

Tripti Singh

**Digital Art Fabric Prints: Procedure, Process and Progress
(Paper and Artwork)**



Abstract:

Digital tools merging boundaries of different mediums as endeavoured artists exploring new areas. Digital fabric printing has motivated artists to create prints by combining images acquired by photograph, scanned images, computer graphics and microscopic imaginary etc to name few, with traditional media such as hand drawing, weaving, hand printed patterns, printing making techniques and so on.

It open whole new world of possibilities for artists to search, research and combine old and contemporary mediums for their unique art prints. As artistic medium digital art fabrics have aesthetic values which have impact and influence on not only on a personality but also interiors of a living or work space. In this way it can be wear, as fashion statement and also a interior decoration.

Digital art fabric prints gives opportunity to print almost everything on any fabric with long lasting prints quality. Single edition and limited editions are possible for maintaining scarcity and uniqueness of an art form.

These fabric prints fulfil today's need, as they are eco friendly in nature and they produce less wastage compared to traditional fabric printing techniques. These prints can be used to make unique and customised curtains, quilts, clothes, bags, furniture, dolls, pillows, framed artwork, costumes, banners and much, much more.

This paper will explore the procedure, process, and progress techniques of digital art fabric printing in depth with suitable pictorial examples.

**Topic: Digital Art
Fabric Prints:
Procedure, Process
and Progress**

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Keywords:

Digital Art, Fabric Printing, Digital Fabric Printing, Fabric Design

Digital Art Fabric Prints: Procedure, Process and Progress

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Abstract:

Digital tools, merging boundaries of different mediums as artists [1] are exploring new areas. Digital fabric printing has motivated artists to create prints by combining images acquired by photograph, scanned images, computer graphics and microscopic imaginary etc to name a few, with traditional media such as hand drawing, weaving, hand printed patterns, printing making techniques and so on.

It has open whole new world of possibilities for artists to search, research and combine old and contemporary mediums for their unique art prints. As artistic medium digital art fabrics have aesthetic values which have impact and influence on not only on a personality, but also interiors of a living or work space. In this way it can be worn, as fashion statement and also an interior decoration.

Digital art, fabric prints give opportunity to print almost everything on variety of fabric with long lasting print quality [2]. Single edition and limited editions are possible for maintaining scarcity and uniqueness of an art form.

These fabric prints will fulfill today's need, as they are eco friendly in nature and they produce less wastage compared to traditional fabric printing techniques. These prints can be used to make unique and customised curtains, quilts, clothes, bags, furniture, dolls, pillows, framed artwork, costumes, banners and much, much more. Future prediction for digital fabric prints is full of possibilities as it is growing day by day. [3]

This paper will explore the procedure, process, and progress techniques of digital art, fabric printing in depth with suitable pictorial examples.

Keywords: Digital Art, Fabric Printing, Digital Fabric Printing, Fabric Design.

1. Digital Fabric Printing [4]: I had worked as, Head of design and market development of an Hi fashion company so in this paper I will share about the technology, design process and possibilities. Digital fabric printing is a very new technology with varied applications. Most available printed fabrics are rotary screen printed, single print run is several thousand yards. The high cost is due to time required to prepare screens, as each color in a design require a separate screen. But digital printing has advantage as it has the ability to do very small runs of each design (may be even less than 1 yard) because screens are not needed. Digital printing was first patented in 1968, in the 1990s, inkjet printers mostly been used for paper printing applications. The development in technology has now specialized wide-format printers which can handle a variety of substrates – everything from paper to vinyl to canvas and fabrics also.

2. Fabrics: The words cloth [5] and fabric are used in textile [6] assembly trades as synonyms for textile. Cloth may be used synonymously with fabric, but often refers to a finished piece of fabric used for a specific purpose (e.g., table cloth). Fabric refers to any material made through knitting, weaving, crocheting, bonding, or spreading that may be used in the production of further goods (garments, etc.). However, specialised usage of term textile refers to any material made of interlacing fibers.



2.1. Natural fabrics:

Natural fabrics derived from the fibres of animal, plant, stems and leaves, and silkworm cocoons. They are breathable, soft and less discolouration. There are many natural fabrics but some are mentioned here as they are best fabrics for digital fabric printing.

