SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
MSK Transport Conveyors

MSK transport conveyors are roller conveyors with soft start and photo switch. Depending on the need some are supplied with breaks. Each has it own drive motor and conveyor with conveyor chain drive capable of holding a max weight of 5,060#.

Functional Description

Pallet in feed roller conveyor (position 02)

A pallet/skid is loaded on to the MSK in feed conveyor position 02 via forklift. When the light beam on the roller conveyor is occupied a delay time will start. After the delay time, the pallet is ready for transport.

Shuttle car (position 03)

If the roller conveyor position 02 is ready for transfer of the pallet/skid the shuttle car starts the conveyor. After start the conveyor on the shuttle car, the shuttle car is ready to receive the pallet/skid. The pallet/skid will be transported from the roller conveyor position 02 to the shuttle car position 03 or from 1CC skid discharge conveyor. If at 1CC discharge conveyor skid will be transported to the shuttle car position 03. When the light beam on the shuttle car is occupied the speed from the conveyor on the shuttle car will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop position. The shuttle car has received the pallet/skid and the roller conveyor position 02 will stop.

The shuttle car 03 will move into transfer position back in line with conveyor positions 02 & 04.

Roller conveyor (position 04)

If the shuttle car 03 is ready for transfer of the pallet/skid the roller conveyor position 04 starts. The roller conveyor position 04 is ready to receive a pallet/skid after start. The pallet/skid will be transported from the shuttle car position 03 to the roller conveyor position 04. When the light beam on the roller conveyor position 04 is occupied the transport will stop. The roller conveyor position 04 has received the pallet/skid and the conveyor on the shuttle car will stop.

Lift conveyor (position 05)

If the roller conveyor position 04 is ready for transfer of the pallet/skid the lift conveyor position 05 starts. After start, the lift conveyor position 05 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 04 to the lift conveyor position 05. When the light beam on the lift conveyor position 05 is occupied the transport will stop. The lift conveyor position 05 has received the pallet/skid and the roller conveyor position 04 will stop. After receiving the pallet/skid the lift conveyor moves down until the lower conveyor level is reached.

1. The lift is hung at two roller chains which make it possible, due to the high stiffness, an accurate positioning of the lift.
2. The vulkolan wheels, which lead the lift, area especially silent and with a low vibration and with a high wear abrasion.
3. The weight of the lift is with a (counter) weight counter balanced, which is moved inside the frame of the vertical transport system. With this construction the re-tensioning of the chains is no longer necessary.
4. The pallet is positioned in the vertical transport system at the chain conveyor by a photo switch or/and sprocket wheel. Is the pallet not placed correctly the movement of the vertical transport system will not be started.
5. The positioning of the lift with conveyor in the vertical transport system is provided by a proximity switch. The lift drive is controlled by frequency. Before the stop position of the lift is entered, the lift change to slowly movement.
6. If the brake of the lift motor out of order the worm gear is approximately self-locking by the speed increasing ratio.

Safety equipment
The down and upper stop position of the vertical transport system is secured by protective guards.
Safety light barriers provide, that the area of the pallet in feed in the down position of the vertical transport system can not be entered/respectively blocked by persons or items.
The end position of the vertical transport system is secured by an end stop. These part stop the machine if the end position is crossed.
The vertical movement of the lift is secured against toe-in's by mechanical roller switches.

Roller conveyor (position 06)

If the lift conveyor position 05 is ready for transfer of the pallet/skid the roller conveyor position 06 starts. After start, the roller conveyor position 06 is ready to receive a pallet/skid. The pallet/skid will be transported

from the lift conveyor position 05 to the roller conveyor position 06. When the light beam on the roller conveyor position 06 is occupied the transport will stop. The roller conveyor position 06 has received the pallet/skid and the roller conveyor position 05 will stop.

Turntable (position 07)

If the roller conveyor position 06 is ready for transfer of the pallet/skid the conveyor on the turntable starts. After start, the turntable is ready to receive the pallet/skid. The pallet/skid will be transported from the roller conveyor position 06 to the turntable position 07. When the light beam on the turntable is occupied the speed from the conveyor on the turntable will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop position. The turntable has received the pallet/skid and the roller conveyor position 06 will stop.

