LOT Classification of Fabric Shades in Garment Enterprises

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ABSTRACT: *LOT classification of fabric shades plays an important role in maintaining the quality, progress and efficiency of the production process in garment factories. This article has summarized and analyzed the LOT classification of fabric shades process of 3 factories specializing in garment production. As a result, this article has analyzed and proposed the LOT classification of fabric shades process from fabric sampling, cutting samples, arranging fabric pieces, color comparison, color grouping, fabric sample storage and reporting. This process helps to ensure that each fabric LOT has uniform color and respond the required quality, thereby avoiding shade color problems in garment products.*
Keywords: Fabric LOT, shade of fabric, garment

I.   INTRODUCTION

LOT classification of fabric shades for production in garment factories divides fabric into lots (LOT) according to each color or color group to serve the garment industry. Each LOT can include a quantity of fabric that is uniform in color, material, thickness, and other technical characteristics [1].

LOT classification of fabric shades helps garment factories manage materials, divide fabrics by color and type to easily track the quantity, quality and inventory status of each type of fabric, avoiding shortages or surpluses. Ensuring color synchronization in production, LOT classification of fabric shades helps ensure that finished garments have uniform colors, avoiding color differences between different fabric batches [2]. Optimizing the production process, fabric batches with similar colors will be used at the same time, helping to minimize the transition time between different colors during production. Quality control, LOT classification of fabric shades also helps businesses easily check and handle quality issues related to each type of fabric, thereby improving the quality of the final product. Easily track the origin and history of fabric use, each LOT will have a code and information related to import, production and use, helping to quickly retrieve information about the origin of the fabric when needed.

LOT classification of fabric shades plays an important role in maintaining the quality, progress and efficiency of the production process in garment factories

II.   RESEARCH METHODS

Object and scope of the study

LOT classification of fabric shades at some garment factories with production workshops in the North of Vietnam. These factories use the LOT classification of the fabric shades process to serve the garment industry.

Methods

The method of analyzing and synthesizing data on LOT classification of fabric shades at some garment factories is used. To connect and collect LOT classification of fabric shades data, the method of collecting documents, visiting and directly exchanging with departments related to LOT classification of fabric shades of garment factories is used.

III. RESULTS AND DISCUSSION

LOT classification of fabric shades helps ensure that garments have consistent color and meet aesthetic requirements throughout the production process. Depending on each factory, the process of performing LOT classification of fabric shades is customized to suit the production at that factory. Below is the LOT classification of fabric shades process of some garment factories.

3.1. LOT classification of fabric shades in the Song Hong Garment Joint Stock company

Process at LOT classification of fabric shades department.

When the fabric has been imported into the warehouse, the material warehouse staff is responsible for cutting 100% of the ends of the rolls, noting the number of rolls, yards, lot numbers, and transferring them to the

LOT classification of the fabric shades department to check the color shade. The LOT classification of the fabric shades department receives the ends of the rolls from the fabric warehouse. 100% of the fabric rolls are cut to the ends of the fabric rolls with a size of 50cm x 20cm (50cm in width and 20cm in length of the fabric roll). The ends of LOT noted the customer's name, item code, color, lot number, number of rolls, number of yards or meters, and the supplier's LOT.

When LOT classification of the fabric shades, if the fabric is used for unwashed garments, place the fabric rolls 3cm apart, and rotate the ends of the rolls to one group. To assign color LOTs, assign the largest number of rolls of the same shade to LOT 1. Then, assign to the following LOTs.

If the fabric is used for washing, it is necessary to separate the color LOT before washing. To divide the color LOT, arrange the fabric rolls 3cm apart, and change the position of the ends of the rolls to one group. To assign the color LOT, assign the rolls with the same color shade with the largest quantity to LOT 1. Then, proceed to assign the next LOTs. After washing, the fabric needs to be divided into color LOT. It is necessary to check the color LOT after washing. If there is a change between the ends of the rolls, it is necessary to correct the color LOT report data.

After the LOT classification of the fabric shades, a report needs to be made. The information needs to be clearly stated at the top of the fabric roll. The report needs to be revised after checking the washing sample (if any). These reports will be sent to the material balance department, technical department, QA department, and factories.

