

# Endi silk of the new millennium: A scope for development of fashionable dresses

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■ **ABSTRACT** : Endi silk/Eri silk has a potential of emerging as “A silk of the new millennium”, providing excellent dimension of scope in design development and produced fashionable dresses with special properties to produce abundant finished products. Considering the different properties and cost of Endi silk and Modal an attempt has been made to produce the structural design fabrics with twill and diamond weaves and explore its properties so that even a common person can enjoy the unique richness of silk with excellent softness and lustre of Modal. A comparative subjective evaluation was done based on fabric quality, viz., aesthetic appearance, luster and texture by the panel of 100 respondents. Respondent opined that all the woven samples have good appearance, soft in hand and smooth in texture. It was observed that cent per cent of respondents found endi-modal blended union fabrics with twill and diamond weaves were high in lustre. The costs of blended yarn and the cost of union fabrics of different proportion were got reduced in comparison to that of 100 per cent endi-silk yarn and controlled endi silk fabrics. Based on the properties, developed dresses may be found suitable for spring-summer seasons. Endi silk union made-ups definitely have better market potential and can create new horizon in the fashion world.

■ **KEY WORDS**: Endi silk, Modal, Union fabrics, Twill structured, Dress design

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**D**ress design is the applied art dedicated to the design of clothing and lifestyle accessories created within the cultural and social influences of a specific time. A garment is attractive only if it fits well. To achieve a good fit, it is necessary to give attention to finer details such as fabric structure, individual proportion and contours (Kothari, 2011). In the present age of fashion and style, not only women, but everybody wants to look different and stylish (Bakewell *et al.*, 2006).

Textile materials are of interest to everyone as these

are an integral part of civilized life (Thomas, 1998). In textiles, fabrics are manufactured in wide varieties and designs, which are produced by different weaving techniques that enhance the look of aesthetic value of the apparels. Weaving is the method or process of interlacing two or more sets of yarns or similar materials so that they cross each other at usually right angles to produce woven fabric (Tortora and Merkel, 2005). A fabric may be defined as a planer assembly of fibre, yarn and combination of these.

Weaves fall into three main categories, namely Basic weaves (which are the most popular and include plain, twill, satin and those weaves that are developed from them), Fancy weaves and Compound weaves (Wynne, 1997). Union fabrics are those, where fabric are created with warp of one kind of yarn and weft of another yarn. Union fabric can also be produced by using blended yarn in one direction or both warp and weft direction of different blended yarn. Weaving of such fabrics has opened a new era with limitless possibilities in the field of textile, as well as in fashion world (Koranne *et al.*, 2015).

Blending of fibres is usually made with different fibres having dissimilarity in their properties, with a view to achieving or improving certain characters of the yarn or its processing performances. Fabric produced from the blended yarn might have better characteristics than the in a fabric produced from a single fibre. The blending of fibre is done to develop drape properties, comfortability, durability and many other properties of the fabric products (Prakash *et al.*, 2012).

Natural fibres are self-blended in order to improve the uniformity of the fibre. This improves spinning, weaving and finishing efficiency and results in a more uniform final product. Silk is the most cherished of all the textile fibres. It is the queen of all the fibres and have the most exciting characters like extra lustre, extreme smooth feeling and good insulation (Vatsala, 2002). The Eri or Endi silk is a rather stiff silk of natural grey or beige colour. As it possesses excellent thermal property, closer to wool, it is mainly utilized to manufacture of shawls, jackets and blankets (Gogoi and Kalita, 2009). Eri yarn can also be interwoven with man-made fibre such as modal, rayon, acrylic, polyester to produce union fabrics.

Modal is wood pulp based cellulosic fibre, made out of pure wooden chips from the beech tree technically, as the European Schneider Zelkova tree. In many ways Modal acts like cotton, but it also have some significant advantages over cotton. Modal displays high dimensional stability, both for low shrinkage and low unrecoverable extension. It is more hygroscopic in nature *i.e.* absorbs 50% more water than cotton and as strong as polyester with excellent wear resistance ([www.holistic-interior-designs.com/modal-fabric.html](http://www.holistic-interior-designs.com/modal-fabric.html)).

In the field of textiles the present era can truly be called the era of blending. Discovery of different types

of man-made fibres and the use of them in staple form have opened immense scope to produce textile having diverse properties and visual appeal to cater the taste of all kinds of people. The survival of textile industry depends primarily on the fabric quality as well as fashion trends meet the national as well as international demands. Diversification in the product can be brought about at various stages *viz.*, yarn, fabric, design, fashion and style.

