Best Practice Wool Scouring

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Best Practice - Definition

Make a profit by producing a product in an environmentally sustainable way that is acceptable to the customer at the lowest possible cost

Factors Affecting Best Practice

- Type of wool
- Type of enterprise
- Resource issues
- Environmental issues

Type of Wool

- Combing types
- Carding types

Type of Enterprise

- Commission scourer
- Commission comber/topmaker
- Vertical mill

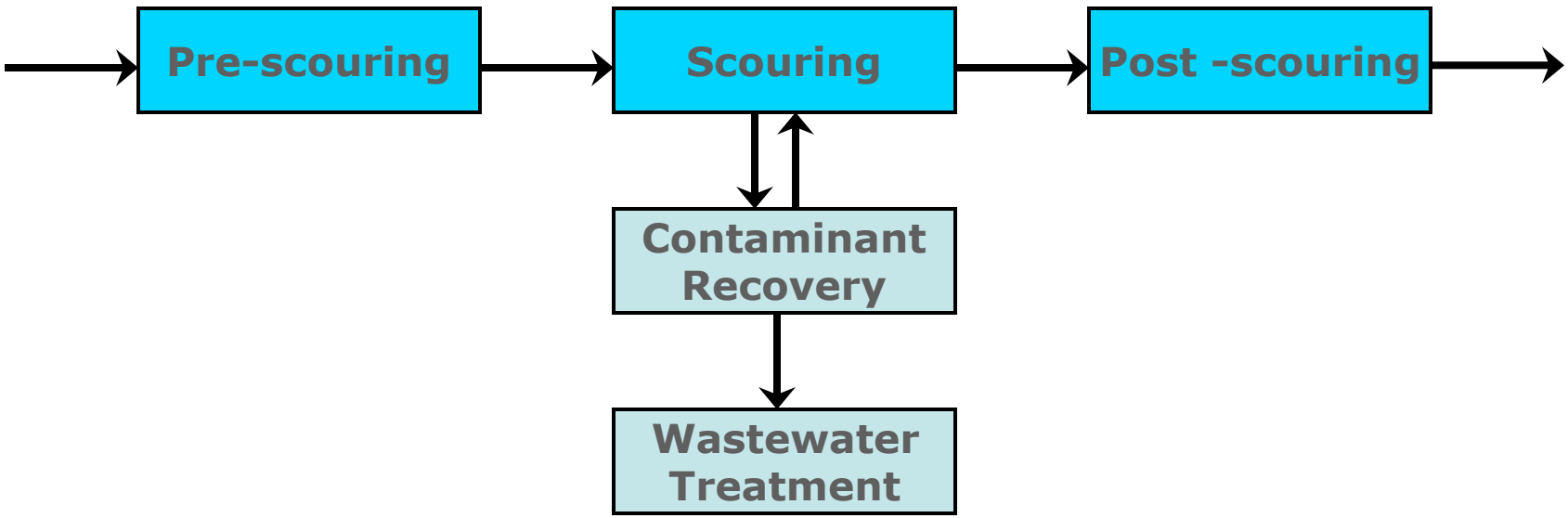
Resource issues

- Water
- Energy
- Chemicals
- Labour
- Spare parts

Environmental Issues

- Discharges from scouring line
- Environmental discharge regulations
- Options for effluent treatment
- Market Drivers

Layout of a Scouring Line



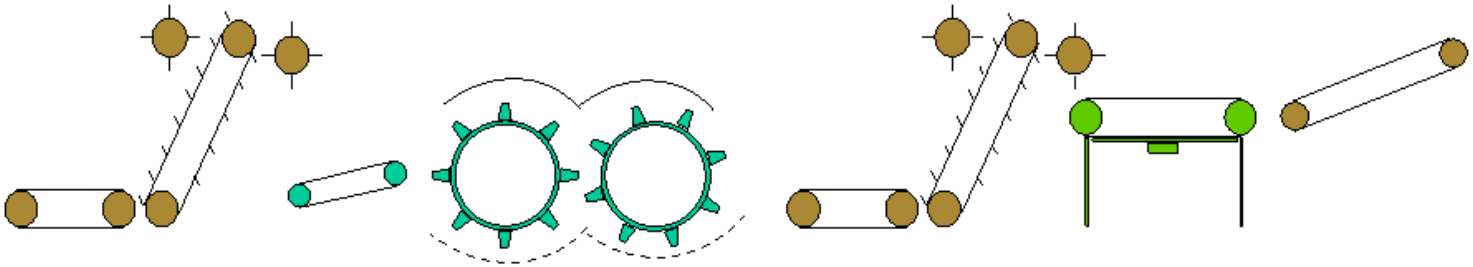
Best Practice - Processing

- Pre-Scouring Processes
- Scouring process
- Post-Scouring Processes
- Contaminant Recovery

