

Controlling Tension over a Wide Tension Range

Controlling tension over a wide tension range is possible, but often a challenge. There are various solutions for this situation which include utilizing multiple web paths with individual transducer locations, two wrap angles on one transducer location, etc. The challenge is created by limiting factors such as selecting a transducer load rating that is appropriate for the maximum tension while still being able to provide sufficient output from the transducer at minimum tension, or because of space constraints in the machine and cost issues for the customer.

One solution for controlling a wide tension range is the use of multiple transducers in a single location. This solution has its limitations, but it does work well in many cases.

One application we came across involved five unwind zones with five individual webs being laminated to form one web that is rewound. Our task was to control web tension in four of the unwind zones.

The application specifications for each unwind zone were identical, and were as follows: Web Material = Polyethylene, Web Tension = 1 - 60 lbs., Wrap Angle = 180°, Direction of Force = Horizontal, Weight of the Idler Roll = 15 lbs., and Maximum Line Speed = 20 fpm.

The primary limiting factor in this application was space availability within the machine. Additional idlers could not be added to accommodate more than one web path for different tension ranges, and the idler selected as the transducer roll could not be moved left and right to create two wrap angles.

The solution for this application was to mount Model C (PBC0D-10) transducers with the Extended Range option on top of UPBH2-100 transducers with the Extended Range Option in one location for each of the unwinds. The Model C (PBC0D-XR) transducers covered a 1 - 6 lbs. tension range, and the UPBH2-100-XR transducers covered a 3 - 60 lbs. tension range.

A SteadyWeb MicroProcessor (16P) that included Dual Transducer Input and Extended Range options was the tension controller of choice. The Dual Transducer Input option includes a dual calibration function, enables the SteadyWeb to accept a tension signal from both pairs of transducers, and enables the SteadyWeb to control tension based on the tension signal from one pair of transducers at a time.

The complete tension control package for each unwind zone included a [SteadyWeb MicroProcessor](#) 16P controller, two [Model C transducers](#), two [UPBH transducers](#) with drilled and tapped top plates, transducer cables, a B66 [pneumatic brake](#), and related brake accessories. Our customer was able to maintain the versatility of the machine by controlling tension through the full 1 - 60 lbs. range, and the work required of the customer's maintenance department was minimized by utilizing a single, existing web path.