



SIMPLICITY

SECTION V

PAPER MACHINE AND WINDER DESCRIPTION



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PAPER MACHINE DESCRIPTION

Dimensions of Machine:

Mould	48" Dia.	162" Face
Slice Width		158"
Top Couch Roll	24" Dia.	162" Drilled Face
First Press Roll	30" Dia.	162" Drilled Face
Center Press Roll	24" Dia.	167" Face
Third Press Roll - Grooved	23" Dia.	167" Face
Press Felt Rolls	11-1/4" Dia.	174" Face
Press Paper Roll	11-1/4" Dia.	174" Face
Paper Dryers	48" Dia.	160" Face
Dryer Felt Rolls	10" Dia.	173-3/4" Face - Approx.
Dryer Paper Roll	10" Dia.	173-3/4" Face - Approx.
Spreader Roll	10" Dia.	173-3/4" Face - Approx.
Pull Rolls	22" Dia.	158" Face
Reel Drum	36" Dia.	158" Face
Reel Spools	8-1/2" Dia.	168" Face
Winder Drums	15" Dia.	156" Face



SIMPLICITY

Forming Unit:

A complete Beloit cylinder type vacuum unit is furnished, all parts coming in contact with stock and water are made of or lined with non-corrosive metals. The distributor is of the multiple inlet type having a stainless steel header fitted with flanged inlet connection and recirculation connection. The headbox incorporates an air pressure rising chamber in its upper section, and is fitted with two (2) 12" diameter rectifier rolls which have side openings for mounting the slice parts.

The slice assembly has its bottom member rigidly supported in the machine framework, and is of substantial construction to avoid deflection. The bottom lip is of stainless steel and spaced in close relationship to the forming wire. The top slice member is so shaped as to form the metering slice opening between itself and the bottom lip and to extend beyond this point to define the major formation area between its surface and the forming wire. Adjustments are provided for regulating the slice opening, including front and back worm gear units, and a cross shaft with a hand wheel. Separate adjustments also are provided for positioning each end of the top slice with respect to the forming wire.

The cylinder mould is 48" diameter, with a substantial center shaft carrying mould spiders and end rings. Cross rods and winding tape is assembled to provide a forming surface having minimum eccentricity or run-out. The ends of the cylinder are sealed with end plates from the center shaft to the face. One (1) oscillating mould cleaning shower and one (1) stationary shower are provided.

The vat framing forms, in connection with the distributor and slice assembly, a rigid and tight structure with roller bearing mountings for the cylinder mould, and means for sealing the closure between the vat framing and the rings attached to the cylinder end plates. A removable outgoing lip member is provided, fitted with an edge piece of micarta or similar material and spaced close to the face of the cylinder mould on the side opposite to the slice. This lip is readily adjustable as to clearance from the leaving nip of the top couch roll, the face of the mould, and the under surface of the pick-up felt. The vat structure has its bottom portion terminating in a flange to seal with the top edge of the white water pit located below floor level immediately under the vat structure.



SIMPLICITY

Top Couch Roll:

Top couch suction roll is 24" outside diameter with a rubber covering of 1" thickness. The roll has fixed, two-position, end deckles set at 159" with provisions for 162" spacing. There is a minimum internal obstruction to the passage of air and water drawn through the shell perforations. The top couch roll is carried in swing arms pivoted from frame members and is fitted with diaphragm-type pressure equipment for relieving the nip pressure between the top couch and the mould, and also for raising the couch out of contact. Hand-operated ratchet type jacking equipment is provided for raising the roll during mould and felt changes.

Press Section - General:

The press section is of the Twinver type, with a first suction roll, a plain center roll, and a grooved third roll.

Press Rolls:

The first press suction roll is of the latest Beloit design having a centrifugally cast bronze shell, heavy duty anti-friction bearings, air loaded packing strips, and a 90 degree divided suction box with the last 4" being a high vacuum area.

The center roll has a 22" diameter cast iron core covered with 1" of self-skinner rubber and fitted with bolted-on heads and pressed-in steel journals.

The third roll has a 22" diameter cast iron core fitted with bolted-on heads and pressed-in steel journals. This core is covered with 3/4" of rubber, and is grooved to function as a Beloit Venta-Nip press.

Heavy duty anti-friction bearings and housings are provided for the center and third press rolls.



SIMPLICITY

Pressure Applying Equipment:

Pressure applying equipment for the first and third rolls are the air-loaded type, incorporating rubber diaphragms conveniently located at the front side of the machine for applying and regulating the pressure independently at the front and back side of the machine. Hand-operated ratchets are provided for lowering the first roll and raising the third roll to facilitate felt changes.

