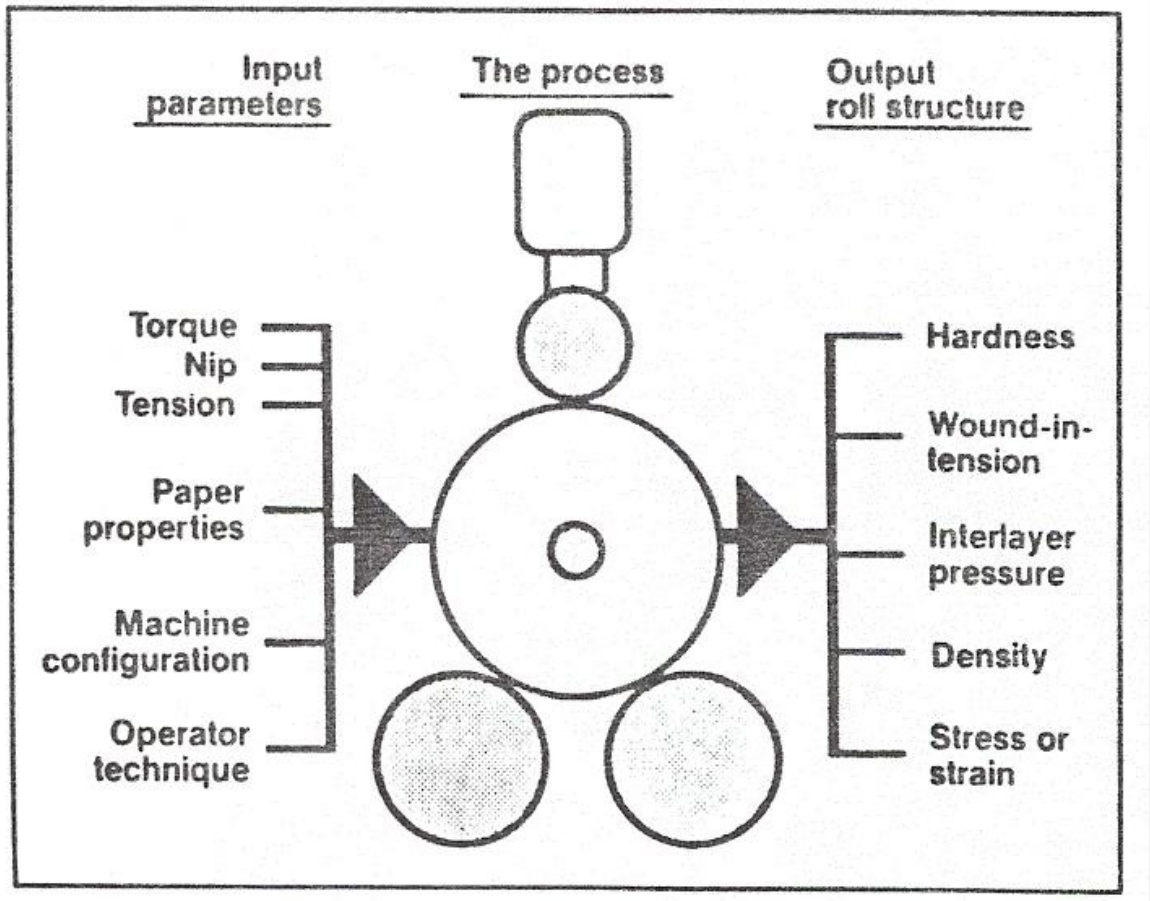
ACA RoQ™

Roll Hardness Profiler

New ACA RoQ analysis platform
that revolutionises
profile test practices

Winding process



- Input parameters can be controlled to optimize the output results.
- TNT (Torque, Nip, Tension) parameters are easiest to control.
- Paper properties are the most difficult.