After sending the report, the color LOT division needs to make fabric samples. For unwashed goods, it is necessary to make 3 samples, of which one fabric sample is kept, one sample is sent to the factory, and one sample is sent to the buyer to confirm the color of the fabric. For washed goods, it is necessary to make a color LOT for washing inspection. At that time, the color LOT division needs to make 4 sets of samples, of which 2 samples are sent for washing, 2 samples are kept for comparison after washing and inspection. For samples sent to the washing factory, they use the samples for comparison during the washing process. Specify the color LOT from the number of looms, the number of yads, the LOT number... from the sample after washing and inspection. From the sample set before washing, it will be converted to the number of looms, the number of yads, the LOT number and sent to the cutting house of the factory to make a comparison sample during the cutting process.

To check the color of the fabric, it is necessary to take samples of the original fabric and pieces of fabric cut from the sampled rolls and compare the color on a light box under at least 2 light sources D65 and TL84.

LIGHT BOX

Table 1. Corporate quality assurance department of crystal group collect different customer light box.

Buyer	Primary	Secondary	Tertiary	Light box
A&F	INCA	U35		Macbeth Spectralight ® II/III Light box
Ann Taylor	CWF	D65	A	
Charming	TL84	D65		
Dollar General	D65			
Eddie Bauer	D65	CWF	INCA	Macbeth Spectralight ® II/III Light box
JCPenney	U3000	D65		

D65 : Daylight
CWF = Cool White Fluorescent
INCA : Incandescent A 28560 Kelvin
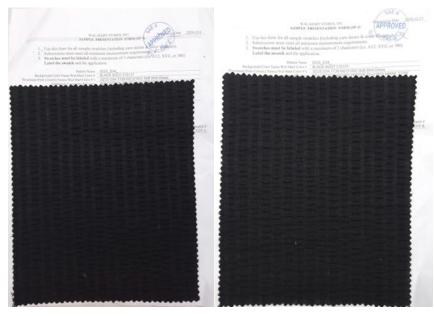TL 84 : Tube Light 84
U3000 : Ultralume 3000

Figure 1: The color LOT sent by buyer with code 51643 [1, 2]

Figure 2: Image of the color LOT before and after washing code 51643 [1, 2]

LOT color report results, figure 3.

SHADE BAND INSPECTION REPORT
Style: CLBA 97
Colour: Black
Total of Rolls: 164 Rolls
Total of Yads: 164 Yads
Date: 8/1/2025
Quantity: 344

LOT 1				LOT 2				LOT 3				LOT 4				LOT 5			
No.	Roll no.	Yads	LOT of buyer	No.	Roll no.	Yads	LOT of buyer	No.	Roll no.	Yads	LOT of buyer	No.	Roll no.	Yads	LOT of buyer	No.	Roll no.	Yads	LOT of buyer
1	1	65	17	1	1	107	37	1	1	99	55	1	1	119	59	1	1	123	1
2	2	88	17	2	2	123	37	2	2	83	55	2	2	93	59	2	2	80	1
3	3	88	17	3	3	43	37	3	3	106	55	3	3	90	59	3	3	79	1
4	4	106	17	4	4	100	37	4	4	116	55	4	4	98	59	4	4	86	1
5	5	60	17	5	5	135	37	5	5	81	55	5	5	88	59	5	5	96	1
6	6	50	17	6	6	120	37	6	6	82	55	6	6	109	59	6	6	100	1