Press Framing:

Fabricated steel posts, rails and beams are supplied for supporting all of the press equipment. Swing arms are furnished for the first and third press rolls. The center roll is set in stationary mountings.

Press Felt Equipment:

Complete felt handling equipment is provided for one (1) felt including nine (9) plain and one (1) wormed felt rolls and mounting parts. All felt rolls are interchangeable in all positions. The rolls are of steel tube, rubber covered construction and are fitted with anti-friction bearings. The felt handling equipment includes a hand-operated stretcher assembly, a diaphragm type automatic felt guide, a hand-operated felt positioner, and a hand-operated seam straightener. Three (3) showers are provided, one (1) located at the first outside felt roll, one (1) on the inside of the felt ahead of the suction box, and one (1) on the outside of the felt ahead of the guard board.

Guard Board:

One (1) guard board of the non-oscillating type is provided for the pick-up felt.

Felt Conditioner:

One (1) felt suction box is located on the sheet side of the pick-up felt following the second press nip.



SIMPLICITY

Paper Carrying Roll:

One (1) 11-1/4" diameter rubber covered paper roll with anti-friction bearings and mountings is provided for carrying the sheet between the second press nip and first bottom dryer. The roll is belt driven from the first felt roll.

Doctors:

One (1) oscillating doctor with Lodging blade and holder, motor oscillator, and necessary mountings is provided for the center press roll.

One (1) combination vacuum type stationary wipe and doctor with mountings is furnished for the grooved third press roll.

Savealls:

Fabricated stainless steel savealls are provided for the top couch roll, suction first press roll, grooved third press roll, the guard board and the felt suction box.

Lubrication System:

A Beloit 5 GPM lubrication system is provided, including sump tank, pump and motor, pressure gauge, filter, relief valve, alarm horn, transformer and back pressure valve for servicing the dryer bearings.

Dryer Section - General:

Dryer section to consist of fourteen (14) 48" diameter paper dryers and two (2) 48" diameter felt dryers, arranged in one (1) two-deck section.



SIMPLICITY

Dryers:

All dryers have a cast iron shell bored on the inside, turned and ground on the outside, with properly fitted bolted-on heads, and journals machined to accept anti-friction bearings. The dryers are coded for 75 psig maximum working pressure. The front paper dryer heads have a rope groove and manhole. Official test certificates and inspection reports are furnished.

All paper and felt dryers are mounted in heavy duty SKF anti-friction bearings of self-aligning type with front bearings arranged for expansion. The bearings are designed for continuous lubrication, and the journals are drilled and grooved for easy bearing removal.

Dryer Frames:

The front and back dryer frames are of cast iron construction and have the latest Beloit box type design. The front bearings on all top dryers are carried on the dryer frames, and the bottom bearings are carried on pedestals mounted on sole plates.

Steamfits and Syphons:

Each paper and felt dryer is equipped with a Johnson "S-DP" type self-supporting steamfit and Joco stationary syphons. Flexible braided type connections are provided for inlet steam and condensate.

Footboards and Gear Guards:

Footboards, hand rails, ladder and gear guards are furnished for the back side of the dryer section.



SIMPLICITY

Dryer Felt Equipment:

Thirty (30) 10-1/2" diameter by 173-3/4" approximate face dryer felt rolls are provided for the dryer section; the rolls are of steel pipe construction having pressed-in cast iron heads with brass end plates and steel journals. The outer surfaces of the rolls are carefully finished. Self-aligning SKF anti-friction bearings are provided for the felt rolls, in housings designed to retain the lubricants and to provide for expansion of the felt rolls. The back dryer felt roll bearings are designed for continuous lubrication, and the front bearings designed for static lubrication. The felt rolls are balanced for 900 fpm.

Automatic stretchers are provided for each felt. The felt stretcher rolls are equipped with SKF anti-friction bearings. The bearing housings are mounted in trolley type holders which will run on a horizontal track. Tension is maintained by weights and cables.

Beloit air operated felt guides, complete with palm assemblies and air devices, are provided for the top and bottom dryer felts. The hand guides are designed so they can be operated from the operation floor. The automatic guides are located on the back side of the machine, and the hand guides are located on the front side of the machine.

Dryer Gears:

Fourteen (14) dryer gears and one (1) dryer pinion are furnished. The top dryer gears have a 5" face, and the gears at either side of the drive pinion have a 6" face. The felt dryers are driven by the felt.

Doctors:

The two (2) genuine Lodding type dryer doctor backs and holders are equipped with motor driven oscillators. The doctors are mounted at the first bottom and the last top dryers.



