that the last return roll is allowed to shake with the Fabric to prevent creasing.

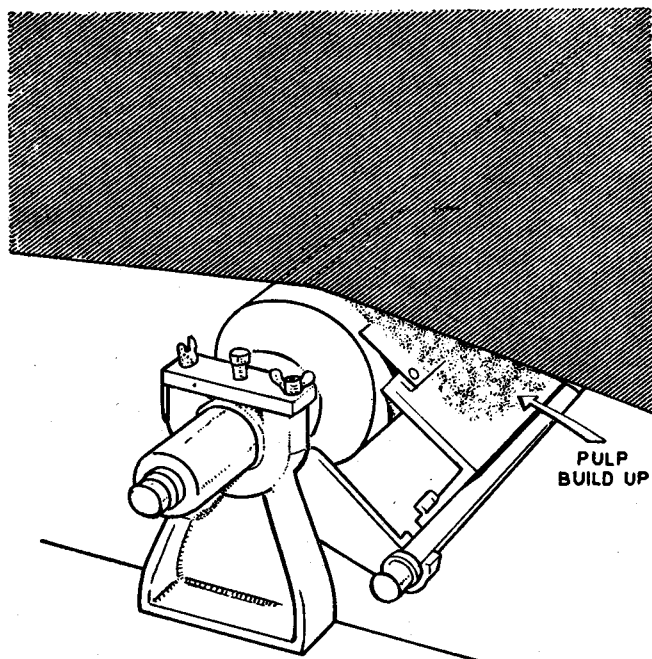
(b) **Frame Shake**—Frame shake should be kept to a minimum as violent shake can induce creasing.

**Bagally Box**—A Bagallay Box is similar to a suction couch and therefore induces extra drag, and this can cause problems when changing from Metal to Fabric Clothing.

**Suction Couch**—A high vacuum and good wrap angle drive the Fabric and subsequently reduces slippage.

**Forward Drive Roll**—A high wrap angle improves the driving of the Fabric. Rubber at  $15^{\circ}/17^{\circ}$  on the surface of the roll increases the coefficient of friction reducing slippage and wear on the Fabric.

**First Return Roll**—If the first return roll is driven with a good wrap angle the performance of a Fabric may be improved. It is imperative that this roll rotates freely and has an effective doctor, otherwise pulp will be transmitted to other rollers causing pulp build-up with subsequent creasing and damage.

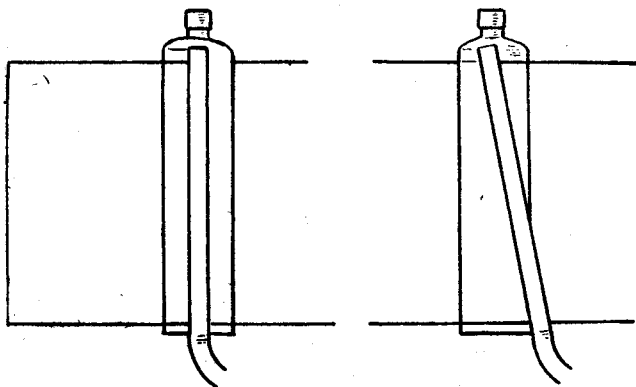


**Stretch Rolls**—Stretch rolls should have a good wrap angle and be able to take up a maximum amount of stretch.

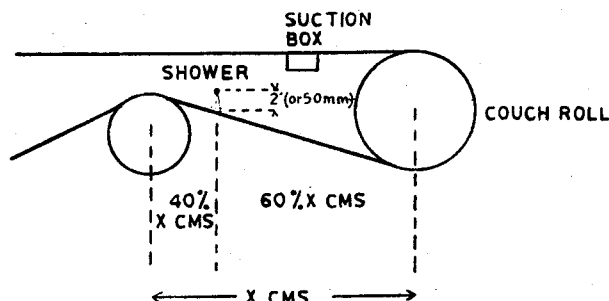
**Auto Tension Roll**—A good wrap angle and accurate measure of tension is important.

**Auto Guide Roll**—The wrap angle of the auto guide should be constant at 20°–25°. Spade guides should be free from scoring and there should be no area which would cause a “sewing” action. All moving parts should be well maintained.

**Showers**—Showers should be at right angles to the direction of movement of the Fabric. If the shower is off square it could cause difficulties in guiding. The pressure required depends on the stock and on certain particular machine conditions.



Where pitch is a problem high-pressure showers are recommended. A needle jet at 45/50 Kgs/sq.cm gives the most satisfactory results. The following diagram indicates the most suitable position. If the centres of the jets are 10° (254 mm) the shower should oscillate at least 12” (305 mm.) in case any of the jets should become blocked.



### FITTING, RUNNING AND MAINTENANCE OF FABRICS

#### Correct Length of Fabric

Plastic wet-end clothing has a relatively high modulus of elasticity and can be considered as having similar characteristics to an elastic band. It is therefore made shorter than the measured loop length. The amount by which the length is reduced depends on many factors including suction box drag, speed, furnish, etc. The length is calculated by formula and experience of performance on similar machines.

