

Layouts and Calculations for Rayon Fabrics

By E. H. DOUTE, SHELTON, CONN.

The constant demand for something new in the textile industry has made chemical material a very welcome ally in creating novel fabrics in which the synthetic material is used as an ornamentation for fancy effects.

As the rayon-containing fabrics proved to be successful in the retail stores, the creative effort of the ultra progressive textile manufacturer brought to the fore fabrics of a more staple character, such as voiles, chiffons, satins, crepes for the dress goods trade, and a variety of fancies such as mufflers, plaids, striped fancies and jacquard faconnes, of all-rayon fabrics, for the neckwear trade.

Textile manufacturers who ventured into the new field of all-rayon fabrics were obliged to learn by repeated experiments how to handle rayon material successfully; many troubles have disclosed to them that the rayon with its delicate filaments, particularly the multi-filament yarn, has to be handled with greater care and attention than silk in the grege or silk dyed in the skein requires. Therefore, it cannot too strongly be pointed out that good judgment in the construction of an all-rayon fabric is essential, and a sample must be thoroughly tried out before accepting an order on a large scale for a new fabric that differs greatly in its

construction from an all-silk fabric of a like nature but finer construction.

It is the object of this article to present a few concrete instances of fabric constructions that have stood the test of fair production if handled as described in my previous article.*

Cloth sample Figure 1 is an all-rayon surface printed flat crepe.

Construction of the Cloth:

Width of cloth finished, 39 inches.

Ground: Reed 36 dents per inch 3/1 ends per dent = 108/1 ends per inch.

Edge: Reed 36 dents per inch 3/1 ends per dent = 24/1 ends on each side.

Filling: Shot 56 picks per inch, 1 end per pick, shot 2 picks right and 2 picks left twist.

Materials used:

Ground: 150 denier viscose 36 filaments, 2 1/2 turns.

Edge: 80 denier viscose 30 filaments 2 thd., 10/8 turns.

*The Melliand, February, 1930, Vol. I, No. 11, page 1706.

Filling: 150 denier viscose 36 filaments, 55 turns crepe twist right and left.

Warping Disposition:

Width in reed raw state, 43 inches.

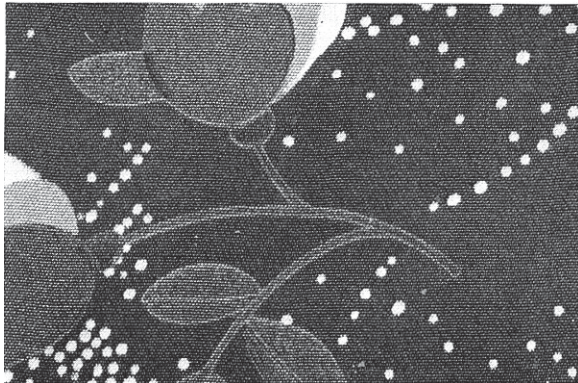


Fig. 1 All-Rayon Surface Printed Crepe de Chene

Woven length raw state, 100 yards.

Due allowance must be made for take-up and shrinkage of cloth.

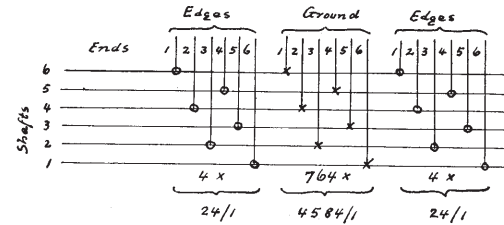


Fig. 2 Diagram showing draft

Weave Pattern:

The weave pattern at A, Figure 3, is designed to illustrate the cloth as coming off the loom. Pattern at B is designed to fit the harness.