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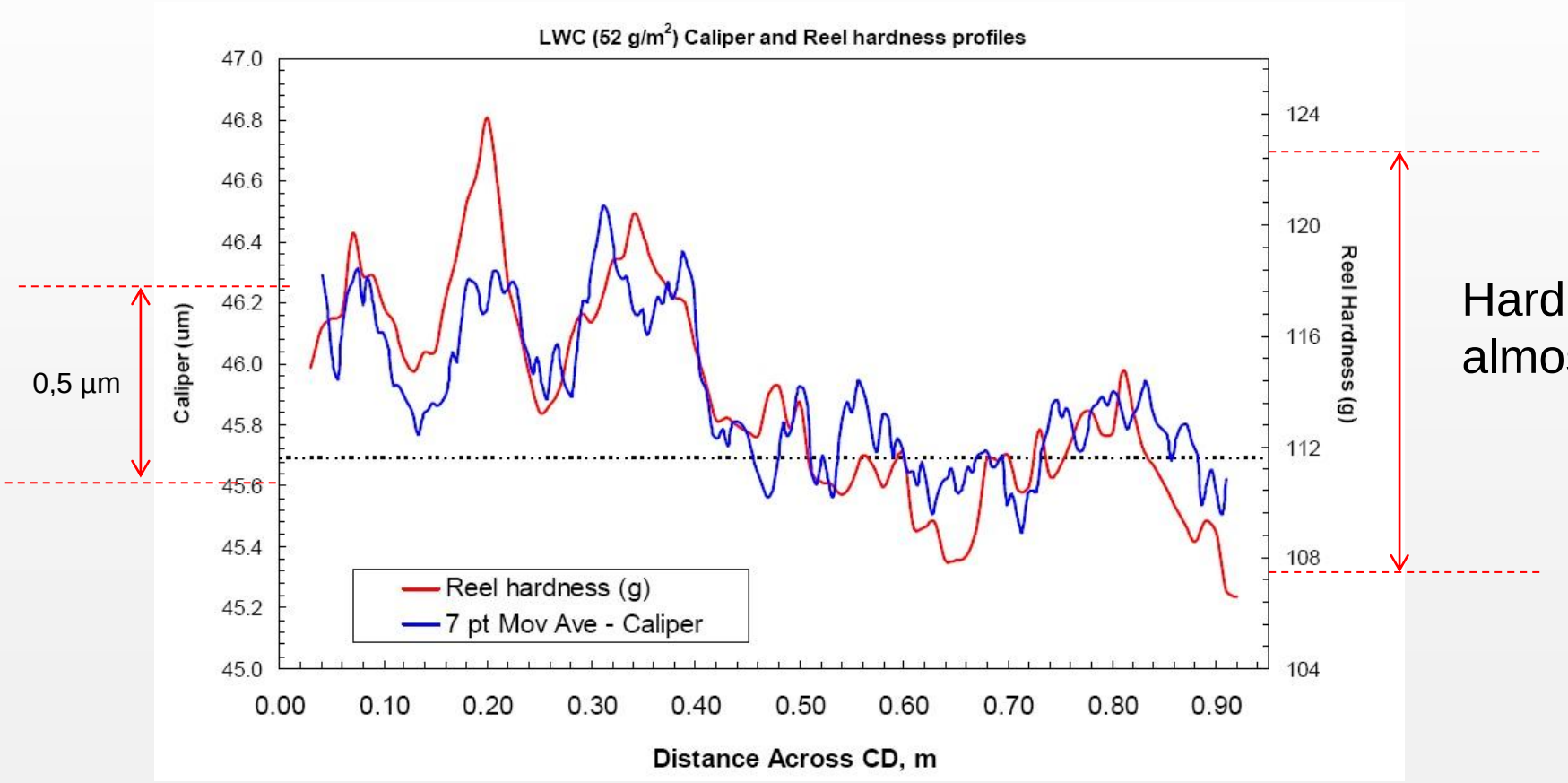
Roll structure

- Some paper properties have a strong influence on roll structure
  - Caliper, density, MD yield and tensile strength, coefficient of friction, coefficient of hygroscopic expansion, porosity, elastic moduli in the MD and ZD.
- Other properties affect web quality have no effect on roll structure.
  - Like optical properties (brightness, opacity), freeness, water retention.
- Typically Caliper has absolutely the strongest influence!

Caliper control

- Most online scanners are nowhere near good enough for the purpose of detecting profile problems.
- For thin grades much smaller than 1 µm variation can be a problem.
- Often, roll hardness is a more sensitive measure of caliper variation than is direct measurement from the web itself because you are measuring hundreds of layers with a roll hardness meter.

Caliper and Hardness



0,5 µm

Hardness variation almost 15%

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Typical roll defects

- Out-of-round rolls
- Gauge bands or hard spots
- Baggy areas
- Corrugations or rope marks
- Dished or telescopic rolls
- Starred rolls
- Soft edges

"Good roll has the right shape, the right size, the right consistency and it must look good!"

