

# MICROCONTROLLER BASED ADVANCED FABRIC TENSION MODELLING AND IMPLEMENTATION

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**Abstract** – Instruments are widely used in every fields. Same way here in textile industry it has an major advantage of measuring different parameters of the fabric. Different types of fabric have different thickness, elongation, quality and weight. In this project we are overcoming the disadvantage of the current systems which measures only one parameter at a time. In advanced fabric tension modelling, the above said factors along with the metal detector are to be measured in the same instrument within a lesser time. This would bring a dramatic change in the measurement of fabrics which helps the customers to identify the quality by their own using this instrument.

**Key Words:** RFID reader –quality, type of stitching, fading conditions, type of washing, size determining.

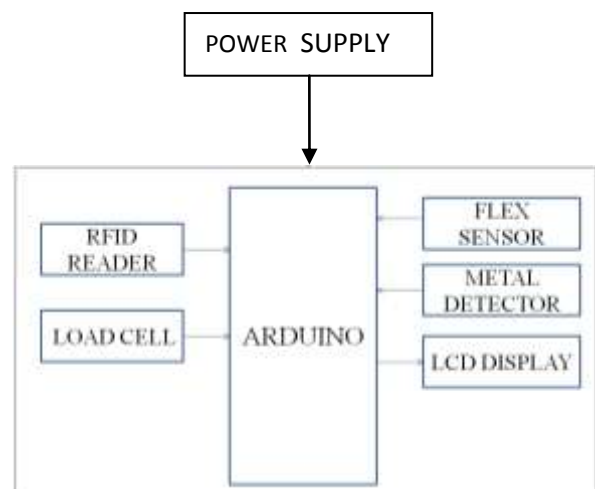
## 1. INTRODUCTION

To help the customers by identifying the quality of the cloth by themselves and also to know the fading conditions of the cloth and to check the properties of the cloth for different materials they buy. It is also used in industries to differentiate materials of the cloth .With this, the customers can be satisfied and the tag number for the top standard industries can be decided by them in a tag. This will bring a change in selling fake products in the name of the top standard companies like adidas, reebok.

### 1.1 Existing Systems

- AFIS - It measures only the length. The process is done on 2-3 minutes . It measures the fabric from the same production area.
- HVI - It measures only the strength .It does not measures single fibers. The process is done on 1-2 minutes.
- INSTRON - Power consumption is more. Maintenance cost is high . Circuit is complex.
- Fake fabrics cannot be identified easily.
- Metal is not detected in the normal existing system.
- There is no tag for the customers to identify the quality.

### 1.2 Block Diagram



## 2. DESCRIPTION

**RFID READER**-Radio Frequency identification Reader.

It is a device used to gather information from a RFID tag . Radiowaves are used to transfer data from the tag to the reader. The distance between the tag and the reader can be 3-300 feet. From this, the quality of the fabric can be found for the sake of customers.

**METAL DETECTOR**

It is an electronic instrument which detects the presence of metal hidden within the object. Mostly metal detectors are used in many applications like military, industrial applications and also used for detecting the weapons. During weaving process, it is used to detect the process of any metal such as needle.

**FLEX SENSOR**

It is also known as bend sensor or flexible potentiometer. It is used to measure the amount of deflection or bending or bending. The resistance of the flux sensor increases as the body of the components bend. In this project, the flex sensor is used to measure the elongation. It is measured in mm.

## LOAD CELL

Load cell is a physical element that can translate pressure into an electrical signal. It is measured in gsm. It is used to measure the weight of the fabric. It can withstand upto 1kg. Thin and thick fabrics show different weights from which the quality for the product manufacture can be determined.

RFID TAG



ARDUINO UNO



### 2.1 WORKING

The power supply is given to the circuit. Then the fabric to be measured is placed above the sensors. Where a cloth with a RFID tag is made to interact with the RFID reader which checks the quality of the fabric. It can be used in real time application for the customer satisfaction. Then with load cell the weight of the fabric is measured. The flex sensor measures the elongation of the fabric where it is used in industries to differentiate sizes like S, M, XL, XXL. The metal sensor is used for the detection of the metal where there is a possibility that it may be broken during the weaving process.

### 2.2 PERFORMANCE ANALYSIS

TYPE OF FABRIC	EXAMPLE PRODUCTS
Light weight	Blouses, Shirts, Summer dresses.
Medium weight	Bags, reinforcing roofing, Fishing nets.
Heavy weight	Rain coats, Umbrella, etc.

Light weight fabric range : 30-150gsm

Medium weight fabric range : 150-350gsm

Heavy weight fabric range : above 350gsm.

The weight is measured using the load cell and according to the above values it is differentiated and materials mentioned in the above tabular column are manufactured.

## 3. CONCLUSION

Hence, we measure all the parameters by the same instrument and it will be very useful to safeguard peoples from skin diseases like dermatitis which occurs due to the usage of bad quality of cloth. It will be very useful in industries to limit wastewater by increasing the fading conditions of the cloth. It suits to all textile shops where it can be brought into real time for the satisfaction of customers.

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