



CRC

for

Premium

Quality

Wool

# Staple Length Staple Strength

Produced for the CRC for Premium Quality Wool undergraduate program by;  
Angus Ireland, Australian Wool Testing Authority Ltd.



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# Methodology

- IWTO- 38      **Grab Sampling**
- IWTO- 7      **Staple Sampling**
- **IWTO- 30**      **Length & Strength Measurement**



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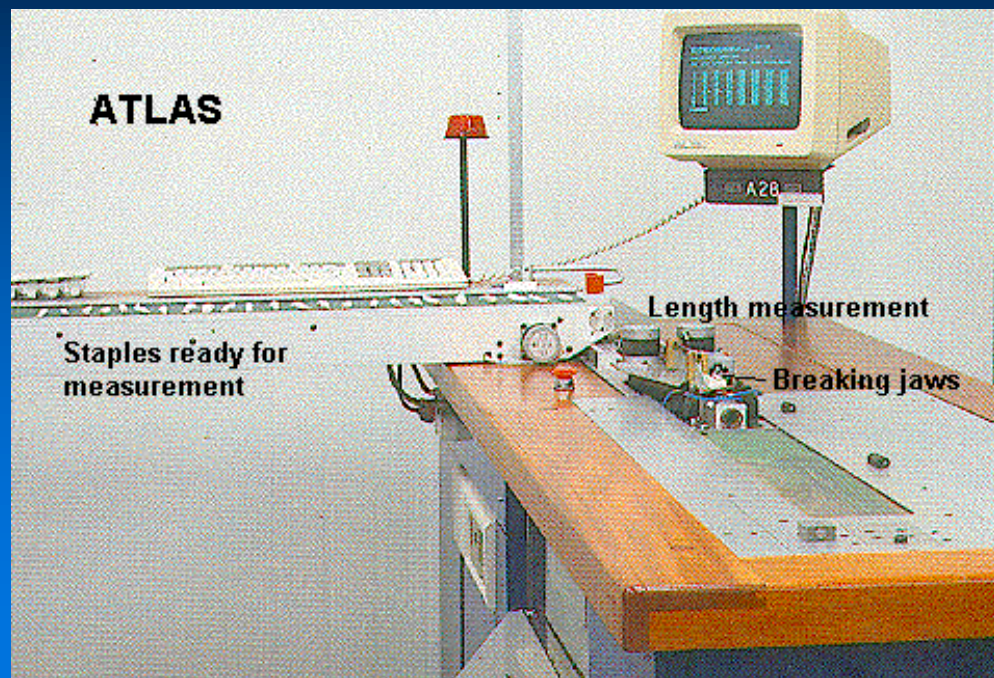
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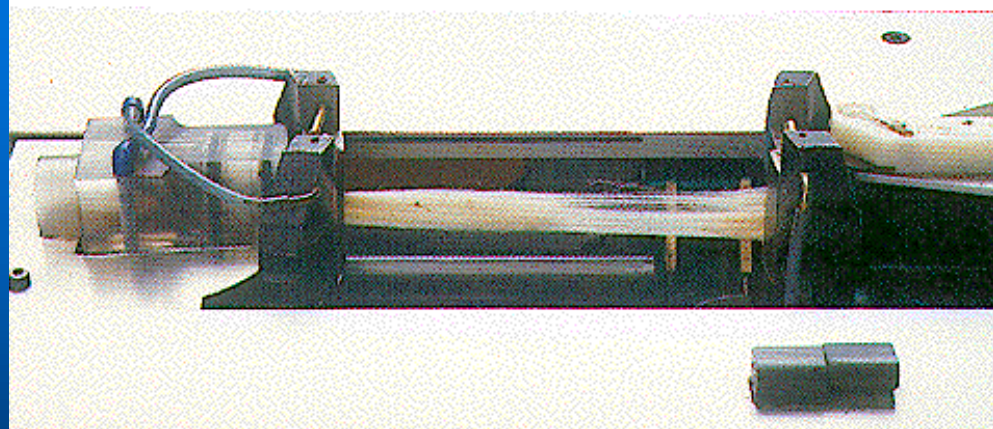
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## Measuring staples for length & strength



