SAWTRI BULLETIN

SA ISSN 0036-1003

SOUTH AFRICAN
WOOL AND TEXTILE RESEARCH INSTITUTE
OF THE CSIR

P.O. BOX 1124
PORT ELIZABETH

Vol. 21 DECEMBER 1987 No. 4

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SA ISSN 0036-1003

SEASON'S GREETINGS

The Chief Director and Staff extend Best Wishes to Readers of the Bulletin for the Festive Season and Health and Prosperity for 1988.

INSTITUTE NEWS

Chief Director retires from the CSIR

Dr D W F Turpie,
Chief Director of SAWTRI.

As reported in recent issues of the Bulletin, the CSIR is at present in the midst of major structural changes involving amongst others that some 28 Institutes are being consolidated into 11 newly-created Divisions. The existing activities of this Institute have been assigned to the Division of Processing and Chemical Manufacturing Technology under Dr A Pizzi as Divisional Director with its headquarters in Pretoria. In this new-look CSIR, which will be fully operational as from 1st April next year, the rank and functions of Chief Director will fall away, and in the light of this, Dr D W F Turpie, Chief Director of SAWTRI, has announced his retirement from the CSIR effective from the end of this year.

Dr Turpie joined the CSIR in 1967 as Head of the Department of Carding and Combing at SAWTRI, a position he held with distinction until January 1979 when he was appointed as Assistant Director. In June of that same year he succeeded Dr D P Veldsman as Director of SAWTRI and in 1983 he was promoted to the rank of Chief Director, a position he has held ever since.

Dr Turpie, author or co-author of some 150 scientific papers dealing mainly with carding and combing, scouring, carbonising, effluent treatment and worsted processing of wool and mohair and associated machine developments, has received national and international recognition for his important contribution to the advancement of technological and scientific knowledge and understanding in these disciplines. He served on numerous national and international committees related to textiles and is the recipient of various awards, including Fellowship of the Textile Institute, in recognition for his distinguished services to the textile industry spanning a career in textiles of some 35 years. Dr Turpie was appointed as Professor Extraordinary occupying the Philip Frame Chair of Textile Science at the University of Port

Mr H W Labuschagne of the Long Staple Processing Department (third from the right), explaining some aspects of combing to a group of wool and mohair farmers from the Steytlerville district.

This delegation of wool and mohair farmers from the Oudtshoorn/Mossel Bay district was taken on a conducted tour of SAWTRI towards the end of October. Mr J Knoesen of the Mohair Department at BKB (far left), accompanied the group during their stay in Port Elizabeth.

Mr Bill Baker (left) from Texas, USA, photographed together with Mr P Horn from SAWTRI and Mr Derek Hobson, a mohair farmer from Graaff-Reinet, who acted as Mr Baker's host and guide during his stay in the Eastern Cape.

Sericulturist respectively of the Taiwan Sericultural Improvement Station, who visited the Institute to view its processing facilities and to have discussions with some senior members of staff on the processing of silk; and Prof G Blankenburg from DWI, Aachen, West Germany, who had discussions with the Chief Director on a wide range of research-related topics.

Production advisory committee meetings

Meetings of the advisory committees for Wool, Mohair and Cotton were held on the 29th October, 16th September and 31st August respectively. Dr D W F Turpie represented SAWTRI at the Wool and Mohair meetings held at the Animal and Dairy Science Research Institute at Irene, while Dr L Hunter attended the advisory committee meeting for Cotton production which was held in Pretoria.

SAWTRI PUBLICATIONS

Since the previous edition of the Bulletin, the following papers were published by SAWTRI:

Technical Reports

No. 598 Hunter, L., Cizek, J. and Turpie, D.W.F., The Correlations between Different Measures of Weak Places in Worsted Yarns and Weaving Performance (November 1987).

No. 600 Barella, A., Castro, L., Manich, A.M., Castellar, M.D. and Hunter, L., The Effect of Fibre Parameters on the Hairiness of Ring-spun and Rotor-spun Cotton Yarns (November 1987).

Special Publication

WOL 78 Hunter, L., A Summary of SAWTRI's Research on Wool and Wool Blends, 1952 — 1987 (November 1987).

SEAM SLIPPAGE IN WOOLLENS FOR LEISURE WEAR

by

S. Galuszynski

ABSTRACT

Seam slippage in woven woolen fabrics for leisure wear was investigated. The results obtained showed that a change in the stitch length or sewing thread type did not have a significant effect on the magnitude of seam slippage. However, the use of lap seams and fabric reinforcement (resin spray or fusible tapes) produced a significant reduction in the seam slippage.

