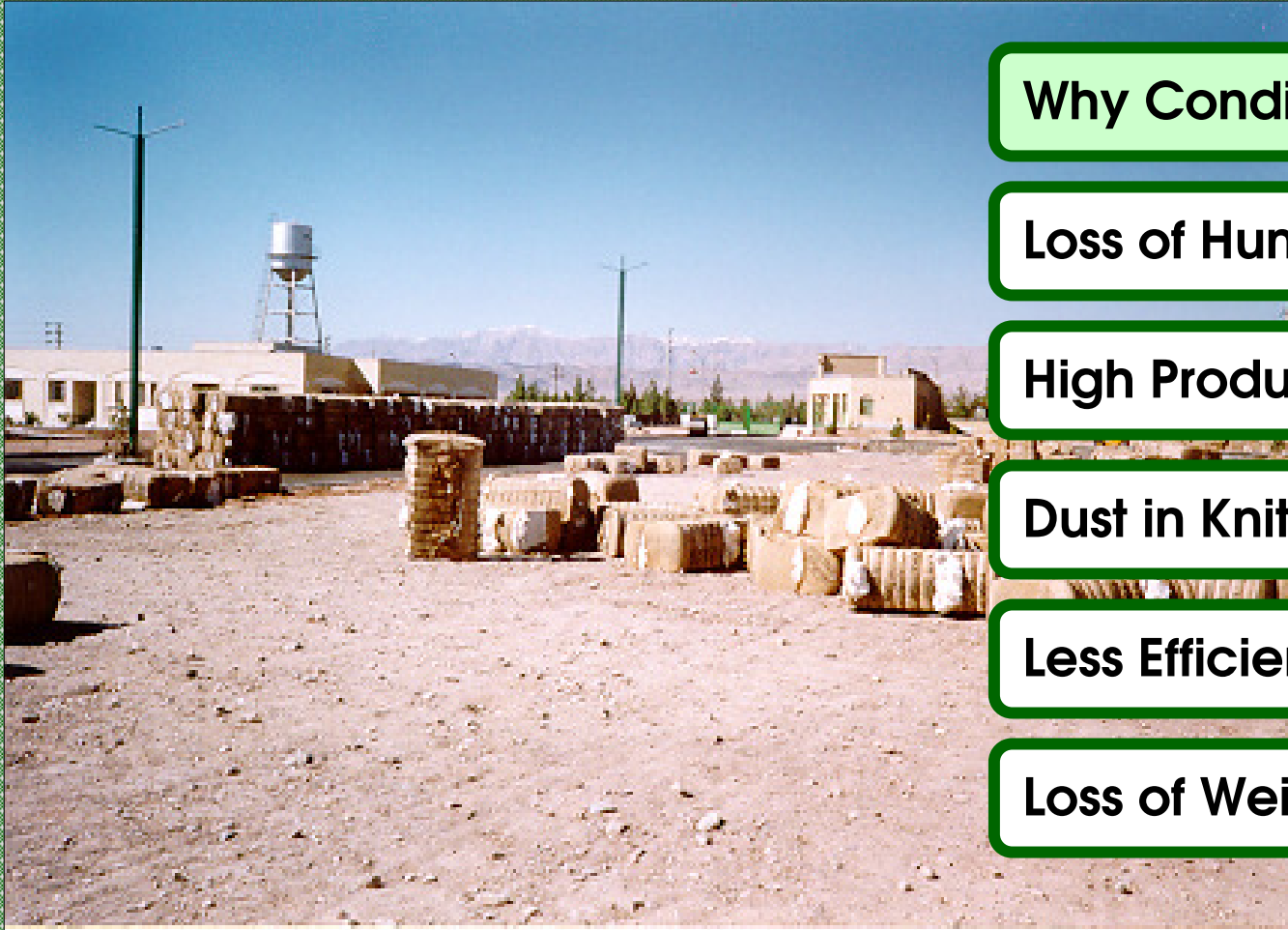


Conditioning Basics



Why Conditioning?

