Analysis of sewing defects and control measures for apparel industry

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Abstract

Sewing is the stage in apparel manufacturing process sequence where large number of work force is employed compared to other stages of manufacturing processes. The quality of garments made in sewing depends upon various factors such as skill of sewing machine operator, machine settings, fabric and thread quality etc. Since many factors involved in determining the quality of product, possibility for occurrences of defects is also very high. In order to achieve maximum productivity and efficiency in sewing room, it is important to control and minimize the defects in sewing process. In this project an attempt is made to study the various defects occurs in sewing room for 10 different garment styles. The data collected has been analysed and suitable remedial measures have been supported. The study reveals but there is scope for improvement of productivity by effective management and quality of production.

Keywords — *Sewing, Defects, Garment Styles .*

I. INTRODUCTION

Sewing process is one of the most important stages in garments production. During production in sewing process can be create some faults or defects, that can be causes low quality of the garments item. Some faults are recoverable and some cannot recoverable. Sewing faults can be causes of lower price of products, which not economical friendly for the garments industries. Rapid detection of a sewing defect is significant to optimization of the relationship between quality and productivity. Defects found after sewing negatively affect costs of the product. There is different plus to identifying an imperfection before other operations hinder seam removal and re sewing. This observation is based upon the current system in which the operator serves as the first line of quality control implementation. And other sewing stations have no operator to serve in the first line quality control position. Then finally assessment procedure of defect was done and find out the best suggestion (1).

II. METHODOLOGY

Ten different garment styles covering kids wear, ladies wear and men's wear were chosen for the study. In each style, data related to types of defects occurred, causes for the defects and the number of defects were recorded and analysed. Remedial measures were suggested to minimize the defects and to improve quality.

III. FINDINGS

A. Skirt

Order Quantity. : 662
Cut Pieces Quantity. : 800

Hour / Defect Type	**I Hour**	**II Hour**	**III Hour**	**IV Hour**	**V Hour**	**Total Pieces**
Zero Defect	97	116	150	115	102	580
Stain	20	15	8	13	14	70
Hole	8	2	3	2	5	20
Rework	37	30	21	19	23	130
Total	162	163	182	149	144	800

Type of Fault	Operation	Remedial Measure	Number of Defective Pieces
Waistband uneven & open seam	Waistband elastic attachment	Change operator & Machine	42
Broken stitch	Bottom, side seam	Machine change	25
Skip stitch	Bottom hem flat lock	Repair & rectified	26
Label in-out	Label attachment	Change the operator	37
Printing mistake (oil)	Artwork front & back	Cut panel inspection	45
Fabric oil	Panel attachment	Cut panel inspection	25
Fabric Hole	Panel attachment	Cut panel inspection	7
Needle hole	Side Seam	Needle change	13
Total			220
% Defectives			27.5

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Centre out	Waistband attachment	Cutting problem. Return & reshape the panels	19
Centre out	Pocket placement	Follow-up the pattern	23
Broken stitch	Bottom hem (turn-up)	Singer Machine set 3*3	10
Uneven stitch	J-stitch	Educate the operator	3
Broken stitch	Eyelet	Adjust the Machine setting	11
Broken stitch	Embroidery	Cut panel inspection	4
Needle Line in Fabric & Holes	Panel attachment	Cut panel inspection	23
Oil Stain	Panel attachment	Cut panel inspection	7
		Total	100
		% Defectives	15.38

B. Bermuda

Order Quantity. : 590

Cut Pieces Quantity. : 650

C. Leggings

Order Quantity. : 781

Cut Pieces Quantity. : 870

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	0	180	100	130	140	550
Stain	0	5	0	1	1	7
Hole	0	1	6	0	1	8+15 *(rejection)
Rework	0	25	30	9	6	70
Total	0	211	136	140	148	650*

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	100	147	136	183	170	736
Stain	0	0	0	0	0	53*(printing mistake)
Hole	2	0	3	0	0	5
Rework	25	13	14	10	14	76
Total	127	160	153	193	184	870*

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Uneven stitch	U' joint & elastic	Educate the operator	24
Gathering	Leg	Adjust the Machine setting	32
Unsecured stitch	Label attachment	Educate the operator	7
Skip stitch	Waistband & leg open	Servicing the Machine	10
Open seam	Rise	Educate the operator	3
Printing Mistakes	Printing	Cut panel inspection	53
Fabric hole	-	Cut panel inspection	5
		Total	134
		% Defectives	15.40

D. T-shirt

Order Quantity. : 707
Cut Pieces Quantity. : 780

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	61	130	100	183	198	672
Stain	3	1	2	0	0	37
Hole	0	0	2	0	2	4
Rework	23	12	14	8	10	67
Total	87	143	118	191	210	780

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Centre out	Placket	Check the Marking & Pattern follow-up	8
Print seat out	Chest print	Cut panel inspection	31
Placement out	Pocket attachment	Follow-up the pattern	14
Skip stitch	Placket & 'X' stitch	Machine adjustment	18
Unsecured	Label attachment	Educate the operator	7
Broken stitch	Bottom hem	Change sewing thread (2ply)	5
Broken	Button fixation	Re-join the buttons	6
Uneven stitch	Neck	Educate the operator	9
Oil	Panel & sleeve	Oil Stain Removal	6
Fabric hole	Knitting	Cut panel inspection	4
		Total	108
		% Defectives	13.85