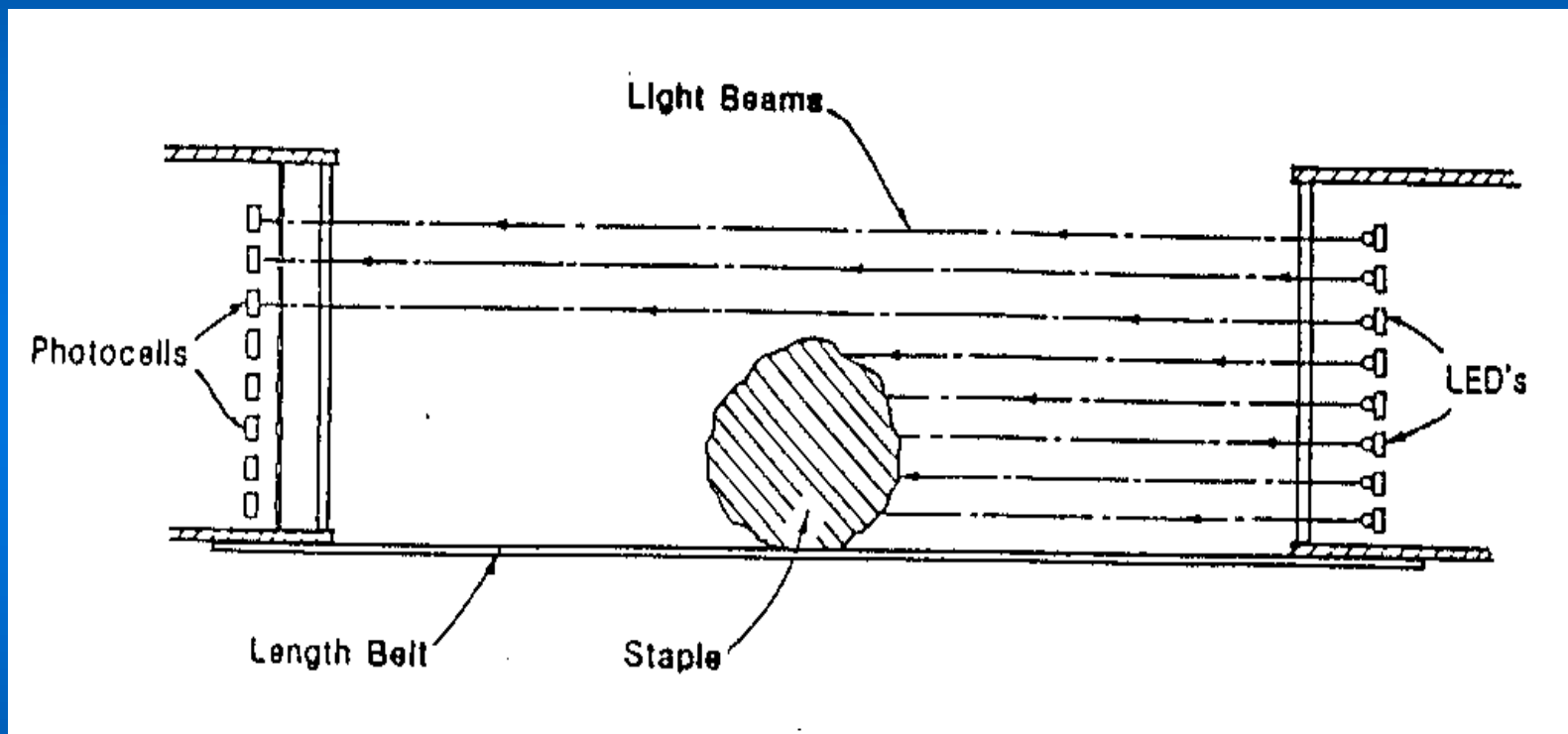
**Staple Strength Measurement**  
**Staple held in breaking jaws**







