



## **ROLL COATER MACHINES – Which Option & Why**

**David Brown – Technology Manager**

**Bronx International Pty Ltd**

Roll Coater Machines are the ‘Heart’ of the painting process on Continuous Coil Paint Lines. The Roll Coater Machine has significant control over the paint application, paint thickness control and aesthetic appearance so the Machine must be well designed and engineered, well made and the best fit for the purpose required.

There are a number of different designs available for different applications but all machines must have some fundamental engineering characteristics to meet the high standards. Roll Coater Machines can be used to apply chemicals (pretreatments and passivations), inks and several different types of paint.

### **ENGINEERING CHARACTERISTICS**

- A stress relieved, rigid frame that guarantees no vibration under all operating conditions.
- Linear rails for all sliding or moving parts, to guarantee no unwanted vibration.
- High quality, Link Belt bearings for all rotating rolls for trouble free long life operation.
- Positive pressure hydraulic actuation with full pressure being maintained when in operation to guarantee repeat and constant settings for repeat product quality.
- Both side hydraulic cylinder actuation to ensure accurate side to side operation.
- Interlocked safety guarding with software operational controls, safety isolation switches and back-up safety devices for operator safety.
- Safety shields on rotating shafts, universal joints and couplings.
- Infinitely variable vector drives to guarantee accurate and repeatable roll speeds under all operating conditions
- Quick release roll drive couplings and bearing caps for fast and easy roll changing to maximize production utilization
- Correct gearbox ratios for all pressure adjustment devices for required fine tuning.

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Bronx International Pty Ltd Tel: +61 2 9534 4233 Web: [www.bronxintl.com](http://www.bronxintl.com) Email: [salesteam@bronx.com.au](mailto:salesteam@bronx.com.au)

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- The Applicator Rolls to be made from special grade polyethylene, no joins.
- The Pick-Up Rolls to be chrome plated to certain surface roughness.
- Three Roll Head configuration, Applicator Roll, Pick-Up Roll and Metering Roll.
- The Top Head ready to fit equipment for Patterning (ink or paint) applications.
- All Heads to be able to operate in both the Forward and Reverse Coating method.
- Cartridge type Scraper Blades on the Back-Up Rolls for fast and easy cleaning and replacement.
- The Paint Trays to be both vertically and horizontally adjustable for fast, easy and safe cleaning and set-up.
- The machine must paint both sides of the strip simultaneously with full adjustments on all coating Heads.
- Certain levels of automation should be standard on all machines:

### **Standard Automation:**

- Automatic roll speed changes with line speed
- Automatic heads retract and apply with stitch passage
- Automatic heads retract with line or roll stoppage
- Automatic heads retract with oven or ventilation malfunction
- Applicator Roll diameter compensation to ensure correct roll surface speed

### **Optional Equipment:**

- Pressure Measurement- the addition of Load Cells between rolls and between rolls and strip, used to measure and set-up the painting head to pre-determined specifications
- Hydraulic Position Cylinders, or electric Stepper or Servo Position motors for pressure adjustment- replaces the manual gearbox systems for roll pressure adjustment but can add considerable capital cost to the machine. These devices allow for remote operation outside the Coater Room.



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## ROLL COATER MACHINE DESIGNS

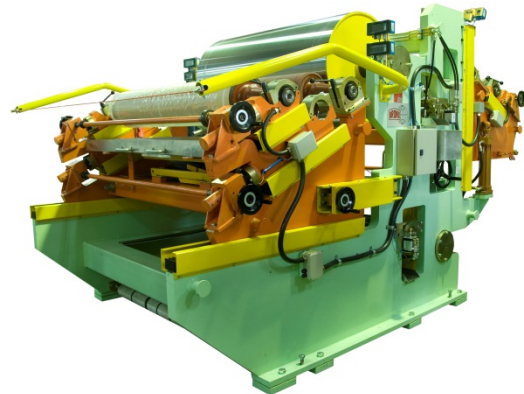
### **Horizontal Coater Machine:**

This machine is the most basic of Roll Coater Machine designs. The strip travels horizontally through the centre of the machine so this machine can be added to most line situations at minimal cost. It is used mostly for chemical applications but is also used for paint applications on smaller Paint Lines.



### **S-Wrap Coater Machine:**

This machine is the most popular machine used around the world. The main advantage of this machine is that the Top Head paints the strip as the strip is supported around a large diameter Back-Up Roll. This Back-Up Roll supports the strip and keeps it very flat so the painting process can be done very accurately. This machine provides very good operator access and visibility on both the top and bottom sides of the strip.