E. Sleeveless top

Order Quantity. : 756
Cut Pieces Quantity. : 795

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	96	145	157	141	172	711
Stain	5	0	2	3	1	11
Hole	2	1	0	1	0	4
Rework	21	13	10	11	14	69
Total	**124**	**159**	**169**	**156**	**187**	**795**

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Fabric Hole	Panel	Cut panel inspection	4
Oil	Panel	Cut panel inspection	3
Printing mistake	Placement, Seat out, & cracks	Cut panel inspection	8
Bowing	Bottom hem	Machine setting	14
Open seam	Bow rope & piping	Educate the operator	12
Shape out	Neck shape	Change the operator	20
Unsecured	Label & Peak	Change the operator	18
Missing	Label	Trained the helper & operator	5
		Total	84
		% Defectives	10.57

F. Kids Leggings
Order Quantity. : 624
Cut Pieces Quantity. : 660

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	109	122	119	134	113	597
Stain	3	1	1	1	3	9
Hole	1	0	1	0	1	3
Rework	15	8	6	12	10	51
Total	128	131	127	147	127	660

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Fabric Hole	Panel	Cut panel inspection	3
Fabric oil	Panel	Cut panel inspection	9
Fleet	Crotch	Change the operator	21
Open seam	Cuff	Educate the operator	12
Unsecured	Side cuff band	Educate the operator	12
Missing	Wash care label	Trained the helper & operator	6
		Total	63
		% Defectives	9.55

G. Round Neck T-shirt
Order Quantity. : 535
Cut Pieces Quantity. : 570

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	96	103	110	107	103	519
Stain	4	1	0	0	1	6
Hole	3	0	0	1	2	6
Rework	11	7	5	9	7	39
Total	114	111	115	117	113	570

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Oil Stain	Panel	Cut panel inspection	6
Fabric Hole	Panel	Cut panel inspection	6
Loose stitch	Bottom	Machine Service	4
Skip stitch	Sleeve hem & Neck	Needle change	6
Unsecured	Dorsal fin	Educate the operator	10
Placement	Body fin (Print)	Cut panel inspection	6
Uneven	Neck stitch	Trained the operator	9
Wrong placement	Label	Educate the operator	4
		Total	51
		% Defectives	8.95

H. Style : Romper
Order Quantity. : 545
Cut Pieces Quantity. : 590

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	90	105	102	109	104	510
Stain	4	3	2	1	2	12
Hole	3	1	0	3	0	7
Rework	19	15	12	6	9	61
Total	116	124	116	119	115	590

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Oil Stain	Panel	Cut panel inspection	12
Hole	Panel	Cut panel inspection	3
Needle hole (Fabric Hole)	Panel	Cut panel inspection	4
Fleet	Crotch	Trained the operator	9
Unsecured	Snap button, Dorsal fin	Re-joining	14
Skip stitch	Side	Machine service	5
Improper	Placket	Follow-up the pattern	10
Uneven	Neck	Educate the operator	16
Bowing	Sleeve	Educate the operator	7
		Total	80
		% Defectives	10.34

I. Style : Track pant
Order Quantity. : 798
Cut Pieces Quantity. : 836

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	145	159	156	154	161	775
Stain	5	1	2	4	2	14
Hole	3	1	0	0	2	6
Rework	11	8	9	5	8	41
Total	164	169	167	163	173	836

TYPE OF FAULT	OPERATION	REMEDIAL MEASURE	NUMBER OF DEFECTIVE PIECES
Oil Stain	Panel	Cut panel inspection	14
Fabric Hole	Panel	Cut panel inspection	6
Uneven	Leg	Educate the operator	11
Missing	Label	Trained the helper & operator	6
Twisting	Out seam	Solve the problem with line sup.	9
Open seam	Cuff rib	Educate the operator	5
Fleet	V' joint	Educate the operator	3
Unforward	Inseam	Machine setting	7
		Total	61
		% Defectives	7.3

J. Kids Top

Order Quantity. : 402

Cut Pieces Quantity. : 425

Hour / Defect Type	I Hour	II Hour	III Hour	IV Hour	V Hour	Total Pieces
Zero Defect	77	77	77	77	80	388
Stain	4	0	0	1	0	5
Hole	2	1	0	0	0	3
Rework	5	6	6	6	6	29
Total	88	84	83	84	86	425

Type of Fault	Operation	Remedial Measure	Number of Defective Pieces
Oil	Panel	Cut panel inspection	5
Hole	Panel	Cut panel inspection	3
Fleet	Sleeve	Educate the operator	6
Gathering	Waist	Machine setting	3
Uneven	Neck & cuff rib	Educate the operator	7
Uneven	Neck stitch	Educate the operator	5
Skip stitch	Neck & Bottom	Needle change	4
Broken & Miss	Buttons	Re-join	4
		Total	37
		% Defectives	8.7

IV. CONCLUSIONS

From the study it has been found that defective garment made in the sewing room varies accordingly to the garment style and it ranges from 7.3% to 27.5%. Out of the various defects occur in garments, fabric hole and oil stain accounts for 18 to 43% for various styles. Hence by adopting a vigilant fabric inspection before sewing will help to reduce defectives drastically.

Following remedial measures can be taken to reduce the defects.

To avoid sewing defects:

- Periodic service of Sewing Machines
- Skill training to operators
- Selection of Right quality sewing threads
- Using correct needle size

To avoid Oil Stain

- Cut panel inspection to be done thoroughly
- Operators should use Gloves to handle bleached samples
- Correct Machine service

To avoid fabric holes:

- Cut panel checking.

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