7	7	34	17	7	7	140	37	7	7	122	55	7	7	50	59	7	7	88	1
8	8	39	17	8	2	100	43	8	10	100	55	8	8	83	59	8	8	75	1
9	9	118	17	9	3	47	43	9	1	133	64	9	9	79	59	9			
10	1	116	40	10	4	133	43	10	2	121	64	10	1	118	15	10			
11	2	42	40	11	6	67	43	11	3	145	64	11	2	115	15	11			
12	3	110	40	12	7	125	43	12	4	150	64	12	3	136	15	12			
13	4	114	40	13	8	90	43	13	5	133	64	13	4	43	15	13			
14	5	70	40	14	9	69	43	14	6	119	64	14	5	108	15	14			
15	6	113	40	15	2	98	50	15	1	116	65	15	6	122	15	15			
16	7	115	40	16	3	111	50	16	2	103	65	16	7	50	15	16			
17	8	102	40	17	4	109	50	17	3	68	65	17	8	99	15	17			
18	1	74	57	18	5	89	50	18	4	120	65	18	1	135	22	18			
19	2	65	57	19	6	94	50	19	5	77	65	19	2	140	22	19			
20	3	123	57	20	7	78	50	20	6	75	65	20	3	110	22	20			
21	4	139	57	21	8	105	50	21	7	77	65	21	4	141	22	21			
22	5	95	57	22	9	118	50	22	8	75	65	22	5	116	22	22			
23	6	77	57	23	1	98	52	23	9	102	65	23	6	106	22	23			
24	7	93	57	24	2	95	52	24				24	2	147	67	24			
25	8	83	57	25	3	98	52	25				25				25			
26	9	44	57	26	4	45	52	26				26				26			
27	1	74	66	27	5	60	52	27				27				27			
28	2	70	66	28	6	98	52	28				28				28			
29	3	115	66	29	7	92	52	29				29				29			
30	4	131	66	30	8	95	52	30				30				30			
31	5	110	66	31	9	62	52	31				31				31			
32	6	130	66	32	10	33	52	32				32				32			
33	7	77	66	33	3	57	2	33				33				33			
34	8	79	66	34	4	100	2	34				34				34			
35	1	100	28	35	5	55	2	35				35				35			
36	2	137	28	36	6	27	2	36				36				36			
37	3	44	28	37	1	137	48	37				37				37			
38	4	71	28	38	2	143	48	38				38				38			
39	5	71	28	39	3	105	48	39				39				39			
40	6	108	28	40	4	125	48	40				40				40			
41	7	94	28	41	5	123	48	41				41				41			
42	8	90	28	42	6	128	48	42				42				42			
43	9	80	28	43	1	110	62	43				43				43			
44	1	72	53	44	2	110	62	44				44				44			
45	2	82	53	45	3	127	62	45				45				45			
46	3	128	53	46	4	129	62	46				46				46			
47	4	120	53	47	5	110	62	47				47				47			
48	5	80	53	48	6	117	62	48				48				48			
49	6	108	53	49	7	121	62	49				49				49			
50	7	55	53	50				50				50				50			

51	8	56	53	51			51			51			51		
52	9	87	53	52			52			52			52		
53	1	81	63	53			53			53			53		
54	2	80	63	54			54			54			54		
55	3	105	63	55			55			55			55		
56	4	111	63	56			56			56			56		
57	5	81	63	57			57			57			57		
58	6	72	63	58			58			58			58		
59	7	49	63	59			59			59			59		
60	8	92	63	60		4801	60		2403	60		2495	60		
	Total	5263			Total			Total			Total			Total	727

Reported by   **Figure 3: Color LOT report [1, 2]**

The fabric will be initially stored in the original package, then cut to take samples to check for shrinkage and LOT classification of the fabric shades. Cut the entire 20cm fabric and make a " ten thousand flags". After that, the fabric is brought to the laboratory to conduct the testing and color analysis stages. Follow the steps and flow of the fabric laboratory.

The fabric is stacked and squares are drawn to sew and compare the color, figure 4.

Figure 4. Sewing the flag panels together to compare color tones [3]

Color confirmation flow:
- Classify according to product style, color of fabric samples
- Arrange fabric samples based on batch number and roll number in order from small to large
- Classify fabric samples from the first roll and roll according to batch number, roll number
- Write the batch number, roll number on the fabric sample and then paste it on the sample table.
- On the sample table, write the contract number, product code, raw material code, color code, date
- Put the sample table under the light of the fabric light box to observe and compare
- Based on the color classification, register for reservation and distribute.

Figure 5. Conducting color test [4]

Fabric testing process:

Based on the label on the fabric to fill in the basic information in the fabric testing report (order, fabric type, color, fabric width, meter number). Then, compare the color chart confirmed by the buyer, compare the color difference chart of the batches provided by the fabric factory, compare the tested fabric with the fabric testing report of the fabric factory. For each batch color difference chart, cut a piece of fabric from the beginning, middle and end, each piece is cut into 6 pieces, according to 1,4,2,5,3,6, sewn in order of beginning, middle, end to see the color difference on a piece of fabric.

3.3. LOT classification of fabric shades in the Nam Tien Nam Dinh Joint Stock Company

LOT classification - cutting the end of the roll. After fabric are brought to the temporary import location and all related procedures in this area are completed, LOT classification and cutting of the end of the roll must be carried out. Based on the packing list and the stamp on the fabric roll, the fabric must be sorted into LOTs, types and colors. All fabric rolls must be cut into 10cm x 10cm square samples at the end of the roll and sent to the QA department for color comparison and LOT grouping. Each fabric sample must be fully noted with the number of fabric rolls/fabric LOT/fabric roll length according to the convention xx/yy/zz, where xx is the number of fabric rolls, yy is the number of fabric LOT, zz is the length of fabric roll [5].

