

## WOOD FINISHING TRAINING FOR ENVIRONMENTALLY FRIENDLY MATERIAL EMPOWERING CARPENTER POTENCY IN MERUYA UTARA SUB DISTRICT–KEMBANGAN – WEST JAKARTA

Prita Prasetya<sup>1\*</sup>, Riska Rosdiana<sup>1</sup>  
Management Department, Economy & Business Faculty,  
Mercu Buana University  
\*pritasetya@gmail.com

**Abstract** - Carpentry industry particularly furniture and interior production have been growing rapidly since any market demand increment is globally opened accessed either national or international. Kembangan, West Jakarta area, typically had many wood industries both furniture and interior. It prompted manpower absorbing from outside of the area to work in this sector by lack of knowledge and skill. Traditional carpenters who would refine their skill in carpentry, especially furniture and interior *finishing* experience. Training was organized for people whose potency and skill in furniture and crafting by organizing furniture training that focusing on finishing insight highly needed. By the activity, it's expected to elevate their knowledge and skill in carpentry. The expected output of the activity was partners whose colourful abilities, as the consequence it generates productivity in 'green' or environmentally friendly furniture products. By any activities have been shared to partners, and then they expected to create best furniture products for both quantity and quality, and expanded their marketing.

**Keywords:** Furniture, training, green product, productivity

### INTRODUCTION

Carpentry industry particularly for furniture and interior production has been developing well. It has been experienced by global, middle company or industry in carpentry and furniture. The development is driven by market demand increment globally is getting opened either national or international. Ministry of Industry, Airlangga Hartarto stated that furniture and craft industry was lifestyle-based sector for people. It means product design innovation is needed following recently market taste and be able to compete with imported products. Three important factors prescribe it, namely capital, technology, human resource. To make this national industry to be competitive in global market, it is guided as well to create high value added products by maximizing local natural resource and environmentally friendly.

On the other hand, the development of hotel and shopping mall interior or business in big cities around Indonesia provokes any taste and end technique change in finishing. Thereby, it generates consumer need and goal globally has to be satisfied. The need has to be found out for alternative and solution. Therefore, industrialists, furniture crafters, and stakeholders, such as vocational schools have to seek solution that mutually benefit each other and tackle any questions, challenges, and demands are continuously mount up. Furniture product demand in overseas market (export) mostly offered high quality ones, but they have not done *finishing* process yet. The consequence of it was going to lose in price,  $\pm 40\%$  was compared to the products have been done by *finishing*.

Bunch of *finishing* types may be decided as work ending in furniture production and each of types have own excellences and shortcomings. Those excellences and shortcomings of each finishing technique need to be probed scientifically. The *finishing* types are encompassed of varnish, deco, and melamine, polyurethane, water-based and etcetera. The undeveloped one is high quality and environmentally paints, are polyurethane and water-based. Environmentally friendly paint is recently the most preferred one by export market, even for local consumer as well is getting care to the types of paint. Hence, it needs *finishing* touch in order to get the higher market opportunity. The more expectation is someday

it will be trendsetter as *finishing* applied by people. *Finishing* has been popular shortly, old fashioned, and have not been dominated yet in technology and made by industrialists, wood crafters, and vocational schools. Subsequently, demand is highly insisted and on the other side raw material for high quality furniture is getting rare. Producers and education institutions have to be able to take this as big opportunity by existing materials. However, good finishing can be done by technology, as the result it produces high quality product.

Carpentry industry mainly in furniture and interior production has being developing well. It has been experienced by big and middle company or industry for carpentry and wooded furniture. It is indicated by high demand either national or international is getting wide. West Jakarta denotes the most industrial and populated area. It makes this area is best place to look for work or developing business in carpentry both furniture and interior. It creates bunch of vacancies for people outside of the area working there even though they have lack of knowledge and skills. Some of traditional carpenters would refine their skill in this sector particularly *finishing* insight of furniture and interior making. It needs any guidance and training to elevate their knowledge and skills in carpentry.

### **The focus on Community Service**

Carpentry skill in term of deciding *finishing* material has been rare on *melamine* paint. Consequently, it needs to promote environmentally friendly *finishing* system, namely *Polyurethane* and *Water-based* material. Training participants were shared skills in *finishing*, as the result it may be developed and applicable for high quality furniture business and eventually it improves their income. This activity might be expected to share modal for wooded furniture crafters in Meruya sub district and refine mediums used through production variation in high quality and by environmentally friendly *finishing* materials to be able competing in the market. By high quality and environmentally friendly finishing materials are attempts to lift up product quality and competitiveness. For long term reason, if creativity and quality refinement are doable, then they allow furniture *finishing* business compete in global market.

### **Justification and Target**

Bunch of *finishing* types may be decided as work ending in furniture production and each of types have own excellences and shortcomings. Those excellences and shortcomings of each finishing technique need to be probed scientifically. The *finishing* types are encompassed of varnish, deco, and melamine, polyurethane, water-based.