Best Practice – Pre-Scouring

- Blend layout
- Blending/Opening equipment
- Extent of opening

A Typical Preparation Sequence



Brattice Feed Hopper

Double Drum Opener

Brattice Feed Hopper

Weigh Belt

Best Practice – Scouring Process

- Minimising entanglement
- Scour configuration
- Mechanical issues
- Water
- Detergent

Entanglement and Processing Performance

- Definition
- Causes
- Reduction

Causes of Entanglement

- Fibre characteristics
- Opening
- Mechanical effects
- Scour configuration
- Scouring conditions

Fundamental Issues in Felting of Wool

- Scales are the major cause of felting
- scale direction affects differential friction
- fibre flexibility affects felting
- water increases differential friction and flexibility

Practical Issues in the Felting of Wool

- Felting requires both fibre movement and contact
- felting is most efficient when fibres are wet
- soap and lubricants increase felting
- fibre disorientation promotes felting
- felting increases with water temperature up to a point

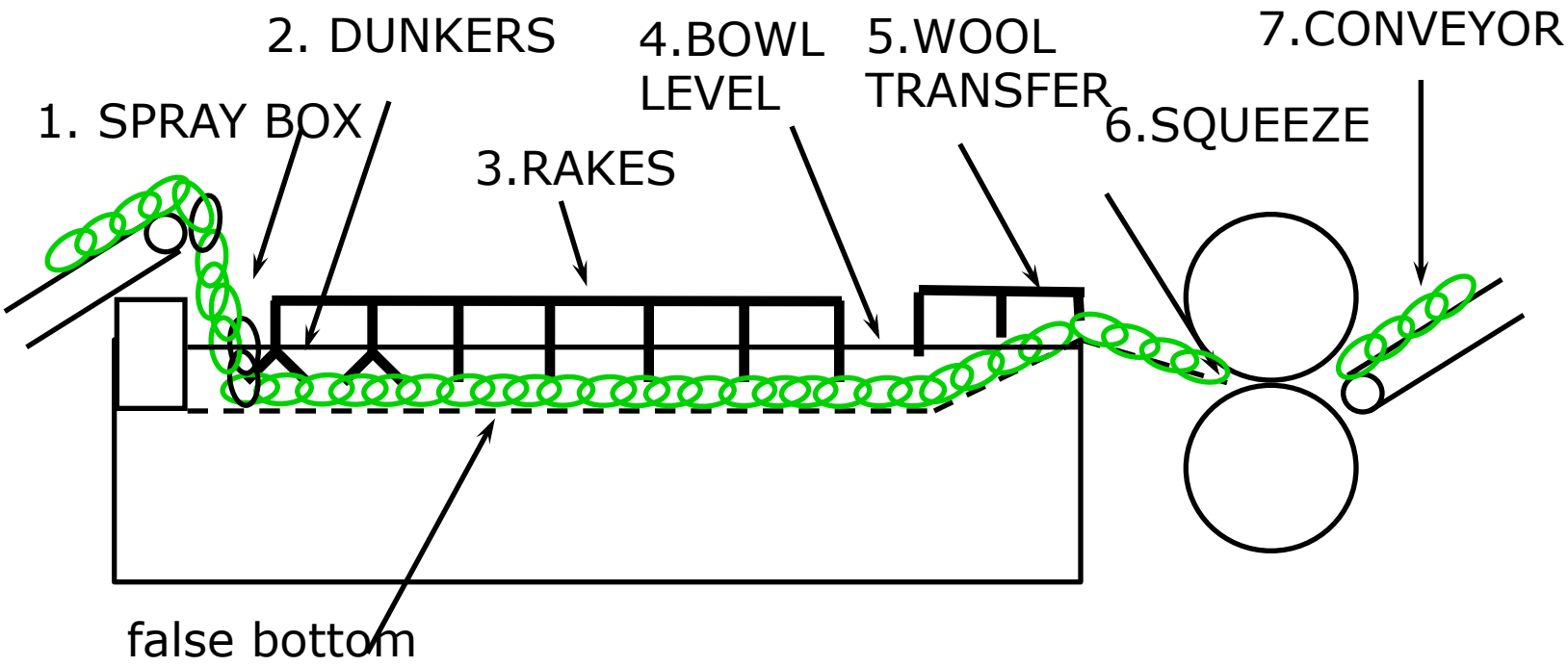
Entanglement

- Mechanical Elements
  - Preparation
  - Fibre movement in bowl
  - Length of bowls
- Bowl Configuration
- Operating Conditions