Loss of Humidity in Spinning

High Production Speeds

Dust in Knitting and Weaving

Less Efficiency Downstream

Loss of Weight in the Yarn

Conditioning Basics

Loss of Humidity in Spinning

Machine type	Cotton Ne 30 Ring Low speed	Cotton Ne 30 Ring High speed	Cotton Ne12 OE Low speed	Cotton Ne 12 OE High speed
Opener	6,8	7,1	6,6	6,8
Cards	6,7	6,9	6,5	6,6
Combers	6,4	6,5	-	-
Drawing frames	6,1	6,2	6,3	6,3
Roving frames	5,6	5,7	-	-
Spinning frames	5,0	5,0	5,8	5,5
Winders	4,7	4,4	-	-
Total loss	2,1%	2,7%	1,8%	2,3%

= -1,8 up to -2,7% !

Conditioning Basics



Advantages

+ Better Performances

++ Better Quality in Knitting

+++ Better Quality in Weaving

++++ Better Quality in DENIM

Higher Weights up to +2,5%

Conditioning Basics



Advantages

- Dust and Fly

- Broken Needles

- Torque Problems

- Snarling Problems

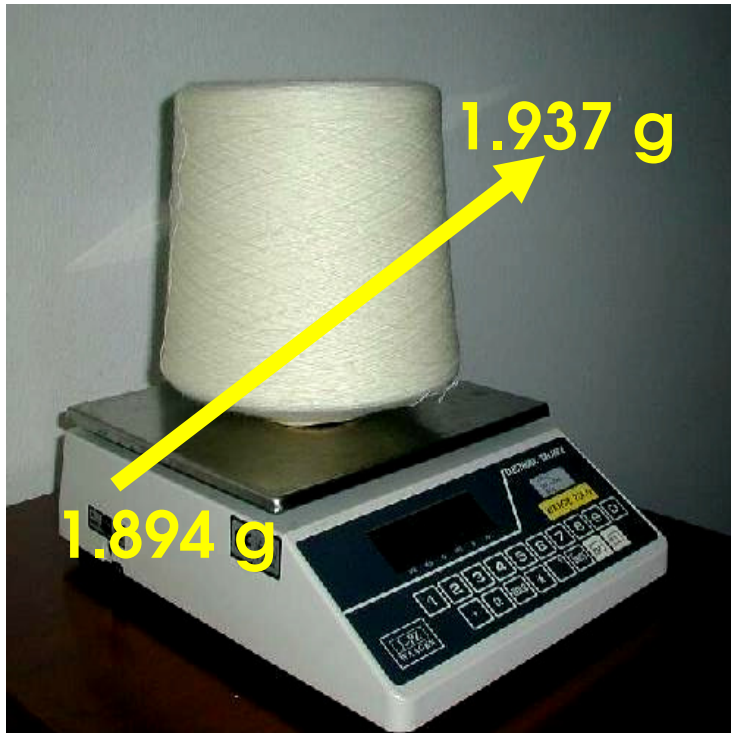
- Critical Weft Defects

Softer Touch and Volume



Conditioning Basics

Water = + Weight Increase

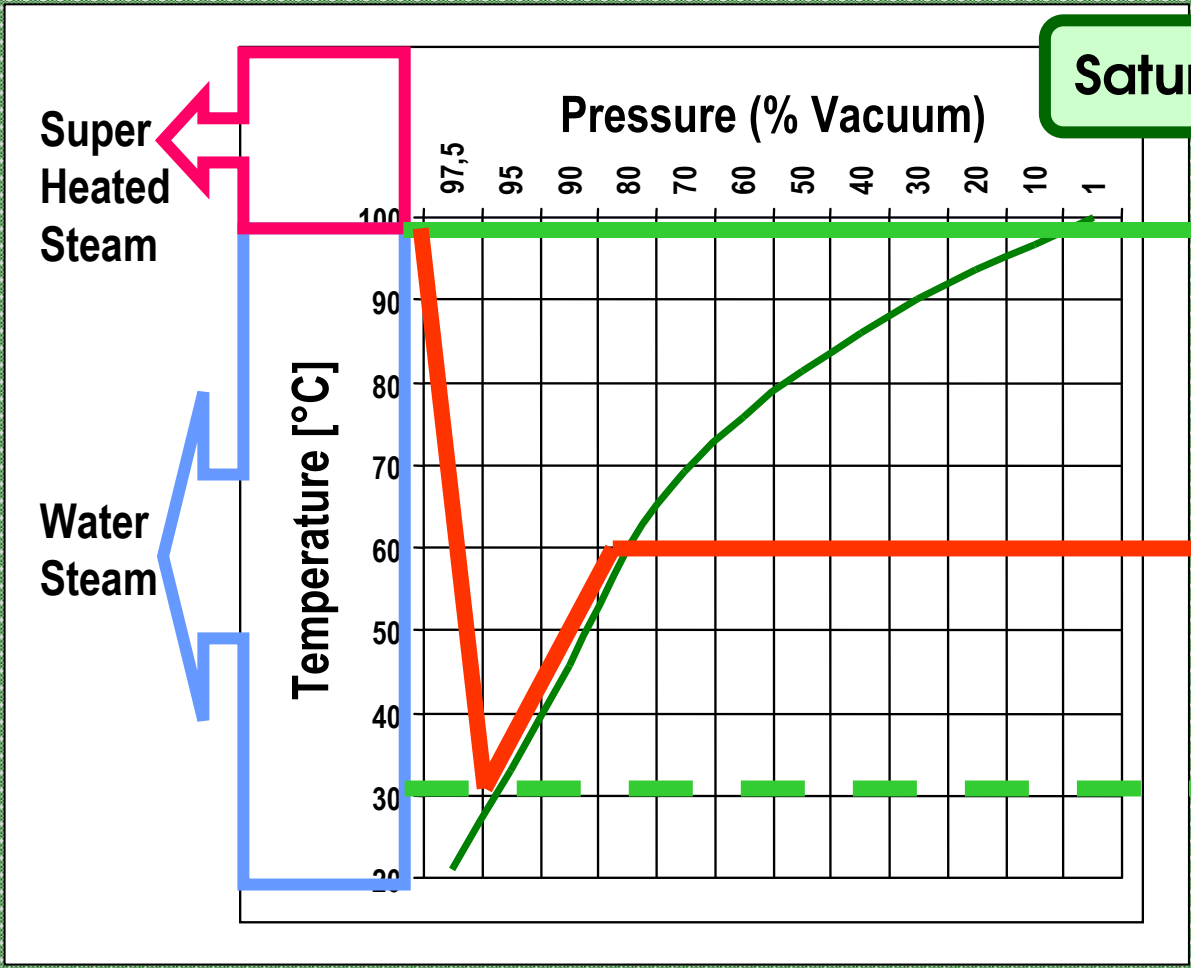


Initial weight	1,894 Kg
Final weight	1,937 Kg
Weight increase	2,27 %

Yarn moisture	5,2 %
Yarn weight	1,894 Kg
Dry weight	1,800 Kg
Conditioned weight	1,937 Kg
Final moisture	7,59 %
Increase of water content	2,39 %

