

ABSTRACT

Various class of dye have different fastness properties to various extents. Even dyes those who are belonging to the same class have widely varying fastness properties. A single dye which dyes all the textile material (fiber) is not made yet. In present study acid dye was used for silk fabric because silk is a protein fiber so acid dye is excellent for printing and Indalca gum is stable in both acidic and alkaline conditions so it is good for printing with acid dye on silk. Applying colour on fabric in different shape or design is textile printing. In textile printing colour is bounded with fabric. Various printing style were used for printing. After printing or dyeing it is necessary to have excellent fastness. For checking the fastness, various tests were done. These were washing, rubbing fastness and blue wool scale was used to assess the light fastness.

I. INTRODUCTION

A dye is a coloured substance that has an affinity to the substrate to which it is being applied for print dye is used with thickener. Dye is generally applied with gum to fabric in definite patterns. Synthetic dyes are manmade. These dyes are made from synthetic resources such as petroleum by products and earth minerals. Acid dyes are water soluble anionic and are applied to fiber such as silk, wool, nylon, acrylic etc.

Silk is a natural protein fiber. In present study silk fabric was used for printing. Color was transferred through direct style of printing in which the color has a place saved for it on the fabric and the printing operation will ensure that the right colours are placed in right shape and location. Most textiles are printed in the fabric from with direct printed style such as stencil, block, screen, discharge, roller, spray etc. In the present study block and screen printing were used.

For preparing the printing paste Indalca gum was used. Gum Indalca is a gaur gum based thickener and it stable in both strongly acidic and strongly alkaline conditions. This thickener is suitable for ordinary screen, automatic flat bed and rotary screen printing. Indalca powder is added slowly to cold water under high speed stirred and stirred for ½ an hour. It is then left over night. It has very thick concentration.

Beauty of the fabric is no value to consumer unless the dye may be considered fast under the conditions in which the fabric will be used. Colour must such tests as washing, ironing, steaming, perspiration strong light and dry cleaning.

II. OBJECTIVE OF THE STUDY

1. Use of natural binder (Indalca Gum) with acid dyes for printing.
2. Check effect on silk.
3. Check the colour fastness of the printed fabric.

III. MATERIAL & METHOD:

1. **Research Method:** Experimental Method was used.
2. **Material used in printing:**

Fabric: In the present study silk fabric was taken as the sample for printing.

Dye stuff: Dye depends on the nature of the fabric which was used for printing. Silk is a protein fiber so acid dye was used for printing.

Thickener: Thickener was used for making viscose paste with dye. It depends on the class of dye used for printing paste. Indalca is modified gaur gum and gaur gum is acidic in nature. So in the present study Indalca gum was used.

Solvent: (A hygroscopic agent) The main function of hygroscopic agent to take sufficient amount of water (moisture) during steaming to mobilize the dye to get absorbed into the fabric. In the present study urea was used as a hygroscopic agent.

Urea: It increases the solubility and therefore the brightness and intensity of dyes when applying then directly such as in printing with acid dyes. So in the present study urea was used.

Acid and Alkalies: Whenever acidic conditions have to be created during steaming an liberating agent is added to printing paste. In the present study ammonium oxalate was used.

Method

A. Method of preparing thickener

Concentration	6%
Gum	6 gm.
Water	100 ml.

Method: A Small amount of gum was mixed continuously in water and was stirred well. The solution was stirred so that the bubbles may not formed. Then the viscose paste was ready.

B. Method of preparing printing paste

Ingredients

Ingredients	Quantity (by part)
Acid dyes :	05
Solvent (Glydote B):	05
Hot water:	20
Urea:	05
Ammonium Oxalate:	02
Acetic Acid:	02
Thickener:	61

Mix all ingredients and then the printing paste was ready for printing. After preparing the printing paste and fabric, fabric was printed. In present study it was done by using following techniques like Block and Screen. After printing it was dried in shade.

C. **Printing of fabric:** After preparing the printing and fabric was printed. It was done using various techniques such as block and screen printing.

D. **Drying:** After printing the fabric was dried in shade.

E. **Fixation of dye (steaming process):** After printing and drying the fabric was steamed for 1-2 hours in the cottage steam at 100-102°C. After that fabric was rinsed cold water and dried.

F. **Assessment of colour fastness:** For checking the colour fastness of the fabric, samples were conditioned as per ISO standard.

