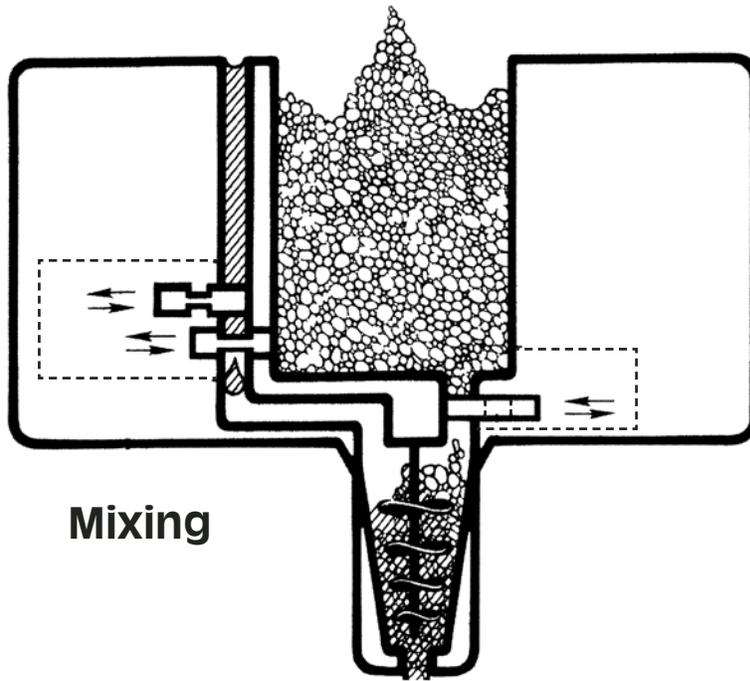


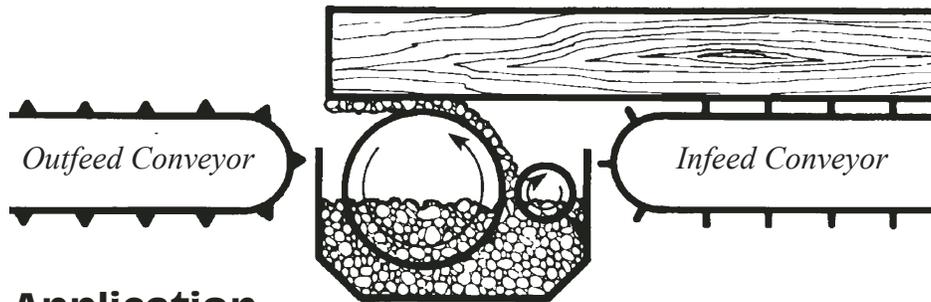


# Glue Application

## Glue Mixing



Mixing



Application

## JAMES L. TAYLOR MANUFACTURING

New Ideas in Edge Gluing Technology

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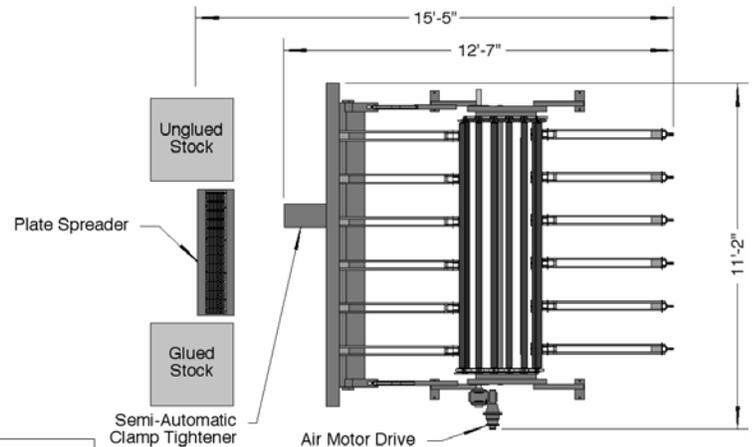
# Taylor Plate Spreader



Plate Spreader. Inset: glue spread from Plate Spreader

For small and mid-size operations, we offer two styles of glue application machines, the manual Plate Spreader and the Roller Spreader

The Plate Spreader provides an accurate and efficient glue spread. Works well with our Clamps to quickly apply glue to multiple boards. A perforated aluminum grid, 8" x 48", rises from the stainless steel glue container by a foot activated pedal to provide the correct amount of adhesive. Boards over 48" can be 'dipped' twice. An aluminum cover for the glue container extends glue use. Fast, convenient, easy to use and clean.