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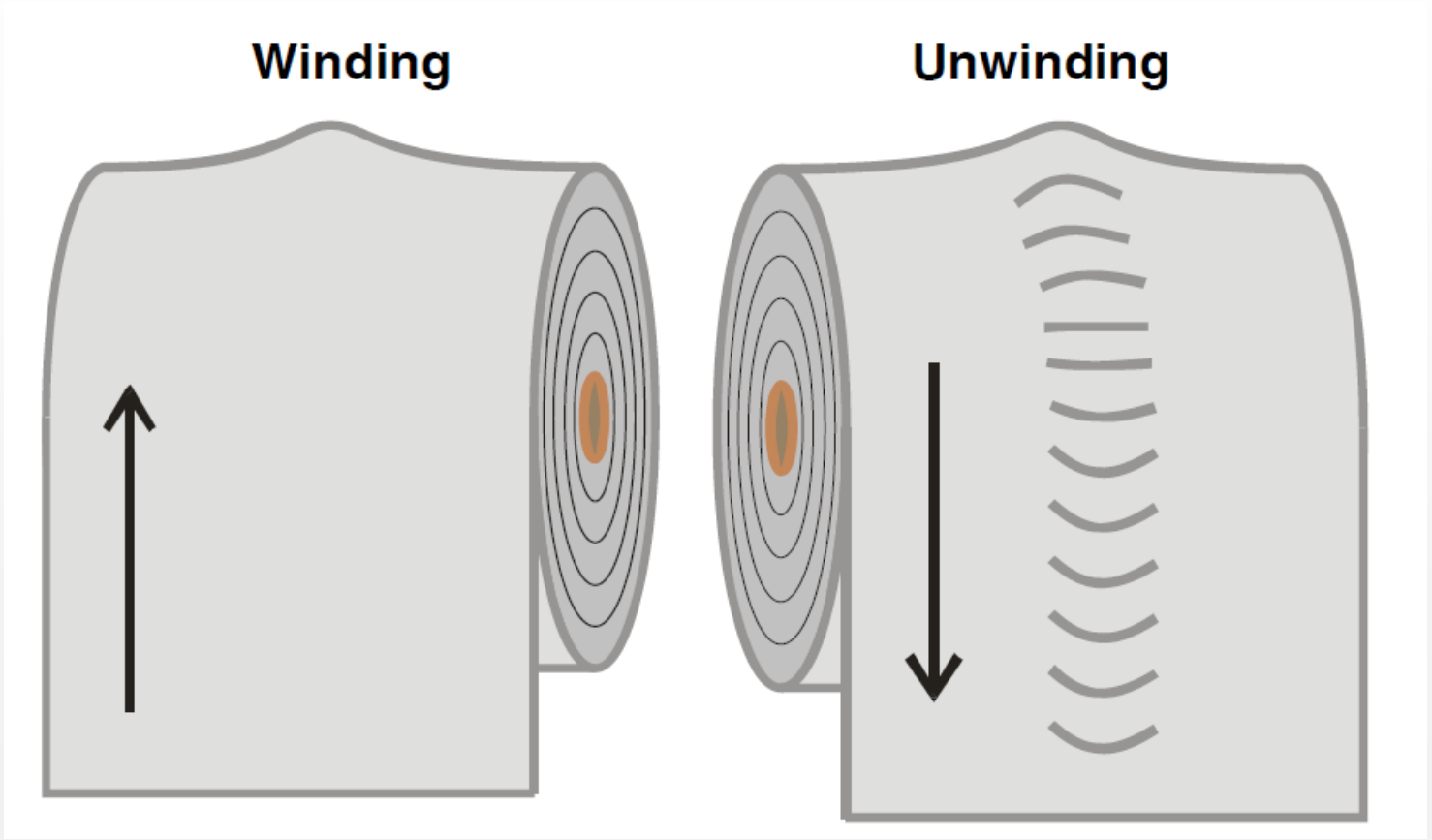
Bagginess



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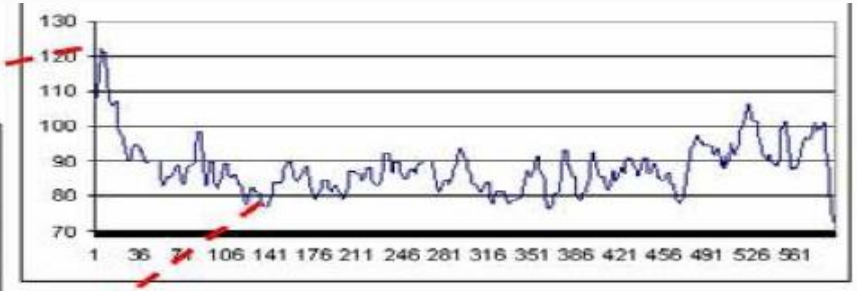
Parent reels vs. customer rolls