SIMPLICITY

Paper Carrying Roll:

One (1) 10" diameter by 173-3/4" face steel pipe type roll, complete with tension type mountings and motor drive, is furnished for position between the last dryer and the calender stack. One (1) 10-1/2" diameter by 173-3/4" face crowned steel pipe roll and bearings is supplied as a lead-in roll to the pull roll stack.

Rope Carrier Equipment:

Complete rope carrier equipment, including sheaves, brackets, and rope stretcher, is provided for threading the sheet from the press through the dryer section. A separate rope carrier system is provided for threading the sheet through the pull roll stack and onto the reel drum.

Condensate Removal System:

A Beloit two-stage cascade condensate removal system is provided, consisting of one (1) pressure recording controller, one (1) differential pressure recording controller, one (1) pressure indicating controller, one (1) temperature indicating controller, one (1) differential pressure transmitter, three (3) 1", one (1) 1-1/2", one (1) 2" and one (1) 2-1/2" control valves, two (2) control valve positioners, three (3) flanged Visi-Flos, one (1) vacuum relief valve, three (3) globe valves, two (2) separator tanks, one (1) two-pass heat exchanger, two (2) condensate pumps, one (1) vacuum pump and one (1) operator's control cabinet.

Pull Roll Stack:

The pull roll stack consists of two (2) 22" diameter by 158" face Farreloy rolls mounted in anti-friction bearings, with fabricated steel support frames, stationary mountings for top roll, swing arms for bottom roll, Airide spring type loading and air devices for bottom roll and two (2) non-oscillating doctors with mountings.



SIMPLICITY

Reel:

One (1) Model "LLR" level rail pneumatic design reel is provided, having a constant speed reel drum mounted in heavy duty spherical roller bearings. The reel drum is accurately machined and balanced, with the back journal extended for connection to the machine drive.

The reel is of the transfer type. The empty spool is initially placed in the primary arms, brought up to sheet speed, and then lowered onto the sheet passing over the drum. The sheet is then transferred to the empty spool and the spool is transferred, by means of motor operated transfer arms, to the level secondary rails on which the finished roll is wound.

Air cylinder loading is provided for the primary arms and at the secondary position, so that the pressure between the winding reel of paper and the reel drum can be maintained at the desired value. Separate pneumatic regulators are furnished for adjustment of nip loading, both front and back, in primary and secondary positions.

The primary and secondary arms are cross-connected by means of a cross shaft to maintain proper alignment.

Primary Arms:

The primary arms are air motor driven through a heavy duty worm gear reducer.

Secondary Arm Stops:

Mechanical stops are located in the secondary receiving position to properly position the secondary arms prior to receiving the reel spool from the primary arms.



SIMPLICITY

Reel Frames:

A heavy cast iron frame provides easy access for operation, maintenance and cleaning at all times. Bottom flanges of the frame are finished to mount on the baseplates.

Spreader Roll:

A steel bodied, crowned, spreader roll, mounted in anti-friction bearings, and supported in adjustable mountings, is located between the calender and the reel.

Reel Doctor:

An air motor oscillating doctor is furnished for the reel drum. The doctor back is air cylinder loaded, and fitted with a suitable blade.

Operator's Controls:

All controls, electric and air, are mounted on one (1) desk type control console. The controls are mounted, wired and piped to receive interconnecting lines.

Roll Brake:

Shoe type brakes, used to stop the finished reel, are located at the ends of the secondary rails. After the sheet transfer is made, the secondary arms permit the reel to roll down the inclined portion of the secondary rails to the roll stops. Air operated brake shoes are engaged against both ends of the reel spool until the reel comes to rest.

Reel Spools:

Three (3) 10-5/8" diameter pipe size steel reel spools are furnished. Each spool is equipped with heavy duty tapered roller bearings having dumbbell type housings and hardened clutch blocks on each end.



SIMPLICITY

The high tensile steel journals are specially machined for accepting the crane hooks. The spools are balanced for maximum winder speed.

Spreader Roll Mounting:

The spreader roll is mounted off the reel frame.

Water Cooling:

A water connection for the reel drum provides cooling for the sheet in order to aid in winding a more uniform roll. The water inlet and outlet are located on the front side.

Sheahan Rope Run:

A rope carrier is provided to aid in threading the sheet over the reel drum. A single rope, double loop system is used with the rope driven from a fixed sheave on the reel drum. The rope system is installed on the front side, and the position of the sheaves is adjustable.

Mechanical Drive:

The Beloit mechanical drive is a short center, flat belt design with separate enclosed spiral bevel gear units for the press, dryer and pull roll sections.

