

SUPPLEMENTARY KNITTING FOR SJ86 PROJECT

AUTHOR: JAMES T. EATON
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1. INTRODUCTION

In order to supplement the NTI 24 gauge single jersey fabric which will form the base of this project, it was decided that some fabrics should be made available from both 18 and 28 gauge machinery. The first plan consisted of one yarn count on each gauge over five stitch lengths, with three pieces being made of each quality to enable three finishing routes to be investigated.

The 18 gauge was knitted at IIC and the 28 gauge, using 1/38's cc was knitted at Camber International.

After a more critical look at all the fabrics available for this project, it was decided that in order to cover the lighter weights, which would enable a more precise equation to be obtained, some ultra light fabrics would be investigated. Therefore some 1/50's cc cotton was purchased and three qualities were produced with three pieces of each quality. This knitting took place at Top Jersey Limited, Leicester.

The fabrics consist of the following:-

NTI Fabrics

3 yarn counts x 5 stitch lengths using combed yarns = 15 qualities x 3 pieces
Total 45 pieces.

1 yarn count carded x 5 stitch lengths = 5 qualities x 3 pieces = 15 pieces.

The knitting details are reported in Research Record No. 165 and the production sheets are shown in Tables 1-4.

18 Gauge using 1/18's cc Knitted at TRD

1 yarn count x 5 stitch lengths = 5 qualities x 3 pieces = 15 pieces.

28 Gauge using 1/38's cc Knitted at Camber

1 yarn count x 5 stitch lengths = 5 qualities x 3 pieces = 15 pieces.

28 Gauge Using 1/50's cc Knitted at Top Jersey

1 yarn count x 3 stitch lengths = 3 qualities x 3 pieces = 9 pieces.

This makes a total of 99 pieces of fabric, comprising 3 x 33 qualities with a total weight of approximately 1670Kg.

2. KNITTING OF 18 GAUGE FABRIC AT IIC TRD

Yarn: The yarn used was 1/18's cc 100% combed cotton, Quality LW purchased from Courtaulds Spinning Limited (Kent Mill). It was ordered with a twist factor of 3.6 (spliced and waxed).

Testing at IIC gave the following results (Lab Ref. 1167/1189).

Count Tex	32.63 (18.10cc)
Twist Factor	Alpha Tex 35.89 (English 3.75)
Turns/metre	628.33 (15.96 Turns/inch)
Friction	0.10

Knitting:

Machine: Velnit 18 gauge 26" diameter with 1500 needles (36 feeds)
Positive feed by Triptape
Course length on machine was measured by a Welmstar electronic run-in meter.

Fabrics produced:

Quality	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Ne 1/18 (cms)	.327	.344	.362	.380	.399

Three pieces of each quality were produced and samples for greige testing were taken from piece No. 1.

The pieces were coded in the following manner:

Gauge/yarn count/stitch length/sample No.

i.e. 18/1-18/327/1, 2, or 3

The production sheet is given as Table 5.

Comments: No major difficulties were encountered during the knitting of these fabrics.

3. KNITTING OF 28 GAUGE FABRIC USING 1/38's cc AT CAMBER INTERNATIONAL

Yarn: The yarn used was a 1/38's cc 100% combed cotton quality LW (Kent Mill).

Testing at IIC gave the following results (Lab Ref. 1167/1189)

Count Tex	15.38 (38.40cc)
Twist Factor	Alpha Tex 36.24 (English 3.79)
Turns/metre	924.17 (23.47 turns/inch)
Friction	0.15

Knitting:

Machine: Camber Quattro 28 gauge 26" diameter with 2280 needles (78 feeds).
Positive feed by IRO IPF (model 2905) storage units
Course length on machine was measured by a Welmstar electronic run-in meter.

Fabrics produced:

Quality	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Ne 1/38 (cms)	.246	.259	.273	.287	.301

Three pieces of each quality were produced and samples for greige fabric testing were taken from pieces No. 1.

The pieces were coded as per the 18 gauge fabrics, i.e. 28/1-38/246/1, 2, or 3. The production sheet is given as Table 6.

Comments: The knitting machine was set up with four triptapes driving IRO (IPF) storage units which proved very difficult to balance because of the four tapes. In order to improve the situation the machine was reorganised so that 2 tapes controlled the 78 storage units. IRO only recommend about 36 per tape. However, no problems were encountered by having 39 units per tape. The tension varied between the start of the piece and the end, the difference being in the region 2-3g.

Apart from these two points the knitting caused no problems even at high speed production of 30 rpm.

KNITTING OF 28 GAUGE FABRIC USING 1/50's cc AT TOP JERSEY LIMITED

Yarn: The 1/50's cc yarn was ordered from Courtaulds with a twist factor of 3.8. Unfortunately, upon testing the yarn it was apparent that the twist factor was in excess of 4.2 and so the yarn was returned. Replacements were obtained from Courtaulds Swan Lane Spinning, and testing at IIC gave the following results:- (Lab Ref. 7167/1189).