#### Horse Power and Tension

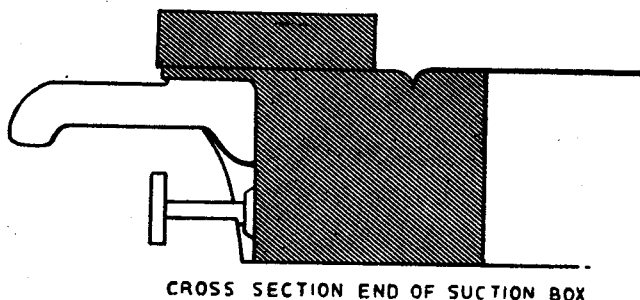
It is necessary to set a Fabric at the right tension; this becomes increasingly important at higher speeds. If the tension is too low slippage will occur at the couch or forward drive roll, followed by wear.

If the details in the survey form are completed our Technical Services Department is able to calculate the required tension to prevent slippage and wear, and also the required horse power to drive the Fabric.

#### Points to Note before Installation

1. Do not use a knife to cut the wrapper (use “rip cord”). Take care not to knock the Fabric against any sharp object.
2. Hose off the wet end of machine to remove loose scale.
3. The life of the Fabric is longer than Metal Wire, therefore any foreseeable maintenance should be carried out.
4. Dress up grooved or worn suction box tops, forming board and renew old foil blades. Note that if the edges of the suction box tops

have been worn by a metallic wire, the Fabric will fold over into the groove and traying will soon occur.



5. Ensure guides are in good mechanical order.
6. Check for and, if required, replace worn or cracked deckle rules.

#### Points to Note during Installation

1. On a knock-down type Fourdrinier, where the breast roll is lowered into position, care should be taken to prevent the roll from striking the slice lip and cutting the Fabric.
2. As the Fabric is being draped on the machine, all sharp edges, such as forming board leading edge, hydrofoil blade edges, etc., should be either covered or extreme care taken to avoid cutting the Fabric.
3. As Monofilament Fabrics are shorter than their equivalent Metal Wire, then :  
For cantilever or roll-out Fourdriniers a wire pole may be left out of the wire-stringing sequence or alternatively, the Fabric may be pulled on loose.  
For knock-down Fourdriniers the shorter Fabric may necessitate some tension on the breast roll and pressure on the wire-return rolls to relocate them in their supports.

#### Points to Note after Installation

1. Ensure that the leading edges of the deckle rules are not digging into the Fabric.
2. Check all wire rolls, breast roll and couch roll are square, and rotate freely.
3. Check slice clearance.
4. Note dipped leading edge of forming board.
5. Loop length at both sides of the machine checks squareness.
6. It is important to finally ensure the tension is right.
7. The cleaning of the Fabric is covered in Appendix I
8. Patching of Fabrics  
Adhesive patches have not proved totally acceptable, although work now being carried out could make repairs a fairly quick and effective method of prolonging Fabric life.

It is possible, however, to repair a Fabric by replacing the damaged wefts and warps.

## APPENDIX I

### The cleaning of Monofilament Fabrics

The life of a Monofilament Fabric is normally three to six times that of a Metal Wire, and regular cleaning is essential to prevent any make-up.

#### Cleaning under Running Conditions

To prevent the Fabric making-up, we recommend the use of continuous clarified white water or fresh water fan-type sprays (60-90 psi. or 4-6 kgs/cm-) on the return run with intermittent high pressure water cleaning (1,000 psi. or 70 kgs/cm-). The use of chemical cleaners added continuously to the Fabric, e.g. Nafloc N228 and Diadavin E.P., can help keep the Fabric clean.

#### Weekend or Shut-Down Cleaning

When the machine is shut at weekends, we recommend that the Fabric be given a thorough clean. One way to do this is to mix the proper concentration of cleaner in a drum, and feed this through a return wire spray pipe whilst the Fabric is put on crawl. Another method, often used, is to clean the Fabric when cleaning through the stock system, i.e. via the mixing pump, cleaners and headbox. Cleaners, such as Brill-Tak 5% concentration, Hostapal D.L. 10% concentration, Solugan 10% concentration, are suitable for general cleaning.

#### Cleaning of Soiled Spots

Virtually all solvents are suitable—Benzene, Xylene, Toluene, Carbon Tetrachloride, Trichlorethylene, etc.

#### Removal of Oil and Grease

Benzene, Toluene, Methylated Spirits, Trichlorethylene, Genklene, D-Solvo (similar to Polyclens), Kerosene (with steam).

#### Removal of Pitchresin, tar, latex

10% solution Hostapal D.L., 10% Solugan solution, 10% Sulphuric Acid solution, Polyclens, Nafloc N66, N803, N809, Oakite 117 and 118, Pitch Solvent.

#### Removal of Rosin, Size and Hardwater Deposits

A 5% solution of Acetic acid wash followed by a 1% solution of Soda Ash wash, Nafloc N809, Everite.

Note : If the Fabric is *not* to be run immediately after cleaning with the above, then a rinse with fresh water must be given.

#### Precautions

Never use metal bristle brushes to accelerate Fabric cleaning—always use nylon bristle brushes. Acids should not be concentrated as these will rot the Fabric, causing chemical degradation.