Conditioning Basics

Saturated Steam Curve

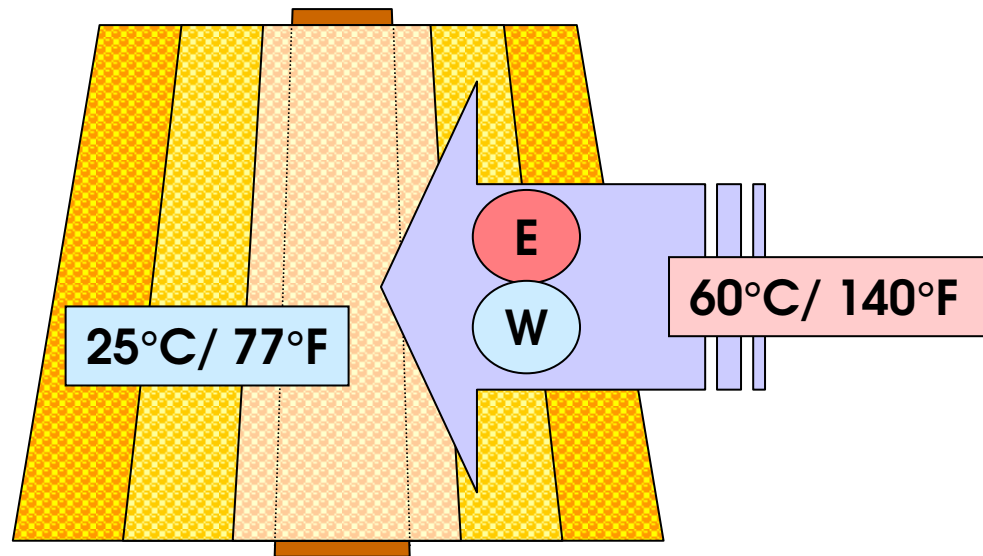


Saturated steam at 99,6°C/ 212°F and a pressure equivalent to 0,0 m NN

Typical conditioning temperature at 60°C/ 140°F

Saturated steam at 32,9°C/ 90°F in a vacuum of 95%, or 50 mbar

Conditioning Basics



$$\frac{60^{\circ}\text{C} / 140^{\circ}\text{F}}{25^{\circ}\text{C} / 77^{\circ}\text{F}} = 35^{\circ}\text{C} / 63^{\circ}\text{F} = \text{approx. } +2,0\%$$