Count Tex	11.97 (50.08cc)
Twist Factor	Alpha Tex 38.67 (English 4.04)
Turns/metre	1126 (28.60 turns/inch)
Friction	0.14

Knitting:

Machine: Camber Cheminit 28 gauge, 26" diameter, 78 feeds but only 60 in use. 2304 needles.

Positive feed by Triptape

Course length on machine was measured by Hatra clock course length tester.

Fabrics produced:

Quality	<u>1</u>	<u>2</u>	<u>3</u>
Ne 1/50 (cms)	.230	.243	.264

Three pieces of each quality were produced and samples for greige testing were taken from piece No. 1.

The pieces were coded as per previous codings, i.e. 28/1-50/230/1, 2, or 3.

The production sheet is given as Table 7.

Comments: We were unable to use the Welmstar run-in meter to record course length so we used the HATRA clock course length tester, which in the past has given results which are different from the ones usually obtained from the Welmstar. This, coupled with the fact that some of the fabric was produced during the night shift, without supervision, left us wondering if any adjustments had been made without a record being kept of them. Therefore, as a check, the stitch length was tested at IIC on all the pieces produced.

<u>Piece No.</u>	<u>Code</u>	<u>x</u>	<u>%CL</u>	<u>%A</u>
1	28/1-50/230	2.344 (mm)	0.006	0.260
2	28/1-50/230	2.336	0.010	0.418
3	28/1-50/230	2.346	0.009	0.390
1	28/1-50/243	2.477	0.011	0.437
2	28/1-50/243	2.455	0.011	0.454
3	28/1-50/243	2.447	0.010	0.403
1	28/1-50/264	2.651	0.009	0.353
2	28/1-50/264	2.649	0.007	0.263
3	28/1-50/264	2.647	0.013	0.498

These numbers show that although the readings are higher than nominal (target) the differences between pieces within a quality is very small.

Weights of each Processing run

The 33 pieces marked Piece No. 1 = 543.95 kilos
The 33 pieces marked Piece No. 2 = 566.70
The 33 pieces marked Piece No. 3 = 559.60

Individual weights are given in Table 8.

Details of the 1/18's cc, 1/38's cc and 1/50's cc supplementary yarns are given in Table 9.

Machine: MONARCH XL-JS

Gauge: 24

No. of Needles: 1920

No. of Feeders: 60

Machine Diameter: 26 INCH

TABLE 1

PIECE NO.	COURSE LENGTH TARGET	MEAN CL AT START OF PIECE	MEAN CL AT END OF PIECE	C/3CM ON MACHINE		C/3CM OFF MACHINE	WIDTH AT ROLLER (CM)	WIDTH ON ROLL (CM)	REVS PRODUCED	PIECE WEIGHT KG	FAL
				Start	End						
124 1-24 306 1	588	588	588	42	43	48	83	83	2933	21.2	5
124 1-24 306 2	588	588	588	42	43		83	83	2666	23.5	9
124 1-24 306 3	588	589	591	43	43		83.5	82.5	2666	23.6	12
124 1-24 321 1	616	616	617	39	39	45	83.5	82.5	2750	21.0	9
124 1-24 321 2	616	616	617	39	40		83	82	2500	22.9	10
124 1-24 321 3	616	617	617	39	39		83	82	2500	21.8	6
124 1-24 337 1	647	647	648	36	35	41	83	83	2505	20.5	8
124 1-24 337 2	647	647	648	36	35		83	83	2277	21.7	7
124 1-24 337 3	647	648	647	36	36		83	83	2277	20.2	6
124 1-24 354 1	680	679	680	33	32	38	83	83	2322	18.5	8
124 1-24 354 2	680	680	681	32	32		83	83	2111	20.75	5
124 1-24 354 3	680	679	680	32	32		83	82	2111	20.6	5
124 1-24 372 1	714	714	713	30	29	35	83	83.5	2138	18.4	8
124 1-24 372 2	714	713	712	29	29		83	83.5	1944	19.8	3
124 1-24 372 3	714	712	713	29	29		83	83.5	1944	18	8