2.1.1. Cotton is one of the best natural fabrics. Cotton is strong, soft, unlikely to cause allergy. It easy to wash and flame retardant. And it is the most popular natural fabric used in making clothing.

2.1.2. The silk is the strongest natural fabric in the world, it is obtained from the cocoons of silk worms. Silk is, beautiful, luxurious. It is warm in the cold or cool in the heat. Silk is used in clothing, home furnishings and medical textiles.

2.1.3. Linen is protects against sun radiation and does not cause an allergic reaction. It is comfortable and luxurious. It is good absorbent of water as it can absorb up to 20 times its own weight in liquid and it is strong. Linen is obtained from the flax plant. It is used for apparel, painting canvases and rugs etc.

2.1.4. Ramie is stronger than linen or cotton. It is obtained from the ramie plant. Ramie is strong, absorbent and can be dyed easily. Its uses include clothing, pillow cases, tablecloths, sacks and cable insulation etc.

2.1.5. Hemp is quite unusual in that it is both very durable and soft. It can be used for many things from work clothing to home decoration, sheets and dish towels. It has a great lustre and dyes easily.

2.1.6. Wool is durable and soft fabric. Wool comes from goats, sheep, and rabbits. There are various types of wool such as flannel, chenille, tweed and melton etc. Wool absorbs moisture and it is warm. Wool is used in blankets, carpets and clothing.

2.2. Poly based fabrics: The synthetic fibres, polyester [7] fibres, are long chained polymers derived from water, coal, air and petroleum. They are formed through chemical reaction between an alcohol and acid. In this reaction, two or more than two molecules combine to make a large molecule whose structure repeats throughout its length. These molecules are very stable and strong. Fabric blends are made of different types of fibres twisted together. This can result in an item that is, care for or more comfortable and easier to clean.

2.2.1. Types of Polyester

The polyester fibres are generally available in two varieties- PCDT (poly-1, 4-cyclohexylene-dimethylene terephthalate) and PET (polyethylene terephthalate). PCDT has more elasticity and resilience and PET is the most common production. It is stronger than PCDT. PET can be used alone or blended with other fabrics for making stain resistant and wrinkle free clothing.

2.2.2. Polyester viscose [8] is a blend of viscose, it is a form of rayon, mixed with polyester, which increases the viscose's wet strength and durability to handle washing and drying by machine. The blend makes the fabric stronger, but it retains feel of standard viscose rayon and the same drape.

2.2.3. Cotton comes from a naturally grown plant where as polyester is a synthetic material. Cotton that provides good moisture absorption and is a very soft material, while polyester is a more durable material that when combined with cotton, allows for the production of more durable clothes, linens, undergarments and other industrial fabrics.

2.2.4. Silk can be blended with wool to result in a subtle texture, for example in making ties.

2.2.5. Ramie blended with acrylic results in a soft fabric which is easy to care.

2.3. Width and length of the textile bolts: The length is usually either 100 or 40 garden, but it may vary depending on the fabric being referred to, e.g., a bolt of cotton is traditionally 39 garden. The width of a bolt is usually 60 or 45 inches, but it may vary from fabric to fabric according to need.

2.4. Shrinkage: When fabric reduces the size than its original size is called shrinkage. Shrinkage happens due to high tension during preparation of fabric which result in excess stretch or squeeze of the size of the yarn. Two types of shrinkage are lengthwise and widthwise. Digital printing process include washing, drying and padding etc. which results the shrinkage

Shrinkage is determined as: $\text{Shrinkage Length \%} = \frac{(\text{length of fabric before wash}) - (\text{length of fabric after wash})}{(\text{length of fabric after wash})} * 100$

Normally shrinkage is acceptable less than 5% but there is a difference in shrinkage between natural fabric and poly-based fabric. For natural fabrics shrinkage is higher around 10% and for poly-based it is around 5%. The shrinkage ratio also differs by the length and the width of the fabric.

3.1. Design Process:

Designs can be created by using graphic design software such as Photoshop and Illustrator as these softwares are the most popular. Artwork, photographs and designs can be scanned and then can be digitally manipulated to make a pattern. Designs are seamless pattern that is repeated across the fabric.