Parent reel



Customer roll

Rope marks on the customer roll

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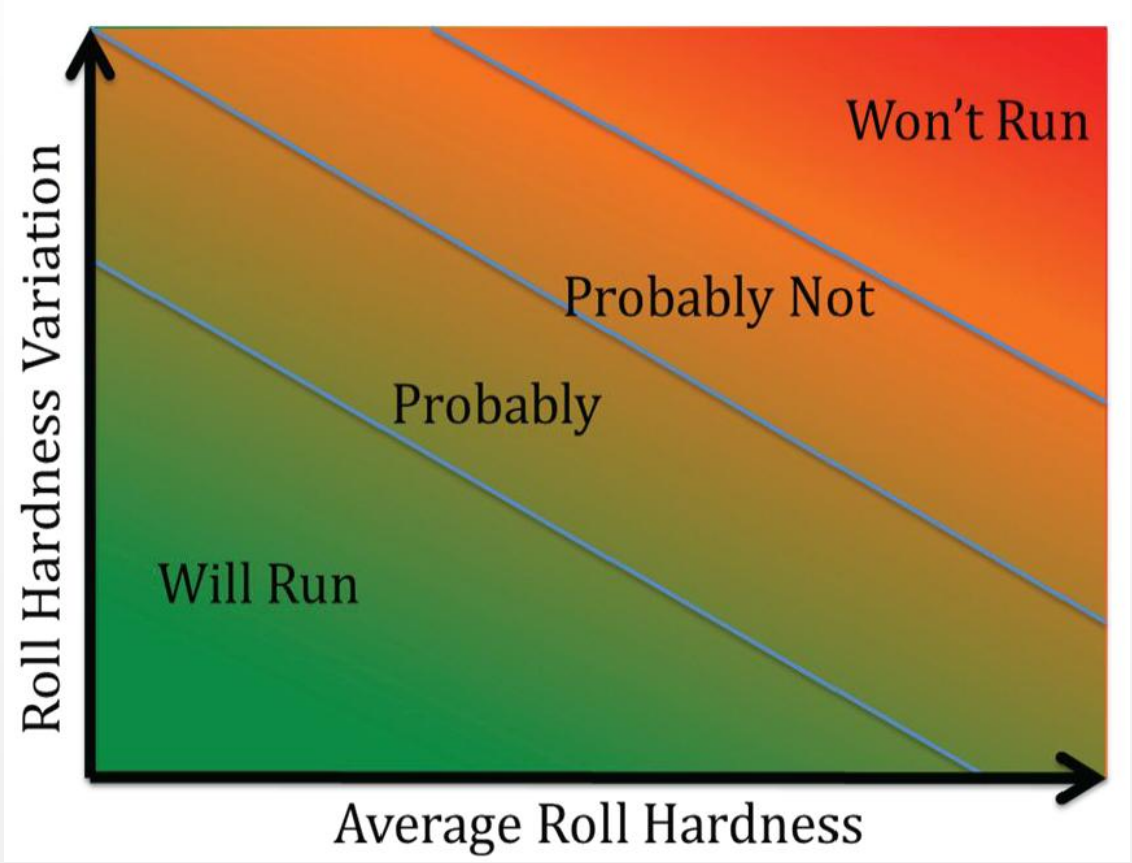
Runnability problems



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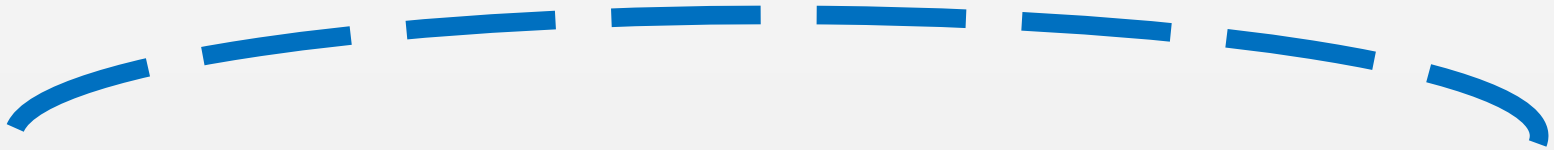
Ideal hardness profile?

- In the ideal hardness profile edges are a little bit softer than the centre. But not too much, a couple of percent is enough.
- If edges are harder than centre, often big problems are faced in calendering or winding.
- If edges are too soft then edge customer rolls must be rejected or they cause problem in further processes in converting or printing.