# Length Measurement



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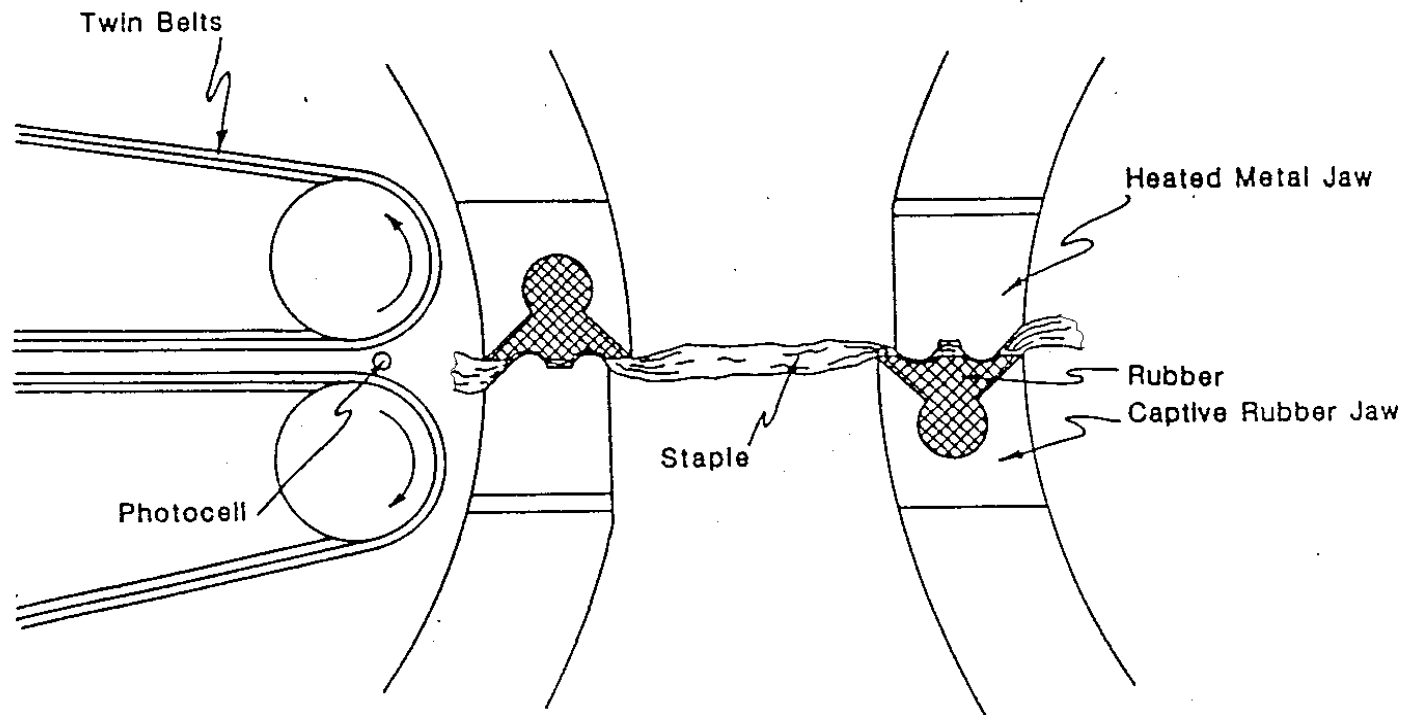
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# Force Measurement