Patterns [9]: Patterns are ideas which merge different techniques and different skills. Artistic patterns are unique through it can be driven and can be improved according to artist's taste. Some of the popular patterns are mentioned here.

Table 1. The Types of Patterns

Art movements	Art Deco	Art Nouveau	Anthemion	Cartouche	Ethnic Art	Gothic	Ancient Art	Optical Art
Geometrical	Celtic Knot	Diaper	Fret Pattern	Greek Key	Zillij	Arabesque	Foulard	Henry John Woods
Animal prints	Tiger	Leopard	Peacock	Cheatah	Cat Patterns	Dragon fly	Figurative	Snake
Abstracts	Airbrush	Optical Art	Stylized	Minimalist	Colour-Related	Light-Related	Curvilinear	
Strips	Awning	Bayadere	Barcode	Bengal	Pencil	Chevron	Guilloche	Hairline
Eyes effect	Bird's Eye	Fish Eye	Bull's Eye	Pheasant's eye				
Floral	Botanical	Boteh	Liberty Style	Palmette	Anthemion	Calico	Tapestry	Toile Jouy
Onamental	Paisley	Anthemion	Arabesque	Islamic	Architecture	Herati	Ogee	
Over all	Neats neat	A Liberty Style	Basketweave	Calico	Coral	Chintz Glazed	Madder camouflage	Ditzy ditzy
Technique	Batik	Collage	Tie and Die	Dry-brush	Hound's tooth	Watercolor	Spray	eccentrics
Check	Gingham	Hound's Tooth	Tattersall	Pincheck	Windowpane	Glen	Shepherd	Dupplin
Pattern	Dotted Swiss	Stylized	Seamless	Ikat	Greek Key	Herringbone	Twill Weave	Chevron
Mathematical	Frieze Pattern	Fractals	Flexagon	Symmetric union	Polygon	Snowflakes	Golden spiral	Tetradodeca
Repeat	Composite	Croquis	Foulard	Frieze	Guilloche	Half-drop	Henry John Woods	Irregular



Anthemion: A classical motif based on a stylized honeysuckle plant or a radiating, fan-shaped palm leaf (palmette) commonly found in Greek, Egyptian, Assyrian, and other ancient art.

Arabesque: An elaborate ornamental design of intertwined curvilinear floral or geometric motifs. Commonly comes from (or inspired by) Islamic art or architecture [10].

Art Deco: A style of decorative art typical of the 1920s and 1930s. The name was derived from the 1925 International Exhibition in Paris that showed "des Arts Decoratifs."

Art Nouveau: A design style of the late 19th century characterized by dynamic, flowing curves suggesting foliate motifs.

Cartouche: An oblong decorative figure resembling a frame, tablet, shield, or scroll bearing an inscription or emphasizing a design element. Used as a standalone or as part of a pattern's motif. On ancient Egyptian monuments, an enclosure for royal and divine names.

Celtic Knot: A knot formed by interfaced ribbons that lead seamlessly into one another. Same as everlasting knot.

Diaper: A small-scale geometric pattern in a set layout of interlocking or closely aligned forms. Also a weave forming a diamond (diagonal) pattern.

Ethnic Art: typical of a specific nationality or a design based on folk art.

Foulard: A small-scale pattern with basic block repeat, also called a set pattern or a tailored pattern. Originally, the term foulard referred to a soft, lightweight silk cloth. Classic foulards are small-scale, regular-shaped geometrics, usually in set layouts.

Greek Key Pattern A plane geometric pattern or a border interlocking that consists of lines that meet at right angles. Also known as fret pattern. Often used as an ornamental border design.

Optical Art An abstract artwork that creates the illusion of movement, vibrating effects, moire (moiré) patterns, an exaggerated sense of depth, or other visual effects.

Palmette: A classical motif based on a stylized radiating, fan-shaped palm leaf commonly found in Greek, Egyptian, Assyrian, and other ancient art.