- 8-1/2' Clamp Carrier w/ 12 Sections of 44" Opening Clamps
- Pneumatic Semi-Automated Clamp Tightener
- Pneumatic Panel Flattener
- Air Motor Drive
- Plate Spreader

# The Taylor Roller Spreader

## The New Taylor Roller Spreader

This is a compact yet versatile Glue Applicator. We have incorporated many of the features of our full size Glue Applicator.

- Live doctor roll for precise and adjustable glue spread
- Overnight glue storage system
- Removable glue roll
- Expandable with infeed roller conveyor
- Felt covered glue roll

Precise and adjustable glue spread: The Taylor Roller Spreader is equipped with a fully adjustable live doctor roll. The doctor roll spins in the opposite direction (from the glue roll) which provides a controllable even spread.

Attaining the proper glue spread thickness is very important. Too much or too little glue spread will weaken glue joints. Also, too much glue wastes money, slows production and creates more “clean up time” for both the applicator and the Clamp Carrier.

Though compact, this machine is very productive and works well with the Automated Clamp Carriers. As the Automated machine is running by itself, the operator has time to apply glue to the boards for the next section to be clamped. These can be stored on a simple stand next to the spreader.

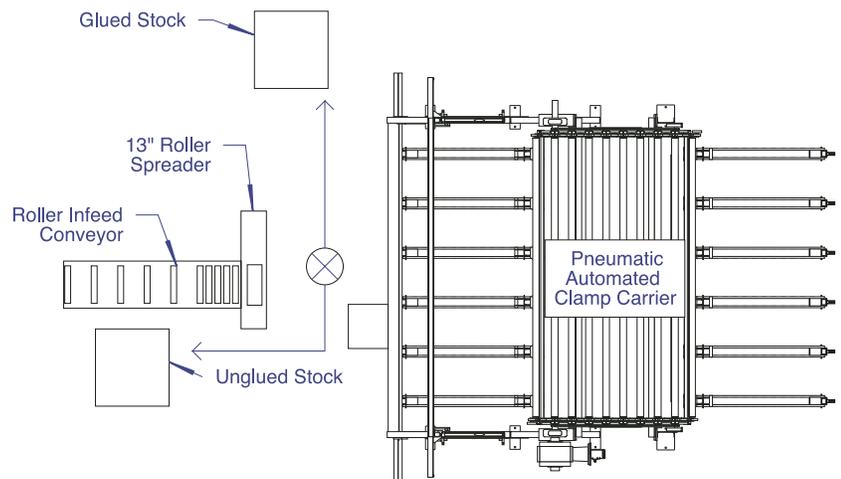
This compact machine is also well suited for coating stock for longer panels and laminations using the infeed conveyor to help guide the pieces over the glue roll.



Long Laminations



Short stock



# Taylor Conveyor Type Applicator



16' Conveyorized Glue Applicator

## Increased efficiency with better material handling

### The Taylor Glue Applicator

The Taylor Automatic Conveyor-Type Glue Applicator is available in lengths from 10' to 40'.

Standard models are supplied one of two ways. The Felt Roll model is designed for use with PVA type adhesives. It is equipped with a stainless steel glue pan, doctor roll, and out-feed cross bars. The glue roll is felt covered to provide even glue spread and is quickly removed for easy cleaning.

The Stainless Roll model is designed for use with urea, resorcinol and isocyanate type glues. It is equipped

with a stainless steel glue roll, stainless steel doctor roll, and water jacketed glue pan. Optional: Rubber coated glue roll.