Environmentally friendly paint is recently the most preferred one by export market, even for local consumer as well is getting care to it. Hence, it needs *finishing* touch in order to get the higher market opportunity. The more expectation is someday it will be trendsetter *finishing* applied by people. *Finishing* has been popular shortly, old fashioned, and have not been mastered yet.

### **Problem Identification**

Base on the problems have been identified then it could be formulated crucial points are:

1. What does environmentally friendly *finishing* mean?
2. What is the *Polyurethane* and *water-based* paint?
3. How do differ between *Polyurethane* and *water-based* application technique in paint?
4. What tools and materials are used to apply *finishing*?
5. How the good procedures and techniques are used in *finishing* paint for *Polyurethane* and *water-based*?
6. How do resolve problems happened during *Polyurethane* and *water-based* are applied?

### **Relevance**

This training might be expected to share modal for wooded furniture crafters in Meruya sub district and refine mediums used through production variation in high quality and by environmentally friendly finishing materials to be able competing in the market. By high quality and environmentally friendly finishing materials are attempts to lift up product quality and competitiveness. For long term

reason, if creativity and quality refinement are doable, then they allow furniture finishing business can compete in global market.

## **METHOD**

The method used in this activity was organized into three steps:

### **(1) Lecturing**

This method was taken to deliver theories and basic concepts must be mastered by participants of the training. The issues delivered in this method were comprised of:

- a. Description of environmentally friendly *finishing*.
- b. Description of *Polyurethane* and *water-based* paint.
- c. Description of the difference between *Polyurethane* and *water-based* technique application in paint.
- d. Tools and materials were used to deal with *finishing*.

### **(2) Demonstration**

This method was crucial since in training steps, a procedure would be understandable by participants if core skills especially spray technique was demonstrated concretely by instructor. Thereby, participants would observable comprehensively techniques have been practised by instructor. The following was the demonstrated material by instructor:

- a. The way to set spray tool in fogging *Polyurethane* and *water-based*.
- b. The way to set spray tool in splashing colour substance (*wood stain*). For transparency (natural), semi-transparency and solid. Imitation and its spray way.
- c. The way to overcome frequently problem faced in application.

### **Practice**

This method aimed to share optimum skill to participants. In this method, they did by themselves or practised it by imitate as instructor did that has been successful. During the practice, sometimes to do one step, it was needed repetition, as the consequence it got optimum result. Practice material had to be done and mastered by participants, were entire of procedure in *finishing* process such as transparency, semi transparency, imitated marble, and granite. This practice was started from preparing basic materials until *finishing step* done totally. To have high output in skill then participants had to apply in product like wood craft.

## **RESULT AND DISCUSSION**

### **Opening**

In this section, lecturing method to deliver theories and basic concepts must be mastered by participants concerning to environmentally friendly *finishing*. This method was taken to deliver theories and basic concepts must be mastered by participants of the training. The following was the result of this section:

Participants understood environmentally friendly *finishing*. After that, participants understood *Polyurethane* and *Water-based* paint use. Participants understood the difference between *Polyurethane* and *Water-based* paint application technique. Then participants understood tools and materials needed to make *finishing*.

### **Discussion**

#### **The excellence of *Polyurethane* and *water-based* painting:**

Free of formaldehyde and does not smell spicy. Then Creating solid film layer but flexible and cratch resistant and unbreakable. Last, good durability on ice water and household chemical.

#### **Mixing Steps of *Polyurethane* Painting**

Pour whole component B into component A's can and rinse the B component can by thinner, then pour it into A's can. The last, stir it until equal before and during use.

### ***Polyurethane Finishing Tips***

The process is Mix A and B component, and thinner have to fit to suggested comparison. Then mix the three components adequately to anticipate unused material since pot life of PU only for 3 – 4 hours. Use air filter that is connected to compressor to avoid water contamination of spray gun. The filter must be checked routinely. Last, to have soft finishing result, do the application in free space of dust.

#### **Tools used to create good paint layer:**

1. Compressor is equipped by air filter



**Figure 1.** Compressor & Air Filter

2. Spray gun with fix nozzle (material's hole):



**Figure 2.** Spray gun

3. Buffing



**Figure 3.** Buffing

## Practice

In this section, participants did direct practice on *Polyurethane* and *Water-based* paint application. The highly difference was felt when use environmentally friendly paint materials. Painting in *Polyurethane* material was not spicy before eyes, like melamine most used. Moreover, the steps were quickly since film layer performed thicker, as the result it did not need to spray repeatedly. Paint application process in *water-based* material was simpler in process since it does not need solvent and only used water. Furthermore, during spraying paint layer, it did not create bad smell from solvent, as the consequence the sprayer was healthier and minimized fire risk.