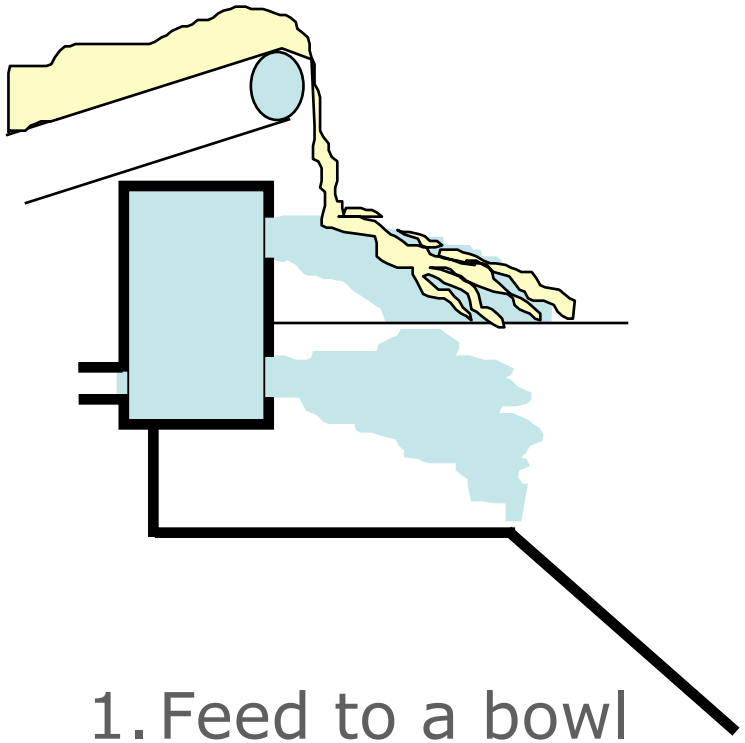
Entanglement

The concept of working points

Working Points in a Typical Wool Scour



Opportunities for Entanglement in a Scour

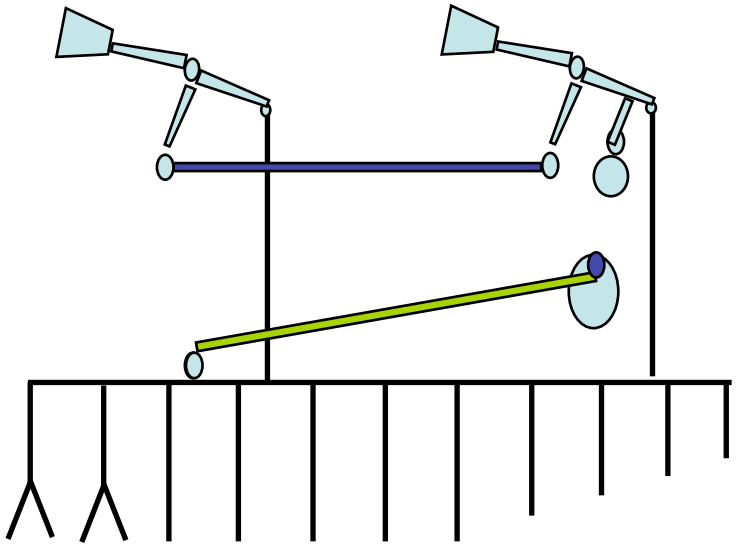


1. Feed to a bowl

Opportunities for Entanglement in a Scour

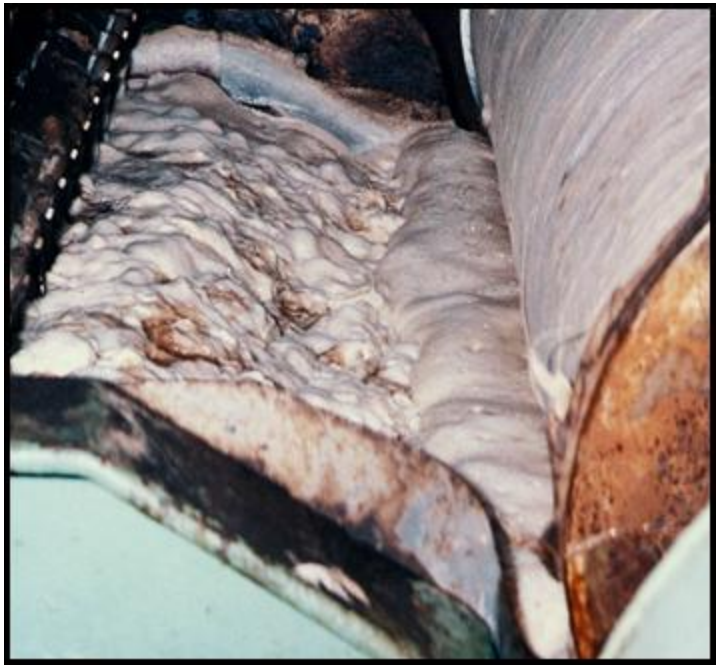
2. Dunkers

Opportunities for Entanglement in a Scour



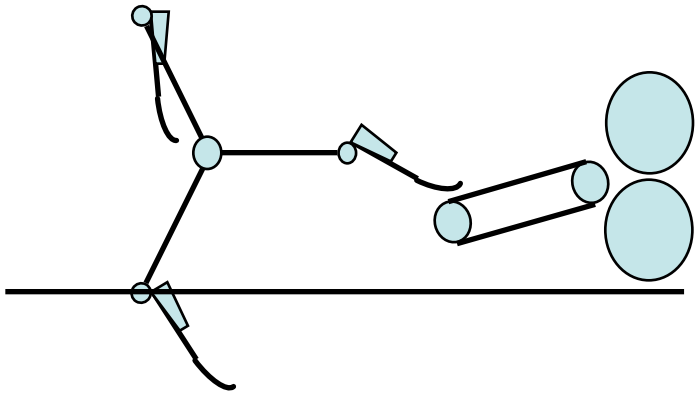
3. Transport Mechanisms

Opportunities for Entanglement in a Scour



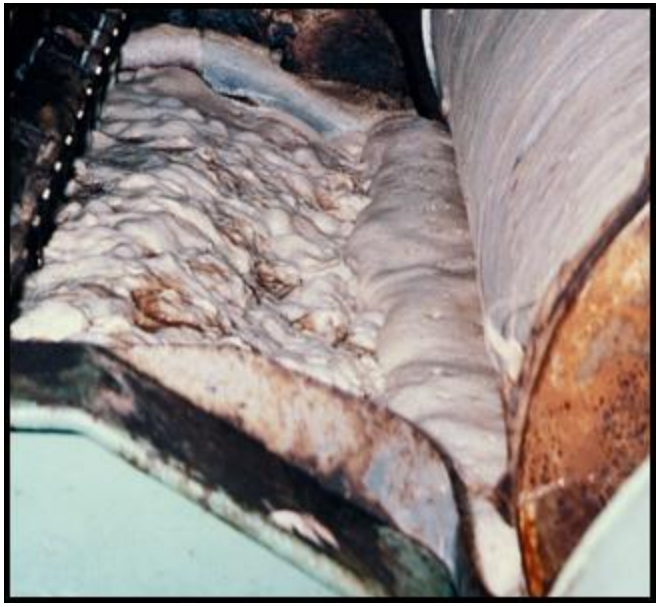
4. Water Level

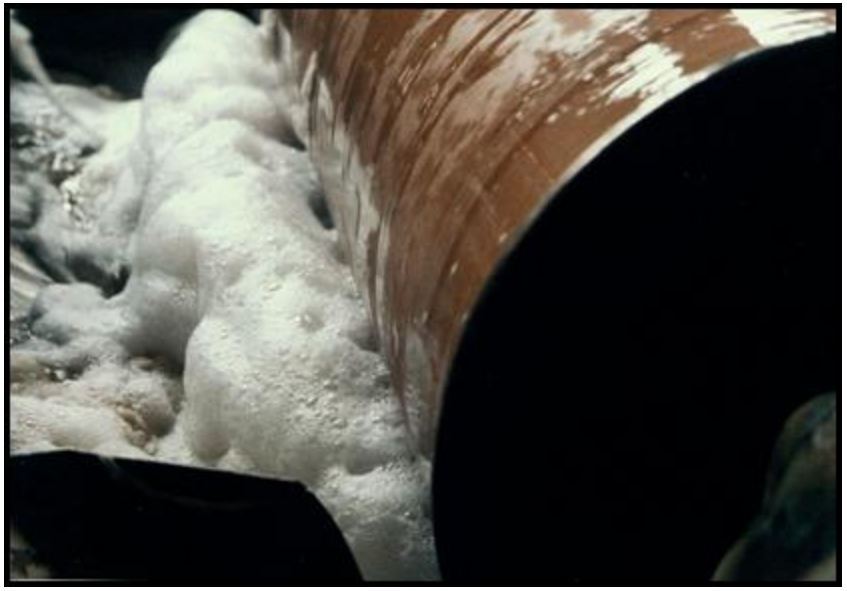
Opportunities for Entanglement in a Scour



5. Transfer from the Bowl

Opportunities for Entanglement in a Scour