Machine: MONARCH XL-VS Gauge: 24 No. of Needles: 1920

No. of Feeders: 60 Machine Diameter: 26 INCH

PIECE NO.	COURSE LENGTH TARGET	MEAN CL AT START OF PIECE	MEAN CL AT END OF PIECE	C/3CM ON MACHINE		C/3CM OFF MACHINE	WIDTH AT ROLLER (CM)	WIDTH ON ROLL (CM)	REVS PRODUCED	PIECE WEIGHT KG	FAL
				Start	End						
124 1-28 291 1	559	558	559	47	47	59	82.5	83	3605	23.6	8
124 1-28 291 2	559	559	559	47	47		83	82.5	3277	23.4	6
124 1-28 291 3	559	558	560	46	47		83	83	3277	24.5	9
124 1-28 306 1	588	587	588	43	42	46	82	82.5	2811	18.2	3
124 1-28 306 2	588	587	587	42	42		82	82	2556	19.5	3
124 1-28 306 3	588	587	587	42	42		82	82	2556	19.3	3
124 1-28 321 1	616	615	617	38	37	43	82.5	82	2628	18.2	7
124 1-28 321 2	616	618	618	39	38		83	82	2406	19.3	4
124 1-28 321 3	616	617	617	39	38		82.5	82	2389	18.6	2
124 1-28 337 1	647	647	648	35	34	41	82.5	81.5	2505	13.9	1
124 1-28 337 2	647	647	647	34	34		83	81.5	2277	18.2	1
124 1-28 337 3	647	647	648	35	34		83	81.5	2277	19	6
124 1-28 354 1	680	680	679	31	31	38	82	81	2322	18.9	4
124 1-28 354 2	680	680	680	31	31		82	81	2111	18.8	1
124 1-28 354 3	680	680	681	31	31		82	81	2111	17.3	2

TABLE 2

Machine: MONARCH XL-JS

Gauge: 24

No. of Needles: 1920

No. of Feeders: 60

Machine Diameter: 2.6 INCH

TABLE 3

PIECE NO.	COURSE LENGTH TARGET	MEAN CL AT START OF PIECE	MEAN CL AT END OF PIECE	C/3CM ON MACHINE		C/3CM OFF MACHINE	WIDTH AT ROLLER (CM)	WIDTH ON ROLL (CM)	REVS PRODUCED	PIECE WEIGHT KG	FAU
				Start	End						
24 1-32 236 1	530	530	530	48	47	58	82	81	3544	18.5	5
24 1-32 236 2	530	530	531	47	47		82	81	3222	19	5
24 1-32 236 3	530	530	530	47	48		82	82	3222	19	0
24 1-32 291 1	559	559	558	44	44	51	81	81	3116	15.5	1
24 1-32 291 2	559	560	559	44	43		81	81	2833	17	7
24 1-32 291 3	559	559	559	44	44		81	81	2833	17.5	6
24 1-32 306 1	588	588	588	38	39	48	82	80.5	2933	16.6	7
24 1-32 306 2	588	588	588	41	40		82	80.5	2666	17	1
24 1-32 306 3	588	589	588	41	40		82	80.5	2666	17	3
24 1-32 321 1	616	615	615	36	36	43	82	80.5	2628	15.4	3
24 1-32 321 2	616	615	615	36	36		81	80.5	2389	15.6	1
24 1-32 321 3	616	615	615	36	36		81	80.5	2389	15.9	5
24 1-32 337 1	647	648	648	34	34		81.5	80.5	2423	15.4	1
24 1-32 337 2	647	648	648	34	34		81	80.5	2277	15.4	2
24 1-32 337 3	647	648	648	34	34		81	80.5	2277	15	4

Machine: MONARCH XL-2S

Gauge: 24

No. of Needles: 1920

No. of Feeders: 60

Machine Diameter: 26 INCH

TABLE 4

PIECE NO.	COURSE LENGTH TARGET	MEAN CL AT START OF PIECE	MEAN CL AT END OF PIECE	C/3CM ON MACHINE		C/3CM OFF MACHINE	WIDTH AT ROLLER (CM)	WIDTH ON ROLL (CM)	REVS PRODUCED	PIECE WEIGHT KG	FAUL
				Start	End						
124 1-28CD 306 1	588	587	587	42	42	46	82.5	82.5	2811	14.8	17
124 1-28CD 306 2	588	588	588	42	42		83	82.5	2556	18.25	10
124 1-28CD 306 3	588	587	588	41.5	42		83	82.5	2556	15.5	21
124 1-28CD 321 1	616	617	618	38	38	43	82.5	81	2628	17.8	20
124 1-28CD 321 2	616	617	617	37	37		82.5	81.5	2389	18.4	6
124 1-28CD 321 3	616	617	617	37	37		82	82	2389	18.6	7
124 1-28CD 337 1	647	647	647	34	34	41	83	82	2505	17.4	15
124 1-28CD 337 2	647	646	645	34	33		83	82	2277	17.2	13
124 1-28CD 337 3	647	647	648	34	34		83	82	2277	17.5	8
124 1-28CD 354 1	680	679	680	31	31	38	83	82	2322	16.8	10
124 1-28CD 354 2	680	680	681	31	31		83	82	2111	15.5	15
124 1-28CD 354 3	680	680	680	31	31		82.5	82	2111	16.5	12
124 1-28CD 372 1	714	713	715	29	29	35	83	83	2138	13.2	3
124 1-28CD 372 2	714	714	714	29	29		83	83	1944	18.5	4
124 1-28CD 372 3	714	714	714	29	28.5		83	83	1944	18.2	11

