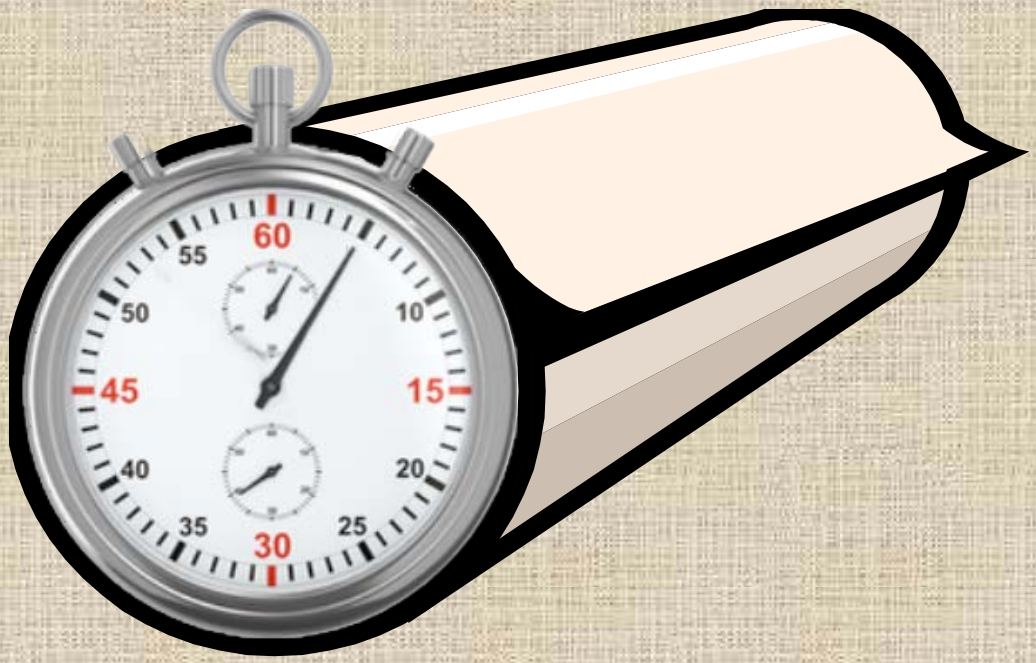
Web 101.86SM – Good Winding Starts

The First Five Seconds



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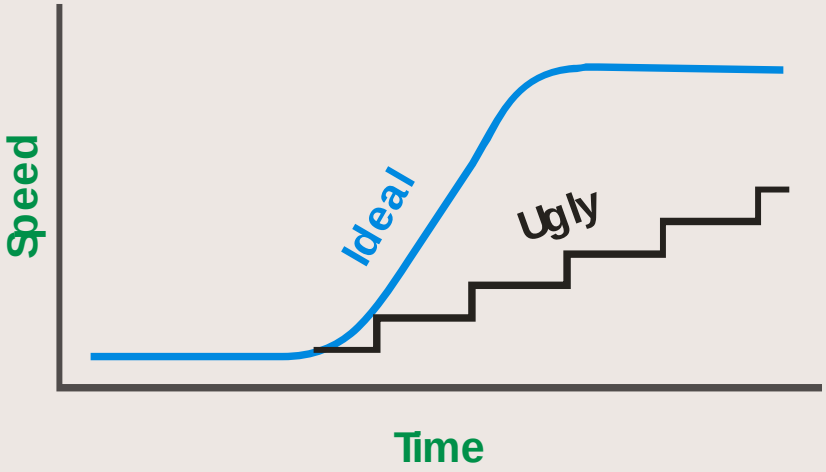
First Seconds are Important

- Tension challenged during
  - Roll change
  - Speed change
- Tension one of the TNT's of winding
  - Becomes relatively *more* important due to low effectiveness of nip just above core
- Nip uniformity challenging near core
- Path upsets worse near core
- Many winding defects favor core area