Sampling method: Each fabric lot must check at least 10% of the Lot of all POs. When sampling, the number of fabric rolls will be rounded up to the next roll. Check the information on the packing list to match the label on the top of the fabric roll.

After checking all the information, start checking the appearance of the fabric roll before opening the poly bag to ensure that the fabric roll is not damaged. If the appearance check meets the requirements, start cutting the poly bag to cut the top of the roll. Measure the first yard of the fabric roll to cut to test the fabric. Then take another 20cm to cut to check the color, group the Lot, and write full information on the fabric piece.

Color comparison: Based on the packing list, technical documents, color chart issued by the technical department, re-check the information on the fabric to match the Packing list and record it in the report. Then, compare the color of the original fabric sample with the fabric in the roll.

QA performs cutting, sewing, and checking the color difference of the fabric. If the fabric has a clear color difference with the eyes, notify the warehouse manager for handling.

3.4. Proposed process for LOT classification of the fabric shades in garment factory

LOT classification of the fabric shades is an important step in ensuring that fabric lots are uniform in color and respond the required production standards. Below is a suggested LOT classification of the fabric shades process:

Step 1. Pick the fabric

Select the fabric roll to be tested: Determine which fabric roll will be sampled for LOT classification of the fabric shades. Each fabric roll must be fully marked with information such as roll code, color, supplier and date of receipt.

Check storage conditions: Before picking the fabric, make sure the fabric roll is stored in good conditions (dry, away from direct sunlight).

Step 2. Cut fabric samples

Determine sample size: Cut fabric samples of standard size, usually from 10x10 cm to 20x20 cm depending on the requirements of the inspection process. However, sample size may vary depending on the type of fabric and the requirements of the inspection department.

Sampling location in the fabric roll: Fabric samples are cut at different locations in the roll to ensure representation of the color and quality of the fabric on the entire roll. Avoid cutting in areas with defects or uneven color, cut in the center and edges of the fabric roll for an overall view.

Step 3. Sorting the Fabric Pieces

Collecting the cut fabric samples: After cutting, the fabric samples from different rolls need to be sorted separately by color group.

Marking the fabric pieces: Label each fabric piece with clear information such as fabric roll code, color, and other details to avoid confusion during the LOT process.

Step 4. Color Comparison

Using a color testing device: Use a spectrophotometer or colorimeter to compare the color of fabric samples with the established standards. This device helps to accurately measure the difference in light and color, helping to identify small changes in the color tone of the fabric.

Conducting color comparison: Place the fabric sample in the colorimeter and compare it with the standard color chart or previously accepted sample. The system will measure the color index (XYZ, Lab* or RGB index). Compare these indexes with the prescribed color indexes to determine whether the fabric sample meets the color requirements.

Step 5. Color Grouping

Grouping by Color Similarity: Based on the color measurement results from the device, the fabric samples will be grouped into LOTs with similar colors. These groups may include the same or similar color tones. If there is a small but acceptable difference, the fabric can be grouped into one group, but if there is a clear deviation, the samples will be grouped into separate groups.

Color LOT Marking: After grouping, each color group will be clearly marked and noted with the color, LOT code, fabric quantity and other necessary information.

Step 6. Storage and tracking

Fabric sample storage and reporting: The fabric samples that have been assigned to LOTs will be stored and preserved so that they can be compared with the sewing products later if needed.

Update information into the system: Update the results of fabric color LOTs into the management system to track and ensure the correct fabric color is used for each production order.

This process helps to ensure that each fabric LOT has a consistent color and meets the required quality, thereby avoiding color problems in the garment.

IV. CONCLUSION

LOT classification of the fabric shades plays an important role in maintaining the quality, progress and efficiency of the production process in garment factories. This article has summarized the LOT classification of the fabric shades processes of 3 companies specializing in garment manufacturing. Based on the LOT classification of the fabric shades process of companies specializing in garment manufacturing, this article has analyzed and proposed the LOT classification of the fabric shades process from fabric sampling, sample cutting, fabric piece arrangement, color comparison, color grouping, fabric sample storage and reporting. This process helps to ensure that each fabric LOT has uniform color and meets the required quality, thereby avoiding color problems in the final product.

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