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## DEVELOP AN ELECTRONIC EYE TO IMPROVE EFFICIENCY AND ACCURACY OF CUTTILE MEASURING FUNCTION BASED ON IMAGE PROCESSING TECHNIQUES

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Lanka Walltiles produces cut tile for export market at the 3rd firing section, where they use manual measuring device with linear encoder for measuring the length and width of a cut tile. Currently, three workers work for measuring and recoding the dimensions of a cut tile and averagely 20 seconds take for a single cycle. As this process rather inefficient and less accurate, Lanka Walltiles desires to automate these processes while improving the efficiency and accuracy.

This research work aims to improve efficiency and accuracy of cut tile measurement function by developing an electronic eye measuring device. The proposed automated system consists three main parts. First, conveyer belt that carries the cut tiles one after the other. The color of the belt is black and the color of tiles may vary, but it can easily separate from the background color. Second part is the camera unit. The camera unit directly connects to a computer which is the third main part of the automated system. To maintain the same light condition throughout the process, two 10W LED external light system is used. The developed algorithm will capture the image of the cut tile when its reach to the center of the frame. Then image processing techniques applied for calculating the length and the width of the cut tile. The captured RGB image first converts to a binary using the pre-defined threshold value. Then the angle correction has to implement as the tiles reach to the belt in different angles. Here we used radon transformation to locate the horizontal and vertical lines and angle correction was done accordingly. Row and column sum were used to separate the tile area from the background of the noise reduced image. Then, the average value for the length and width of the cut tile calculate as number of pixels. Then the pixel value converts to length in mm and data will be saved in a text file. If the cut tile dimension is not in the given range the system automatically warn to the worker. When using this system only one worker is needed to be employed. Another result obtained was 0.001mm resolutions and measurement time is 2.5 seconds per one tile. As the final conclusion it can be stated that efficiency and accuracy has developed after using this system.

**Keywords:** *Cut Tile, Image Processing, Electronic Eye, Linear Encoder, Walltiles*