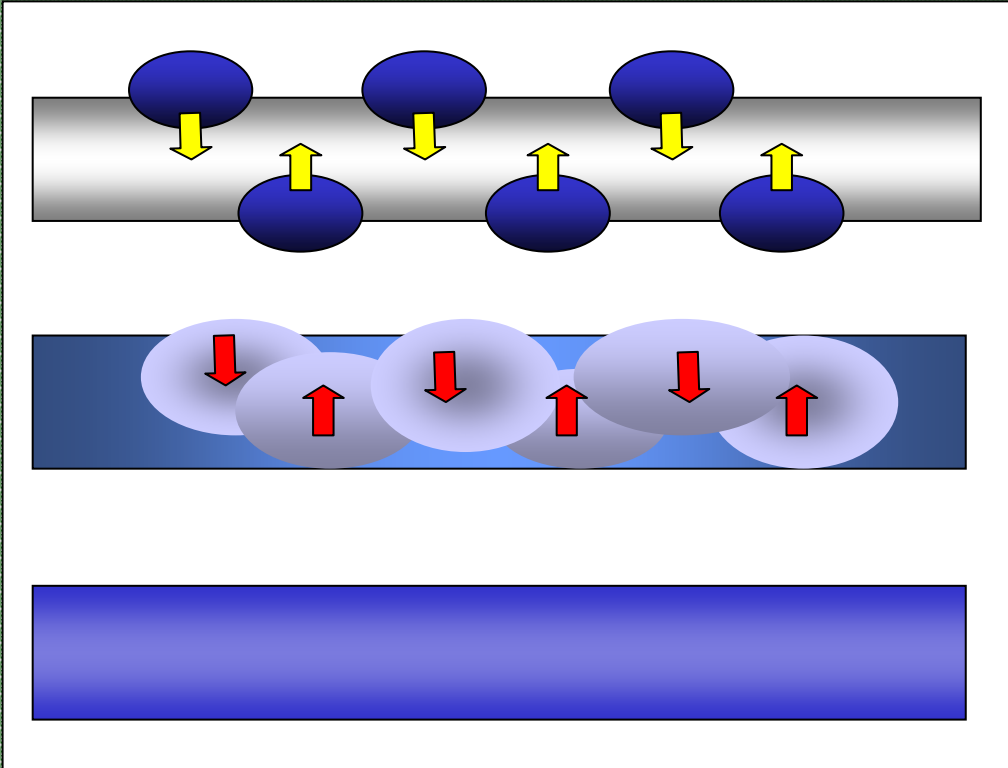
Condensation process

Saturated steam carries two elements for the process:

- Water, and
- Energy in form of heat.

As the bobbin temperature is colder than the steam temperature, water condenses on the colder yarn surface.

Conditioning Basics



Conditioning Process

Condensation

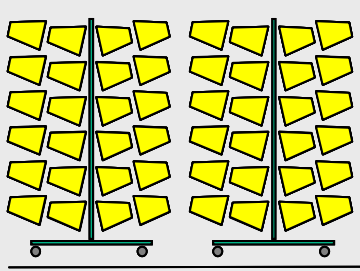
Penetration

Absorption

Conditioning Basics

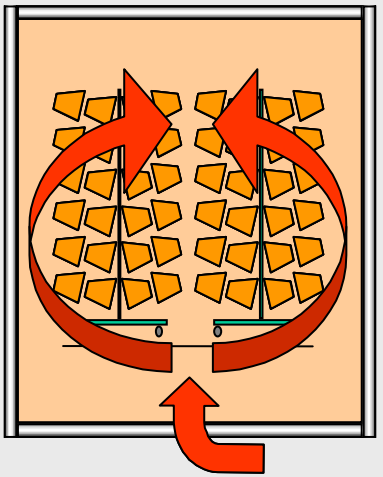
Sequence of Process

Phase 1:
Resting after spinning for 12 hs.



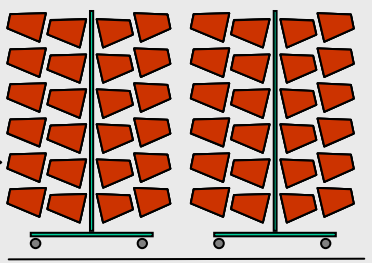
Objective:
Reduction of temperature

Phase 2:
Conditioning with steam



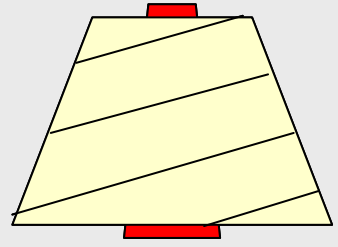
Objective:
Optimised process duration

Phase 3:
Cooling outside the autoclave for 45 min.



Objective:
No condensate on the packaging

Phase 4:
Packing



Objective:
Keep the moisture in the bobbin

Conditioning Basics

When to Condition?