### **U-Wrap Coater Machine:**



This machine is a modification of the S-Wrap Coater Machine. It provides all the characteristics and benefits of the S-Wrap Machine but also provides the excellent advantage of being a 'Quick Change Coater'. A Quick Change Coater is a machine that has two painting Heads for the top side of the strip. While one Head is painting the strip, the second Head is being made ready. When it is time to change paint colour, the first Head is retracted off the strip and the second Head with a different colour is applied

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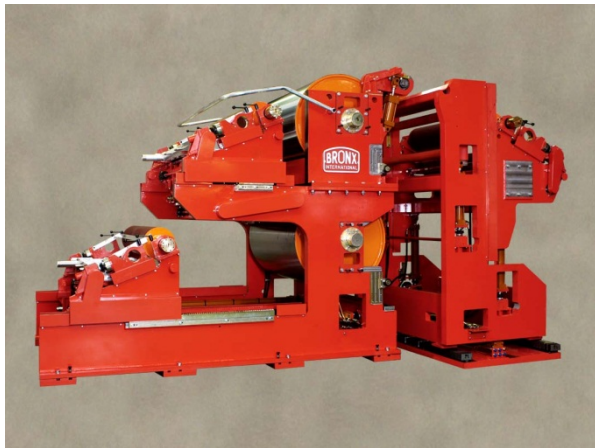


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onto the strip. This eliminates the 'down-time' associated with changing paint. Once the second Head is painting, the operator can now change the paint on the first Head and make it ready for another different colour while the line remains in full production.

### **C-Wrap Coater Machine:**

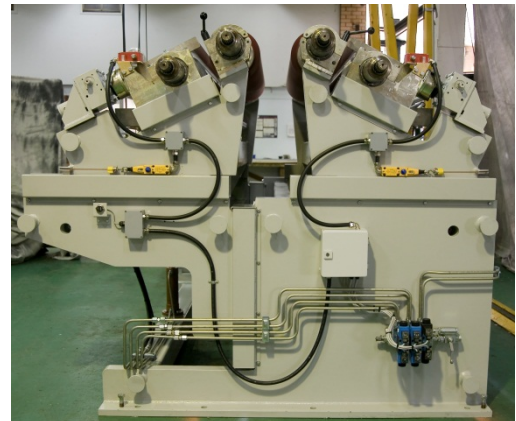
This machine is also a modification of the S-Wrap Coater Machine. It operates in a similar manner to the U-Wrap Coater Machine in that it is also a Quick Change Coater. The main difference here is that the two Back-Up Rolls are positioned vertically above each other whereas in the U-Wrap Coater Machine, the Back-Up Rolls are positioned horizontally apart from each other.



Whether a U-Wrap Machine is used or whether a C-Wrap Machine is used depends on the application area. The U-Wrap machine requires more space horizontally whereas the C-Wrap machine requires more space vertically. In both cases, the complete painting operation takes place in one room and this has good advantages for line manning and paint movement and storage logistics.

### **Vertical Coater Machine:**

The Vertical Coater Machine has similar characteristics as the Horizontal Coater Machine but in the Vertical machine the strip travels vertically upwards through the machine. This machine is mainly used for chemical application on both Paint Lines and Galvanising Lines. Operator access is very good but there is no Back-UP roll to hold the strip perfectly flat.



### **S-Wrap A and B Coater Machines:**

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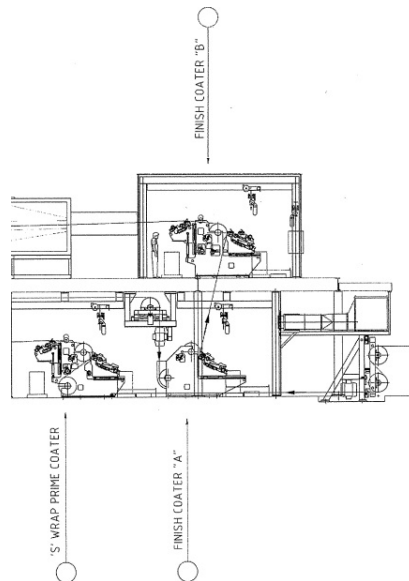


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### Coil Coating Line Solutions

To achieve the advantage of the Quick Change Coater technology, but not use the U-Wrap or C-Wrap Coater Machines, an option is to use part of the S-Wrap Coater machine at ground floor level and then have a second S-Wrap Coater Machine on the mezzanine floor level directly above the first machine.

One of the disadvantages of the C-Wrap and U-Wrap Quick Change Coater Machines is that they are physically quite large and require a larger than normal Coater Room. Having part of an S-Wrap machine on the ground floor and another S-Wrap machine on the mezzanine floor keeps the room sizes relatively smaller but now you have the disadvantage of two separate painting areas and this option is a more expensive option than a U-Wrap or C-Wrap option.



In all cases, the Roll Coater Machine must be a very high quality machine as this machine needs to operate very accurately for the next 30-40 years.