

UNIFORM MORTAR FOR TILE

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ABSTRACT

Nowadays, the use of tiles as floor finishes is getting the attention of the people. Installing tile flooring requires a high level of expertise to ensure that the floor surface looks beautiful and tidy. Finishing work is the final phase of construction work. Finishing is very important in raising the aesthetic value of a building being undertaken. The selection of the type of flooring must be done precisely to ensure the quality of flooring to be done. There are many floor types in the market today. Most people prefer tiles as their floor finish. This is because this type of floor finish is easier to get on the market. Additionally, this type of floor finish has a variety of sizes, patterns, colors and also because it is easy to install. To produce a tidy floor surface, floor finish installation skills are required to ensure the installation of the tile looks beautiful and neat. In this case not everyone has the expertise in the installation of floor finishes. Therefore, as an innovative tool solution has been designed to help overcome this problem. The innovation tool has been named "UNIFORM MORTAR FOR TILE". It is hoped that innovation tools can help in solving problems related to floor finish installation especially in order to obtain uniform mortar thickness and fastest installation time

Keywords: installing tile, floor, uniformity, finishing

1. Introduction

Floor is flat tread surface portion of a building which receives all live loads and dead loads imposed on it. The floor has its own functions which is to provide a flat surface, to support the load, functioning as sound insulation, heat and fire. Besides it also serves to raise the floor of the series in the neighborhood. Floor construction should also have safety features and comfort to occupants. However there are some problems in ensuring the floor to be built is always has a same level. This is because there are some problems in the installation of floor finishes. Commonly the workers who perform installation work finishing the floor is does not have expertise in the installation of floor finishes. Laying floor tiles is more convenient because the floor tiles are provided with tongues which can be fitted readily into grooves in adjacent tiles because the depth of each groove is less than the magnitude of the portion of a tile which is overhanging a portion of the adjacent tile. (United State Patern,1976)

Failures of tiling systems continued to plague the building and construction trade both in Singapore and Malaysia over the last more than 10 years. Problems and shortcomings in the tile selection, installation and maintenance encountered more than 10 years ago are still occasionally encountered today (Wong Chung Wan, 2004). Such is the quality of the work produced is not quality and the floor surface that has a surface that is not uniform. Indirectly, these things can contribute danger to occupants and users in the area. Another problem in the installation of floor finish is related to the time required to complete the installation of the floor finish. Usually the time required to complete the installation depends on the size of an area of the building. If that area has a large size, the longer the time required to complete the installation of the floor finish. Cases relating to the installation of floor finishes been reported from time to time. However, the problem continues to this day despite all the efforts that have been made. If want to compare with the developed countries to another. Our country has been lagging behind, especially in terms of technology and innovation in construction

This problem is indeed a negative impact, particularly in developing countries, especially in terms of construction. Because this issue is a rather serious problem in developing countries, especially in the construction aspect .This study should be done with the hope to help solve the problem of persisted. Hollow sounds produced by tapping tiles can also be a result of an improper installation method called spot-bonding. Spot-bonding is when an installer applies “spots” of adhesive on each corner of a tile and one in the center, and then presses it into place. This leaves voids under the tile, and ultimately throughout the entire installation, which can lead to big problems. When this method has been used, the hollow sound can heard where there is no adhesive (the voids) and the solid sounds can be heard where the tile is spot-bonded. (Donato Pompo, 2013). Frequently cracked grout is a precursor to cracked tile, although not always as there are many causes of cracked grout. Tile cracks because of movement of the substrate or cracks in a slab telegraphing through the tile. Improper installation of the subfloor and underlayment are very common problems (David M. Gobis, 2003). The cause of the failure may be primarily due to a lack of control joints or soft joints in the tile work and around the perimeter of the area and/or insufficient coverage of adhesive. (David M. Gobis, 2003).