INTRODUCTION

Investigations of seam slippage[1-7] have shown that it mainly depends on fabric structure, raw material, seam type and fabric finish.

Because of the problem sometimes experienced with seam slippage in woven light-weight woollen leisure fabrics, the possibilities of reducing seam slippage in such fabrics were investigated using sewing thread, stitch length, seam type and seam reinforcement as variables.

EXPERIMENTAL

Fourteen commercially available woven woollen fabrics were used in the investigation and the fabric particulars are given in Table 1. Sewing threads used were: R47 tex mercerised cotton (ticket No. 60), R32 tex spun polyester (ticket No. 120), R22 tex spun polyester (ticket No. 180). The backs of the seams (seam allowance) were reinforced using BERBRO^R edge lock spray or fusible tapes. Commercially available woven bias cut fusible tapes and tapes cut from fusible interlinings were used. The interlinings were:

No. 1 — warp knitted (weft inlay), polyester/rayon, 140 g/m^2

No. 2 — warp knitted (weft inlay), polyester/rayon, 104 g/m^2

Adhesive — 100% polyamide, glue line temperature 127 — 132°C.

The tape width was 19 mm . The tapes were fused across the seam allowances after sewing (Fig. 1a), or sewn and fused after sewing (Fig. 1b). In the latter case two-thirds of the tape width was in the seam allowance. Lock and chain stitch as well as open and lap seams (Fig. 2) were used. The sewing operation and the seam slippage testing procedure were conducted in accordance with the standard method BS3320 1970 (needle size — 90, sewing

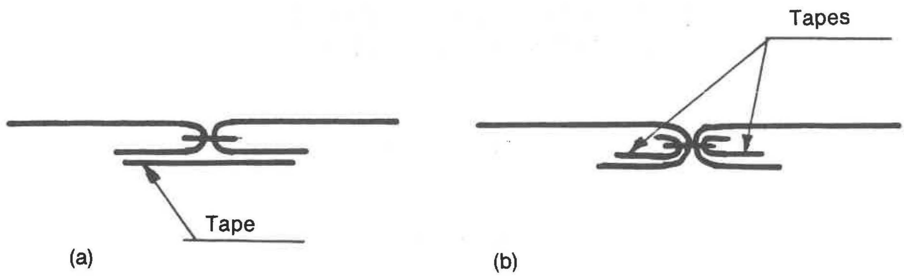

Fig. 1 One-tape (a) and two-tape (b) seam reinforcement

Fig. 2 Investigated seams:
(a) Open seam SSa^{-1}
(b) Lap seam LSq^{-2}

TABLE 1
FABRIC SPECIFICATION

Fabric Code	Weave	Fabric mass g (m^2)	Fabric Sett (threads/ (10 cm)		Yarn count (text)		Blend composition (%)	
			Warp	Weft	Warp	Weft	Wool	Other fibres
1	plain	184	151	147	R55/2	60	100	—
2	plain and	179	182	146	55	55	100	—
3	twill effect	205	135	139	80	74	100	—
4	plain	216	133	119	80	80	100	—
5	3/1 twill	230	180	130	63	77	13	87
6	3/1 twill	255	180	131	62	98	11	87
7	2/2 twill	229	181	131	59	85	22	78
8	herringbone	232	182	130	60	85	40	60
9	Dobby weaves	215	110	100	104	95	25	75
10		218	109	100	104	96	25	75
11		269	140	120	94	96	12	88
12		275	142	121	95	96	13	87
13		270	141	120	94	96	15	85
14		272	142	121	95	96	15	85

thread — 36/3, stitch length — 2,54 mm). Fusing was conducted on a continuous fusing press.

RESULTS AND DISCUSSION

Effect of stitch and seam type

The results given in the first four columns (of the results) in Table 2 showed that on average the chain stitch produced higher values of seam slippage than the lock stitch.

The difference in seam slippage can probably be attributed to the seam grinning which is always greater for the chain stitch than that for the lock stitch. However, irrespective of stitch type, all fabrics had seam slippage values greater than 6 mm . Variation in the seam type showed (Table 2) that the use of LSq-2 lap seams (Table 2) produced a significant decrease in the seam slippage. The majority of fabrics still, however, had seam slippage values greater than 6 mm .

It should be noted that some of the fabrics broke during the seam slippages tests. In some cases it was impossible to obtain a reading. This fabric breakage was observed throughout the experimental work.