PIECE NO 1 - 85 METRES
 PIECES NO 203 - 75 METRES

10 METRES FROM PIECE 1 FOR TESTING

Machine: VIELNIT (TRD) Gauge: 18 Number of Needles: 1500

PROJECT - SJ 86

KNITTED - NOV 85

Piece No.	Course Length Target	Mean CL at Start of Piece	Mean CL at End of Piece	C/3cm on Machine (MC)	Width at Roller	Width on Roll	Revs Produced	Piece Weight (g)
18/1-18/327/1	490.5	490.5	490.5	47 (50)	82cms	80cms	3935	19.5 (5)
18/1-18/327/2	490.5	491.0	490.5	47	82	80	3472	19.75 (5)
18/1-18/327/3	490.5	490.5	490.5	47	82	80	3472	19.60 (5)
18/1-18/344/1	516	516.0	516.0	42 (48)	82	80	3777	19.25 (1)
18/1-18/344/2	516	515.0	516.0	42	82	80	3333	19.75 (1)
18/1-18/344/3	516	515.0	516.0	42	82	80	3333	19.50 (1)
18/1-18/362/1	543	543.0	543.0	38 (45)	82	80	3542	19.25 (1)
18/1-18/362/2	543	543.0	543.0	38	82	80	3125	19.50 (1)
18/1-18/362/3	543	543.0	543.0	38	82	80	3125	19.50 (1)
18/1-18/380/1	570	571.0	571.0	34 (40)	82	80	3148	18.25 (1)
18/1-18/380/2	570	572.0	572.0	34	82	80	2777	18.20 (1)
18/1-18/380/3	570	572.0	571.0	34	82	80	2777	18.00 (1)
18/1-18/399/1	598.5	598.5	599.0	30 (36)	82	80	2833	17.20 (1)
18/1-18/399/2	598.5	599.0	599.0	30	82	80	2500	17.20 (1)
18/1-18/399/3	598.5	599.0	599.0	30	82	80	2500	17.0 (1)

TABLE 2

SPINNING 30 RPM

PIECES NO 1 85 METRES
PIECES 2 03 45 METRES

QUANTITIES 286 CAMBER
SINGLE OVERSEY

10 METRES FROM PIECE 1 FOR TESTING

Gauge: 28

Number of needles: 2280

KNITTED AT CAMBER

Pieces No.	Course length Target	Mean CL at Start of Piece	Mean CL at End of Piece	C/3cm on Machine	Width at Roller	Width on Roll	Revs Produced	Length
28/1-38/246/1	560.8	561	561	54 (64)	85cms	87cms	2325	14.2
28/1-38/246/2	560.8	560	561	55	85cms	87cms	2051	13.6
28/1-38/246/3	560.8	561	562	55	85cms	87cms	2051	14.0
28/1-38/259/1	590.5	592	590	50 (58)	85cms	86cms	2107	13.1
28/1-38/259/2	590.5	591	591	50	85cms	86cms	1859	13.0
28/1-38/259/3	590.5	591	591	50	85cms	86cms	1859	13.0
28/1-38/273/1	622.0	623.0	624	44 (54)	85cms	85cms	1961	13.0
28/1-38/273/2	622.0	624.0	624	44	85cms	85cms	1731	13.1
28/1-38/273/3	622.0	624.0	624	44	85cms	85cms	1731	12.8
28/1-38/287/1	654.0	652.0	652	42 (48)	85cms	85cms	1744	12.0
28/1-38/287/2	654.0	651.0	652	42	85cms	85cms	1538	12.0
28/1-38/287/3	654.0	652.0	652	42	85cms	85cms	1538	11.9
28/1-38/301/1	686.0	686.0	686	39 (44)	85cms	85cms	1598	11.6
28/1-38/301/2	686.0	686.0	686	39	85cms	85cms	1410	11.5
28/1-38/301/3	686.0	686.0	685	39/40	85cms	85cms	1410	11.5

TABLE 6

WEIGHTS OF EACH PROCESSING RUN *4 kilos*

<u>Piece No. 1</u>	<u>Piece No. 2</u>	<u>Piece No. 3</u>
21.2	23.5	23.6
21.0	22.9	21.8
20.5	21.7	20.2
18.5	20.75	20.6
18.4	19.8	18.0
23.6	23.4	24.5
18.2	19.5	19.3
18.2	19.3	18.6
13.9	18.2	19.0
18.9	18.8	17.3
18.5	19.0	19.0
15.5	17.0	17.5
16.6	17.0	17.0
15.4	15.6	15.9
15.4	15.4	15.0
14.8	18.25	15.5
17.8	18.4	18.6
17.4	17.2	17.5
16.8	15.5	16.5
13.2	18.5	18.2
19.5	19.75	19.6
19.25	19.75	19.5
19.25	19.5	19.5
18.25	18.2	18.0
17.2	17.2	17.0
14.2	13.6	14.0
13.1	13.0	13.0
13.0	13.1	12.8
12.0	12.0	11.9
11.6	11.5	11.5
11.8	10.6	10.5
11.4	10.0	10.1
<u>9.6</u>	<u>8.8</u>	<u>8.6</u>
<u>543.95</u>	<u>566.7</u>	<u>559.6</u>