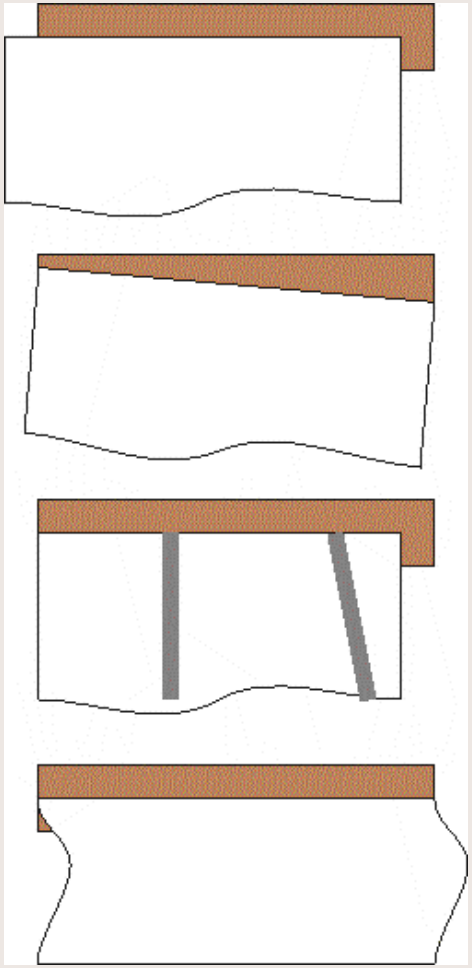
Ideal Tension Sequencing

- Thread square and evenly taut
- Back/stall tension unwind or pretension windup
- Allow accel to begin *only after* load cell sees substantial tension
- Single Round-Ramp-Round ‘S’ Curve
- Typical: accels 5-40 mpm/sec, round 1-3 secs



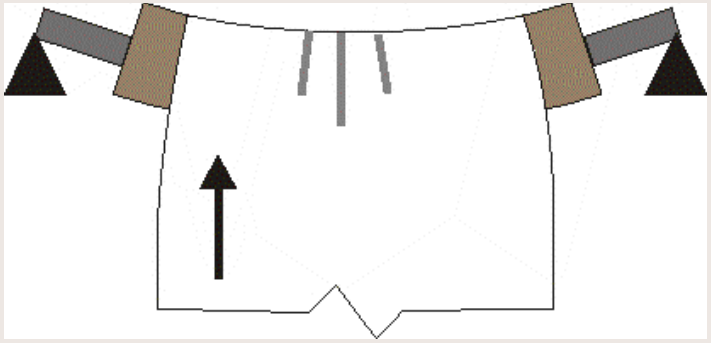
Core & Splice Alignment Errors

- Offset
  - Easy to detect
- **Angular**
  - **Insidious**
  - **Causes a decaying oscillation**
- Wrinkle in Web or on Core
  - No-brainer no-no
- Upstream slack
  - Pull more web through

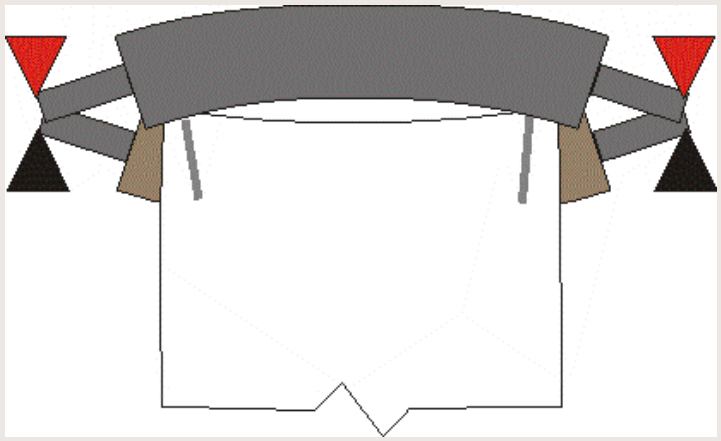


Core Deflection & Wrinkles

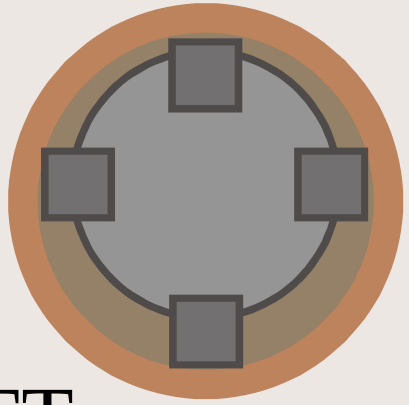
- Simple Centerwind
  - Acts like a bowed roller, pointing backwards
  - Fan or frown shaped wrinkling pattern



- With Layon Roller
  - Pinch on end, open at middle:
  - Fan or frown shaped wrinkling pattern



Other Core Issues

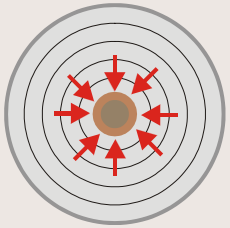


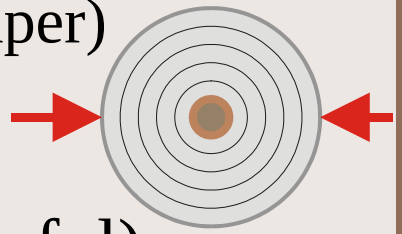
- Poor Cylindricity
- Excessive Deflection
- Eccentric Chucking
- ESPECIALLY with AIR SHAFTs
- Variability of winding tightness with Slipped Core Winding