Proper cleaning of the back of tile will help on obtaining better bonding between the adhesive and the surface. Using the right joint and caulk is a best practice that will facilitate the installation work. It is important to highlight that proper inspections should take place at least 6 feet away from the tile, anything closer than that does not follow ANSI standards and might create additional issues(Enmanuel, 2016). Therefore this study is carried out:

- i. To innovate method of installation of mortar for tile.
- ii. To compare time when using the conventional method with the innovation product of installation work for tiles.
- iii. To ensure the surrounding of work site always clean and tidy.

2. Method

The materials used to produce these products (figure 2) are comb spreader, plywood, screw and plastic bracket. First, sketch, design and prepare the equipment needed for “Uniform mortar thickness for tile”. After that, set the size of tile that we have according to the standard size of tile in this country. Then, shape the plywood regarding to the size at the sketch and install all the material.

To get the data two methods are used. The first method was professional tile installer used the product and testing the product. The aim to that testing is to know the difference of time installation for tile by using conventional method and by using the new method using Uniform Mortar for Tile. The second method is

direct interview to 3 public person as a respondent, where the aim of this interview is to get the comment from respondent this product. The question that will be asked to respondent is about the condition of workplace when using this product. This is important to know what the method is more tidy and clean in tile installation work. The data are collected through product testing and direct interview among the tile installation worker and public person. After gathered the data about the product from different method, then data that as collected it will be to analyze to know how it work, how about it workability and acceptance of the product towards the construction industry.

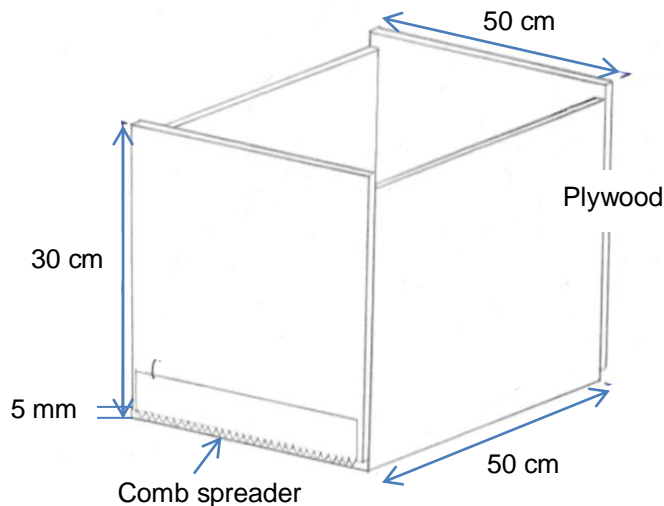


Figure 1: Expected product

Expected from this product (figure 1) is that it can fulfil all the needs and solve all the problem faced by the contractor during the last phase of construction which is floor finishes. We are hope that this product will be use widely by developer and really help contractor to finish the last phase without any problem

3. Results

From the data that have been collected from worker at construction site, most respondent agreed that this innovation project achieve the objective which is to produce an innovation method of mortar installation for tile, to compare time when using the conventional method and this product and to ensure that the surrounding of work site always clean and tidy. This can be proved from the data collected base on the interview with the expertise and general people that we pick randomly to test the product workmanship of the product. The respondent is an expertise in tiles installation, the owner of the house that is being constructed and some general people. General people is choose because to show that anybody with no expertise in tiles installation also can do the job. As the conclusion, this product is successfully tested and the result satisfied the objectives.

3.1 Innovation Product produced to install mortar for tile.



Figure 2: Uniform mortar tile

3.2 Comparizon of time

Table1 show time taken when professional tile installer used uniform mortar for tile and use conventional method for same area.

METHOD	TIME TAKEN	AREA (M ²)
UNIFORM MORTAR FOR TILES	7.39 MIN	2.25 m ²
CONVENTIONAL METHOD	18.30 MIN	2.25 m ²

Table 1: Time comparison for tile installation by using the diferent method

3.3 Surrounding of work site.

Table 2 show about direct interview to 3 public person as a respondent about clean and tidy.