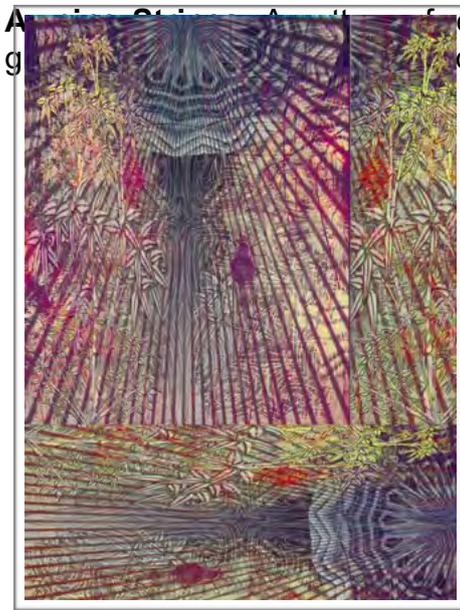
Tracery: The ornamental framework of interlacing stone, wood, or cast iron ribs supporting (or implying the support of) glass in a Gothic window.

Zillij: The intricate geometric mosaic tilework created from sets of characteristic shapes, typically cut from enameled terracotta squares. Used as decorations outside and inside buildings. Another spelling is zalij.

Herati: A stylized rosette, enclosed in a diamond, with a serrated "acanthus leaf" along each side, often used as a motif in the rug designs from the Caspian region. The "leaf" may actually represent a fish and then the pattern is also called the mahi (fish) design. The name comes from the city of Herat in Northwestern Afghanistan (formerly the Persian empire).

Airbrush: Imitating effects produced with a painter's spray air gun. Often creates patterns with a light, soft, and modern look.

Stylized: A design with modified or abstracted elements that give the design a more decorative look.



relatively wide, even, usually vertical stripes of solid color on a lighter background on awning fabrics.

Bayadere Stripes: Brightly colored stripes of various widths laid out horizontally (from side to side on the fabrics). The color effects usually range from lively to startling to bizarre. Often made with black warps and crosswise ribs (plain or twill weave). Mostly produced in India. The name is derived from the Bayadere dancing girl of India, dedicated to a dancing life from birth.

Bead and Reel A decorative motif consisting of oval or round shapes ("beads") alternating with elongated or cylindrical shapes ("reels").

Barcode: A stripe pattern consisting of lines of varying width as in a barcode.

Basketweave An all-over pattern resembling the structure of a basket or a woven fabric. See also examples in weaving.

Bengal Stripes: Stripes of apparently the same width and alternating light and dark colors. Bengal stripes are usually wider than candy stripes, but narrower than awning stripes. Commonly used in wallpaper, upholstery, and shirtings. Originated in India and became popular during the Regency era in the United Kingdom. Also called Regency stripes and tiger stripes.

Pencil Stripes: A stripe pattern produced by lines that are about as thick as ones drawn by pencil. The distance between lines is often wider than the lines.

Chevron: A traditional, woven or printed design of zigzags in a stripe layout, also called herringbone.

Guilloche: A decorative repeat of interlacing curved bands, sometimes forming circles.

Hairline Stripe The thinnest stripe pattern possible, with stripe width of about the diameter of human hair.

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Bird's Eye: A weave forming small-scale diamond shapes (diaper) each with a dot in the center, suggestive of the eye of a bird. Also a small-scale (typically geometric) design of a similar shape.

Bull's Eye: A pattern of concentric circles, often creating optical effects, such as movement or pulsation.



Pheasant's Eye: A weave forming diamond shapes that are somewhat bigger than bird's eye weaves.

Boteh: A stylized teardrop-shaped design originally on shawls from Kashmir and mass-produced in Paisley, Scotland.

Botanical: A pattern design showing realistic representation of herbs, garden plants, and other botanical objects. Also a design based on botanical illustrations.

Liberty Style: An all-over, small-scale organic (usually floral and other plant-inspired) printed or dyed patterns, characterized by highly stylized, flowing curvilinear forms and subtle, artistic tones of Art Nouveau, developed by Liberty & Co. of London.

Palmette: A classical motif based on a stylized radiating, fan-shaped palm leaf commonly found in Greek, Egyptian, Assyrian, and other ancient art.