- **Colour Fastness to washing:** Test no. 3 of ISO was applied to assess the colour fastness to washing.
- **Colour fastness to rubbing:** Crock meter was used to assess the colour fastness to rubbing for the printed sample. To check the colour change (CC) of the printed sample and Colour stain (CS) of the adjacent sample. Grey scale was used.
- **Colour fastness to sunlight:** Blue wool scale/ASTM light fastness standard was applied to check the colour fastness to sunlight. The sample was exposed to sunlight.

IV. RESULT AND DISCUSSION

The present research work was carried out on experimental basis. After going through various tests on printed sample, following results were drawn. Fastness test were done as per ISO standard and blue wool scale/ASTM set for each test.

- 1. Fastness of washing:** Washing fastness of Indalca gum with block and screen printing in change in colour (CC) of treated sample was rated 2 (poor) and the colour stain (CS) of two adjacent fabric (cotton & silk) with block printing were rated 3 (fair) and with screen printing were rated 2 (poor).

Table No. 1

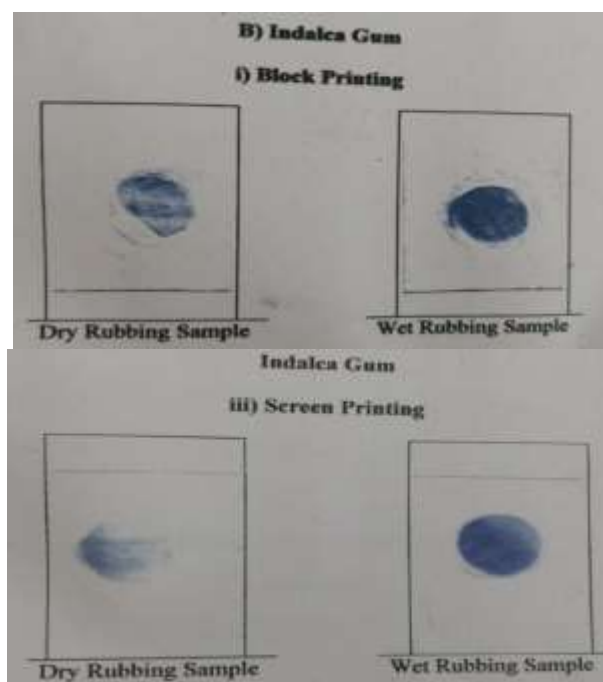
S.No.	Thickening agent	Style of printing	Numerical rating for change in colour of the Treated sample	Inference	Numerical rating for change in colour of the Treated sample		Inference
					Silk	Cotton	
1.	Indalca gum	Block	2	Poor	3	3	Fair
2.	Indalca gum	Block	2	Poor	2	2	Poor



2. **Fastness to rubbing:** Rubbing fastness of printed fabric with block in dry condition was rated 3 (fair) and in wet condition was rated 2 (poor) and the fastness with screen in dry condition was rated 3 (fair) and in wet condition was rated 2 (poor).

Table No. 2

S.No.	Thickening agent	Style of printing	Sample tested by rubbing	Numerical rating for staining of adjacent fabric	Inference
1.	Indalca gum	Block	In dry condition	3	Fair
			In wet condition	2	Poor
2.	Indalca gum	Screen	In dry condition	3	Fair
			In wet condition	2	Poor



3. **Fastness to sunlight:** To assess the color fastness of printed sample kept outside in sunlight for 7 days with blue wool standard. So the fastness of printed sample with both the style block and screen was rated 4 (good).

Table No.3

S.No.	Thickening agent	Style of printing	Exposure (Time & Days)	Light fastness A/C to ISO	Inference
1	Indalca gum	Block	7 hrs. & 7 Days	4	Good
2	Indalca gum	Screen	7 hrs. & 7 Days	4	Good



V. CONCLUSION

From the above findings washing fastness of Indalca gum with various printing technique was poor. Rubbing fastness in dry condition was fair and in wet condition was poor and the light fastness was good. All the results clearly showed that the printed sample prepared with 6% concentration Indalca gum produce a excellent quality print, but its fastness was not good. Prepared sample was even, lustrous and good quality print. So it will be better alternatives for large scale paper printing industries.

VI. REFERENCES

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CITE AN ARTICLE

Kumari, T., Mrs, & Singh, D. R. (2017). ASSESSMENT THE COLOR FASTNESS OF DEVELOPED PRINTING PASTE USING INDALCA GUM WITH ACID DYE. INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY, 6(11), 97-101.