Either model Glue Applicator can be set up with a manual feed of the adhesive to the glue pan or with a PVA Glue Pump which automatically feeds and controls the amount of adhesive in the glue pan.

The length of the Glue Applicator depends on the loading area of the Clamp Carrier. For instance, an 8-1/2' wide Clamp Carrier is usually equipped with a 16' (8' infeed,

8' outfeed) Glue Applicator. And a 14-1/2' Clamp Carrier is usually equipped with a 28' (14' infeed, 14' outfeed) Glue Applicator.

The width of the Glue Applicator depends on the thickness of the panel. Generally, 3/4 and 4/4 stock only require a 13' wide glue roll. Thicker material, 5/4, 6/4 and above, require our 26" or 39" machines.

We recommend the use of a wet film mil gauge to measure optimum glue spread thickness (7-9 mils).

# Features

To produce the best Glue Applicator on the market, we have concentrated our efforts in three key areas:

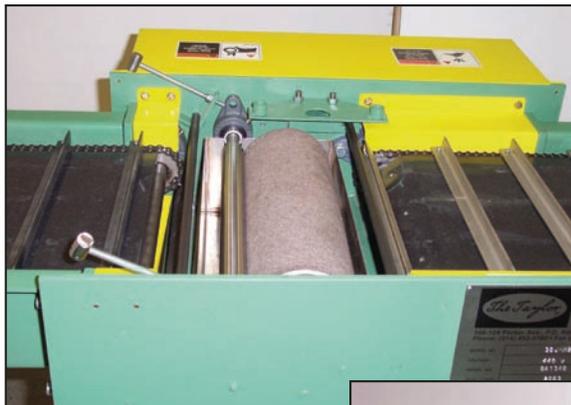
## A) Precise and adjustable glue spread

**spread:** The Taylor Glue Applicator is equipped with a fully adjustable live doctor roll. The doctor roll spins in the opposite direction (from the glue roll) which provides a controllable even spread. Thumbscrews and locking nuts are used to independently adjust both ends of the doctor roll.

Attaining the proper glue spread thickness is very important. Too much or too little glue spread will weaken glue joints. Also, too much glue wastes money, slows production and creates more “clean up time” for both the applicator and the Clamp Carrier.

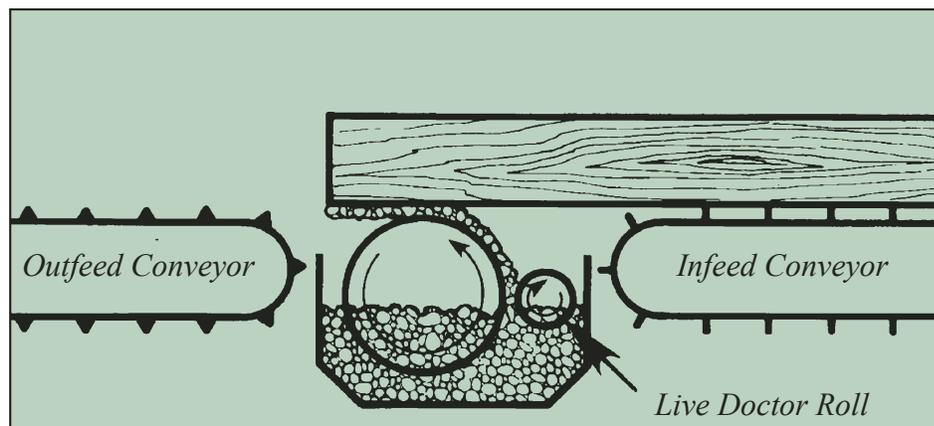
With each machine, Taylor provides a wet film thickness gauge for measuring. More importantly, it is our Live Doctor Roll design that allows each customer to fine tune the spread to their specifications.