Roller conveyor (position 09)

If the turntable position 07 is ready for transfer of the pallet/skid the roller conveyor position 09 starts. After start, the roller conveyor position 09 is ready to receive a pallet/skid. The pallet/skid will be transported from the turntable position 07 to the roller conveyor position 09. When the light beam on the roller conveyor position 09 is occupied the transport will stop. The roller conveyor position 09 has received the pallet/skid and the conveyor on the turntable position 07 will stop.

If the push button at position 08 is activated, the roller conveyor position 09 will be free for loading a pallet/skid manually at position 09 by a forklift.

Roller conveyor (position 10)

If the roller conveyor position 09 is ready for transfer of the pallet/skid the roller conveyor position 10 starts. After start, the roller conveyor position 10 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 09 to the roller conveyor position 10. When the light beam on the roller conveyor position 10 is occupied the transport will stop. The roller conveyor position 10 has received the pallet/skid and the roller conveyor position 09 will stop.

Roller conveyor (position 11)

If the roller conveyor position 10 is ready for transfer of the pallet/skid the roller conveyor position 11 starts. After start, the roller conveyor position 11 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 10 to the roller conveyor position 11.

When the light beam on the roller conveyor position 11 is occupied the transport will stop. The roller conveyor position 11 has received the pallet/skid and the roller conveyor position 10 will stop.

Roller conveyor (position 12)

If the roller conveyor position 11 is ready for transfer of the pallet/skid the roller conveyor position 12 starts. After start, the roller conveyor position 12 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 11 to the roller conveyor position 12. When the light beam on the roller conveyor position 12 is occupied the transport will stop. The roller conveyor position 12 has received the pallet/skid and the roller conveyor position 11 will stop.

Roller conveyor (position 13)

If the roller conveyor position 12 is ready for transfer of the pallet/skid the roller conveyor position 13 starts. After start, the roller conveyor position 13 is ready to receive a pallet/skid after start. The pallet/skid will be transported from the roller conveyor position 12 to the roller conveyor position 13. When the light beam on the roller conveyor position 13 is occupied the transport will stop. The roller conveyor position 13 has received the pallet/skid and the roller conveyor position 12 will stop.

Shuttle car (position 14)

If the roller conveyor position 13 is ready for transfer of the pallet/skid the conveyor on the shuttle car starts. After start, the shuttle car is ready to receive the pallet/skid. The pallet/skid will be transported from the roller conveyor position 13 to the shuttle car position 14. When the light beam on the shuttle car is occupied the speed from the conveyor on the shuttle car will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The shuttle car has received the pallet/skid and the roller conveyor position 13 will stop. The shuttle car moves to the roller conveyor position 15. The movement of the shuttle car stops when the shuttle car is at position 15.

Roller conveyor (position 15)

If the shuttle car position 14 is ready for transfer of the pallet/skid the roller conveyor position 15 starts. After start, the roller conveyor position 15 is ready to receive the pallet/skid. The pallet/skid will be transported from the shuttle car position 14 to the roller conveyor position 15. When the light beam on the roller conveyor position 15 is occupied the transport will

stop. The roller conveyor position 15 has received the pallet/skid and the roller conveyor position 14 will stop.

The roller conveyor on position 15 is divided in two single conveyors, in order to separate the pallets. When the transport to the next conveyor starts, only the conveyor part next to the position 16 will start to transport. If in this case the other conveyor part will be driven too (detecting by impulse counting), the conveyor starts also. In this case the conveyor detected a single pallet. Otherwise the conveyor part will not start because the conveyor detected two half pallets. This second half pallet will remain on the conveyor until the next transport step.

Roller conveyor, measuring station (position 16)

If the roller conveyor position 15 is ready for transfer of the pallet/skid the roller conveyor position 16 starts. After start, the roller conveyor position 16 is ready to receive the pallet/skid. The pallet/skid will be transported from the roller conveyor position 15 to the roller conveyor position 16. When the light beam on the roller conveyor position 16 is occupied the transport will stop. The roller conveyor position 16 has received the pallet/skid and the roller conveyor position 15 will stop.