Calico: A small-scale all-over floral design in bright colors originally from India. Later associated with American country-style.

Tapestry: A woven textile art with hidden warp (vertical) threads and visible colored weft (horizontal) threads usually depicting a floral design, geometric pattern, or historic or other pictorial motif. Commonly used for wall hangings, curtains, and upholstery.

Toile De Jouy: A decorating pattern on a scenic, pastoral, or floral theme usually printed in one color on a light or white ground. Originated in 18th century France. Often abbreviated to "toile."

Paisley [11]: A stylized teardrop-shaped design that originally appeared on Kashmir shawls mass-produced in Paisley, Scotland.

Islamic Pattern: A pattern based on simple geometric shapes that uses symmetry [12] and repeatability to create an impression of the infinite; that emphasizes beauty, flow, and unboundedness; with cultural or historic connections to Islamic art.

Ogee: An onion-shaped motif.

Neats A neat: Is an all-over, small-scaled, spaced pattern with floral or geometric motifs usually printed in one or two colors on a white or colored ground. Inexpensive to produce and economical for dressmaking

Basketweave: An all-over pattern resembling the structure of a basket or a woven fabric. See also examples in weaving.

Coral: An organic all-over pattern suggestive of coral growth.

Chintz Glazed: Usually printed in bright florals and stripes, mostly used for drapery and upholstery, but also for apparel.

Madder camouflage: Patterns are frequently described as belonging to more than one class; for example, an abstract unidirectional all-over madder camouflage pattern, which has the simple shift symmetry [13] and the half-drop layout.

Ditzy A ditzy (ditsie): Is an all-over design of small buds, circles, zigzags, and other elements that are simple, eccentrically silly, and may be funny.

Dotted Swiss [14]: A pattern of small, evenly spaced raised dots (usually on a thin, lightweight fabric).

Drybrush: Employing or imitating effects produced with a brush holding a small to negligible amount of paint. Characterized by a scratchy, textured look.

Batik [15]: A design with a tie-dyed appearance created by coating the parts of cloth not to be dyed with removable wax. Colors often include indigo, dark brown, and white. Certain patterns have historic meanings and can only be worn by nobility.

Collage: A collage pattern is one assembled by gluing paper scraps, photographs, cloth, or other objects onto a flat surface. Also an imitation of such a technique. Derived from the French "collar", to glue.

Hound's Tooth: A pattern of small broken or jagged checks created by four-pointed stars.

Watercolour: Imitating effects produced by painting with watercolors (aquarelles). Often creates patterns with light, soft, and transparent gradations.

Airbrush: Imitating effects produced with a painter's spray air gun. Often creates patterns with a light, soft, and modern look.

Eccentrics: An eccentric is a pattern of thin lines generating an illusion of a distortion or op-art effects. Another spelling is excentrics. The class is believed to be originated from the Lane's Net pattern.

Pincheck: A check pattern produced by intersecting pin-sized stripes that are one or two yarns thick.

Gingham Check: Fabrics woven in a block or check effect. An all-over pattern of solid-color squares made by overlapping stripes of the same width.

Ikat Pattern: A pattern design created by tie-dyeing either warp or weft threads prior to weaving the fabric, or a design simulating such a technique.

Pincheck: A check pattern produced by intersecting pin-sized stripes that are one or two yarns thick.

Windowpane Check: A widely spaced check pattern resembling panes in a window. Commonly used on suits, shirtings, and accessories.

Shepherd's Check: The simplest of the district check patterns consisting of small, even-sized checks of two colors. Resembles the Gingham check. Was also known as "Spongebag."

Stylized: A design with modified or abstracted elements that give the design a more decorative look.

Seamless Patterns: Repeating patterns without visible boundaries between motifs. Created by elements of the motif that appear in a regular manner (as in set layout) or artfully extend beyond geometric boundaries of the repeating region (as in interlocking patterns). Blending of neighboring units is another way to achieve seamless repeats.

Twill Weave: A weave in which each weft thread passes over two (or more) warps and then under the same number of warps to produce diagonal ridges. Compare with plain and satin weaves.