**B) Easy and fast clean up:** We have equipped the Glue Applicator with a nightly storage system to save glue and clean up time. The glue pan cover fits tightly over the top of the glue pan and a large sponge is fitted to the roof of the cover. When soaked with water, the sponge keeps the cavity of air moist and prevents skimming of the glue during the night. During weekends and vacations, the glue pan and glue roll should be removed and cleaned. This job is completed quickly because the glue pan drops out with the removal of two pins. The glue roll is mounted on a removable shaft. When the shaft is gently pulled, the glue roll slides out of the top of the Glue Applicator for cleaning.



**C) Durability:** The machine is designed with components which stand up to the rigors of a high production gluing operation. In addition, an adjustable safety clutch protects the conveyor chain against damage when careless operation

results in wood jamming in the conveyor. This feature reduces down time and is self-healing so the machine returns to normal function once the jammed stock is removed.



# Optional Equipment

## **Powered Holddown Assembly**

This attachment insures uniform glue spread when coating wide stock for laminating and/or long stock for beams and rails.

The holddown assembly is equipped with a 5" diameter stainless steel roll. It can handle stock of uniform thickness ranging from 3/4" to 3".

The unit can be rotated up and positioned vertically allowing 10" clearance for edge gluing stock.



## **The Taylor PVA Glue Pump**

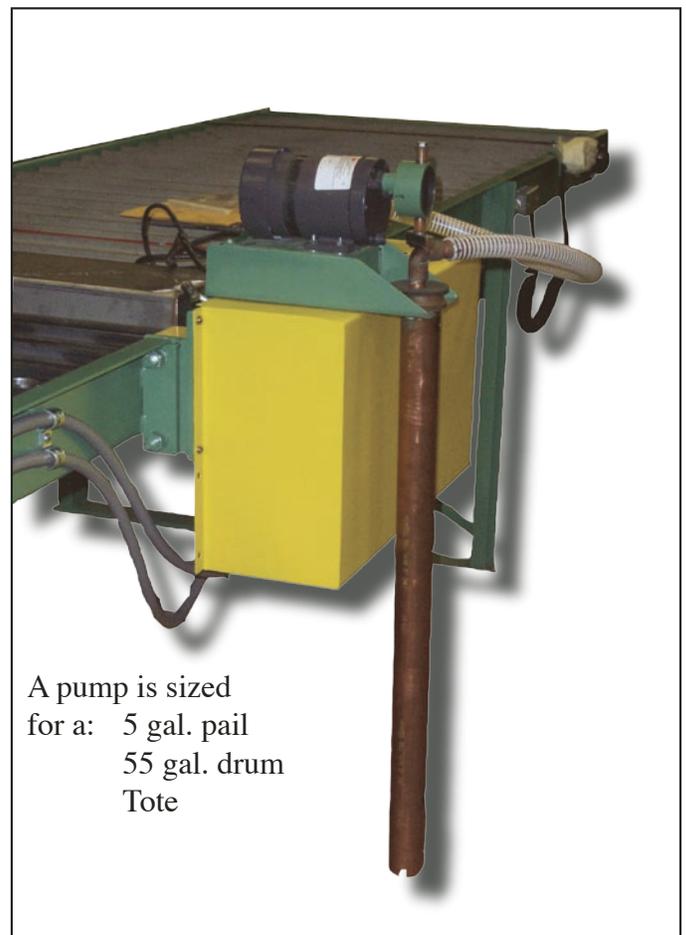
The Taylor PVA Glue Pump transfers glue directly from a 55 gallon drum on the floor to the Taylor Conveyorized Glue Applicator or the Taylor Plate Spreader. It can be used with all polyvinyl and aliphatic adhesives.

Equipped with an electronic sensing circuit, the pump turns on and off automatically to maintain the optimum glue level in the glue pan.

The PVA Pump incorporates a unique hollow piston design and a force limiting system, ensuring reliable performance even when using cold or thick glues.

## **Gravity Skate Wheel Conveyor**

The Gravity Skate Wheel Conveyor mounts over the Glue Applicator to provide automatic return of glued panels from the Clamp Carrier operator's position to the operator loading the Taylor Glue Applicator.