6. Squeezing Rollers

Opportunities for Entanglement in a Scour

7. Wet Opening

Best Practice – Scouring Process Scour Configuration

- Number of bowls
- Length of bowls
- Shape of bowls
- Bowl function

Best Practice – Scouring Process Mechanical

- Entanglement minimisation
- Fibre cleansing
- Production of an even mat through the scour

Best Practice – Scouring Process Water

Aim

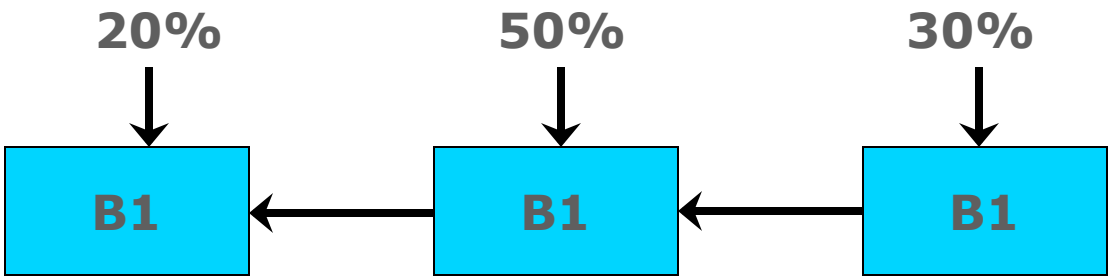
- Minimise water consumption without comprimising product quality

How

- Water quality
- Optimise recovery loops
- No uncontrolled discharges
- Split flows
- Recycle rinsewater

Best Practice – Scouring Process Detergent

- Type of detergent
- Method of addition
- Multiple bowl additions with countercurrent flow



Best Practice – Post-Scouring

- No wet openers
- Even mat of scoured wool
- Dryer performance

Best Practice – Contaminant Recovery
Dirt Recovery

- Bowl is for scouring not a dirt recovery device
- Flow rates 5-10 KL/hour per bowl
- Manifold system connecting to bowls

Best Practice – Contaminant Recovery
Wool Wax Recovery

- Three-stage recovery
- Flow rates 1KL/hour per 100kg greasy wool
- No discharge without passage through wax recovery

Best Practice – Wastewater Treatment

- Integration with scouring line
- Optimisation of contaminant recovery
- Optimisation of water use
- No uncontrolled discharges
- Separation of waste streams

Summary