The results obtained (Table 2) also showed that the majority of fabrics

TABLE 2
EFFECT OF STITCH AND SEAM TYPE, AND APPLICATION OF SPRAY ON SEAM SLIPPAGE (mm)

Fabric	Lock stitch (SS a-1 seam)		Chain stitch (SS a-1 seam)		Lock stitch LSq-2 lap seam		Lock stitch and spray (SSa-1 seam)	
	Warp*	Weft	Warp	Weft	Warp	Weft	Warp	Weft
1	17,1	8,2	FF**	8,2	14,2	5,9	6,8	4,5
2	8,6	12,8	8,2	FF	5,9	9,2	4,4	6,5
3	14,3	FF	13,6	FF	8,5	FF	4,1	5,9
4	7,8	FF	9,5	FF	5,5	FF	4,5	5,4
5	8,3	9,7	9,5	9,7	5,0	5,4	3,5	4,9
6	6,6	8,7	8,6	9,1	5,0	6,1	4,3	4,6
7	9,5	11,0	11,4	9,8	5,8	7,4	3,5	4,8
8	9,2	12,6	9,8	10,6	6,3	7,5	3,1	5,1
9	13,3	17,4	17,3	FF	7,5	9,7	4,8	5,8
10	14,7	18,2	14,5	15,5	7,6	10,7	5,7	5,9
11	13,9	13,7	14,7	18,0	6,7	7,4	4,1	4,2
12	10,0	10,0	12,2	12,2	5,6	5,6	4,3	4,6
13	12,9	13,1	16,9	16,1	7,0	7,2	3,8	5,1
14	12,6	11,9	16,2	15,3	7,1	7,3	5,1	5,3

Warp* — in warp direction, FF** — fabric failure.

had greater seam slippage in the weft direction compared with the warp direction.

Effect of stitch length on seam slippage

The results obtained (Table 3) showed that a change in the stitch length (within the investigated range, 1,5 — 3,5 mm) had an inconsistent effect on the seam slippage, and the magnitudes of the changes were insignificant.

Effect of sewing thread type

The type of sewing thread had neither consistent nor a significant effect on seam slippage (Table 4).

TABLE 3
EFFECT OF STITCH LENGTH ON SEAM SLIPPAGE (mm)
(WEFT DIRECTION)

Fabric	Sticth Length (mm)		
	1,5	2,5	3,5
1	8,8	8,2	8,2
2	15,8	12,8	15,9
5	9,4	9,7	8,1
6	7,7	8,7	8,2
7	11,1	11,0	9,2
8	10,0	12,6	9,0
9	16,4	17,4	14,2
11	12,1	13,7	13,7
13	11,5	13,1	12,3

TABLE 4
EFFECT OF SEWING THREAD ON SEAM SLIPPAGE (mm)
(WEFT DIRECTION)

Fabric	36 Mercerised cotton	120 Spun polyester	180 Spun polyester
1	8,2	,9	8,7
2	12,8	15,8	17,0
5	9,7	9,2	9,5
6	8,7	8,0	8,0
7	11,0	11,7	12,1
8	12,6	9,7	9,6
9	17,4	17,6	15,9
11	13,7	12,2	12,6
13	13,1	12,0	11,7

Effect of fabric reinforcement by spraying

The seam allowances were sprayed, after sewing, with BERBRO® edge lock spray. This produced a significant reduction in the magnitudes of seam slippage (Table 2). Only in two cases the seam slippage was greater than 6 mm (6,8 and 6,5 mm, respectively) after reinforcement. However, the seam assembly became very stiff which could be a disadvantage. Another negative feature was an increase in the seam slippage after dry-cleaning. An increase in the number of dry-cleaning cycles led to an increase in seam slippage, and the largest change was observed after the first cycle. The stiffness of the seam assembly was still very noticeable, even after 6 dry-cleaning cycles.

Effect of seam reinforcement using fusible tapes

Two methods of tape seam reinforcement were applied (Fig. 1) termed "one-tape reinforcement" (Fig. 1a) and "two-tape reinforcement" (Fig. 1b) respectively. One-tape reinforcement resulted (Table 5) in a reduction in the magnitudes of seam slippage compared with those where no reinforcement was applied (Table 2) irrespective of type of tape used. Nevertheless, the magnitudes of seam slippage were still greater than 6 mm . On average the reduction was about 16% for all-wool fabrics and about 28% for the blended fabrics.