After Spinning

Spinning



Warehouse

Customer

Before Delivery

Spinning

Warehouse



Customer

Before Weaving

Yarn Seller

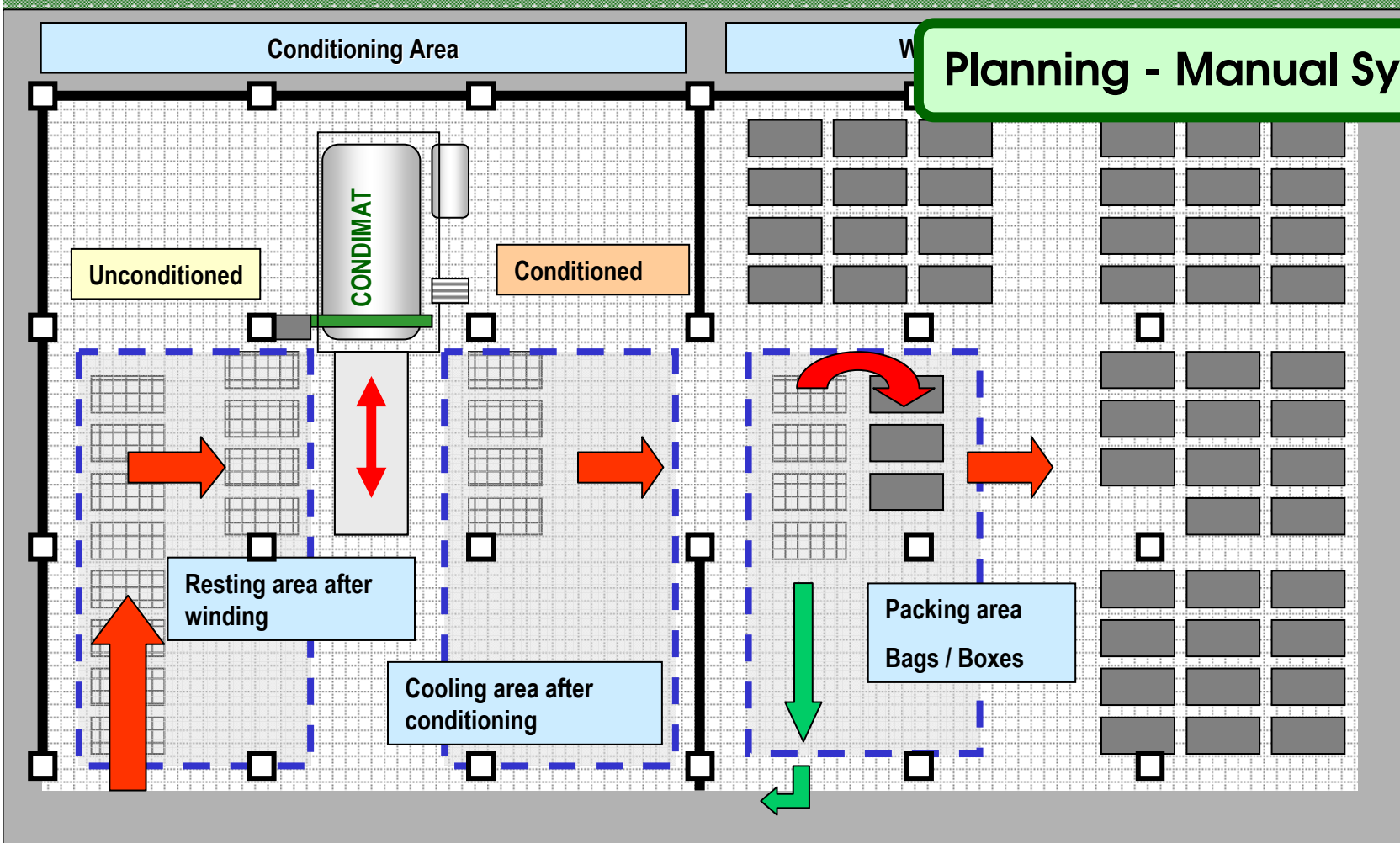
Warehouse



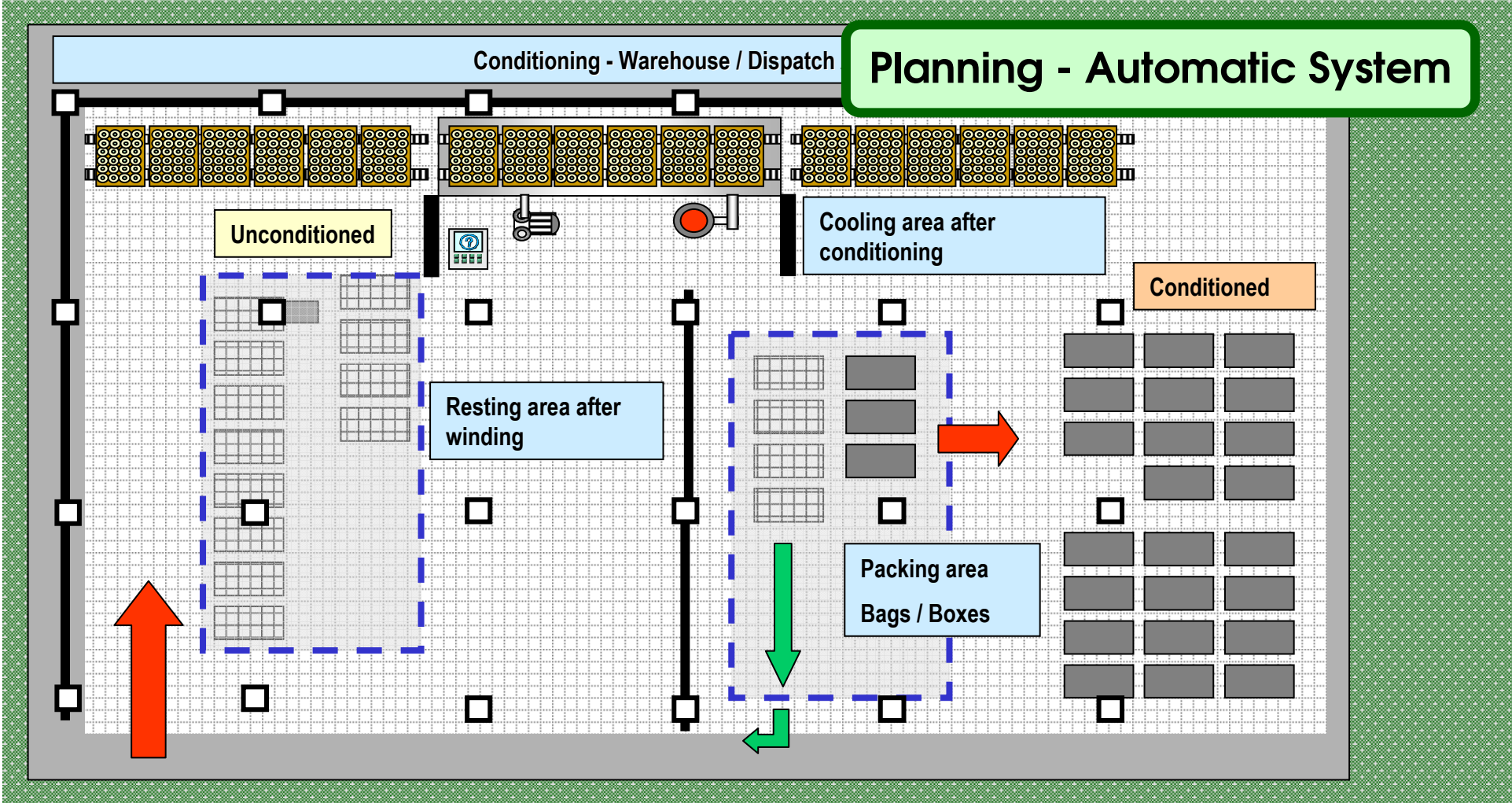