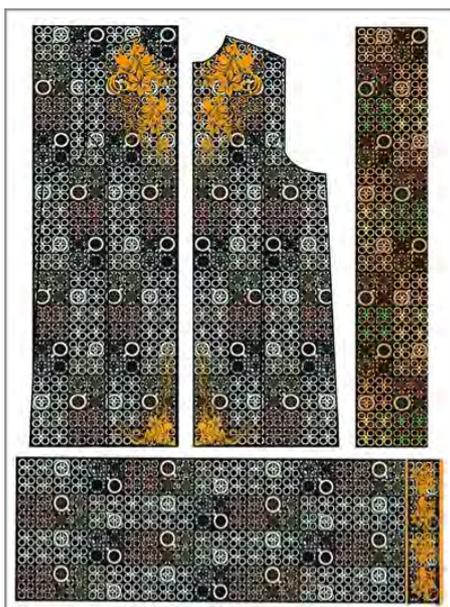
Fractals[16]: Some mathematical rule-patterns can be visualised, and among these are those that explain patterns in nature including the mathematics [17] of symmetry [18], waves, meanders, and fractals. Fractals are mathematical patterns that are scale invariant. This means that the shape of the pattern does not depend on how closely you look at it. Self-similarity is found in fractals.

Composite Overlay: Two or more patterns stacked on top of each other. A typical example is patterned background.

Composite Repeat: A combination of two or more symmetry types in one pattern. For example, rotational medallions put in a drop repeat. In Artlandia SymmetryWorks, created with replicas. Contemporary A design with simple, extremely stylised motifs.

Croquis: A fully painted design that is not in repeat; same as sketch.

Irregular Repeat: A design based on the same principles as the half-drop and brick layout repeats, but in which consecutive units are not always moved by a fraction of the repeat size



4. Process for creating digital art fabric design:



.1. Garments :

Garments and clothes have historical roots often goes thousands of years back. Many common garment types throughout the world have different variations, different names and in different places.

Classification of garments [19] e.g. through layers, e.g. from inner to outer; through body areas they aim to cloth, cover, or, sometimes to reveal; through fabrics that are used; through purposes and events they are designed to serve; through ease of fabrication; by country; by culture; by ease of fabrication; by family, and so on.

4.2. Home Furnishing and Measurements: Types of possibilities in home furnishing.

(a) Bed Covers

1. Standard Bed Sheet sizes in inches

Single Bed fitted sheet	36" x 76" + 16"
Single Bed flat sheet	71" x 100"
King Single Bed fitted sheet	42" x 80" + 16"
King Single Bed flat sheet	79" x 106"
Double Bed fitted sheet	54" x 76" + 16"
Double Bed flat sheet	90" x 100"
Queen Size fitted sheet	60" x 80" + 16"
Queen Size flat sheet	97" x 108"
King Size fitted sheet	72" x 80" + 16"
King Size flat sheet	102" x 108"

(b) Cushion Covers,

30 x 30	12" x 12"
30 x 50	12" x 20"
40 x 40	16" x 16"
45 x 45	18" x 18"
50 x 50	20" x 20"
65 x 65	26" x 26"
40 x 110	16" x 43"

(c) Table Covers,

Sizing Charts: The table sizing charts to determine the best table shape and size. The charts below, a standard banquet table height of 30 inches is assumed. Therefore, a drop of 30 inches would indicate a floor-length table linen drop.

Round Table (inches)

Table 2. Table Diameter

	30	36	42	48	54	60	66	68	72
70	20	17	14	11	8	5	--	--	--
78	24	21	18	15	12	9	6	5	--
90	30	27	24	21	18	15	12	11	9
108	--	--	--	30	27	24	21	20	18
120	--	--	--	--	--	30	27	26	24
132	--	--	--	--	--	--	--	--	30

Round Tables

To find the tablecloth drop (the length tablecloth will hang down from the tabletop), subtract the table diameter from the linen diameter and then divide by two. For instance, for a 60 inch round table and which have a 120 inch round tablecloth. Subtract 60 from 120 (120-60=60) then divide by 2 (60/2= 30 inches). A 120 inch round tablecloth will cover a 60 inch round table and drop 30 inches off the table, all the way to the floor.