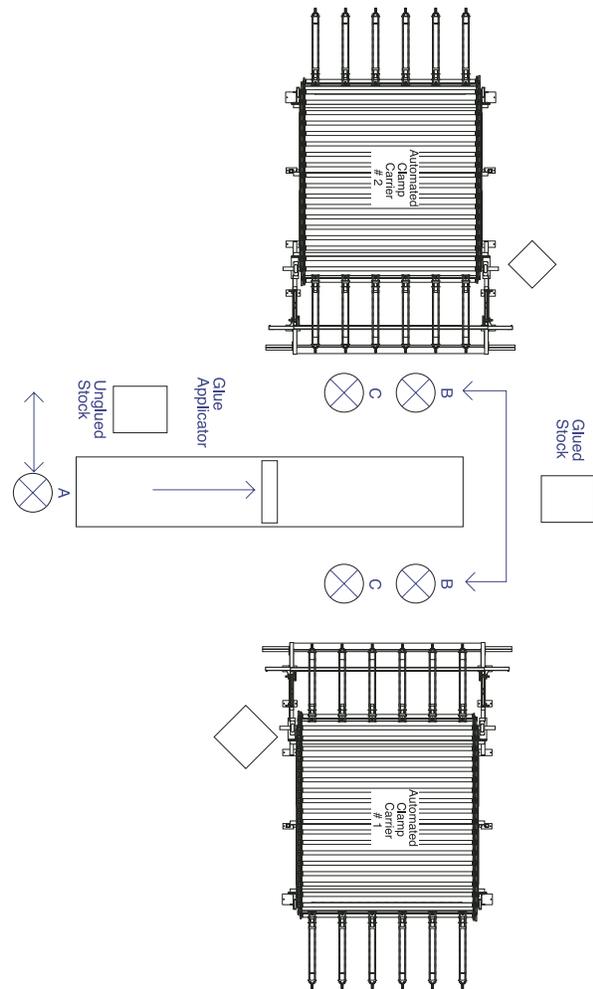


A pump is sized  
for a: 5 gal. pail  
55 gal. drum  
Tote

# Floor Layouts & Operation

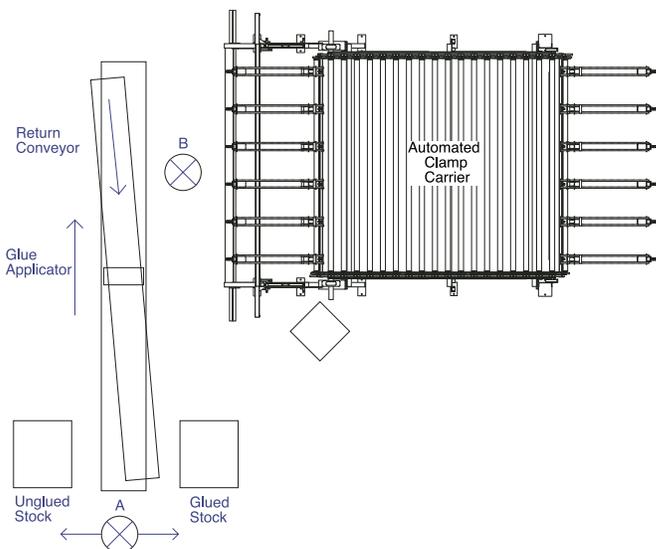
## Operation with Two Automated Clamp Carriers

1. Operator A loads unglued stock onto the infeed of the Glue Applicator
2. Operator B & C walk to the left end of Clamp Carrier #1 when it has just finished loosening the clamps on the far left hand panel. (Note: For this setup, Clamp Carrier #1 loosens clamps from left to right.) They follow the Automated Clamp Carrier carriage, removing the cured panels. The panels are stacked on the pallet of glued stock.
3. As they remove glued panels from the clamps, operator B & C reloads the clamps with stock from the Glue Applicator.
4. When all of the clamps are reloaded, operator B presses Clamp Carrier #1's "Tighten" button to begin its automated cycle.
5. Operator B & C then proceeds to Clamp Carrier #2 and repeats step 2 through 4 on the second machine.