SINGLE JERSEY '86
YARNDATA

Lab ref no 11677/1189

11-4-86

Sample no.	1	2	3
Yarn count (Tex)	32.63	15.38	11.79
Twist (turns per metre)	628.33	924.17	1126.00
Single end strength (g)	509.40	201.35	161.24
Extension at break (%)	7.93	6.10	6.54
Coefficient of friction (μ)	0.10	0.15	0.14
Twist liveliness (tpm)	53.03	70.23	93.93
Yarn Count (Ne)	18.10	38.40	50.08
Turns per inch	15.96	23.47	28.60
Twist Factor - alpha Tex	35.89	36.24	38.67
Twist Factor - English	3.75	3.79	4.04
Tenacity (g./Tex)	15.61	13.09	13.67

A P P E N D I X 1

GREIGE FABRIC TEST RESULTS

Lab Ref. 947 = Original Testing 1982

Lab Ref. 1178= Testing 1986

Sheet 1 =	1/24'scc and 1/28'scc	1986
2 =	1/32'scc and 1/28'scc (carded)	1986
3 =	1/38'scc and 1/18'scc	1986
4 =	1/50'scc	1986
5 =	Original 1/24'scc and 1/28'scc	1982
6 =	Original 1/32'scc and 1/28'scc (carded)	1982

Project Name - Single Jersey '86 - Grey Fabrics

GREY

	24/306	24/321	24/337	24/354	24/372	28/291	28/306	28/321	28/337	28/354
Length shrinkage, 5x	17.19	19.36	23.18	27.81	27.64	17.48	19.27	22.69	23.73	26.96
Width shrinkage, 5x	17.23	13.55	9.74	5.82	2.16	20.46	17.78	14.97	12.91	7.82
Weight (gsm)BW	140.80	135.40	125.11	118.93	117.05	127.13	122.30	113.40	111.36	105.56
Weight (gsm)AW	195.17	187.23	180.10	169.80	168.08	182.84	176.05	170.64	164.37	156.62
Courses per 3cm BW	48.80	44.50	40.60	36.60	33.98	50.40	46.70	42.50	39.20	35.40
Courses per 3cm AW	58.30	55.10	51.80	49.40	47.60	60.80	57.90	53.90	51.20	48.60
Wales per 3cm BW	33.50	34.00	34.20	33.90	34.10	34.50	33.80	33.90	33.80	33.67
Wales per 3cm AW	41.20	40.30	39.30	37.97	36.80	43.50	42.40	41.70	39.90	38.50
Stitch length (mm) BW	3.89	3.24	3.39	3.56	3.74	2.94	3.09	3.23	3.40	3.57
Stitch length (mm) AW	3.05	3.19	3.38	3.51	3.68	2.92	3.04	3.19	3.36	3.52
Burst strength, BW	711.90	686.80	649.30	612.50	625.70	674.40	632.80	606.40	573.60	578.10
Burst strength, AW	697.30	667.60	621.90	605.40	585.60	668.20	622.40	594.10	588.90	515.80
Distension at burst, BW	16.82	17.35	16.95	16.12	16.46	16.19	16.52	16.78	16.07	17.30
Distension at burst, AW	23.20	21.88	23.65	21.61	21.88	21.37	21.40	21.76	21.64	21.59
Angle of spirality, BW	6.07	6.98	6.99	7.92	9.39	6.16	7.38	8.98	9.64	10.37
Angle of spirality, AW	11.29	12.30	14.21	17.17	20.11	18.24	19.48	21.89	23.73	25.34
Width, BW	82.97	83.40	82.43	82.47	83.73	81.60	81.67	82.25	82.70	81.83
Yarn strength, BW	335.31	302.60	321.29	322.55	321.96	307.95	311.41	302.77	309.84	307.32
Yarn strength, AW	341.51	340.40	322.89	326.57	331.92	304.93	292.17	279.88	296.24	285.29
Yarn extension at break, BW	7.47	6.86	7.21	7.39	7.42	6.78	7.43	6.94	7.43	7.22
Yarn extension at break, AW	8.86	8.72	8.72	8.88	9.15	7.44	7.67	7.69	8.10	7.89
Yarn count (tex), BW	24.66	25.23	24.92	25.37	24.68	21.96	21.89	22.07	22.22	21.87
Yarn count (tex), AW	24.02	24.43	24.39	24.47	24.45	21.45	21.57	21.74	21.85	21.46
Thickness, BW	580.30	585.20	580.70	581.10	586.70	560.90	561.30	559.30	564.30	553.20
Thickness, AW	845.00	876.70	881.80	895.40	918.20	813.40	825.70	849.50	864.40	868.10
Turns per metre	740.50	721.67	750.50	737.50	690.00	793.00	807.50	785.00	770.50	760.00