To calculate size of table cloth first measure table and length of a drop then, by multiplying the drop length by 2, then adding the table diameter. For example, for a 60 inch table and a 15 inch drop (halfway to the floor), multiply 15 by 2 (15x2=30) then add the table diameter (30+60=90) to get 90 inches, which means it is 90 inch round tablecloth.

Standard sizes for common round tables:

48 inch round table: 70 inch cloth

60 inch round table: 90 inch cloth for a drop that goes halfway to the floor, 120 inch for a full drop. For the "square-on-round" look, an 85 inch square tablecloth is used on top of a 120 inch round tablecloth.

72 inch round table: 120 inch cloth, or a 132 inch for a full drop

Square Table Linens (inches)

Table 3. Table Sides

	34	36	48	54	60	72
54	10	9	--	--	--	--
70	18	17	11	8	5	--
85	25.5	24.5	18.5	15.5	12.5	6.5

Square Tables

To find the tablecloth drop (the length of tablecloth will hang down from the tabletop), simply subtract the table length from the linen size and then divide by two. For instance, for a 48 inch square table and have a 70 inch square tablecloth. Subtract 48 from 70 (70-48=22) then divide by 2 (22/2= 11 inches). This means a 70 inch square tablecloth will cover a 48 inch square table and drop 11 inches off the table, just over a third of the way to the floor.

If the size of the table and length of a drop known, then to find out the tablecloth size by multiplying the drop length by 2, then adding the table length. For example, 36 inch table and a 18 inch drop (just over halfway to the floor), multiply 18 by 2 (18x2=36) then add the table length (36+36=72) to get 72 inches, which means 72 inch square tablecloth.

Rectangular

Rectangular Table Linens (inches)

Table W x L

30 x 48 (4 ft) 30 x 72 (6 ft) 30 x 96 (8 ft)

Table 4. Rectangular Table Measurements

60 x 102	15 x 27	15 x 15	--
60 x 126	--	15 x 27	15 x 15
70 x 120	--	20 x 24	20 x 12
90 x 132	--	30 x 30	30 x 18
90 x 156	--	--	30 x 30

Rectangular Tables

To find the tablecloth drop (the length of tablecloth will hang down from the tabletop), subtract the table length from the linen length and then subtract the table width from the linen width and then divide the differences by 2. For example, a standard 6 foot rectangular table, so the width is 30 inches and the length is 72 inches, and a 70x120 inch rectangular tablecloth. Subtract 30 from 70 to get 40 inches wide (70-30=40) and then subtract 72 from 120 to get 48 inches long (120-72=48). Now divide those numbers by 2, giving a 20 inch drop on widthwise and a 24 inch drop lengthwise (40/2=20 and 48/2=24).

To know the size table and length of a drop needed, then find out the tablecloth size by multiplying the drop length by 2, then adding the table width and length (for a non-uniform drop, individually calculate the widthwise and lengthwise drop lengths). For example, for an 8 foot table (30 inch by 96 inch) and a 15 inch drop (halfway to the floor), multiply 15 by 2 (15x2=30) then individually add the table width and length to get 60 inches wide by 126 inches long (30+30=60 and 30+96=126, respectively), which means a 60x126 rectangular tablecloth to get a uniform tablecloth drop of 15 inches.

Standard tablecloth sizes for rectangular tables:

6 foot rectangular banquet table: 60x102 tablecloth and 90x132 tablecloth
 8 foot rectangular banquet table: 60x126 cloth and 90x156 tablecloth

(d) Pillow Covers,

Standard	19" x 29"
Superking	19" x 36"
Square	26" x 26"
Baby Pillow	12" x 16"

5. Curtains are made to fit these common window lengths:
 24", 30", 36", 38", 45", 54", 63", 72", 81" or 84", & 95".

5. Machine Printing:

Digital printing [19] is a form of printing in which inkjet [20] printhead's micro-sized droplets of dye placed onto the fabric. The the data supplied in a cadmic_Textile digital image file interpret by printing system software. The digital image file data control the droplet output so that the colour control and image quality may be achieved. Digital textile printing referred as DTG printing [21], digital garment printing or direct-to-garment printing. It is a process of printing on garments and textiles using specialised inkjet technology. This is the recent development in textile printing industry and it is expanding very fast.

