



## Evaluation of Physical properties of Twill weave Morhom fabric

Benyapha Khuangthip<sup>1,a,b</sup>, Supa Chulakup<sup>2,b</sup>, Srikanjana Jatuphatwarodom<sup>3,b</sup>,  
Sakorn Cholsakorn<sup>4,b</sup>, And Rattanaphol Mongkholrattansit<sup>5,c</sup>

<sup>a</sup>Phrae Vocational college, Yuntaragitgason road, phrae, THAILAND.

<sup>b</sup> Department of Textile & Clothing, Faculty of Home Economics Technology,  
Rajamangala University of Technology Thanyaburi, Pathumthani, THAILAND

<sup>c</sup>Textile Chemical Technology Department, Faculty of Industrial Textiles and Fashion Design,  
Rajamangala University of Technology PhraNakhon, 517Nakornsawan Road,  
Suanjidlada, Dusit, Bangkok, THAILAND

benyapha\_tomm@hotmail.co.th<sup>1</sup>, koy147@yahoo.com<sup>2</sup>, srikanjana555@hotmail.com<sup>3</sup>,  
csakorn@hotmail.com<sup>4</sup>, [rattanaphol.m@rmutp.ac.th](mailto:rattanaphol.m@rmutp.ac.th)<sup>5</sup>

**ABSTRACT:** This research was concerned with the twill weave Morhom fabrics dyed with indigo and natural indigo dyes (*Baphicacanthus Cusia (Ness) Bremek*) by exhaustion process. In this experiment, the colour fastness to rubbing was investigated, the results of which showed fair to good fastness, where as the colour fastness to in washing, water, perspiration and light were at a good to very good level. The physical properties of fabric; weight, thickness, tensile strength, tearing strength and dimensional stability to washing were also evaluated.

Keywords: Morhom fabric, Twill weave, Indigo dyes, Thoong hong, colour fastness

### 1. Introduction

Morhom fabric product is a product created by the Local wisdom which developed to be a cultural heritage of Phrae people. From the data of the Ministry of commerce reported that in 2003, there were 1000 of Morhom fabric business owner both large and small and the income of selling Morhom products about 300 million baht. The customer who is interested in Morhom products can choose a satisfied variety of them. Besides Morhom fabric product were developed and modernized by bleaching process like denim but more comfortable to wear. This makes more people who like to wear denim clothing prefer to wear Morhom clothing.

As we know that when we wash Morhom product, the colour will be and there are many creases. The Department of Industrial and Phrae Industrial office suggested the solutions by setting an academic program with heddle weaving courses to enhance skills and improve the quality of woven fabrics in various forms with more quality by the experts who teach details of style and twill weave Morhom fabrics to focus on the Eastern region denim with dyed blue with natural indigo. It is good for environment and this is the first hand woven fabric of the world.

Therefore, the researcher is interested to study the physical properties of twill weave Morhom fabrics and test the durability of it to develop knowledge of the quality of twill weave Morhom fabrics of weaving group in Tonha village and Thoonghong village of Phrae Province.



## 2. EXPERIMENTAL

### 2.1 Materials

Sample 1: Dyeing with 50 % Natural Indigo (*Baphicacanthus Cusia* (Ness) Bremek) and 50 % Indigo

Sample 2: Dyeing with Natural Indigo (*Baphicacanthus Cusia* (Ness) Bremek)

### 2.2 Equipments

2.2.1 LLOYD LR5K Instruments for Tensile Strength Testing

2.2.2 Elmatear Model 655(Digital tear Testes) for Tearing Strength Testing

2.2.3 Mettler Toledo

2.2.4 Crockmaster for Colour Fastness to rubbing/crocking testes

2.2.5 Whirlpool Gold for washing

2.2.6 Gyrowash for washing & Cleaning Colour Fastness Testes

2.2.7 Gray Scale for Stanning of color

2.2.8 Gray Svale for Changing of color

2.2.9 Light Box for evaluation

2.2.10 Xenon-arc lamp facing apparafus for Color Fastness to light Testing

2.3 How to test the physical properties and durability of a woven fabric Morhom twill weave. Experiment by repeating five times to find the mean of the results.

2.3.1 The Physical properties of Twill weave Morhom fabric of two formulas. The tests are as follows.

The test of fabric weight by a standard test ASTM D 3776-96.

The test of thickness of fabric by a standard test ASTM D 1777-96.

The test of tensile Strength of fabric by a standard test ASTM D 5034-95.

The test of tearing Strength of fabric by a standard test ASTM D 1424-96.

The test of changes in size and appearance after washing of fabric by a standard AATCC test 135-2004(2) II D.

2.3.2 To test the durability of twill weave Morhom fabric of two formulas. There are different tests.

The test of colour fastness to washing by a standard test ISO-105-C06 A1S:1994.

The test of colour fastness to water by a standard test ISO-E01:1994.