## Operation with an Automated Clamp Carrier and Two Operators

1. Operator A loads unglued stock onto the infeed of the Glue Applicator
2. Operator B follows the Automated Clamp Carrier carriage, removing the cured panels and placing them on the Return Conveyor as he goes. The panels are conveyed by gravity to the pallet of glued stock for off loading and stacking.
3. As the glued panels are removed from the clamps, the Operator B reloads the clamps with stock from the Glue Applicator.
4. When all of the clamps are reloaded, the operator presses the Clamp Carrier's "Tighten" button to begin its cycle.
5. Operator A unloads the glued panels from the Return Conveyor and stacks them on the pallet of glued stock.



# Fundamental Gluing Information

## Temperature

The temperature of the wood, glue and room are important in determining the speed of set. Clamp times at summer temperatures can be one-half that encountered in cold shops in winter.

Reducing the temperature of the wood, glue, or room adversely affects most wood glues. Setting speed is usually retarded, and in some cases strength is decreased if the glue is colder than the critical temperature.

In an emulsion adhesive, the discrete particles of adhesive are suspended in water much as is fine sand in water. Upon drying the loss of water pulls the particles together with enough force to form a continuous adhesive film. If the drying temperature is below a critical point, the force of the water evaporation is inadequate to pull the particles into a continuous film, leaving discrete and unjoined particles in the dry film. This will make the dried film appear whiter than normal. This is known as “chalking” and the critical temperature is the “chalk temperature”. When it occurs, the glued joint loses strength. This can be corrected by raising the temperature of the air, glue or wood, or changing to a glue which does not chalk at the operating temperature.

Since the mass of glue in a joint is small compared to the mass of the adherend, the temperature of the substrates being glued is usually the controlling factor. The temperature of the air is important in that it usually affects the temperature of the surfaces being glued. It also influences the temperature of the glue squeezed out of the joint, which may be the temperature of the glue in the joint minus the lowering due to evaporation of water from the surface. It can be seen that as the critical temperature is approached, chalking may occur in the squeeze-out but not in the joint.

## Adhesive

The adhesive affects the speed of set in many ways. An adhesive with a high percent solids will often set faster than a lower percent solids. An emulsion adhesive releases its water more easily than an adhesive dissolved in water. Some emulsion adhesives “break” or coalesce more readily than others, causing a faster set. Some with a wet tack will give a faster grab than a non-tacky adhesive. The formulation of a fast setting adhesive should be left to the adhesive manufacturer. Speed of set cannot be simply determined by comparing percent solids of two glues. There is a wide difference in the speed of set of cold glues

## Adhered Materials

With a fast-setting cold glue, joint strength increases faster in the initial stages of setting than in the later stages. The strength at 1-minute will be doubled at approximately 4 minutes; and the 4-minute strength will be approximately doubled at 15 minutes.

With normal gluing conditions, cold glues set over twice as fast on hard maple as they do on ring porous woods such as walnut, oak, and ash.

Many of the less dense woods, such as pine and poplar in reality set more slowly than maple but their lower strength and resultant lower rigidity reduce the stress placed upon the glued joint when unclamped; the required clamp time is, therefore, not as long as for denser ring-porous woods.

As speed of set is directly related to the drying of the glue in the joint, it can readily be seen that drier wood with its fast water

absorbency, will set faster than higher moisture content wood. Higher wood moisture content will significantly increase the clamp time.

The same concept carries over into the effect of exposure conditions on the gluing surface immediately prior to gluing. Though no change might be noticed on a moisture meter reading, the exposure of surface-to-be-glued to high humidity will slow down the speed of set because these surfaces collect a thin film of water. This is particularly noticeable during humid summer weather. The effect is magnified when machining is done some days prior to gluing.