Lab Ref No. 1178

Project Name - Single Jersey '86 - Grey Fabrics

GREY

	32/276	32/291	32/306	32/321	32/337	28C306	28C321	28C337	28C354	28C372
Length shrinkage, 5x	17.65	22.26	21.62	24.11	27.48	18.81	23.69	24.85	27.71	29.51
Width shrinkage, 5x	24.56	15.69	17.42	14.91	18.54	15.58	12.08	18.84	5.94	2.12
Weight (gsm)BW	182.72	184.83	93.25	91.81	89.72	117.86	184.34	183.47	98.62	95.28
Weight (gsm)AW	157.97	152.69	146.87	141.97	135.13	168.78	154.26	148.39	148.15	134.68
Courses per 3cm BW	52.38	46.88	44.48	41.88	36.68	47.18	41.48	39.28	35.38	32.68
Courses per 3cm AW	62.68	58.68	56.88	52.78	50.68	56.98	53.98	58.98	48.58	45.67
Wales per 3cm BW	33.78	36.33	33.98	34.18	34.88	34.38	34.48	33.78	34.88	33.48
Wales per 3cm AW	46.18	44.78	43.38	42.23	41.38	48.98	39.88	38.58	36.38	35.95
Stitch length (mm) BW	2.88	2.94	3.87	3.22	3.48	3.88	3.23	3.39	3.57	3.74
Stitch length (mm) AW	2.77	2.98	3.84	3.18	3.35	3.84	3.28	3.36	3.54	3.78
Burst strength, BW	514.28	549.68	463.68	468.98	437.68	526.48	435.68	471.78	478.88	451.48
Burst strength, AW	581.18	558.78	587.98	488.18	457.38	522.88	455.88	481.38	431.18	437.38
Distension at burst, BW	16.58	15.95	17.11	16.44	16.53	15.58	15.94	18.28	16.41	15.62
Distension at burst, AW	22.21	22.84	21.54	22.84	21.83	21.18	21.64	21.28	21.74	21.47
Angle of spirality, BW	5.91	6.51	6.38	9.58	8.99	6.88	6.75	6.98	8.85	8.56
Angle of spirality, AW	17.78	17.71	19.37	24.52	26.84	18.88	28.79	22.66	25.86	27.44
Width, BW	88.63	73.48	88.48	81.43	81.93	81.38	81.33	84.67	83.47	84.58
Yarn strength, BW	237.65	232.37	223.61	233.67	227.72	228.83	252.87	252.32	225.87	247.55
Yarn strength, AW	227.59	227.28	238.68	235.88	231.45	224.53	245.47	245.21	233.34	235.14
Yarn extension at break, BW	7.63	7.36	7.48	7.45	7.91	5.91	6.48	6.43	6.22	6.63
Yarn extension at break, AW	6.92	7.46	8.88	8.63	9.44	7.33	7.99	7.97	7.86	7.85
Yarn count (tex), BW	18.82	18.22	18.64	18.54	18.36	21.16	21.89	21.23	21.41	21.82
Yarn count (tex), AW	18.11	18.88	18.12	18.18	17.93	28.56	28.75	28.61	28.49	28.82
Thickness, BW	512.38	515.28	519.88	538.98	512.88	584.18	564.48	566.88	564.18	555.48
Thickness, AW	886.48	816.88	823.98	843.88	855.28	857.28	867.38	883.48	898.88	914.28
Turns per metre	898.88	878.88	987.58	948.88	897.58	739.88	793.58	751.58	746.58	794.58

Lab Ref No. 1178

Project Name - Single Jersey '86 - Grey Fabrics

GREY

	38/246	38/259	38/273	38/287	38/301	18/327	18/344	18/362	18/380	18/399
Length shrinkage, 5x	6.98	7.59	13.39	14.17	18.32	1.35	4.60	7.08	8.99	13.42
Width shrinkage, 5x	27.35	24.30	19.11	17.39	14.04	29.40	25.00	21.17	14.92	15.06
Weight (gsm)BW	107.64	105.78	102.50	97.40	89.34	176.89	175.44	168.39	166.55	154.70
Weight (gsm)AW	152.42	147.29	140.51	137.18	129.97	237.75	225.35	217.18	210.96	204.83
Courses per 3cm BW	67.30	61.40	55.90	51.60	48.09	55.00	50.60	47.10	42.70	39.00
Courses per 3cm AW	70.40	66.50	61.90	58.40	55.60	55.50	52.50	49.50	47.00	45.10
Wales per 3cm BW	37.80	38.10	39.30	39.20	38.90	27.20	27.60	27.60	29.30	28.50
Wales per 3cm AW	52.90	51.40	50.50	49.10	47.86	38.50	37.20	35.70	34.80	33.80
Stitch length (mm) BW	2.48	2.62	2.75	2.87	3.02	3.28	3.46	3.61	3.81	4.00
Stitch length (mm) AW	2.46	2.57	2.72	2.84	2.99	3.24	3.39	3.56	3.74	3.92
Burst strength, BW	510.20	481.20	417.30	431.10	390.90	809.00	764.00	738.40	776.60	756.00
Burst strength, AW	465.30	470.00	446.40	448.80	420.20	840.20	787.40	766.40	708.00	676.70
Distension at burst, BW	18.84	17.53	16.58	18.67	18.61	17.48	17.11	19.48	19.14	19.51
Distension at burst, AW	21.69	20.96	21.61	21.73	21.31	22.24	22.08	22.31	21.66	21.91
Angle of spirality, BW	8.25	7.86	11.26	14.07	14.00	2.56	3.85	7.33	10.31	11.06
Angle of spirality, AW	19.37	20.71	23.83	25.28	26.73	9.57	9.74	10.90	16.31	18.58
Width, BW	89.20	88.83	88.63	88.93	89.07	82.50	82.27	79.73	79.27	81.27
Yarn strength, BW	185.84	174.85	179.15	198.41	184.96	449.21	460.29	453.16	458.23	488.00
Yarn strength, AW	185.97	191.43	185.95	185.79	188.41	483.92	456.48	450.31	458.03	449.36
Yarn extension at break, BW	6.01	5.79	6.40	6.51	6.17	7.16	8.04	8.27	8.53	8.55
Yarn extension at break, AW	7.66	7.92	8.05	7.84	8.32	9.20	9.23	9.85	10.36	9.95
Yarn count (tex), BW	15.38	15.25	15.60	15.38	15.50	31.68	31.86	32.41	32.27	32.55
Yarn count (tex), AW	15.14	15.35	15.22	15.35	15.27	31.94	31.67	32.10	31.77	32.30
Thickness, BW	589.20	579.30	586.20	582.90	579.00	738.00	759.90	773.10	798.10	771.20
Thickness, AW	780.30	785.10	818.80	814.60	823.60	969.10	985.00	993.10	1065.70	1071.30
Turns per metre	962.00	1022.50	972.00	1006.50	997.50	717.50	693.00	664.00	686.00	679.50

