RESEARCH RECORD NO: 206

THE PROCESSING OF RIB85 FABRICS AT MERIDIAN DYERS.

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C O N T E N T S

A P P E N D I C E S

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1. INTRODUCTION

Research Record No. 204 describes the knitting of 25 qualities of 1 x 1 rib carried out in the factory of Meridian Fabrics in Nottingham for the purpose of widening the data base of this particular fabric construction. The existing data base adequately covers the qualities used in the UK but there is a need to be able to use STARFISH both in the USA and also in Scandinavia and it was felt that the STARFISH equations developed from the existing data base may not necessarily be sufficiently accurate for these markets.

Following knitting, the qualities were sampled and tested in the greige state. Finishing was carried out in the factory of Meridian Dyers under the supervisiion of TRD personnel and this brief report records details of this operation.

2. FABRICS

Fabrics were knitted on 14 and 18 gauge machines using 1/20's Ne and 1/26's Ne yarns on the 14 gauge machine and 1/32's Ne, 1/36's Ne and 1/42's Ne yarns on the 18 gauge machine.

Due to limited supplies of yarn only 25 metres of each quality was knitted. For each yarn, five tightness factors were produced resulting in 10, 14 gauge fabrics and 15, 18 gauge fabrics.

Greige state sampling consumed five metres of each quality, leaving 25, 20-metre lengths for finishing.

3. FINISHING TARGETS

The finishing route used was the winch bleach route which consists, at Meridian, of winch bleach, detwist and wet stretch on the Calator Airtex and dry. Drying is either carried out on the Pegg dryers or on the new Ruckh relaxed dryer. For this particular exercise it was decided that the Ruckh machine should be used for the following reasons:-

1. no width control is necessary and therefore is more practical for the short sample lengths of variable width,

2. it is of interest to determine just how close to the course targets the Ruckh machine is able to approach.

Finishing targets were determined for the various qualities using STARFISH. These are given overleaf.

4. FINISHING DETAILS

A practical rope length for winch processing is around 80 metres and therefore four qualities were sewn together to make up a single rope. Seven ropes in total were made up using scrap material to make the seventh rope to the necessary length. The total weight of fabric for processing including the scrap was 124kg. Details of the winch bleaching operation are given in Table 1.

TARGETS FOR 10% LENGTH, 10% WIDTH RESIDUAL SHRINKAGES

QUALITY	FINISHED WIDTH (cm)	C/3cm
14/1-26/267	55	52
14/1-20/285	57	50
14/1-26/285	58	48
14/1-20/306	61	46
14/1-26/306	62	44
14/1-20/326	64	43
14/1-26/326	66	41
14/1-20/350	69	39
14/1-26/350	70	37
14/1-20/368	72	37
18/1-42/260	79	51
18/1-32/275	82	49
18/1-36/275	83	49
18/1-42/275	83	48
18/1-32/289	86	47
18/1-36/289	87	46
18/1-42/289	87	45
18/1-32/303	91	44
18/1-42/303	91	43
18/1-36/303	91	43
18/1-32/318	94	41
18/1-42/318	95	40
18/1-36/318	95	40
18/1-32/334	99	39
18/1-36/334	100	38

Following the winch operation the fabrics were processed on the Calator Airtex. Our earlier work on wet stretching followed by drying on a Kiefer Rotoswing indicated that when using this type of dryer the wet stretching conditions are not critical. It was of interest to determine whether the same is true for the Ruckh machine and therefore where possible, these fabrics were wet stretched to widths in excess of the finished target.

This was not possible for all the fabric qualities because the 18 gauge machine is of large diameter and the upper width limit of the Calator Airtex is only slightly greater than the target finished width of the slackest 18 gauge fabrics. The target finished widths had to be bracketed for practical reasons and the frame widths for the Airtex and the fabric width on leaving the Airtex are given in Table 2.

Following wet stretching the fabrics were dried on the Ruckh dryer under single strand operation. The conditions on the dryer had to be set arbitrarily due to the wide range of fabric weights. Some fabrics were therefore overdried whilst others were only just dry. The air temperature of the dryer was 120°C and the overfeed control was reading 10%. Due to the shortness of the fabric samples it was not possible to count the courses after either the Calator or the Ruckh and therefore the performance of the Ruckh can only be appraised once the test results on the finished fabrics are available. Fabric width was measured however after both machines and although somewhat variable an average figure has been given for each quality in Table 2.

