

I.1 Material Conditions

All films, coated materials and laminations are subject to some or all of the following variations:

Gauge Variation - A gradual uneven thickness across the web width from edge to edge.

Gauge Band - An abrupt change in thickness in a small area. Gauge bands run parallel to the main axis of the web and can exist for the length of the web, or only for short lengths.

Slack Zones - Slack Zones are caused by the uneven production of the original material. In this condition, the gauge can be even, but if the web is laid out on a flat surface and cut into strips parallel to the machine direction, the slack zone strips would be longer than the normal or tight zone strips (Figure I-1).

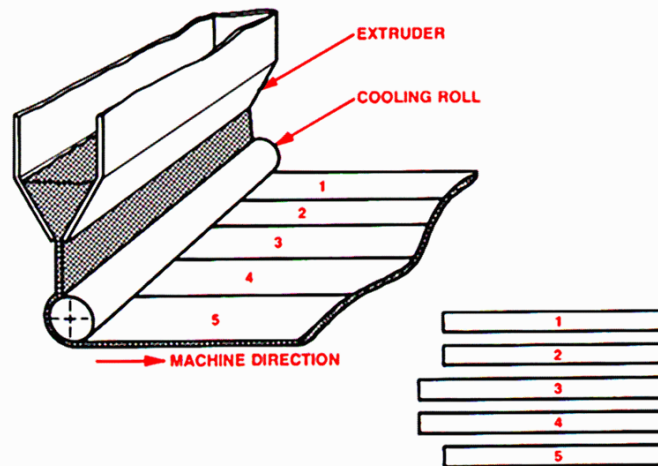


Fig I-1 Slack Zones

I.2 Surface Air

All materials carry a surface layer of air with them as they move through a machine. When films are slit and rewound, the layer of air is carried into the rewind roll. At low speeds, this layer of air can escape at the ends of the slit rolls without causing problems in winding. At high speeds, air is wound into the roll. This can result in the air acting as a lubricant or becoming trapped between the layers of material. When air acts as a lubricant between the layers of material it allows shifting of the second, third, and lower layers (from the outside in) within the axis of the roll (Figures I-2 and I-3).

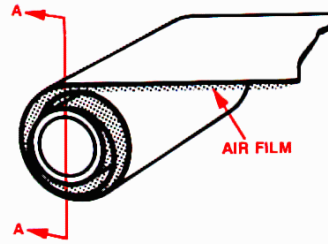
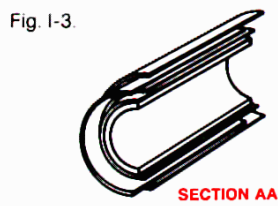
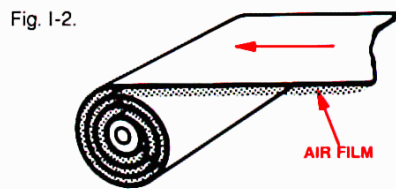


Fig. I-2 and I-3. Air Wound Between Layers showing the relative shifting of the material

When air is trapped between the layers of material and is wound into the roll, it forms tires, balloons or bubbles, causing deformation and occupying volume as a secondary layer (Figure I-4). This causes poor roll formation and deformation of the web.

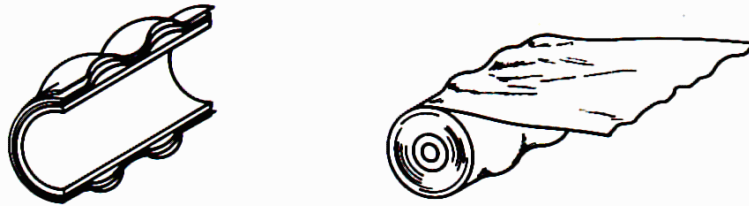


Fig I-4 Air Trapped in Rewound Roll

I.3 Equipment Design

Engineering equipment design and modification is often the outgrowth of one or several techniques developed on a theoretical and sometimes temporary basis to meet an immediate problem; and techniques in turn are inseparably related to machine operation. For the following discussion, the terms Engineering and Techniques are employed interchangeably as a single concept.

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