

Winding Strains

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Everyone at one time or another has observed the phenomena of a nice looking wound roll of film turning into a hard rock corrugated nightmare in a few days. This is caused by several things.

Trapped air, as a roll is being wound makes a roll feel soft. If film touched intimately, it would feel very firm. Static helps trap air. Layon rolls help to squeeze it out. Film tension helps to squeeze it out but also creates other problems. The rapid escape of air produces telescoping.

Tension creates a compression load which will squeeze out the very thin film of air, crush underlayers and crush cores. Tension also tends to even out some wrinkles and irregularities.

Room temperature recoverable strains are residual processing strains that will release themselves at room temperature to produce a stress and or shrinkage.

Today, we have techniques for predicting the level of room temperature recoverable strains.

Crystallization of crystalline polymers also produces shrinkage of a magnitude generally ½ to 2%. Crystals take less space and hence, as the crystal structure goes to completion, shrinkage occurs. With polyethylene film, for instance, it is commonly loosely wound, permitted to shrink for a day or two, slit and rewound.

When problems occur in winding the most important problem is the correct definition of the cause. Find the cause and with today's technology, the problem can be handled.

- Paul Limbach

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