Present work focus to evaluate the impact of blend proportion of endi silk and modal fibre, along with fabric GSM and twill weave design on the aesthetic properties of endi silk- modal union fabric and optimization of those parameters to achieve the required properties, as per the end use requirement.

## ■ RESEARCH METHODS

The endi silk and modal fibres were collected from Industry, Fabric plus Pvt. Ltd. Guwahati, Assam. Endi silk and modal fibre of similar length and micron has been used for preparation of the blended yarns. Details of the procured endi silk and modal fibre have been given in Table A.

Physical parameters	Fibres	
	Endi-silk	Modal
Fibre length (mm)	55.20	55.26
Maximum length	136	128
Minimum length	04	04
Fibre count (tex)	0.55	0.33
Fibre diameter (microns)	17.45	15.40
Density (g/cm <sup>3</sup> )	1.32	1.30
Moisture content (%)	10.70	9.90

Spinning has been carried-out in ring spinning system. Fibre blending was done in mixing stage. The 100 per cent endi and modal and three different blend ratio of EM 70:30, EM50:50, EM30:70 yarns were

Yarn sample code	Blend proportion (Endi:Modal)	Physical parameters	
		Average twist (tpi)	Density (g/cm <sup>3</sup> )
Endi 100%	-	14.54	2.08
Modal 100%	-	12.06	2.35
EM 70/30	70:30	12.85	2.38
EM 50/50	50:50	11.85	2.58
EM 30/70	30:70	10.25	2.67

The results are the arithmetic mean of five determination of each sample

Sr. No.	Sample	Sample code	Weave	Composition		Reed count	Loom pick	Thickness (mm)	GSM
				Warp %	Weft %				
1.	Endi 100%	ET	Twill	Endi 100%	Endi 100%	80	69	0.52	159.10
		ED	Diamond Twill			80	70	0.53	159.20
2.	Modal 100%	MT	Twill	Modal 100%	Modal 100%	28	56	0.47	151.03
		MD	Diamond Twill	100%		60	64	0.52	151.30
3.	Union (Endi- Modal 70:30)	EMT 70:30	Twill	Endi 100%	Endi- Modal 70:30	80	55	0.48	141.11
		EMD 70:30	Diamond Twill			80	55	0.52	155.56
4.	Union (Endi- Modal 50:50)	EMT 50:50	Twill	Endi 100%	Endi- Modal 50:50	80	56	0.47	139.35
		EMD 50:50	Diamond Twill			80	58	0.52	154.93
5.	Union (Endi- Modal 30:70)	EMT 30:70	Twill	Endi 100%	Endi- Modal 30:70	80	50	0.47	138.49
		EMD 30:70	Diamond Twill			80	62	0.52	143.17

prepared. Z twist was used in all the yarns and yarns of 1/30 s metric count (Nm) was spun for each proportion. Details of the developed blended yarn have been given in Table B.

In the present study, an attempt was made to construct the union fabrics by using blended yarns in weft direction and 100 per cent endi silk yarn in warp direction with two different weaves structure *i.e.* twill and diamond weave. Constructional details of woven fabrics along with fabric thickness and GSM were presented in Table C.

Assessment of aesthetic and handle properties of Endi-Modal union fabrics was performed by assessing 100 respondents from different age, education, and occupational groups. Some important properties, such as appearance, texture, luster, handle and suitability of a fabric for developing fashionable dresses were assessed by the respondents with the help of questioner.

## ■ RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

### Subjective evaluation of market potentiality of developed woven fabrics :

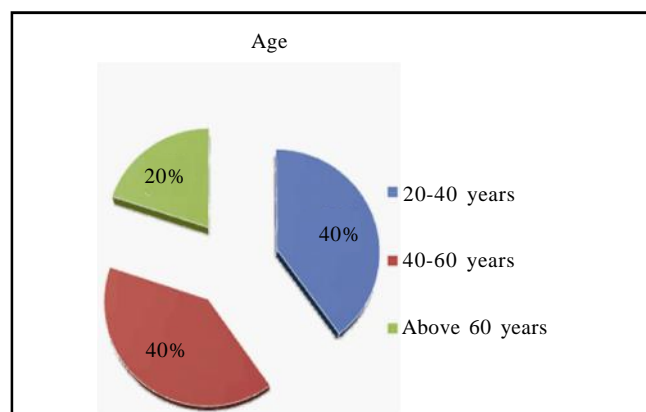
Subjective evaluations of woven fabrics were done to assess the fabrics visual inspection like appearance, lustre, handle, texture and suitability of a fabric for prepared fashionable dresses from union fabrics.