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# Staple Mass

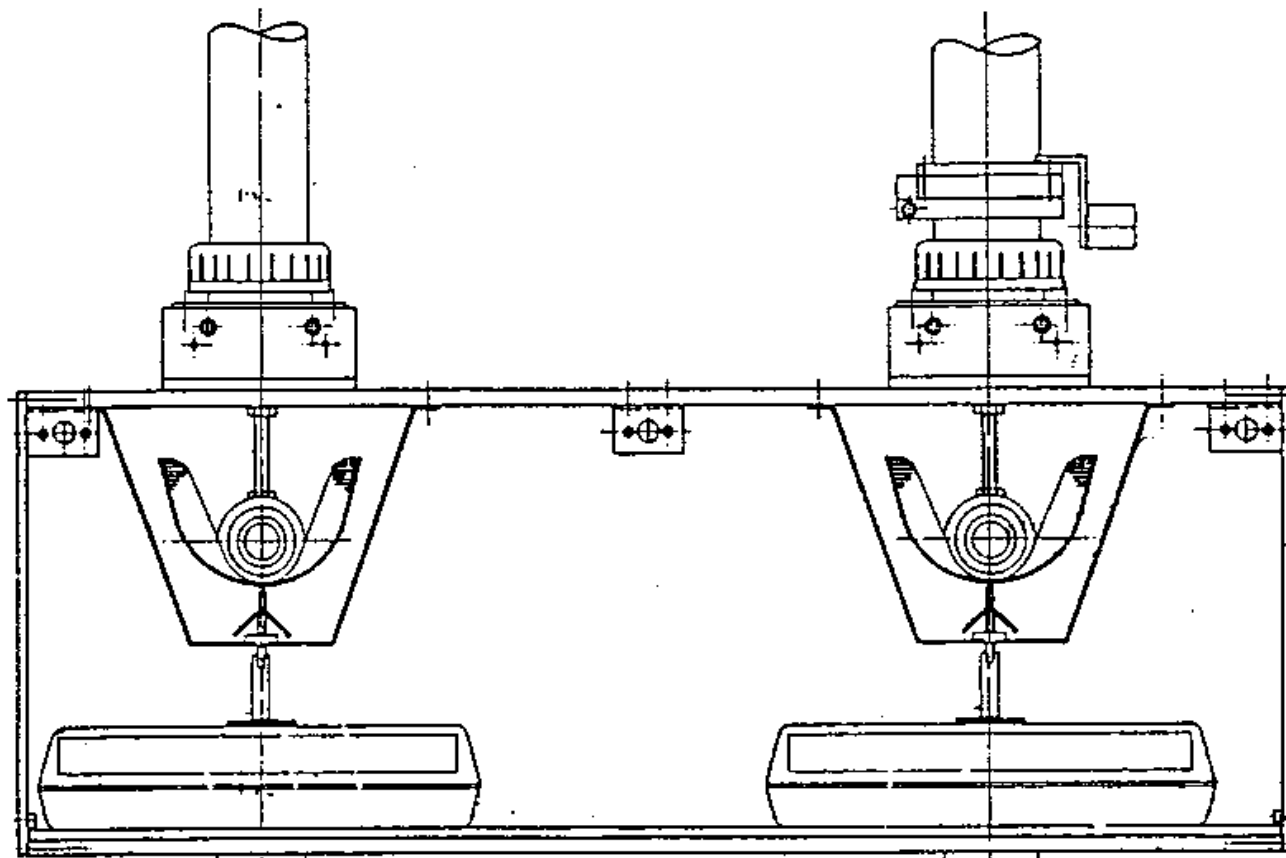
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BROKEN STAPLE WEIGHING



# Calculating Staple Strength (N/ktex)

$$\text{THICKNESS (ktex)} = \frac{\text{Staple Mass (g)}}{\text{Staple Length (M)}}$$

$$\text{UNCORRECTED STRENGTH (N/ktex)} = \frac{\text{Force (Newtons)}}{\text{Thickness (ktex)}}$$

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# Corrected Strength equals

**Uncorrected Strength \* 100**

**Strength factor \* Staple yield**

**Where:**

**Strength Factor =  $1.36704 - 0.006936WB + 0.06126Type$**

**Staple Yield =  $0.83WB + 0.314VMB - 6.18Type + 29.6$**

**Fleece Type = 1**

**Skirting Type = 0**

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# Position of Break (POB)



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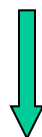
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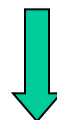
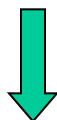
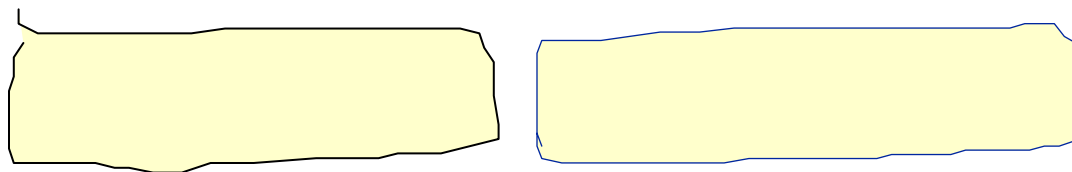
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# Significance of POB



**Longer Hauteur**



**Shorter Hauteur**

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# Summary

## Purpose

- Prediction of fibre length after combing (Hauteur)
- Indication of tear ratio

## Methodology

- Grab Sampling (representative)
- Staple Sampling (representative)
- SL & SS Measurement (accuracy)