TABLE 5
EFFECT OF ONE TAPE REINFORCEMENT ON SEAM SLIPPAGE (mm)

Fabric	Woven, bias cut fusible tape		Tape cut from warp knitted interlining	
	Warp	Weft	Warp	Weft
1	16,1	7,3*	16,0	8,8*
2	6,9	9,7	7,6	11,3
3	11,4*	FF**	11,9*	FF
4	6,5*	FF	8,4*	FF
5	6,2	7,5	6,4	7,9
6	6,3	7,6	6,7	8,3
7	7,1	8,3	7,8	7,8
8	7,1	8,5	6,9	8,7
9	8,6	12,6	10,2	14,2
10	9,0	10,7	10,8	13,5
11	8,2	8,8	8,8	9,0
12	6,9	7,1	7,0	8,5
13	8,8	9,1	8,6	9,1

* — breakage of fabric, but reading was possible
FF** — fabric failure

The two-tape reinforcement (Fig. 1b) resulted (Table 6) in a higher reduction in the magnitudes of seam slippage than the one-tape reinforcement, and the degree of the decrease in seam slippage depended on the type of tape used. The best results were obtained using tapes made from fusible interlining No. 1. In this case all fabrics showed seam slippage smaller than 6 mm . The worst results were obtained when woven, cut on the bias, fusible tapes were used. Visual assessment of the bias cut tapes and tapes cut from interlining No. 1 showed that the interlining had much more adhesive than the bias cut tape. Cutting the tapes from the interlining in warp or weft direction did not produce significant differences in the magnitudes of seam slippage.

A negative phenomenon was observed during testing of samples with two-tape reinforcement. Some of the fabrics showed slippage of tapes and seams or even fabric breakage.

TABLE 6
EFFECT OF TWO-TAPE REINFORCEMENT ON SEAM SLIPPAGE (mm)

FABRIC	Bias cut fusible tape		Tape cut from interlining 1		Tape cut from interlining 2, and cut			
					Warp direction		Weft direction	
	Warp	Weft	Warp	Weft	Warp	Weft	Warp	Weft
1	13,1*	6,8*	3,7*	4,0*	4,8	6,0	4,5*	5,2*
2	5,3	7,2*	4,0	4,0*	5,7*	7,8*	5,0	5,5*
3	8,7	FF**	4,4*	FF	—	—	—	—
4	5,5*	FF	4,7*	FF	—	—	—	—
5	5,4	5,8	2,1	3,6*	5,1	4,7	4,7	5,1*
6	4,3	5,5	3,0	3,8	—	—	—	—
7	4,5	4,3	3,4	3,9*	6,2	5,2*	5,8	4,9
8	4,3	5,4	3,2	3,4	5,5	4,9*	4,8*	4,7
9	6,1*	7,4*	4,0	4,9	6,1	6,6	7,6	6,3
10	8,5	8,9	4,1	4,3	—	—	—	—
11	6,4	9,5	4,3	4,0	6,9	6,5	6,4	6,0
12	6,5	6,1	3,9	3,0	5,5	6,4	5,3	5,0
13	6,8	6,7	4,5	4,0	—	—	—	—

* — also slippage of tapes and seam took place
FF** — fabric failure

SUMMARY AND CONCLUSIONS

Way of reducing the seam slippage of woven woollen fabrics for leisure wear was investigated. The results obtained showed, in agreement with previous findings[1-7], that;

— a change in stitch length or type of sewing thread did not produce significant differences in the magnitudes of seam slippage,

— the use of the lap seams instead of open seams produced significant reduction in the seam slippage,
— the application of a resin spray to the seam allowances resulted in a significant reduction in the seam slippage, however, the seam assembly became very stiff,
— the most significant reduction in seam slippage was obtained with fusible tapes (particularly two-tape reinforcement) used to reinforce the fabrics although slippage of the tape-seam assembly was observed.

It appears that tape reinforcement is the best solution for reducing the seam slippage since it does not alter the fabric handle and appearance, but work would be required to develop suitable fusible tapes and a method of application.

ACKNOWLEDGEMENTS

The author would like to express his gratitude to Atlas Cleaners and Launderers (Pty) Ltd and to Messrs Shroud Riley (Pty) Ltd for their kind co-operation. Thanks are also given to Mrs J.L. Edgar and Mrs E.S.L. Loggenberg for their technical assistance, and the SA Wool Board for their permission to publish the results.

USE OF PROPRIETARY NAMES

The names of proprietary products where they appear in this report are mentioned for information only. This does not imply that SAWTRI recommends them to the exclusion of other similar products.

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Published by
The South African Wool and Textile Research Institute,
P.O. Box 1124, Port Elizabeth, South Africa,
and printed in the Republic of South Africa
by Nasionale Media Beperk, P.O. Box 525, Port Elizabeth