The position 16 has a measuring station. At this station a scanner reads the information about the product from the 4 x 6" Sappi label, which is placed in a prior operation. The label contains an individual license ID number of the product. MSK will send this license ID number after scanning to the MES of Sappi. Sappi will give the data like width, height and the kind of the product (skid or carton) etc back to MSK from the MES of Sappi. The system will set error flags for any measurements and scans that are not successful.

An ultrasonic sensor will measure the pallet height.

Roller conveyor (position 17)

If the roller conveyor position 16 is ready for transfer of the pallet/skid the roller conveyor position 17 starts. After start, the roller conveyor position 17 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 16 to the roller conveyor position 17. When the light beam on the roller conveyor position 17 is occupied the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The roller conveyor position 17 has received the pallet/skid and the roller conveyor position 16 will stop.

Pallet Centering (position 17.1)

If the roller conveyor position 17 is occupied the pallet centering position 17.1 moves forward to center the pallet/skid on the conveyor. After a delay time the pallet centering position 17.1 moves backward. The centering is finished when the centering is back (start position).

Product Centering (position 40)

If the roller conveyor position 17 is occupied and the pallet is centered the product centering position 40 moves forward. After a delay time the product centering position 40 moves backward. The center is finished when the centering is back (start position).

A MSK identification system built into the centering station will identify the pallet/skid in the transversal direction.

Roller conveyor (position 18)

If the roller conveyor position 17 is ready for transfer of the pallet/skid the roller conveyor position 18 starts. After start, the roller conveyor position 18 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 17 to the roller conveyor position 18. When the light beam on the roller conveyor position 18 is occupied the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The roller conveyor position 18 has received the pallet/skid and the roller conveyor position 17 will stop.

Pallet centering (position 41)

If the roller conveyor position 18 is occupied the pallet centering position 41 moves forward. After a delay time the pallet centering position 41 moves backward. The centering is finished when the centering is back (start position).

Product Centering (position 41.1)

If the roller conveyor position 18 is occupied and the pallet is centered, the product centering position 41.1 moves forward. After a delay time the product centering position 41.1 moves backward. The centering is finished when the centering is back (start position).

A MSK identification system built into the centering station will identify the pallet/skid in the longitudinal direction.

Roller conveyor (position 19)

If the roller conveyor position 18 is ready for transfer of the pallet/skid, the roller conveyor position 19 starts. After start, the roller conveyor position 19 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 18 to the roller conveyor position 19. When the light beam on the roller conveyor position 19 is occupied the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The roller conveyor position 19 has received the pallet/skid and the roller conveyor position 18 will stop.

If the system identified a skid present at position 19 by using the skid tracking information, the press moves down. After the pressure switch is activated, a delay time will start. After the delay time the press moves up. If the system identified a carton present at position 19 by using the skid tracking information, the press does not move.

At this position the system has measured the pallet/skid dimensions (height, width, length and weight) and verifies that these measurements match with Sappi data describing the skid. A match will allow the skid to go through the normal process. A mismatch will trigger an alarm and will stop the product.

Sappi has to provide detail information how to handle this situation.

Roller conveyor (position 20)

If the roller conveyor position 19 is ready for transfer of the pallet/skid the roller conveyor position 20 starts. After start, the roller conveyor position 20 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 19 to the roller conveyor position 20. When the light beam on the roller conveyor position 20 is occupied the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The roller conveyor position 20 has received the pallet/skid and the roller conveyor position 19 will stop.

Top sheet dispenser (position 43)

The pallet/skid is laterally centered, identified (by the system using the skid tracking information) and transported to the top sheet dispenser. According to the pallet dimensions the right film reel is selected and the vertical sledge is positioning the film at the gripper position. The clamping device of the horizontal sledge is opened and the sledge moves to the gri0per position. The film is gripped. The vertical sledge is pulling the film

over the pallet by the right film length. The sledge stopped, both clamping devices at the horizontal sledge were closed. The linear cylinder is cutting the film. The clamping device opens and the horizontal sledge is pulling the film completely over the pallet, the film gripper opens and the film is slid on to the pallet. At the same time, the next pallet is already identified, the right film reel is selected and the horizontal sledge moves back to the gripper position.

Roller conveyor (position 21)

If the roller conveyor position 20 is ready for transfer of the pallet/skid the roller conveyor position 21 starts. After start, the roller conveyor position 21 is ready to receive a pallet/skid. The pallet/skid will be transported from the roller conveyor position 20 to the roller conveyor position 21. When the light beam on the roller conveyor position 21 is occupied the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is on the stop position. The roller conveyor position 21 has received the pallet/skid and the roller conveyor position 20 will stop.