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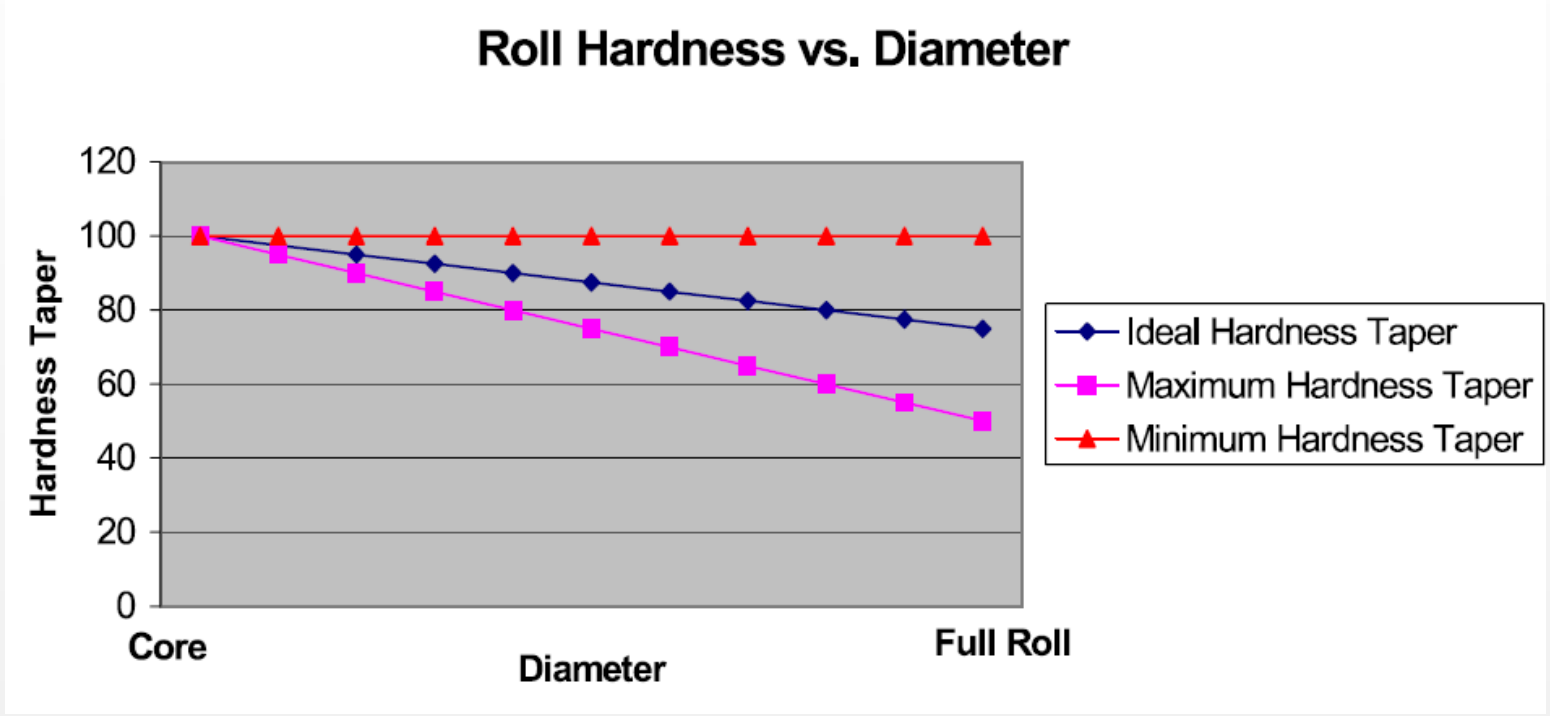
Hardness vs. roll diameter



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RoQ Roll Hardness Profiler

- Solenoid with two coils, no spring.
  - Excellent control of the hitting.
  - Simple calibration.
- 4,3” touch screen.
  - Result available immediately after measurement directly from the integrated display.
  - The device works independently without PC and special software.
  - Settings can be easily changed from the user interface integrated in the device.

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RoQ Roll Hardness Profiler

- Data handling.
  - Data is saved to the internal flash memory.
  - Results are calculated right after measurement and microcontroller creates file directories to the memory.
  - Measurement data can be displayed over the WLAN connection.
  - Results can be interpreted by any device which has WLAN connection and web browser. (smart phone, tablet etc.)
- Batteries and charging.
  - Li-ion batteries.
  - Charged from normal USB port, charging downstream port or dedicated charging port.
  - Own system to control charging and following the status of the batteries.

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RoQ Roll Hardness Profiler

- Maintenance
  - Professionally designed mechanical and electrical components.
  - In the case of failure most spare parts can be changed on a customer site and device is not needed to be sent back to the manufacturer.
  - Strong structure. Cover parts made of aluminium.
  - Advanced problems diagnostics.