ROLL WRAPPING AND HANDLING

MADISON PAPER COMPANY
ALSIP, IL, USA

LAYOUT DRAWING
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Valmet Inc., Appleton Division
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01 DIMENSIONING DATA

01.10 MAIN DATA

PAPER MACHINE DATA

Paper grade	LWC, Newsprint
Production	
- phase 1	115000 Tons / year
- phase 2	160000 Tons / year
Basis weight	
- newsprint	28 - 34 lbs / 3000ft^2
- LWC	35 - 48 lbs / 3000ft^2
Wire width at reel	242 - 244"

PAPER ROLL DATA

Diameter	50" - 60"
Width	14.75" - 150" *)
Weight	400 - 18.000 lbs
Diameter/width ratio	2,5:1
Capacity, max.	40 rolls/hour
Cycle time, max.	80 seconds

*) Rolls widths less than 20" must be bound together at the winder so, that they act as a single roll in the roll handling process.

Cycle time with TopPack wrapping:

Single wrapping (without overlap), up to 2.1 revolutions
- 60 sec/ roll, 50 rolls/h

Two wrappings (one overlap), up to 2.1 revolutions
- 80 sec/ roll, 40 rolls/h

Three wrappings (two overlaps), up to 2.1 revolutions
- 100 sec/ roll, 32 rolls/h

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PERSONNEL REQUIREMENTS

Operators	1
Activities	Operator 1: - general supervision of wrapping - roll ID by handheld barcode scanner - application of inner and outer heads - application of bilge and end labels Part-time helper: - part-time material filler

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10 ROLL WRAPPING AND HANDLING

10.10 TECHNICAL DESCRIPTION

10.10.10 ROLL HANDLING SYSTEM BEFORE WRAPPING MACHINE

The roll set is separated with segmented stop (item 10) to two half sets. Operator will mark and check the rolls by barcode tags between the segmented stop (item 10) and the retractable plate stop (item 11). Operator controls through the control panel, the segmented stops and the retractable plate stop.

From retractable plate stop (item 11) the half sets are released on the slat conveyor item 14, and stoped on it by the fixed plate stop item 12.

After these operations operator starts the conveyor from the control panel, and rolls are conveyed automatically through the lowerator item 15 to the StreamPak roll wrapping machine. The roll scale is located under the slat conveyor item 16.

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10.10.20 STREAMPAK ROLL WRAPPING MACHINE

MEASURING, WEIGHING AND CENTERING

Rolls are first weighed on the conveyor item 16. Here the roll's diameter and width are measured for wrapper length calculations. After this, the roll is conveyed on the slat conveyor item 17. Here operator identifies the roll from barcode with hand held laser scanner (not included to delivery scope), before the roll is kicked to the wrapping station.

The slat conveyor item 17 centers the roll to the centerline of StreamPak wrapping machine. Kicker ejects the roll into wrapping station where roll is smoothly stopped by cushion stop. All the wrapping functions take place at this station.

TopPack COMBINED WRAPPING, CRIMPING AND HEADING STATION

Function description

The **TopPack** wrapping is a new innovation in roll wrapping. All the wrapping combinations are carried out in this case only with one wrapper width, which is optimized according to the actual production widths of paper rolls. E.g. 50" for the volyme size rolls. All the larger sizes will be wrapped by two or three wrappings overlapping the previous wrap.

The wrapper cartridge is designed to be able to use wrapper material widths from 24" to 62".

This machine is equipped with the continuous heat sealing method to seal the package and ensures the highest wrapping quality, or can be changed to conventional hot-melt gluing system on later date. Now the choosed system is the continuous heat sealing.

Wrapping process

The wrapping process begins when roll arrives to the wrapping station. Operator inserts inside heads and activates head holders to support heads against roll ends.

The wrapper roll-carrying cartridge positions itself according to the roll into the center or to the first end with 6" crimp overhang. The crimper and the heat sealing device will be aligned the same way.

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The wrapping process starts with low speed. The heating power is suited to this speed. Right after the wrapper leading edge is sealed to the roll, the wrapping speed will be increased and the heating power adjusted accordingly. When the package has been completed, the power will be reduced to the stand by value.

The crimping takes place simultaneously with wrapping, both ends at the same time or one end at a time.

In case of one or two overlap wrappings for the roll, the cartridge with the wrapper roll will be indexed to the next location according to the roll to be wrapped. To the other end with 6" crimp overlap or to the location of the intermediate wrapping.

The wrapper roll widths to be used may be changed anytime to optimize the wrapper amount in the package. Because the backstand is able to pick up the rolls from the floor, no overhead crane is needed.

Cutting device

The system has a cutting device to cut the wrapper when the required length is reached. The device has two rotating parts, the knife and the anvil powered by an electric motor. The device rotates one revolution when cutting the wrapper and stops to the home position for the next cutting.

Safety with Heat Sealing

Special attention has been given to the automated safety system. This system consists of an extensive software/hardware package including for example the wrapper feed tracking, measurement of the wrapper temperature, flame detector, wrapping cycle tracking, IR-heater unit cooling and fire extinguishing system.

Power Consumption with Heat Sealing

The power consumption is moderate even though the maximum heating power is considerable. For example, when the production is 2300 rolls/day, average roll size, width 60", diameter 40" and with two layers of wrap, the power consumption is about 1500 kWh/day.

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Header Press

After inserting the outside heads to header press platens, the operator starts the head pressing cycle to heat seal outside heads against the roll ends. The heads are kept on the platens with vacuum.

When head pressing cycle is finished the roll is ejected to the floor, and there after. The conveyor centers the next roll.

During the wrapping, crimping and heading cycle the operator labels previous roll on the conveyor.

WRAPROL-TS CONTROL SYSTEM

General

Wraprol-TS is a tool for operators to operate the wrapping line. The wrapping line devices and encoders can also be tuned up and monitored by maintenance personnel.

Wraprol-TS is based on widely used Allen-Bradley 1000 series touch screen (TS). Compact size allows the panel easily to be mounted into desirable place.

Run

Run-function is one of the most used functions by the operators. The various data of the roll is showed at station; roll ID, weight, width, diameter, order code, address, wrapping instruction, etc. This information helps the operator to run the machine. In addition, status of the interface equipment (bar code reader, scale) is showed on the screen, depending on the mill information system information available

The other most used functions (Materials and Alarms) can be selected directly by touching icon buttons. To return to run-function touch the run-function icon.

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Materials

The diameter, width and type of the wrapper can be entered in Materials-function. When the material has almost run out, it is indicated by an alarm and the operators can prepare to add the materials.

Parameters

There are many parameters, which has an effect on the wrapping machine. They are tuned up during start up, but there are parameters, which possibly has to be changed when for example replacing encoders.

There are following parameter displays depending on the wrapping machine:

- Material parameters
- Wrapping tension parameters
- Wrapping speed parameters
- Timer parameters
- Heat sealing parameters
- Device parameters

Switches

The rarely used selector switches can be placed on the screen thus reducing required space on the control desk.

Alarms

To keep availability time of the wrapping machine high, Alarms-function is required to localize disturbances rapidly.

Examples of the alarms:

- Backstand almost empty
- Safety gate open
- Barcode reader didn't read the barcode
- Hydraulic pump 1, no control voltage

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