Flowtech 01 (position 44)

The product is laterally centered and identified (by the system using the skid tracing information). Afterward the product which is covered by a vertical film curtain supported at the sides by two vertical welding beam is transported to the Flowtech film wrapping machine. Owing to the conveying movement the pallet is first wrapped by the film on three sides. Once the product has passed the welding beams a light barrier is no longer occupied and the conveying movement is stopped. A stopper is lifted just behind the welding beams. The welding beams are moved towards each other and closes the film curtain behind the product. Whiles the welding beams are moving toward each other the product is conveyed back towards the welding beams and positioned against the stopper just in front of the welding beams. The film curtain is thus wrapped closely and accurately around the pallet even in the event of different lengths of the pallet. The welding is carried out with a double seam, separated via cutting wire in the middle such that the film wrapping is produced and a new film curtain formed in one single operation.

Roller conveyor (position 22)

If the roller conveyor position 21 is ready for transfer of the pallet/skid the roller conveyor position 22 starts. After start, the roller conveyor position 22 is ready to receive the pallet/skid. The pallet/skid will be transported from the roller conveyor position 21 to the roller conveyor position 22. When the light beam on the roller conveyor position 22 is occupied the

speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop position. The roller conveyor position 22 has received the pallet/skid and the roller conveyor position 21 will stop.

Flowtech 02 (position 45)

The product is laterally centered and identified (by the system using the skid tracking information). Afterward the product which is covered by a vertical film curtain supported at the sides by two vertical welding beams is transported to the Flowtech film wrapping machine. Owing to the conveying movement the pallet is first wrapped by the film on three sides. Once the product has passed the welding beams a light barrier is no longer occupied and the conveying movement is stopped. A stopper is lifted just behind the welding beams. The welding beams are moved towards each other and closes the film curtain behind the product. While the welding beams are moving toward each other the product is conveyed back towards the welding beams and positioned against the stopper just in front of the welding beams. The film curtain is thus wrapped closely and accurately around the pallet even in the of different lengths of the pallet. The welding is carried out with a double seam, separated via cutting wire in the middle such that the foil wrapping is produced and a new film curtain formed in one single operations.

Roller conveyor (position 23)

If the roller conveyor position 22 is ready for transfer of the pallet/skid the roller conveyor position 23 starts. After start, the roller conveyor position 23 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 22 to the roller conveyor position 23. When the light beam on the roller conveyor position 23 is occupied, the speed will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop position. The roller conveyor position 23 has received the pallet/skid and the roller conveyor position 22 will stop.

Shrink frame (position 46)

The product is laterally centered and identified (by the system using the skid tracing information). The gas firing will start and the shrink frame moves down. During this descending movement first the top shrinkage and then the side shrinkage is formed along the pallet from top to bottom. The blower starts and the under shrinkage is formed. An additional side shrinkage is formed and the shrink frame moves to the start position.

Roller conveyor (position 24)

If the roller conveyor position 23 is ready for transfer of the pallet/skid the roller conveyor position 24 starts. After start, the roller conveyor position 24 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 23 to the roller conveyor position 24. When the light beam on the roller conveyor position 24 is occupied the transport will stop. The roller conveyor position 24 has received the pallet/skid and the roller conveyor position 23 will stop.

Shuttle car (position 25)

If the roller conveyor position 24 is ready for the transfer of the pallet/skid the conveyor on the shuttle car starts. After start, the shuttle car is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 24 to the shuttle car position 25. When the light beam on the shuttle car is occupied the speed of the conveyor on the shuttle car will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop position. The shuttle car has received the pallet/skid and the roller conveyor position 24 will stop.

If the system identified a skid present at position 25 by using the skid tracking information, the shuttle car moves to the strapper position 47. The movement of the shuttle car stops when the shuttle car is at position 47. The strapper will place two straps in the machine direct along the skid runners on the skids containing paper stacks. After applying the straps to the skid, the shuttle car moves back to position 25.

No straps will be applied to skids containing cartons. All skids i.e. rejected or normal will be wrapped completely.