The top suction couch roll is belt driven from the press inshaft. This drive consists of two (2) cone pulleys, a hand-operated belt shifter, inshaft, coupling, inshaft bearings, and sub-bases.

Gear Units:

Each gear unit consists of a carefully generated and finished pinion and gear carried on shafts and anti-friction bearings, with provision for the lubrication of gears and bearings. The pedestal pulleys are carried on pulley shafts and anti-friction bearings, with motor driven belt shifters equipped with water cooled paddles. Fawick clutches are provided, complete with controls for operation from the front side of the



SIMPLICITY

machine. Where possible, Fast type flexible couplings and floating shafts are provided for completing the connection from the low speed shaft of the gear unit to the in-drive position on the machine. Air operated quick take-ups are included for the pull roll stack.

Lineshaft Equipment:

Cone pulleys are provided for the lineshaft at the press and pull roll stack gear unit positions, and a crown face pulley is provided for the lineshaft at the dryer gear unit position. A complete heavy duty lineshaft, carried in anti-friction pillow block bearings is provided, extending from the press drive through the pull roll stack drive. The lineshafting is set on the machine room floor behind the drive units. Solid couplings are provided for connecting the sections of the lineshafting, with one (1) flexible coupling being supplied for connection between prime mover reducer and the end of the lineshaft.

Prime Mover:

One (1) 125 H. P., eddy current drive is provided complete with controls, reducer and coupling.

Sole Plates:

New cast iron sole plates with leveling screws and washers are furnished for the front and back machine tracks. The tracks extend from a point underneath the forming unit to the reel.



SIMPLICITY

Roll Ejector:

The winder is equipped with a power operated roll ejector to move the finished sets off the winder drums and onto the roll handling equipment. A hoist type motor with electro-magnetic brake, gear reducer, cross shaft and gear segments is included. Limit switches are furnished to prevent over-travel in both directions and to prevent ejection until the shaft holding slides have been lowered.

Unwind Stand:

Heavy duty unwind stands of the stationary type are provided. The front unwind stand is provided with a saddle having a ratchet adjustment in the cross machine direction.

The front and back unwind stands have saddles for supporting the reel spool bearing housings. The back unit includes the water-cooled brake drum carried in heavy duty anti-friction bearings, complete with a quick-operating disconnect clutch for connection to the journal of the reel spool. The brake drum is accurately finished and dynamically balanced. The braking action is developed by the required number of molded brake blocks carried in swing arms and contacting the drum on opposite horizontal centerlines. The brake blocks are applied by molded rubber diaphragm elements with opposing springs arranged to completely withdraw the brake blocks when air pressure is released. The winder brake is controlled from the winder benchboard.

Water supply and discharge is by means of a combination fitting carried from the back unit frame.

A solenoid valve is provided for the water line to the brake. The valve is interlocked with the drive to shut off the water when the drive stops.



SIMPLICITY

The shear angle and point of contact between top and bottom slitters is pre-set to insure long slitter life, with minimum attention from the operators. Trim guards are provided on the trim slitters to direct the front and back edges into the trim chutes.

Sheet Spreader:

The winder is equipped with a full width flexible D-bar spreader with close spaced adjusting knobs for positive spreading control. Spiral grooving on the back drum also serves to spread and guide the sheet.

Rider Roll Assembly:

The entire rider roll assembly is raised and lowered pneumatically by roller chain carried over sprockets to a full width counterweighting beam. This beam is equipped with rollers which ride on machined surfaces on the frame posts and is connected to pneumatic cylinders concealed in these posts. The cylinders are controlled from the winder benchboard to relieve any desired portion of counterweight, thus providing accurate control over the rider roll nip pressure.

Winder Guard:

A full width guard provides a supporting surface for the finished rolls during removal from the winder.

Winder Shafts:

The winder shafts are equipped with roller bearing units at one end to absorb both radial and thrust loads and are supported by needle bearings at the opposite end. The shaft bearings are carried in mountings with quick-opening, spring-operated caps. The mountings are raised and lowered positively in shaft slides by means of a continuous roller chain. The chain is carried by sprockets on a cross shaft to a hand wheel on the tending side. Counterweighting is provided to minimize the weight of the core shaft.



SIMPLICITY

Winder Drive:

A winder drive is provided, consisting of one (1) 40 KW M. G. Set, two (2) 25 H.P. drum drive motors with reducers, two (2) 5 H.P. rider roll drive motors, one (1) 5 H. P. slitter drive motor and operator's benchboard, with all electrical and air controls mounted thereon. The control features are time-rate and current-limit acceleration and deceleration, regenerative stopping of drums, and a star-wheel rheostat for speed control.