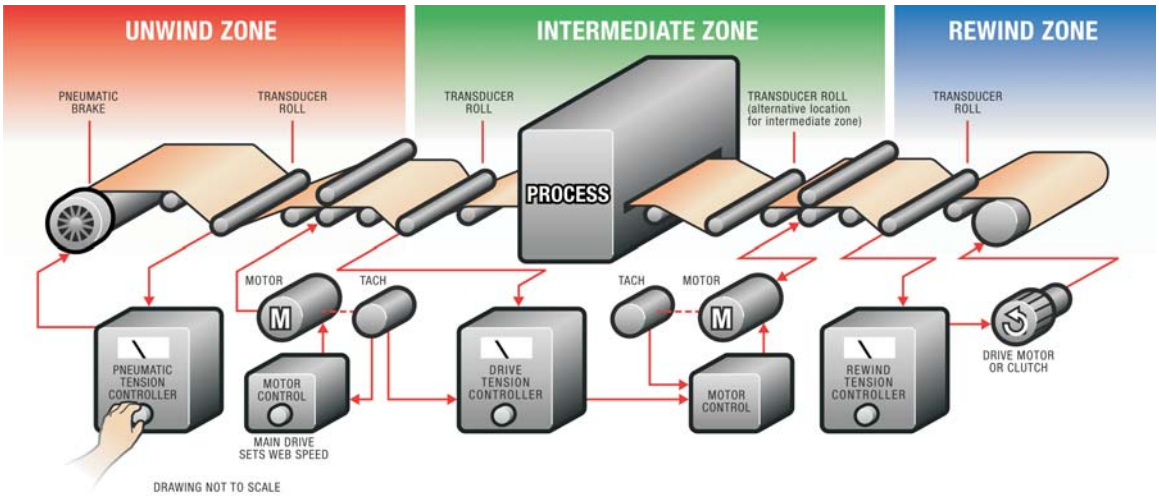
# TECHNICAL BULLETIN

www.dfe.com controlling process tension

# TENSION CONTROL BY ZONE




A tension zone is any segment of a web machine in which the tension on the web (in the machine direction) is isolated from other parts of the process. This occurs between driven rollers, between the unwind stand and the first driven roll or nip, and between the last driven roll and the rewind stand.

## UNWIND ZONE

Tension in the unwind zone can be controlled by a pneumatic brake, an electric brake or a regenerative drive. During machine operation the measurement signal from the tension transducers is input to an automatic tension controller. The controller compares the actual tension to a desired tension set point input by the operator and sends a compensated electric or pneumatic signal output to the control device. The output signal decreases as the material roll decreases in diameter to maintain constant tension going into the next tension zone.

## INTERMEDIATE ZONE

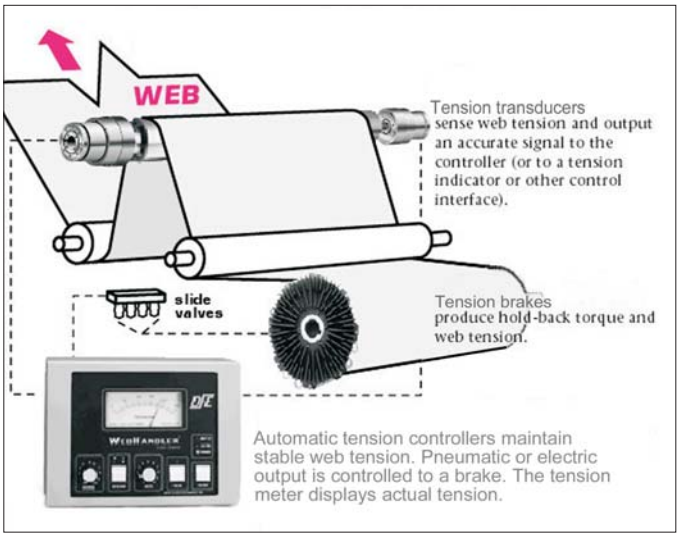
A web process may involve one or more intermediate zones. This can occur prior to the main drive station, or after, or both. In this zone the transducer signal is used only to 'trim' the line speed signal as a follower of the main drive speed signal. This is usually at 5% - 10% of the maximum controller output.

When controlling a nip prior to the main drive, the tension controller output slows down the nip to create the correct tension with respect to the main drive section. If the tension-controlled nip is situated after the main drive, then the output increases the nip speed to create tension. Each section must have a positive grip on the web. Nips can be driven by clutches from a line shaft, or by a DC regenerative, AC vector or servo drive.

## REWIND ZONE

Proper rewind tension control is essential to winding a consistent, unflawed roll and to prevent starred ends, telescoping, or offset edges of the finished wound roll. The tensioning device to be controlled is usually an electric clutch or a variable speed motor drive.

Taper tension, a feature of the rewind controller that causes its control output to gradually reduce as the roll builds, is used depending on the maximum finished roll diameter and surface characteristics of the substrate being wound. Winding with taper tension reduces the incidence of telescoping and starred rolls.




**12/11/2007**
**893tbTensionZones**

THE TENSION CONTROL SPECIALISTS
**DOVER FLEXO ELECTRONICS, INC.**
217 PICKERING ROAD, ROCHESTER, NH 03867 USA • 603-332-6150 • FAX 603-332-3758
E-Mail: info@dfe.com • Internet: www.dfe.com • ISO 9001 Certified