Roller conveyor (position 26)

If the shuttle car position 25 is ready to transfer the pallet/skid the roller conveyor position 26 starts. After start, the roller conveyor position 26 is ready to receive the pallet/skid. The pallet/skid is transported from the shuttle car position 25 to the roller conveyor position 26. When the light beam on the roller conveyor position 26 is occupied the transport will stop. The roller conveyor position 26 has received the pallet/skid and the roller conveyor position 25 will stop.

Roller conveyor (position 27)

If the roller conveyor position 26 is ready to transfer the pallet/skid the roller conveyor position 27 starts. After start, the roller conveyor position

27 is ready to receive the pallet/skid. The pallet/sk9id is transported from the roller conveyor position 26 to the roller conveyor position 27. When the light beam on the roller conveyor position 27 is occupied the transport will stop. The roller conveyor position 27 has received the pallet/skid and the roller conveyor position 26 will stop.

Pallet Centering (position 17.1)

If the roller conveyor position 17 is occupied the pallet centering position 17.1 moves forward to center the pallet/skid on the conveyor. After a delay time the pallet centering position 17.1 moves backward. The centering is finished when the centering is back (start position).

Roller conveyor (position 28)

If the roller conveyor position 27 is ready to transfer the pallet/skid the roller conveyor position 28 starts. After start, the roller conveyor position 28 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 27 to the roller conveyor position 28. When the light beam on the roller conveyor position 28 is occupied a stopper moves up at the end of the conveyor. The speed will switch from fast to slow and an impulse counter starts for transport of the pallet/skid against the stopper. The transport will stop when the pallet/skid is in the stopper position. The roller conveyor position 28 has received the pallet/skid and the conveyor on the roller conveyor position 27 will stop.

Labeler (position 48)

The Labeler (ABB robot) will place two labels on the wrapped stack. The label (11 x 17") printed by two printers will be applied to the front side and the labeler side in the middle and 4 inches from the top of the product. If the label is higher than the stack height, the label will be folded over the top.

Roller conveyor (position 29)

If the roller conveyor position 28 is ready to transfer the pallet/skid the roller conveyor position 29 starts. After start, the roller conveyor position 29 is ready to receive the pallet/skid. The stopper on position 28 will go down and the pallet/skid will be transported from the roller conveyor position 28 to the roller conveyor position 29. When the light beam on the roller conveyor position 29 is occupied the transport will stop. The roller conveyor position 29 has received the pallet/skid and the roller conveyor position 28 will stop.

Roller conveyor (position 30)

If the roller conveyor position 29 is ready to transfer the pallet/skid the roller conveyor position 30 starts. After start, the roller conveyor position 30 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 29 to the roller conveyor position 30. When the light beam on the roller conveyor position 30 is occupied the transport will stop. The roller conveyor position 30 has received the pallet/skid and the roller conveyor position 29 will stops.

Roller conveyor (position 31)

If the roller conveyor position 30 is ready to transfer the pallet/skid the roller conveyor position 31 starts. After start, the roller conveyor position 31 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 30 to the roller conveyor position 31. When the light beam on the roller conveyor position 31 is occupied the transport will stop. The roller conveyor position 31 has received the pallet/skid and the roller conveyor position 30 will stop.

The transfer of the pallets/skids will stop by pushing the switch at the control box to remove the pallet/skid by a forklift.

Roller conveyor (position 33)

If the roller conveyor position 31 is ready to transfer the pallet/skid the roller conveyor position 33 starts. After start, the roller conveyor position 33 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 31 to the roller conveyor position 33. When the light beam on the roller conveyor position 33 is occupied the transport will stop. The roller conveyor position 33 has received the pallet/skid and the roller conveyor position 31 will stop.

Roller conveyor (position 34)

If the roller conveyor position 33 is ready to transfer the pallet/skid the conveyor on the turntable starts. After start, the turntable is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 33 to the turntable position 34. When the light beam on the turntable occupied the speed from the conveyor on the turntable will switch from fast to slow and an impulse counter starts for centering the pallet/skid. The transport will stop when the pallet/skid is in the stop positions. The turntable has received the pallet/skid and the roller conveyor position 33 will stop. The turntable rotates 90° degree clockwise to conveyor position 35. The rotation of the turntable stops when the

turntable is at position 35. The turntable is ready to give the pallet at position 35.