## Evaluation

This activity was appreciated by participants, particularly for furniture crafters caused it enlarged their new knowledge. They were interested in direct practice for furniture. The speed of work process and quality of material layer (paint) produced was being important factor to create high quality furniture. During this activity, participants compared their work to the others like chair was painted by *Melamine*, *Polyurethane* and *water-based*. The result exemplified that environmentally friendly paint use was quick in work process and better in result. By same basic wood material, it could be created high quality product, in consequence it might elevate furniture product sale price. 1 set of dining table with basic camphor wood material and melamine in *finishing* was Rp. 2.500.000. The same product with polyurethane material was up or more expensive, Rp. 4.500.000. It shared much profit for furniture crafters and by environmentally friendly paint was safe for their health.

## Opening

This activity was dealt with lecturing method to deliver theories and basic concepts and they were must be mastered by training participants concerning to environmentally friendly *finishing*. This method was taken to deliver theories and basic concepts must be mastered by participants of the training. The following was the result of this section:

- Participants understood environmentally friendly *finishing*.
- Participants understood *Polyurethane* and *Water-based* paint use.
- Participants understood the different *Polyurethane* and *Water-based* paint application technique.
- Participants understood tools and material used to make *finishing*.

### The Excellence of *Polyurethane* and *water-based* paint:

- Free of formaldehyde and does not smell spicy.
- Creating solid film layer but flexible.
- Scratch resistant and unbreakable.
- Good durability on ice water and household chemical.

### Mixing Steps of *Polyurethane* Painting

- Pour entire of B component into A's can component.
- Rinse B's can component by thinner then pour it into A's can component.
- Mix it until equally before and while use.

### *Polyurethane* Finishing Tips

- Mix A and B component, and thinner in accordance to suggested comparison.
- Mix the three components adequately to avoid material useless caused by pot life of PU for 3 – 4 hours.
- Use air filter that connected to compressor to anticipate water contamination in spray gun. Water filter have to be checked routinely.

To create soft *finishing* product, do the application in free space of dust.

- Tools used to create good layer in painting:
  - a. The equipped compressor with air filter



- b. Spray gun with fix nozzle (material's hole):



- c. Buffing tool



#### 4. Practice

In this section, participants direct used application of *Polyurethane* and *Water-based* paint. The highly difference felt was the material used friendlier environmentally. *Polyurethane* material was not spicy before eyes, like melamine was the most used. Additionally, work steps were quicker since the created film layer was thicker, as the consequence it did not spray repeatedly. Application process in *water-based* paint was simpler caused it did not take solvent and used water only. On the other hand, while spraying paint layer did not smell. Hence, it was healthier for sprayer and minimized fire risk.

## 5. Evaluation

This section was appreciated by participants; typically for furniture crafters caused it enrich their new insight. The impression was prompted by directly practice on furniture during training. The speed of work process and upholstery (paint) material quality were being crucial factors to produce high quality furniture. By this section as well might compare directly chair has been painted with *Melamine*, *Polyurethane* and *water-based*. The result indicated that environmentally friendly paint was quicker in work process and better in paint layer. The basic wood material might be created high quality furniture. Therefore, it might improve sale price of a furniture product. 1 set of dining table in basic camphor wood and *finishing* by melamine paint was commonly sold by Rp. 2.500.000. The same product has been painted with polyurethane was more expensive, Rp. 4.500.000. It shared more profit for furniture crafters exclude main profit was environmentally friendly and safe for health.

## CONCLUSION

Based on the activity has been elucidated, it was responded positively by participants, either businessmen or furniture owners and especially paint sprayer. They were enthusiastic following the training from theory description until practice section. Many questions have been posed by participants to know well painting process with *Polyurethane* and *water-based*. It portrayed that this training had worthwhile for them then driving their curiosity further on this training process.

Furniture with environmentally friendly was confirmed that it shared added value for businessmen or owners in furniture. Work process was quicker and high quality product. In addition, the material paint was more environmentally friendly and safe for health.

## Suggestion

It is needed to do further supervising and training for sprayer in order to elevate their ability in creating stable and high quality furniture. For the owners of furniture, they need aggressive promotion to share information and insight to consumers by opting environmentally friendly paint materials.

## REFERENCES

- Cool, J., & Hernández, R. E. (2011). Improving the sanding process of black spruce wood for surface quality and water-based coating adhesion. *Forest products journal*, 61(5), 372-380.
- Dilik, T., Erdinler, S., Hazır, E., Koç, H., & Hizirolu, S. (2015). Adhesion strength of wood based composites coated with cellulosic and polyurethane paints. *Advances in Materials Science and Engineering*, 2015.
- Fadillah, I. (2000). Sistem Reka Oles Cat Nuansa Retak Seribu. *Laporan Karya Teknologi*.
- Imam, Muchoyar dan Darmono. (1995). *Pengetahuan Finishing dengan Bahan Melamine*. Jurnal Pendidikan Teknologi dan Kejuruan. Yogyakarta: FPTK IKIP Yogyakarta.
- Roux-CTBA-France, M. L. Different coating alternatives to meet the European VOC Directive in the Furniture Industry. *Polyurethane*, 30, 33.
- Sunaryo, A. (1997). Reka Oles Mebel Kayu. *Pusat pengembangan &*