Warehouse

Conditioning Basics

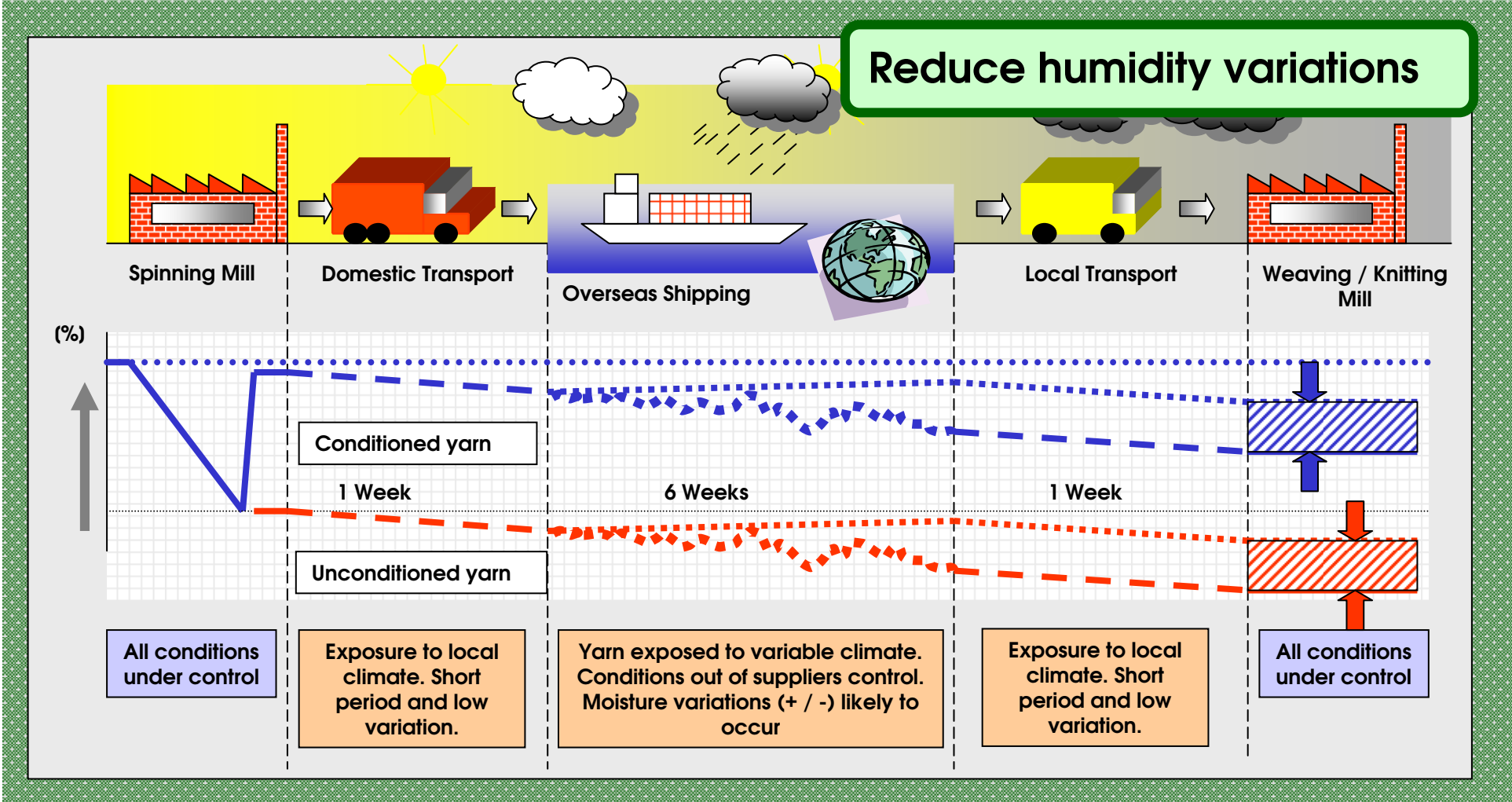
Planning - Manual System



Conditioning Basics



Conditioning Basics



Conditioning Basics

Practical results

<u>Fibres</u>	<u>Temperatures</u>	<u>Conditioning</u>	<u>Fixation</u>
Cotton	50 – 65°C 122 - 149 °F	+2,0%	-
Cotton/Polyester	60 – 65°C 140 – 149°F	+1,3%	-
Viscose	50 –65°C 122 – 149°F	+2,8%	-
Polyester	-	+0,3%	110°C/ 225°F
Acrylics	-	+0,5 %	110°C/ 225°F