# Fundamental Gluing Information

## Glue Application

On roller spreaders, in which the roll turns in a glue container, the use of a felt sleeve has proven useful. It has two main advantages over a steel or rubber roll. 1) its flexibility allows complete coverage over the surface to be glued even though some irregularity exists in the lumber. 2) The spread can be adjusted much lower and still obtain complete coverage. Exact measurements of roller circumference and width are needed to specify the proper felt.

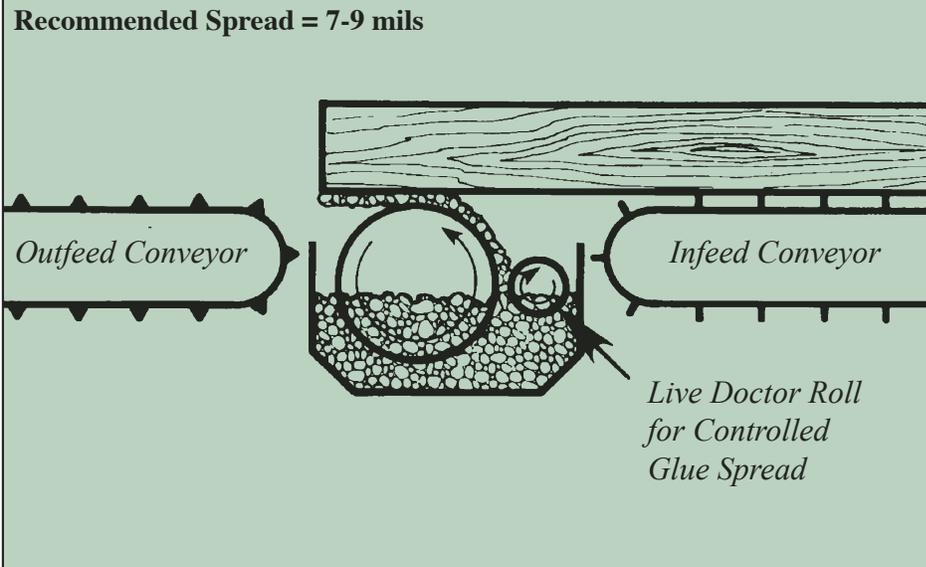
It is usually necessary to spread glue on only one surface. It is important, however, that the operator inspects every piece for complete spread before putting the panel into the clamp. A light over the spreader will speed this inspection. Some people mount a mirror on the far side of the spreader so the operator need only turn the glue line toward the mirror for inspection.

## Wet Film Gauge

A wet film gauge is a convenient way to measure wet film thickness. To use it accurately the film and substrate must have a smooth surface. A ridged glue film cannot be accurately measured.

The film gauge readings, in mil wet film thickness, are convertible into pounds per square feet by the formula, shown on this page.

**Recommended Spread = 7-9 mils**



**SPREAD =  $\frac{\text{WET FILM THICKNESS (mils)}}{1.6^*} \times \text{WEIGHT PER GALLON (LBS.)}$**

As an example, spreading an eight mil wet film of an adhesive weighing 9 lbs. per gallon:  $\text{SPREAD} = 8/1.6 \times 9 = 45$  lbs. per 1000 sq. ft. Rearranging the formula to find the wet film thickness for a certain spread, it becomes:

**WET FILM THICKNESS (mils) =  $\frac{1.6 \times \text{SPREAD (lbs. per 1000 sq. ft.)}}{\text{WEIGHT PER GALLON (pounds)}}$**

Using the above example: **FILM THICKNESS =  $\frac{1.6 \times 45}{9} = 8.0$**

\*A gallon of adhesive uniformly spread in a film one mil thick will cover 1,604 sq. ft.

# PVA Mixer #128



## Features

- Simple, low cost design.
- Mixes small batches on demand.
- Variable mixing ratios from 0% to 10%.
- Adaptable to different glue application systems.
- Flushing system for easy clean up.