### General information of the respondents :

The general information was collected according

to their age, gender, education and occupation for subjective evaluation of union fabrics.

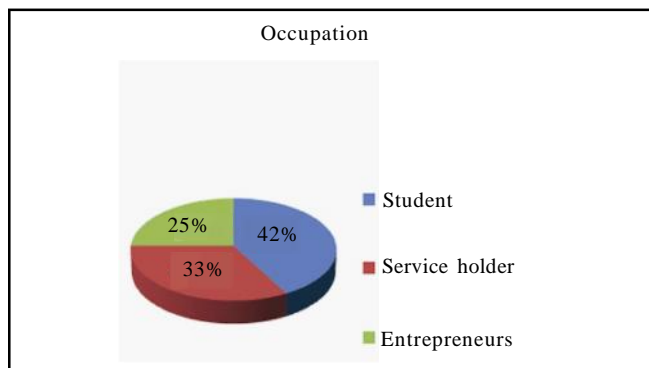
Fig. 1 reveals the distribution of respondents according to their age. It was found that the majority of respondents were belongs to the age group of 20-40 years (40%) followed by 40-60 year (40%) and above 60 years (20%).



**Fig. 1 : Distribution of respondents according to the age group**

Among all the respondents' 50 per cents were male respondents and rest of others 50 per cent were female respondents.

Based on the survey carried out, to determine the occupation of the respondents it was categorizes into three categories like students, service holder and designer cum entrepreneurs. From the Fig. 2, it has been observed that 33 per cent of total respondents were service holder, 42 per cent were students and 25 per cents of the respondents were entrepreneurs.



**Fig. 2 : Distribution of respondents according to the occupation**

lustres. It was observed that cent per cent of respondents found endi-modal blended union fabrics with two weaves were high in lustre.

**Respondents’ opinion regarding handle of woven fabrics :**

The handle of fabrics was assessed by considering three parameters of handle viz., soft, crisp and stiffs. Table 3 narrates the respondents’ opinion regarding fabric handle. It was interesting to observe that cent per cent respondents stated that all the test fabrics with twill and diamond weaves were found soft in hand. No one rated any fabric as crisp or stiff.

**Respondents’ opinion on general appearance of woven fabrics :**

The general appearance was assessed by visually. The general appearance of fabrics was assessed by factor viz., good, fair and poor. Table 1 revealed the respondents opinion on general appearance of the sample. Respondent opined that all the woven samples have good appearance. 60 per cent respondent stated fair appearance for ET sample.

**Respondents’ opinion regarding texture of woven fabrics :**

The texture of the fabric was assessed by respondents through physical touch and categorise into smooth and rough. Table 4 depicts that cent per cent respondents opined that all the test fabrics with twill and diamond weaves were smooth in texture. No one rated any sample as rough textured.

**Respondents’ opinion on lustre of woven fabrics:**

The fabric lustre was assessed by considering three parameters of lustre viz., high, moderate and low. Table 2 depicted the respondents’ opinion on individual fabrics

**Respondents’ opinion for suitability of the fabric for the prepared dresses :**

Different dresses were prepared out of woven fabrics (Plate 1). Opinion was taken from 100 respondents to assess the suitability of prepared dresses.

Test fabric	General appearance (%)			Test fabric	General appearance (%)		
	Good	Fair	Poor		Diamond Weave	Good	Fair
ET	40	60	-	ED	100	-	-
MT	100	-	-	MD	100	-	-
AT	100	-	-	AD	100	-	-
EMT 70:30	100	-	-	EMD 70:30	100	-	-
EMT 50:50	100	-	-	EMD 50:50	100	-	-
EMT 30:70	100	-	-	EMD 30:70	100	-	-

Test fabric	Lustre (%)			Test fabric	Lustre (%)		
	High	Moderate	Low		Diamond weave	High	Moderate
ET	30	70	-	ED	38	62	-
MT	100	-	-	MD	100	-	-
AT	34	66	-	AD	38	62	-
EMT 70:30	100	-	-	EMD 70:30	100	-	-
EMT 50:50	100	-	-	EMD 50:50	100	-	-
EMT 30:70	100	-	-	EMD 30:70	100	-	-