Lab Ref No. 1178

4

Project Name - Single Jersey '86 - Grey Fabrics

GREY

	50/230	50/243	50/264
Length shrinkage, 5x	3.10	7.67	12.33
Width shrinkage, 5x	30.42	27.74	20.01
Weight (gsm)BW	89.70	87.50	82.04
Weight (gsm)AW	130.46	125.28	118.71
Courses per 3cm BW	75.80	67.90	58.90
Courses per 3cm AW	77.20	72.70	65.50
Wales per 3cm BW	39.60	39.80	42.30
Wales per 3cm AW	58.10	56.50	54.50
Stitch length (mm) BW	2.34	2.45	2.65
Stitch length (mm) AW	2.30	2.41	2.62
Burst strength, BW	376.20	373.60	356.80
Burst strength, AW	403.80	422.40	384.10
Distension at burst, BW	17.88	21.06	19.48
Distension at burst, AW	22.25	21.90	22.67
Angle of spirality, BW	13.50	16.11	20.03
Angle of spirality, AW	22.29	23.82	28.08
Width, BW	87.90	87.27	86.37
Yarn strength, BW	152.63	147.07	149.25
Yarn strength, AW	143.73	133.02	145.19
Yarn extension at break, BW	7.40	6.77	7.12
Yarn extension at break, AW	7.41	7.11	7.15
Yarn count (tex), BW	11.66	11.86	11.73
Yarn count (tex), AW	11.64	11.48	11.44
Thickness, BW	546.40	554.20	552.90
Thickness, AW	708.20	737.40	738.90
Turns per metre	1192.00	1183.50	1184.50

Lab Ref No. 947

Project Name - NTI Single Jersey '82 - Grey Fabrics

Grey Fabrics

	24/306	24/321	24/337	24/354	24/372	28/291	28/306	28/321	28/337	28/354
Length shrinkage, 5x	12.30	10.78	17.99	17.40	22.43	11.20	12.06	19.58	18.02	21.89
Width shrinkage, 5x	20.46	18.76	13.07	13.74	7.13	23.99	21.83	17.55	14.13	9.81
Weight (gsm)BW	137.79	138.40	130.71	126.97	125.49	128.73	125.41	116.33	117.05	107.22
Weight (gsm)AW	191.44	185.81	178.00	169.49	164.06	181.56	174.21	167.92	164.64	157.57
Courses per 3cm BW	50.40	48.30	43.00	39.70	37.30	53.40	51.00	43.90	42.70	38.60
Courses per 3cm AW	57.50	54.00	51.40	48.10	46.10	60.40	57.30	52.40	51.30	48.00
Wales per 3cm BW	32.10	32.70	33.20	32.00	32.70	32.70	33.30	33.30	33.70	33.20
Wales per 3cm AW	40.90	40.00	39.00	37.60	36.00	43.50	42.40	41.20	40.20	38.90
Stitch length (mm) BW	3.08	3.23	3.39	3.57	3.74	2.93	3.07	3.22	3.38	3.55
Stitch length (mm) AW	3.04	3.18	3.36	3.55	3.75	2.89	3.04	3.18	3.37	3.52
Burst strength, BW	652.20	688.60	650.00	592.10	564.70	674.00	582.50	588.40	576.00	544.00
Burst strength, AW	661.30	665.40	620.00	566.90	577.00	658.00	603.50	579.20	559.00	525.20
Distension at burst, BW	14.27	14.55	14.79	14.89	14.02	13.91	14.57	14.57	14.76	14.90
Distension at burst, AW	16.12	15.72	15.64	16.30	16.36	16.40	16.47	15.85	16.29	15.90
Angle of spirality, BW	6.45	12.08	14.58	14.92	17.58	8.55	14.03	13.45	18.28	15.98
Angle of spirality, AW	13.36	15.64	17.08	20.44	21.91	16.57	18.00	21.46	22.35	25.12
Width, BW	89.10	89.27	88.30	89.03	87.73	86.60	85.47	86.87	87.90	89.20
Yarn strength, BW	333.40	322.16	337.00	309.23	327.03	310.00	301.05	285.89	283.00	307.40
Yarn strength, AW	314.44	306.40	297.43	287.78	303.79	265.56	273.12	286.41	292.45	278.59
Yarn extension at break, BW	6.75	6.75	6.52	5.81	6.71	7.52	7.00	7.01	6.29	6.86
Yarn extension at break, AW	8.43	8.99	8.43	8.44	8.56	7.96	8.71	8.75	8.77	8.52
Yarn count (tex), BW	25.09	25.00	25.00	24.68	25.16	22.14	21.88	21.95	22.14	22.20
Yarn count (tex), AW	24.50	24.85	24.42	23.79	24.04	21.67	21.77	21.85	21.19	21.03
Thickness, BW	633.40	652.70	641.40	642.60	651.70	593.40	618.00	597.60	651.20	623.30
Thickness, AW	868.38	881.60	869.00	902.60	885.90	832.00	842.00	841.20	880.30	902.20