The warp ends are drawn in the heddles of the shafts as follows:

- End 1 is drawn in on the 6th. shaft
- End 2 is drawn in on the 4th. shaft
- End 3 is drawn in on the 2nd. shaft
- End 4 is drawn in on the 5th. shaft
- End 5 is drawn in on the 3rd. shaft
- End 6 is drawn in on the 1st. shaft

A				B																
Cloth weave				Harness Chain																
ENDS	1	2	3	4	5	6	SHAFTS	1	2	3	4	5	6	ENDS	6	4	2	5	3	1
PICK 1	W	W	W	W	W	W	1	W	W	W	W	W	W	BOX 1	1	2	1	2	1	2
2	W	W	W	W	W	W	2	W	W	W	W	W	W	2	1	2	1	2	1	2
3	W	W	W	W	W	W	3	W	W	W	W	W	W	3	1	2	1	2	1	2
4	W	W	W	W	W	W	4	W	W	W	W	W	W	4	2	1	2	1	2	1
5	W	W	W	W	W	W	5	W	W	W	W	W	W	5	1	2	1	2	1	2
6	W	W	W	W	W	W	6	W	W	W	W	W	W	6	1	2	1	2	1	2
7	W	W	W	W	W	W	7	W	W	W	W	W	W	7	2	1	2	1	2	1
8	W	W	W	W	W	W	8	W	W	W	W	W	W	8	2	1	2	1	2	1

Fig. 3 Cloth weave and Harness Chain

Warp Particulars:

- Ground: Reed 36/3/1, length 120 yds. } inclusive
 - Edge: Reed 36/3/1, length 120 yds. }
- take-up in weaving and shrinkage of finished cloth.,

Warp layout:

- 8 dents edge: 24/1 2 thd. 80 den. viscose 10/8 turns, 3/1 per dent.
- 1528 dents ground: 4584/1, 150 den. viscose 2 1/2 turns, 3/1 per dent.
- 8 dents edge: 24/1 2 thd. 80 den. viscose, 10/8 turns, 3/1 per dent.

The entire ends to be warped on one beam. The entire warp to be machine dressed.

Entering:

A harness of 6 shafts is required for the entering of the warp ends in the heddles of the harness. The ends are drawn in skip as per diagram at Figure 2. The circle stands for the edges, the cross for the ground ends.

The edges are drawn in on the same shafts, being part of the ground weave.

The cloth sample at Figure 4 is an all-celanesse satin and Gro de Londre Raye piece dyed cloth.

Construction of Cloth:

- Width of cloth finished, 24 inches.
- Satin on beam 1; reed 45 dents per inch 6/1 ends per dent = 270/1 ends per inch.
- Gro de L. on beam 2; reed 45 dents per inch 3/1 ends per dent = 135/1 ends per inch.
- Edges on anchors; reed 45 dents per inch 2/1 ends per dent = 20/1 ends on each side.
- Filling; shot 88 picks per inch 1 end per pick single shuttle.

Material Used:

- Satin Beam 1: 75 denier celanesse 20 fil. single raw, 5 turns per inch.

Gro de L. Beam 2: 75 denier celanese 20 fil. single raw, 5 turns per inch.
 Edge Anchors: 75 denier celanese 20 fil. 2 thd. raw organ, 12/10 turns per inch.

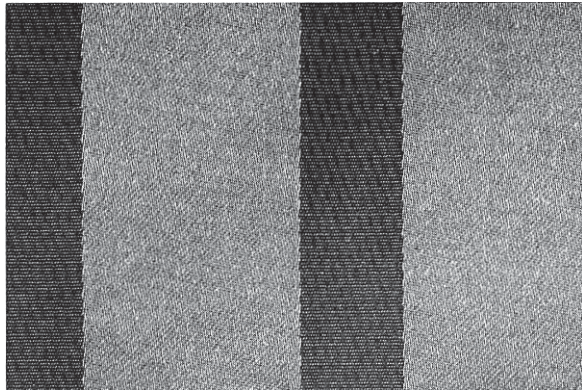


Fig. 4 All-Celanese Satin Gro de Londré

Filling: 150 denier celanese 40 fil. single raw, 2 1/2 turns.

Warping Disposition:

Width in reed raw state, 24.50 inches.
 Woven length raw state, 100 yds.

Due allowance must be made for take-up and shrinkage of cloth, if any. (In this case there is no shrinkage of cloth in the finished state.)