	Clean		Tidy	
	Yes	No	Yes	No
Uniform mortar for tiles	3/3	-	3/3	-
Conventional method	2/3	1/3	1/3	2/3

Table 2: Condition of worksite

From the result that has been collected from the test and also from the interview among of site worker. The data from the test and interview shown the Uniform Mortar for Tile was got the good result and comment. Where the time needed to complete the tile installation are less when using the Uniform Mortar for Tile. It is proving Uniform Mortar for Tile can reduce the time of tile installation if to compare with the conventional method. Other than that by using this product it also can help to make sure the condition of tile installation area always clean and tidy. Therefore, it is proving the second and third objective are archived

4. Discussion

This study found that Uniform mortar for tiles is an invention product which is to ease the installation of mosaic of any size and save time of installation. The main material used for this product is plywood. Plywood is a material which is easy to get in the market. Other than that, the cost of plywood itself is not expensive. The product overall cost is below RM100. This product used plywood because it save times and easy the work of creating the product.

Regarding to the respondent of this product which clearly shows that the objectives is accomplished. Even that there is still comment about the product to be improvise and more but this product manage to attract interest of certain expertise in installing the mosaic. It is said that few things should be added to the product so that less error will happen and will save much more times of installation of mosaic. All of the respondent said that this product way more easier to install the mosaic. In addition it will helps

reduce the time taken for construction to take place. It helps to save more time especially in tiles installation. By using the conventional method, the expertise said that the work will definitely takes more time due to do the work one by one and has to level the tiles to make sure the surface of the tiles whether on wall or floor is even. While using this product, they said that there is no need of levelling after install the mosaic because the thickness of the mortar are even for every tiles.

The suggestions that can be made to repair this product is to convert the materials used. The material that can be upgrade for this product is plastic fiber. The composite fiber plastic material is made from a combination of organic fiber (e.g. rice husk or other similar materials) and post-consumer recycled plastics, which have different mechanical properties within the finished structure. The primary use of this material is for external works such as decks, trellis, screen walls, garden furniture, etc. Durability is the main features of this material. The life of composite materials is generally longer. Although some variety of composite materials can be costly than solid wood, this is often balanced by reduced costly maintenance and less frequent replacement due to rotting and splintering. Besides, the material can be considered as environmentally friendly because it uses recycled plastics. It can also be recycled completely, and processed without any significant deterioration in performance. The plastic content in composite decking makes it less susceptible to moisture, which would normally cause wood to expand and contract. This characteristic reduces wear and tear and prevents warping. The synthetic material also protects the surface from decay caused by prolonged exposure to weather. They do not require frequent staining, sealing and other additional treatments. Decks can be easily cleaned by normal sweeping, hose or water jet occasionally.

In addition, this product has only 5 size of tiles which often used. So, the other suggestions for further enhancing this product which is increasing the size of tiles which often used in development areas such as supermarket, shopping malls and others. If this product increases the size of tiles, the installation of tiles in a wide area will be easier. Generally, large tiles of 60 x 60 cm for example, are more suitable for large space. Even this tile is said to be the current choice. Its use is capable of giving a new dimension to a large space as it produces less coarse lines, thereby creating a wider and more spacious atmosphere. Large tiles also can be changed and cut to fit a small space it's that appears as if the space is not small as expected. From a practical point of view, the lack of line up of the cantilever does not work in the cleaning of the interstitials that need to be done, thereby easing the maintenance work.

As we know, the installation of tiles only for skilled workers in this section. So, with the production of this product, it is expected that this product can be widely marketed so that the public can use it regardless of whether the person has a skill in tiles installation work or vice versa indirect employees who not have expertise in this section will be also proficient.

5. Conclusion

From the test that has been carried out, it could say that the innovation product for mortaring process "Uniform Mortar for Tile" is easy to handle and speed up the tile installation process especially for mortaring work. The data was obtaining from the test and interview to expertise and general people about that product. Base on the result, it can conclude that the all of the objective is archived and also success. This is because, this innovation can help improve the quality of tile installation. It also can help to reduce the time of tile installation, indirectly it also can increase the output of tile installation process. Other than that by using this product, it can help to make sure the condition of worksite is always clean and tidy. Look at the kind of this product, it can be widely marketed to the public as a solution of tile installation problem. That is because this product is really easy to use and it also useful in floor finishes work.

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