After processing on the Ruckh, fabrics are normally calendered since fabric width is usually somewhat below target. The calendering operation also enables correction of skew and gives an acceptable presentation for making-up. Once again, due to the very short lengths being processed the decision to omit calendering was taken. Factors leading to this decision were:-

- it normally takes 15-20 metres of fabric to optimise running conditions for a particular quality
- for this exercise fabric appearance is not critical neither is presentation.
- we are only really interested in the reference state properties
- due to a breakdown of one calender there was a considerable production backlog and insisting on using the calender would not have been popular with the production people with whom we enjoy a very good relationship.

Fabrics were therefore separated after drying and parcelled for return to TRD.

5. CONCLUSIONS

Although the Rib 85 samples were processed satisfactorily the relative shortness of the individual qualities did not allow for optimised conditions on the wet stretching and drying machines. The winch bleaching operation however should be entirely representative. The use of a 30 inch diameter knitting machine again did not allow optimisation of finishing due to the relatively high target finished widths which approached the limits of Meridian's tubular processing equipment.

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DATE 04/10/1985	TIME ON:	TIME OFF:	
MACHINE WID 1	CUSTOMER COTTON INST.	BATCH IIC03770	WEIGHT 124 K
QUALITY C011	SHADECODE OPTIC 40	RUN No 182	VOLUME 3200
SHADE NAME	OPTIC STANDARD		
MACHINE COMMENTS	MACHINE 1		

Dyeing Procedure: COOPTIC3 Target Time 6

DYE BATH - BLEACH/DYE
(Treatment: COOPTIC3) COTTON OPTIC WHITE
START COLD ADD

			GRM	ADD	ADD
17000025	1.00 %	MERUPAN VD	1240		
17000048	1.00 %	LAVOTAN WSF	1240		

RUN 5 MINS ADD DILUTED

			GRM	ADD	ADD
23000015	4.00 %	CAUSTIC SODA LIQ.(70TW)	4960		
23000041	8.00 %	HYDROGEN PEROXIDE STORE	9920		

RUN 5 MINS ADD

			GRM	ADD	ADD
25060106	0.900 %	PHOTINE CXT	1116.00		

RAISE TO 80°C (MAX RATE) ADD DILUTED

			GRM	ADD	ADD
23000015	2.00 %	CAUSTIC SODA LIQ.(70TW)	2480		

RAISE TO THE BOIL (MAX RATE) BOIL 60 MINS AND SHOW
COOL TO 60°C (4°C/MIN) DRAIN
RINSE 10 MINS 70°C DRAIN
REFILL COLD FOR CLARITE
(Treatment: COOPTIC2) OPTIC CLARITE
ADD

			GRM	ADD	ADD
13000124	1.50 %	CLARITE PS	1860		

RAISE TO 60°C RUN 20 MINS AND SHOW.
DRAIN AND COLD RINSE FOR 5 MINS THEN DRAIN
FILL FOR SOFTENER IF REQUIRED.

(Treatment: SOFTENO5) COTTON SOFTEN FOR OPTICS
ADD

			GRM	ADD	ADD
37000103	3.00 %	SANDOLUBE LSN	3720		

RAISE TO 40°C RUN FOR 30 MINS AND SHOW

TABLE 2

PROCESSING MEASUREMENTS

FABRIC REF.	TARGET WIDTH	AIRTEX SETTINGS		WIDTH AFTER AIRTEX	WIDTH AFTER RUCKH
		FRAME	% STRETCH		
14/1-26/267	55	75	36	69	57
14/1-20/285	57	75	32	67	60
14/1-26/285	58	75	29	66	58
14/1-20/306	61	75	23	66	62
14/1-26/306	62	85	37	82	62
14/1-20/326	64	85	33	81	66
14/1-26/326	66	85	29	79	62
14/1-20/350	69	85	23	81	68
14/1-26/350	70	99	41	93	73
14/1-20/368	72	99	37	92	73
18/1-42/260	79	99	25	92	76
18/1-32/275	82	99	21	94	79
18/1-36/275	83	105	27	77	71
18/1-42/275	83	105	27	78	73
18/1-32/289	86	105	22	79	76
18/1-36/289	87	105	21	80	74
18/1-42/289	87	90	NIL	89	75
18/1-32/303	91	90	NIL	89	78
18/1-42/303	91	90	NIL	85	74
18/1-36/303	91	90	NIL	86	75
18/1-32/318	94	96	NIL	88	81
18/1-42/318	95	96	NIL	88	80
18/1-36/318	95	96	NIL	88	79
18/1-32/334	99	96	NIL	89	82
18/1-36/334	100	100	NIL	89	81