Warp Particulars:

Satin beam 1; reed 45/6/1, length 106 yards.	} inclusive	
Gro de L; beam 2 reed 45/3/1, length 110 yards.		} take-up
Edges on anchors; reed 45/2/1, length 110 yards.		

Warp Layout:

10 dents edge: 20/1 75 den. celanese 2 thd. organ 12/10 turns.

42	}	dents satin: 104/1 75 den. celanese single 5 turns.	} outside
		dents satin: 152/1 75 den. celanese single 5 turns.	
24	}	dents Gro. de L.: 72/1 75 den. celanese single 5 turns.	} 1 repeat 14X
42		}	
	}		dents satin: 104/1 75 den. celanese single 5 turns.
10		dents edge: 20/1 75 den. celanese 2 thd. organ 12/10 turns.	

Total ends to cover the entire 24.50 inches of reed width.

The satin: 4464/1 ends of 75 den. single celanese 20 fil. 5 turns raw.

The Gro de Londré: 1008/1 ends of 75 den. single celanese 20 fil. 5 turns raw.

The edge: 40/1 ends of 75 den. 2 thd. celanese 20 fil. 12/10 turns raw.

The entire warp to be machine dressed.

Entering:

A harness of 18 shafts is required for the entering of the warp ends and the edges in the heddles of the harness. The ends are drawn in skip as per diagram at Figure 5. The circle stands for the edges, the cross for the satin, and the dots for the Gro. de Londré.

Weave Pattern:

The weave pattern at A, Figure 6, is designed to illustrate the cloth as it comes off the loom. Pattern at B is designed to fit the harness.

The warp ends are drawn in the heddles of the shafts as follows:

End 1	on the 14th shaft
" 2	" " 12th "
" 3	" " 10th "
" 4	" " 8th "

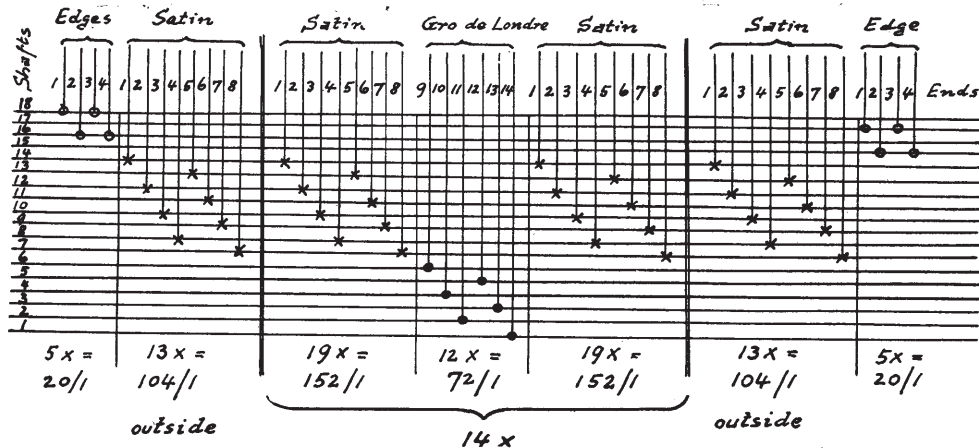


Fig. 5 Diagram showing draft

End 5 on the 13th shaft
 " 6 " " 11th "
 " 7 " " 9th "
 " 8 " " 7th "
 " 9 " " 6th "
 " 10 " " 4th "

Warp Particulars:

Ground: reed 44/4/1, length 110 yds. } inclusive
 Edge: reed 44/2/2, length 110 yds. }
 take-up in weaving.

Warp Layout:

6 dents Edge: 12/2 white 78/2 merc. cotton comb.