Lab Ref No. 947

Project Name - NTI Single Jersey '02 - Grev Fabrics

Grev Fabrics

	32/276	32/291	32/306	32/321	32/337	28C306	28C321	28C337	28C354	28C372
Length shrinkage, 5x	11.05	14.29	14.49	17.05	20.36	15.57	10.25	21.21	22.60	23.65
Width shrinkage, 5x	26.47	19.09	19.75	10.26	13.01	10.73	17.60	14.21	10.00	0.59
Weight (gsm) BW	105.70	107.95	100.60	96.51	96.01	120.05	100.66	105.70	103.07	101.31
Weight (gsm) AW	150.32	150.96	147.34	142.25	139.55	162.51	153.05	149.30	144.60	139.09
Courses per 3cm BW	57.00	52.00	47.30	43.00	41.30	40.70	44.40	41.90	30.40	35.50
Courses per 3cm AW	63.10	57.20	55.10	52.00	49.30	57.60	51.00	50.60	40.00	46.20
Wales per 3cm BW	33.40	35.20	34.30	33.60	33.30	33.50	33.00	33.30	32.30	32.10
Wales per 3cm AW	46.50	45.60	44.30	43.20	41.90	41.70	40.30	39.30	37.50	36.00
Stitch length (mm) BW	2.00	2.96	3.05	3.21	3.39	3.07	3.20	3.30	3.55	3.72
Stitch length (mm) AW	2.76	2.90	3.04	3.17	3.02	3.02	3.20	3.35	3.63	3.60
Burst strength, BW	529.60	516.40	496.50	462.00	440.20	513.30	453.50	459.40	437.30	446.10
Burst strength, AW	530.70	501.70	492.50	472.00	459.20	512.50	447.40	437.60	439.40	419.00
Distension at burst, BW	14.32	15.46	15.25	15.35	15.07	15.40	14.76	15.60	14.66	15.54
Distension at burst, AW	16.75	16.15	16.41	16.11	16.36	16.53	15.07	16.60	16.53	15.76
Angle of spirality, BW	9.98	10.53	14.26	14.32	17.07	14.54	10.37	13.34	15.22	16.44
Angle of spirality, AW	19.91	21.69	24.04	25.95	20.74	16.69	19.12	20.57	23.07	25.94
Width, BW	85.73	80.83	84.30	86.67	89.07	86.40	87.77	91.07	89.30	91.20
Yarn strength, BW	210.09	225.59	231.93	224.41	210.16	219.11	226.12	224.36	225.64	230.43
Yarn strength, AW	207.07	207.47	223.69	216.50	213.21	194.41	210.01	235.92	220.00	232.96
Yarn extension at break, BW	6.27	6.00	7.36	6.26	5.71	5.26	6.00	5.62	5.07	5.27
Yarn extension at break, AW	7.21	7.73	0.19	0.54	7.75	6.96	7.56	7.65	7.60	7.97
Yarn count (tex), BW	10.33	10.04	10.33	10.43	10.17	21.16	21.13	20.95	20.01	21.20
Yarn count (tex), AW	17.65	17.00	17.90	17.91	17.54	21.54	20.07	20.64	20.39	20.43
Thickness, BW	552.20	559.60	571.00	570.40	569.60	657.40	619.20	615.10	635.10	624.90
Thickness, AW	700.20	002.00	012.40	031.40	027.60	059.90	076.90	070.90	091.60	004.00