## The Taylor PVA Mixer #128

The Taylor PVA Mixer #128 is a simple, low cost pumping and mixing system for polyvinyl acetate and aliphatic resins. The mixed or catalyzed adhesive has cross linking properties to make the glue bond more water resistant. Different glue brands and mixtures have varying levels of water resistance.

## How The System Works

The system operates automatically. A 12 volt electronic sensing probe is inserted into the Glue Applicator reservoir to the desired depth. When the glue level develops both pumps are turned on simultaneously and mixed adhesive is delivered.

The Mixing, Flushing System includes a fresh water hook up. When mixing operations are finished for the day, the feed valves are closed and the flush valve is opened to clean out all mixed adhesive from the system. If necessary, the static mixer is easily removed for further cleaning

## Advantages

**Easy Operation** - Glue levels are monitored electronically and are maintained automatically.

**Easy Clean Up** - Opening a “system flush” valve flushes the entire system with water.

**Long Life** - All materials that come in contact with glue are constructed of either stainless steel or corrosion-resistant plastic.

**Expandability** - The unit can be purchased with mixing and waste water recovery capabilities built in, or these features may be added later. The number of mixed glue outlets, with electronic glue level sensors, can also be increased later (up to four outlets total).

# PVA Mixer #140

## The Taylor PVA Mixer #140

The Taylor PVA Mixer #140 is a high capacity, fully automated Metering, Mixing and Distribution System for catalyzed (cross-linking) polyvinyl acetate adhesives. It saves labor and material by automatically pumping precisely metered quantities of PVA resin and catalyst from their original containers, mixing them without using any intermediate containers, and conveying the mixed adhesive to up to four independently controlled outlets.



## How it Works

Two air-operated, self-priming metering pumps (three if waste water is being recycled), controlled by a dual time delay relay, deliver resin and catalyst from 55-gallon drums or other storage containers to the mixing unit. Inside the mixing unit, the resin and catalyst pass through a Ross IGS static mixer, where the two (or three)-component stream is thoroughly mixed. The mixed adhesive passes through four air-operated valves which open and close independently as dictated by their corresponding electronic glue level controls. The four streams of mixed glue exit the mixing unit and are conveyed to their respective outlets.

## Special Features

The Taylor PVA Mixer #140 incorporates many features that make the metering, mixing, distributing and clean-up of catalyzed PVA adhesives fast, safe, and cost-effective:

### Accurate, Consistent, Adjustable Metering of Components -

The Taylor air-actuated, self-priming, positive-displacement piston pumps ensure accurate and consistent metering of components. By adjusting the strokes of the catalyst and waste water pumps, catalyst and waste water-to-resin ratios can be adjusted from 0% to 10%. A fluid flow control valve/pressure gauge system is incorporated to provide for very precise calibration of the Mixer.

**Recycling of Waste Water -** The Taylor PVA Mixer can recycle clean-up water back into the glue mixture thus reducing high waste water disposal costs.



**High Capacity -** Supplies mixed adhesive continuously at over 50 gallons per hour.

**Versatility -** Up to four independently controlled outlets. Each glue outlet has its own three-position control switch, providing three operating modes for each outlet: continuous "off" mode, continuous "on" mode and electronic level-sensing "automatic" mode.

# Specifications

<b>Product</b>	<b>Size</b>	<b>Power Requirements</b>
Plate Spreader	4' (1.2 M)	None
Roller Spreader Infeed Conveyor	13" Roller (330 mm) 5' or 10' Long (1.5 or 3.0 M)	120/230v Single Phase 50/60 Hz None
Conveyor Type Glue Applicator	10' - 40' (3 M - 12 M) 13" Roller 26" Roller 39" Roller	230/460v Three Phase 50/60 Hz
PVA Mixer #128	6 Gal./Hour	120v Single Phase Freshwater Supply
PVA Mixer	50 Gal./Hour	120v Single Phase Compressed Air 90 psi 5 cfm Freshwater Supply