Roller conveyor (position 35)

If the turntable position 34 is ready to transfer the pallet/skid the roller conveyor position 35 starts. After start, the roller conveyor position 35 is ready to receive the pallet/skid. The pallet/skid is transported from the turntable position 34 to the roller conveyor position 35. When the light beam on the roller conveyor position 35 is occupied the transport will stop. The roller conveyor position 35 has received the pallet/skid and the roller conveyor on the turntable position 34 will stop.

Roller conveyor (position 36)

If the roller conveyor position 35 is ready to transfer the pallet/skid the roller conveyor position 36 starts. After start, the roller conveyor position 36 is ready to receive the pallet/skid. The pallet/skid is transported from the roller conveyor position 35 to the roller conveyor position 36. When the light beam on the roller conveyor position 36 is occupied the transport will stop. The roller conveyor position 36 has received the pallet/skid and the roller conveyor position 35 will stop.

A pallet/skid will be taken manually by forklift.

SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
EQUIPMENT

MSK Scanner/Measuring/Centering

Functional descriptions

General functioning of the MSK Scanner/Measuring:

1. Position 16 Measuring Station
2. License ID is scanned
3. Untrasonic Sensor measures the pallet height
4. Product is scaled
5. If within tolerances product is ok'd in system and transported. If not with specs system will show a fault for the operators attention.
6. Information is feed to Majiq for pallet info and interfaced with RSVIEW

General functioning of the MSK Centering:

The pallet arrives at the centering place conveyor and will be positioned by means of a pulse counter and a light barrier. The centering walls will be pressed synchronously two sided against the pallet/skid.

1. Skid/pallet centering transversal
    a. Bottom pneumatic (pallet) presses moves in both sides to center skid/pallet on the transport conveyor
    b. Top pneumatic (product) presses move in both sides to center paper/cartons (product) on the centered skid/pallet.
    c. ½" overhang of paper will be flush with the edge of the skid.
    d. Skewing of tiers will be straigntened.
2. Skid/pallet centering longitudinal
    a. Skid/pallet occupies position 18
    b. Pneumatic presses are moved to line position via shuttle
    c. Bottom pneumatic (pallet) presses move in both ends to center skid/pallet on the transport conveyor.
    d. Top pneumatic (product) presses move in both ends to center paper/cartons (product) on the centered skid/pallet.
    e. ½" overhang of paper will be flush with the edge of the skid.
    f. Skewing of tiers will be straightened.

g. Shuttle move back out of line of the transport conveyor.

General functioning of the MSK Press:

3. If the system identifies a skid present at position 19 by using the skid tracking information received from the scanning system, the press moves down. If cartons are detected, the press does not engage.
   a. The press lifts down onto the skid and presses until the maximum pressing power is reached. When the maximum pressing power is reached, the press lifts up to the start position.
   b. The conveyor starts again

Adjustments

Mechanical adjustments

- Chain
- Wheel
- Bearing
- Link
- Gear motor
- Lift drive
- Load Cells
- Contact pressure
- Pneumatics

Electrical adjustments

1. Scanners
2. Rail
3. Spring
4. Proximity switches
5. Limit switches

Advanced training will be given by a qualified MSK Trainer

SHRINK WRAP SKID CARTON LINE PACKAGING SYSTEM

MSK Top Sheet Feeder

Functional descriptions

General functioning of the MSK Top Sheet Feeder:

1. The product is laterally centered, identified and transported to the Top sheet dispenser. According the pallet dimension the right film reel is selected – the vertical sledge is positioning the film at the gripper – position.
2. The clamping device of the horizontal ledge is opened and the sledge moves to the gripper-position. The film is gripped.
3. The vertical sledge is pulling the film over the pallet by the right film length.
4. The sledge stopped, both clamping devices at the horizontal sledge were closed.
5. The linear cylinder is cutting the film. The clamping opens and the horizontal sledge is pulling the film completely over the pallet, the film gripper opens and the film is sliding onto the pallet.
6. At the same time, the next pallet is already identified, the right film reel is selected and the horizontal sledge moves back to the gripper-position.