**Table 3: Respondents' opinion regarding handle of woven fabrics (%)**

Test fabric	Handle			Test fabric	Handle		
	Soft	Crisp	Stiffs		Diamond weave	Soft	Crisp
ET	100	-	-	ED	100	-	-
MT	100	-	-	MD	100	-	-
AT	100	-	-	AD	100	-	-
EMT 70:30	100	-	-	EMD 70:30	100	-	-
EMT 50:50	100	-	-	EMD 50:50	100	-	-
EMT 30:70	100	-	-	EMD 30:70	100	-	-

**Table 4 : Respondents' opinion on texture of woven fabrics (%)**

Test fabric	Texture		Test fabric	Texture	
	Smooth	Rough		Diamond weave	Smooth
ET	100	-	ED	100	-
MT	100	-	MD	100	-
AT	100	-	AD	100	-
EMT 70:30	100	-	EMD 70:30	100	-
EMT 50:50	100	-	EMD 50:50	100	-
EMT 30:70	100	-	EMD 30:70	100	-

**Table 5 : Respondents' opinion for suitability of the fabric for the developed dresses (%)**

Types of fabric	Diversified products	Suitability (%)		Costing (Approx. Rs.)
		Yes	No	
EMT 50:50	Pleated Shirt and Cargo Pant	100	-	3,942/-
EMT 30:70	Roll Collar Dress with Side Cascade	100	-	4,652/-
EMD 50:50	Shirt with Mandarin Collar and Slack Pant	100	-	4,908/-
EMD 30:70	Lapel Shirt and Trouser	100	-	4,378/-

**Table 6 : Analysis of cost of controlled and blended yarns**

Proportion	Quantity(kg)	Price in rupees/kg *
<b>Controlled</b>		
Eri-Silk 100%	1	3,000.00
Modal 100%	1	500.00
<b>Blended</b>		
Eri Silk-Modal 70:30	1	2,250.00
Eri Silk-Modal 50:50	1	1,750.00
Eri Silk-Modal 30:70	1	1,250.00

\*Include job charge

**Table 7 : Analysis of cost of controlled and union fabrics**

Proportion	Weave type	Quantity (mt.)	Price in rupees/mt*
<b>Controlled</b>			
Eri-Silk 100%	Twill/Diamond	1	985.00
Modal 100%	-Do-	1	495.00
<b>Union</b>			
Eri Silk-Modal 70:30	-Do-	1	838.00
Eri Silk-Modal 50:50	-Do-	1	740.00
Eri Silk-Modal 30:70	-Do-	1	642.00

\*Include job charge



Plate 1 : Dresses developed from twill structured Endi silk union fabrics

Table 5 revealed the suitability of prepared products according to the types of fabrics and the approximate cost of each item. The raw material cost, cost of accessories used, labour cost and the 20 per cent profit were taken into consideration for price calculation. Considering the cost and quality of products, 100 per cent respondents opined that the Pleated Shirt and Cargo Pant; Roll Collar Dress with Side Cascade; Shirt with Mandarin Collar and Slack Pant; Lapel Shirt and Trouser were suitable.

#### Analysis of cost of controlled and blended yarns:

Table 6 depicts that the cost of 100 per cent endi-silk yarn was the highest at 3000.00 Rs/kg., followed by blended yarn of endi-modal 70:30. The costs of blended yarn were got reduced in comparison to that of 100 per cent endi-silk yarn.

#### Analysis of cost of controlled and union fabrics :

From the Table 7 it was observed that, the price of controlled endi silk fabrics with twill and diamond weave were Rs. 985/m, respectively. Moreover, it was also observed that the cost of blended union fabrics of different proportion that got reduced in comparison to that of controlled eri silk fabrics (Arora and Sharma, 2010). Similar work related to the present investigation was also carried out by Akter (2017); Jahan (2017); Ozdemir (2017) and Zhong *et al.* (2017).

#### Conclusion :

From the investigation, it was concluded that Endi silk-modal union fabrics has good potential for development of dresses because of their economics and improved aesthetic appeals and the developed dresses may be found suitable for spring-summer seasons. Endi silk union fabric being highly versatile with fancy effect to produced designer fabrics at more reasonable price. It creates unique products that appeal demand of

consumer. A luxurious feel and incredibly soft hand Endi silk union fabrics would go long way not only to meet the needs of the Indian buyers but also a boon for the Indian exporters. The production cost of Endi silk union fabrics were inexpensive than the pure silk, will be an encouraging enterprise for handloom weavers and designers.

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