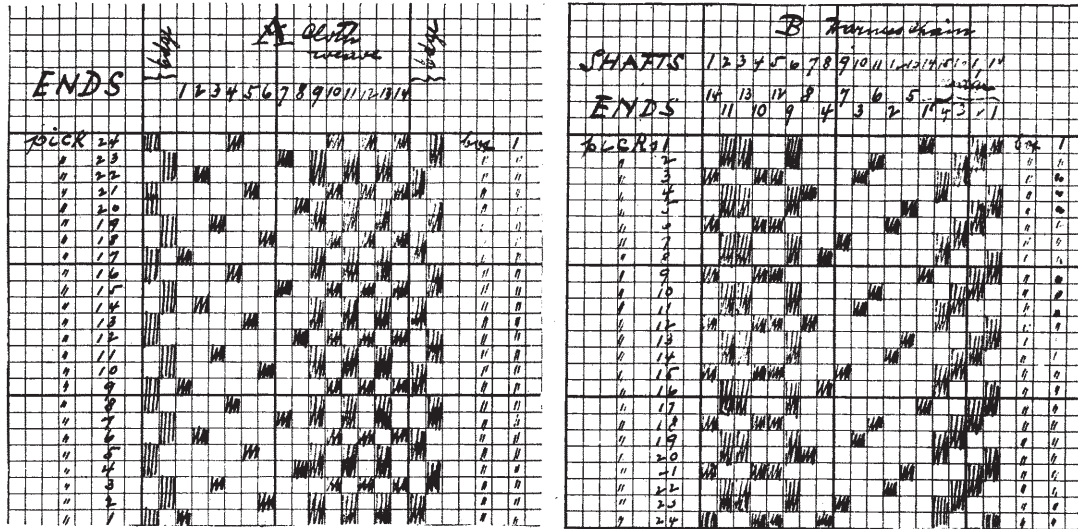


Fig. 6 Cloth weave and harness chain

" 11 " " 2nd "
 " 12 " " 5th "
 " 13 " " 3rd "
 " 14 " " 1st "

The edges are drawn in on extra 4 shafts as follows:

End 1 on the 18th shaft
 " 2 " " 16th "
 " 3 " " 17th "
 " 4 " " 15th "

The cloth sample at Figure 7 is an all-rayon louisine plaid skein dyed.

Construction of Cloth:

Width of cloth finished, 24 inches.

Ground: Reed 44 dents per inch 4/1 ends per dent = 176/1 ends per inch.

Edge: Reed 44 dents per inch 2/2 ends per dent = 12/2 ends on each side.

Filling: Shot 44 picks per inch 2 ends per pick, two shuttles box chain.

Materials Used:

Ground: 80 den. viscose 30 filaments, 6 turns.

Edge: 78/2 merc. cotton comb. peeler, 30 turns.

Filling: 150 denier celta 40 filaments, 2 1/2 turns.

Warping Disposition:

Width in reed, 25.20 inches unfinished.

Woven length, 100 yds. unfinished.

peeler, 30 turns, 2/2 per dent.

15 dents Ground: 60/1 white 80 den. viscose 30 filament, 6 turns, 4/1 per dent. } 36X
 15 dents Ground: 60/1 brown 80 den. viscose 30 filament, 6 turns, 4/1 per dent. }

15 dents Ground: 60/1 white 80 den. viscose 30 filament, 6 turns 4/1 per dent.

6 dents Edge: 12/2 white 78/2 merc. cotton comb. peeler, 30 turns, 2/2 per dent.

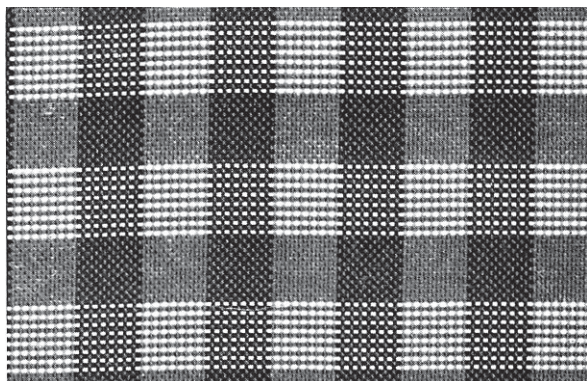


Fig. 7 All-Rayon Plaid for Neckwear

All the ground ends to be warped on one beam. The edges to be warped on anchors. The viscose is skein dressed at the dyer, special process.