Following parts are driven by a pneumatic cylinder:

- ten-edge-knife
- film tongs
- film clamping device
- film format selection
- film drive lifting

Adjustments

Mechanical adjustments

1. Reel contact switches (pre-adjusted by MSK)

Electrical adjustments

6. Parameter "Film length"
7. Parameter "Height scanner occupied"
8. Parameter "Lift down to give the film"

Advanced training will be given by a qualified MSK Trainer

SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
MSK FlowTech 1 & 2

Functional description

General functioning of the MSK Flowtech:

1. The product is laterally centered, identified and covered with a top sheet.
2. Afterwards the product – which is covered by a vertical film curtain supported at the sides by two vertical welding beams – is transported to the MSK FLOWTECH film wrapping machine As the product is transported into the wrapping machine the products are first wrapped by the film on three sides.
3. Once the product has passed the welding beams a light barrier is no longer interrupted and the conveying movement is stopped. A stopper is lifted just behind the welding beams.
4. The welding beams are moved towards each other which closes the film curtain behind the product. While the welding beams are moving towards each other the product is conveyed back towards the welding beams and positioned against the stopper just in front of the welding beams. The film curtain is thus wrapped closely and accurately around the product even in the event of different lengths of the product.
5. The welding is carried out with a double seam, separated in the middle by a ten-edge knife,and a new film curtain formed in one single operation.
6. 2 different widths of film – 2 rolls mounted each side – are mounted to form the film curtains.
7. Overhead hoist is used to move rolls of film to cradles as needed.

Adjustments

Mechanical adjustments

1. The position of the inclined film deflection device can be changed to adjust the film curtain.
2. The contact pressure of the welding beams.

Electrical adjustments

1. The parameters of the welding beam.

- welding time of the beams at the in feed
- welding time of the beams at the exit section
- Adjustments at the Ropex – temperature controller for:
- the welding beams of the welding device via the switch cabinet.
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Advanced training will be given by a qualified MSK Trainer

SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
MSK Synchrotech – Heat Ring

Functional description

General functioning of the Scnchrotech Heat Ring
1.The centered pallets are positioned on the conveyor for transport to the shrinkage place.
2. Gas firing is started.
3. Hot air is blown on the product as the shrink frame moves down. During this descending movement first the top shrinkage and then the side shrinkage is formed along the product from top to bottom.
4. The shrink frame moves upwards.
5. Formation of an additional side shrinkage.
6. The shrink frame moves to initial position.
7. The pallet is further transported.
   (see also following flow sheets)

Adjustments

Mechanical adjustments

7. –

Electrical adjustments

1. Parameters of the heating time:
2. Parameters for the speed of the hot-air ring

Advanced training will be given by a qualified MSK Trainer

SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
MSK Cykop Strapper

Functional descriptions

General functioning of the Cyclop Strapper: Pos 47

1. System identifies a skid present at position 25 by using the skid tracking information.
2. The shuttle car moves to the first strapping position.
3. Skid press/strapper head moves down to compress skid.
4. The strapping guide moves forward through the opening in the skid runner.
5. The strap is fed motor driven into the strapping head and into the strap guide.
6. The strap is clamped and sealed.
7. The guide retracts, the head lifts and the shuttle moves to the second position to be banded and follows the same process.
8. When the banding is complete the shuttle moves back to the original position and readies to transport to position 26.

No straps will be applied to skids containing cartons. All skids i.e. rejected or normal will be wrapped completely.

Adjustments

Mechanical adjustments

1. Strapper head pressure
2. Guide alignment

Electrical adjustments

1.

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SHRINK WRAP SKID CARTON LINE
PACKAGING SYSTEM
MSK ABB Robot Labeler

Functional descriptions

General functioning of the MSK Labeler:

1. Label applicator with two applicator heads.
2. Specific label information will be supplied to label/printer system by existing Sappi product management system.
3. The label size is 11" x 17" for skids and cartons.
4. Two labels will be printed and dropped into 1 of 2 chutes for the robot to pick up via air suction.
5. Labels will be pressure sensitive but will be additionally adhered to packages with sprayed on glue prior to placing on package.
6. Landscape orientation
    a. Label Position: 4" from top position down
    b. Applied front side and labeler side

Adjustments

Mechanical adjustments

1–

Electrical adjustments

1.

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