The test of colour fastness to Perspiration by a standard test ISO-E04: 1994



The test of colour fastness to artificial light: xenon arc fading lamp by a standard test ISO-105-B02: 1994

### 3. RESULTS AND DISCUSSIONS

The results of the physical properties of twill weave Morhom fabric dyed with indigo natural color synthetic compound with a natural appearance as shown in Table 1.

**Table 1** Results of testing the physical properties of twill weave Morhom fabric.

Fabric	Physical testing	Fabric weight (g/m <sup>2</sup> )	Thickness (mm.)	Tensile (Newton)		Tearing (Newton)		Dimensional stability to washing (%)	
				warp	weft	warp	weft	warp	weft
Sample 1		252.3	0.60	799.4	628.36	65.50	63.52	-5.2	-10.2
Sample 2		245.2	0.57	782.1	402.06	66.61	66.29	-10.1	-9.2

**Note:**

Sample 1: Dyeing with 50 % Natural Indigo (Baphicacanthus Cusia (Ness) Bremek ) and 50 % Indigo

Sample 2: Dyeing with Natural Indigo (Baphicacanthus Cusia (Ness) Bremek )

From the table the fabric Morhom twill weave warp yarns rayon number 20/2 yarn weft the cotton number 20/2 The fabric formula 1 has more weight fabric formula 2 the thickness of the fabric, the formula is a thick the second fabric over the strength of the fabric tensile strength than woven fabrics, formula 1, formula 2 and the size of a washing machine after the yarn was a formula that has been shrinking over the fabric of the Formula 2, Formula 1 Fabric shrinkage is less than.

The stability properties of the twill weave Morhom fabric with natural colors and surround. Indigo is the color of synthetic natural aromatic compound shown in Table 2 and 3.



**Table2** The properties of the color fastness to washing, water and perspiration, The twill weave Morhom fabric.

Colour fastness	Washing		Water		Perspiration (Acid)		Perspiration (Alkaline)	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
Colour change	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Colour staining								
Acetate	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Cotton	3-4	3-4	3-4	3-4	4-5	4-5	4-5	4-5
Nylon	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Polyester	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Acrylic	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5
Wool	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4-5

**Note:**

Sample 1: Dyeing with 50 % Natural Indigo (Baphicacanthus Cusia (Ness) Bremek) and 50 % Indigo

Sample 2: Dyeing with Natural Indigo (Baphicacanthus Cusia (Ness) Bremek)

**Table3** The properties of the color fastness to rubbing, light for twill weave Morhom fabric the two formulations.

Colour fastness	light		Rubbing								
	Sample 1	Sample 2	Sample 1				Sample 2				
			Warp		Weft		Warp		Weft		
			Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	
Colour change	5	6	-	-	-	-	-	-	-	-	-
Colour staining	-			4-5	2-3	4-5	2-3	4-5	2-3	4-5	



**Note:**

Sample 1: Dyeing with 50 % Natural Indigo (*Baphicacanthus Cusia* (Ness) Bremek) and 50 % Indigo

Sample 2: Dyeing with Natural Indigo (*Baphicacanthus Cusia* (Ness) Bremek)

From Table 2 and 3 the finding is the color changes of washing is at the highest level, the color stain on cotton is in the middle level. The color fastness to light and perspiration both acid and alkaline condition is at the highest level. The color fastness to color stain rubbing in dry condition is at a high level. The wet condition of color stain is fair.

#### **4. CONCLUSION**

The physical properties of twill weave Morhom fabric test with 2 formulas shows that, the formula 1, the fabric weight, thickness, tensile strength of fabric and size changing and after washing feature is better than the second formula cloth. The test of the two formula dyeing, washing, perspiration, rubbing and artificial light is in good and excellent level. The suggestion before sewing twill weave Morhom fabric in 2 formulas, you should soak it in water.

#### **5. ACKNOWLEDGEMENT**

The research on the physical properties of twill weave Morhom fabric is finished. I would like to thank the Office of Vocational Education Commission, Ministry of Education to support the fund. I would like to thank Textile Chemical Technology Faculty of Industrial Textiles and Fashion Design Rajamangala University of Technology Phra Nakhon. To support the testing textile instruments very well. Thank you all instructors.

#### **6. REFERENCE**

1. Books and historical development. Identity and wisdom. Skip to 0.2542.
2. Wiput University of Revelation. Hmgahgam Ranch Woof. Various indigenous urban spread. In 2545.
3. Contract Offices. With the Bureau of Industrial Development. The field training program. Course of the four skills of weaving heddle 2553.
4. Clay Lewis University Airport competition. Knowledge of fabrics and fiber, "revised". Bangkok: Printing sand. In 2542.
5. Ratanapol Ratana Mongkol right. How to test for color fastness on a textile material standards. Bangkok University Press of 0.2549.



6. Ratanapol Ratana Mongkol right. The analysis of the teaching and physical testing of textiles. Department of Chemistry, Textile Technology. School of Textiles and Fashion Design University of Technology PhraNakhon 0.2554.

7. [www.chianmainews.co.th/Read.Php?Id=19706](http://www.chianmainews.co.th/Read.Php?Id=19706) Retrieved on August 26, 2554.

