COMPARATIVE STUDY OF CALCULATED AND ACTUAL DIMENSIONS IN SHAPED WEFT KNITWEAR

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Overview

- Background
- Justification
- Aim of the work
- Results and discussion
- Summary of finding

Background

- Significant growth in production of fully fashioned garments
  - Advancement in technology
  - Ability to combine complex patterning and shaping
  - Variable stroke (speed and reduced cost per unit)
  - CAD systems (flexibility)
- Significant growth in functional/performance wear
  - compression (swimwear)
  - footwear
  - functional undergarment
- Casual dress - mainstream

Justification for study

- Superior fitting garments = greater consumer satisfaction
- Requirement to reduce landfill from clothing market (poor manufacturing)
- Significant work conducted into anthropometrics
- It is useful linked to size charts

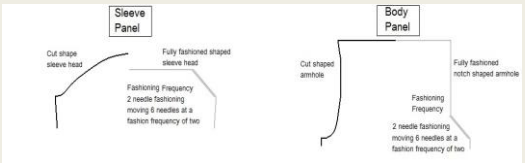
Knowledge Gap – size and fit of knitwear

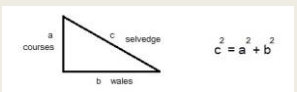
- Complexity of structures (broad range of mechanical properties)
- Used to an advantage – garments that conform to human body
- Knit size charts – Empirical knowledge (commercially sensitive)
- Fully fashioned knitwear is constructed post finishing
- If panels are incorrectly sized they may result in ill fitting garments

Fully fashioned knitwear

Complexity

Armhole/Sleeve head area



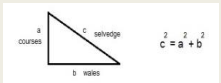


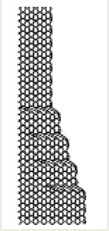
Aims

- To quantify the relationship between traditional mathematical theories used for the calculation of fully-fashioned, weft knitwear and the actual physical measurements of the garment.
- To investigate the alignment of the armhole and sleeve panels in fully-fashioned knitwear.
- Develop a set of principles for new methods for calculating shaped fully-fashioned knitwear to promote better size, shape and fit.

Experiment 1

Comparison of calculated V actual dimensions on the selvedge.





- Number of narrowing was constant 18 (7cm)
- Changed the fashioning frequency 1,2,3,4 courses
- Calculated hypotenuse (selvedge)

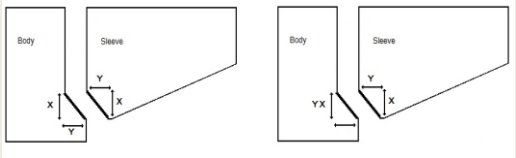
Findings

- Fashioning frequency of one – 54% shorter than expected
- Fashioning frequency of four – 2% shorter than expected

The further the fashioning frequency are apart the closer the actual to the calculated results

Experiment 2

- **Comparing two methods of aligning the sleeve to the body**



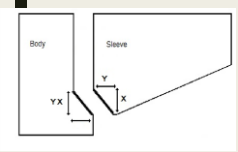
- **Body fashioning frequency of 2,3 and 4 course**
- **Sleeve two different calculation methods (notch, raglan)**

Findings

- **If the no. of fashioning's on sleeves is less than the body use notch, if the body and sleeve are equal (either method), if sleeve has more fashioning's than the body use raglan method.**

Experiment 3

- **Adjusting the raglan method of aligning the sleeve to the body (10% adjustment)**



- **Body fashioning frequency of 6,8 courses**
- **Used the Raglan (equal courses in Y section) but introduced a 10% reduction.**

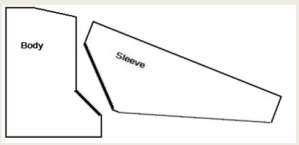
Findings

- **Good alignment using both methods**
- **Raglan = 93% - 108% actual calculated measurement**
- **10% reduction = 99 - 106% of actual dimension**

So the 10% reduction method yields garments that are more accurate to calculated

Experiment 4

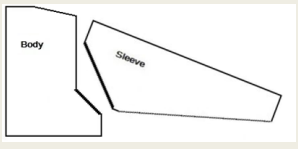
- **Superior fitting garment sleeve alignment (raglan V 10%)**



- **Body fashioning frequency of 2,3,4,6,8 courses**
- **Reduced sleeve widest (should have sloped shoulder – but didn't)**
- **In all armholes the 10% reduction method was preferred**
- **However, none of the garments fitted the human form due to absence of shoulder slope**

Experiment 5

- **Superior fitting garment sleeve alignment (10% method)**



- **Body fashioning frequency of 2,3,4,6,8 courses**
- **Reduced sleeve widest and sloped shoulder**
- **Used real garment dimension**
- **Perfect fit, comfortable armhole was 100% of calculated**

Summary

- Quantifiable relationship - theoretical and physical dimensions (Pythagoras)

Flat panels

- Fashioning frequency of one course unacceptable.
- Fashioning frequencies of 2 and 3 course achieved 83-87% of the measured dimensions.
- The optimum fashioning frequency is four and above course (98%).

Garments

- If the no. of fashioning's on sleeves is less than the body use notch, If the body and sleeve are equal (either method), If sleeve has more fashioning's than the body use 1.0% method.
- If the sleeve widest is narrowed the shoulder should be sloped and shoulder measurements/armhole reduced (closer fitting garment).
- Inset sleeve the 1.0% reduction method should be used to achieve a good fit and smooth curve armhole.

THANK YOU

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