Inkjet printer prints [22] on fabric by using fabric sheets with a removable paper backing. Today, major inkjet technology manufacturers offer specialised services for direct printing on textiles, for sampling and also for bulk production. In early 1990s, inkjet [23] technology developed water-based ink (disperse direct ink or dye-sublimation) made possible to print directly onto polyester fabric. This is mainly related to visual communication in brand promotion and retail e.g. flags, banners etc. Reactive ink used for cellulose based fibers such as linen and cotton. Silk and nylon printed by using acid ink. Inkjet technology in digital textile printing allows, mid-run production, single pieces and even long-run alternatives to screen printed fabric.



Earlier in 1980 fabrics were printed by using dye-sublimation inks on a transfer paper then heat press was applied on fabric. In early 1990s the development of a dye-sublimation printer made it possible to print with low energy sublimation inks and high energy disperse direct inks directly onto textile.

6. Process of printing and finishing of the fabric: The use of the fabric is the most important starting point to identify what to produce as an end-product.



Most used fabrics for digital printing is a polyester based fabrics. The printing process should match with type of ink e.g. low energy sublimation (dye-sub), high energy sublimation (also known as disperse direct), reactive, acid and pigment. The ink chemistry should fit the requirements of the fabric (nylon, polyester, silk, cotton). On the bases of choosing fabric and ink combination, the process followed for heat-press sublimation, infra-red fixation or steaming.

Polyester fabric mostly printed with dye-sub or disperse direct ink, solvent inks, latex and UV [24]. Thesublimation ink colorants bond with the fibre during fixation or sublimation as the inks are

absorbed by the fabrics, then other medium in which the ink remains with the coating and on top of the fabric, as with UV-curable formulations. Many times latex inks on porous textiles suffer crocking or 'rub-off' issues.

7. Advantages of digital fabric printing:

Printing with low energy sublimation ink is easier, but the disadvantage is colours fading, it is UV resistance [25], or light-fastness, is less resistant, than equivalents using high energy disperse direct ink. Dye-sub can also suffer from a 'halo' effect which results in less sharp images. The disperse direct ink is a 'stronger' ink than the dye-sub kind, and this is very important factor artwork to last longer.



Benefit of aqueous-based sublimation ink is that there are no hazardous components as it is found in UV-curable, solvent and in latex inks. Direct fabric printing using disperse ink on uncoated fabrics offers maximum advantages. These prints can be seen from both sides of the fabric which is an essential quality of digital printing. These prints get more profit, with an 'eco-friendly' label and with a higher quality. Other fabric and ink combinations cannot allow this.

The biggest advantage of direct printing on fabric is, it reduces waste as method hasn't used transfer paper before calendaring (or heat-pressing). Reducing waste is an ecological and an economical factor in fabric print production [26].

8. Post-processing:

The qualities of the printed end product should best as it is the artwork. Longevity is an important factor for an antique print. Post-processing is very important as the printed material should be easily handled, confectioned or applied. Making a decision, if it need washing or if it need a finish (e.g. water repellent, fire retardant). A washed textile does not have coating or ink residues and it will have a better feel. It will be less prone to stains and it will last longer. But digitally printed fabric will fade out with repeated washings, so it should be labeled as "dry cleaning only", and the best way is, washing by hand with cold water or using the washing machine with a gentle cycle and use a mild detergent [27].



9. Conclusion.

Digital art textile printing has immense possibilities to create artworks by combining other mediums. It gives artists' possibilities to make modification and sampling. An artist can stick to single edition prints as well as opt for mass customisation. Digital Printing process produces subtle color tones and

fine gradations. It is suitable for small production and it runs at low cost and high speed. This process consist of data files instead of plates used for analog printing. It minimises the environmental burden due to minimal wastage of dyes.

It combines many disciplines contributing to digital textile printing e.g. design, fabric, measurements, ink chemistry, pre and post-treatment of fabric, and lots more. Infact it is a combination of many hired services from different sectors of the digital fabric printing factories [28].

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