- Weight and Torque Capacity (Telescoping I)

Core Crush

- Adjust Wound-in-Tension First
  - I. *Looser* if crush during *winding* (e.g. film)
  - II. Looser if crush due to material shrink (rare)
  - III. *Tighter* if crush during *handling* (e.g. paper)

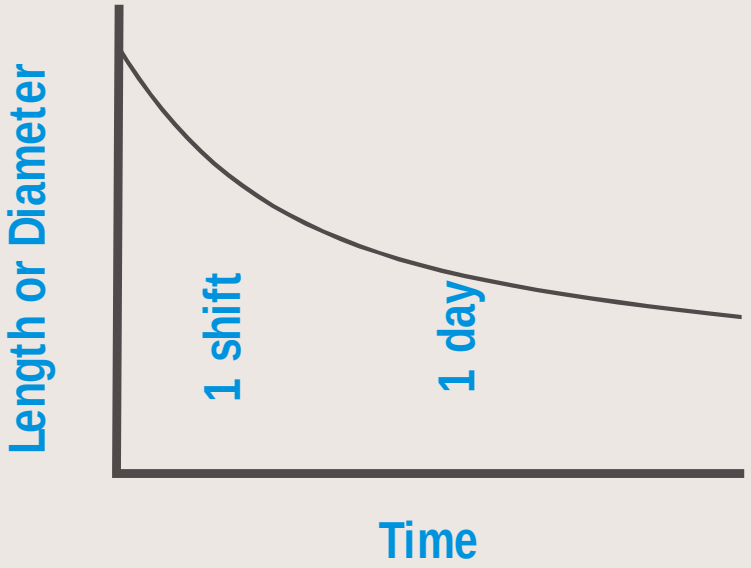




- Redesign Cores Next
  - Wall thickness increase (most powerful)
  - Core diameter decrease (if customer allows)
  - Core plugs (narrow rolls Cases II & III)
  - Stronger core (using better grade of fibers)

Wet Cores > Loose Cores II

- Wet cores will dry
- Dry cores shrink > get **shorter**
- Dry cores shrink > **loose cores**



- Best Practices
  - The best cores are uniformly kiln **dried** to user's environment.
  - The best cores are stored in **conditioned** or hot room
  - The best operators **don't pull cores out until needed**

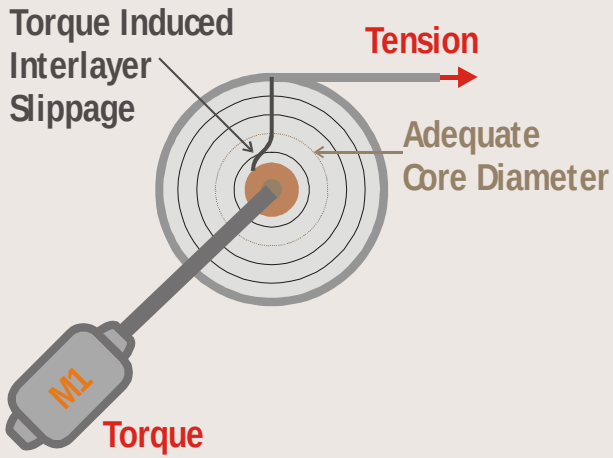
Wet Cores or Loose Winding?

- Wet cores
  - Winding on **fiber cores** wetter than equilibrium with customer
  - Web is **stiff** in MD & ZD
  - **Seasonal complaints** peak
    - Dry climates
    - Dry seasons
- Then
  - Best core practices or
  - Waxed cores

- Loose Winding
  - Rolls are loose near the core right after winding
- Then increase
  - Tension
  - Nip
  - Torque
  - Speed (decrease)

Telescoping Ia&Ib - Diagnosis

- J-line interlayer slip near core during center wind / unwind
- Due to insufficient
  - Interlayer pressure
  - Web-Web friction coefficient
  - Core diameter
- to transmit center torque without slippage
- J-line check:
  - Does not J-line ever – then a different type of 'telescope'
  - J-line motion during winding or unwinding. Rotate roll *without* applying torque and re-check J-line
    - If J-line slippage: due to **weight** induced nip above core
    - If no J-line slippage then, but does slip when torque applied: due to **torque**



Other Defects Favoring Core Area

- **Blocking** due to a combination of interlayer pressure, weight and surface chemistry of web
- **Looseness** near core due to mechanical vibration, air entrainment and radial stiffness that makes nip less effective
- Core **bursts** (crepe wrinkles near core)
- **Interweaving** (or tie-ups on two-drum winders)
- **Offsets** and rough roll edges
- **Telegraphing** (damage of lumpiness near core ruining layers above
- **Wrinkles**

Questions?

Answers:

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