

# Waste Management System from The Remaining Machining Production at PT Astra Honda Motor Plant 1 Sunter North Jakarta

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**Abstract**—Currently, the industry is growing rapidly both in variety and quantity in Indonesia. Each industry has the potential to produce waste resulting from its production process. All parts of the production process produce waste, both recyclable and non-berguna.PT waste. Astra Honda Motor Indonesia produces hazardous and toxic waste from production process activities and can potentially become a pollutant for the environment if not managed properly. Raw materials used in PT. AHM Plant 1 to produce motorcycles is Aluminum Ingot and Plastic Ore so that waste is produced by the rest of the production from PT. Astra Honda Motor Indonesia itself in the form of ash, coolant, scrap aluminum, paint crust, die lube, gases. Pt. Astra Honda Motor Indonesia manages waste management well so that it does not pollute the environment.

**Keywords**—waste, industry, production, automotive

## I. INTRODUCTION

Wastewater will be waste is the wastewater usually comes from industrial households or other places, in general, some materials or substances can harm human health and disrupt the Environment. Notoadmodjo [1], Liquid waste especially coolant is produced from the rest of the operation of the machine used as a coolant machine so that the machine can work normally and stable.

Today, the industry is experiencing rapid development in various types and numbers in Indonesia. Increasing the number of existing industries will result in waste derived from the results of industrial processes. Such waste is among others hazardous and toxic materials. Diverse waste comes from other types of industrial activities and wastes producing factors. For example, the use of raw materials, selectors, selected production processes, and so on will bring waste characteristics that are always related to the industrial process.

Waste handling activities should be carried out to maintain human health and the surrounding environmental ecosystem. But the procurement of waste treatment facilities is still considered burdensome for some industries and agencies. Water pollution is caused by the presence of industries that throw waste directly into the estuary of water. (Following Government Regulation No.18 of 1999) [2], waste management is necessary to prevent and overcome

environmental damage. Liquid waste treatment aims to make the water that comes out clean by removing pollutants that are in the wastewater, or pollutants that are in the wastewater is described so that it loses the properties of its pollutants (Ervina - Center for Chemistry and Packaging, 2018).

## II. METHOD

There is this research by using the stage of implementation of practical work consisting of the implementation stage where the thing that needs to be done is to observe the waste management of the remaining production of machining section in PT. The world-class Astra Honda Motor combines high technology, HR expertise, and concern for employees and the environment. After that, analysis and discussion about the situation in the practical workplace, in addition to evaluating the results of field observations. Comparing theory with reality in the environment is used as one of the analyses of this study.

There is also an observation method, and this method is done utilizing data collection, carrying out observations and measurements directly at the site of the implementation of practical work. And there are also secondary data collection methods including literature data, journals, papers, previous research reports, information data in the form of flow charts of production processes and impacts that may arise, and other supporting data such as information data collection methods by reading and studying literature related to the object of study. There is also an interview method that is by the method of collecting information data by asking questions directly to authorized staff or directly related to the discussion.

## III. RESULT

### A. Production Process

Before going further into waste management the rest of the production would be nice to see some production stage processes in PT. Astra Honda Motor, using aluminum ingot is one of the raw materials, as for the process as follows:

- The casting  
A process of melting Aluminum Ingots which are then printed into several forms used as motorcycle parts is a

melting of aluminum used as the basic material of motorcycle components.

- **Machining**  
Is the process of changing the dimensions and smoothing of all motorcycle parts after the completion of the process of die casting
  - **Assy Engine**  
Is the process of assembling the engine on the motorcycle
  - **Plastic Injection**  
It is the process of making motorcycle parts from plastic materials, with the initial process of vacuuming ABS plastic ore into a popular machine, heated to a liquid, which is then printed according to the model or shape and size desired with the final stage of the scrub removal process.
  - **Painting Plastic**  
The process of painting the outer frame of the motorcycle utilizing spray and that has been made in Plastic Injection
  - **Assy Wheel**  
Is the process of assembling motorcycle tires
  - **Welding**  
The process of making body frame frame, fuel tank and steer with a welding process that uses robotic arm to help perform the activity.
  - **Painting Steel**  
Painting motorcycle parts. For the method of painting by dipping so that the paint is not wasted.
  - **Assembling unit**  
The process of assembling a motorcycle to become a motorcycle is intact and checked again by Quality Control and after that in there is a Final Inspection which is the last check stage before being distributed to the transport track.
  - **Shipping**  
Shipping department is in charge of storing, preparing, and delivering goods, in terms of motorcycles to customers. And in carrying out the delivery of goods is always accompanied by careful recording so that every item that comes out easily can be detected.
- And in addition to the main materials ingot and aluminum there are supporting materials used to support the production process, among others: paint and thinner, chemical, welding wire, argon gas, CO<sub>2</sub> gas, accerlene gas, gasoline, hydrolic and lubricant oil.
- The byproducts of all parts in the production process produce waste, both useful waste where it can be recycled or waste that is useless. The byproducts produced in all production processes are more or less the same in the form of:

Table 1. Production Process Byproducts

Production Process	Production Byproducts	Time
The Casting Machining Assy Engine Plastic Injection	Abu, The lube Coolant Scrap Aluminum, Majun,oil The lube	
Painting Plastic Assy Wheel Welding Painting Steel	Bekas Cat, Spoiled Remaining tires / rubber Abu welding Die lube,Cat sisa, plastic	

## B. Waste Processing

Supporting materials used to support the production process in machining itself, namely hydrolic and lubricant oil and waste produced in the form of Industrial Liquid Waste is coolant.

The components of waste treatment that must be considered related to the urgency of waste treatment produced are. Reduce the principle of reduce is to minimize waste, especially the final result of the production process. However, it is not impossible that this stage can also be done from the beginning, namely raw materials and production processes.

It shows all the production processes that are basically able to strive to produce waste to a minimum. This stage is usually done with a filterization system so that the higher the level of filterization, then automatically the resulting waste will be reduced, and vice versa. efforts to reuse waste produced during the production process called reuse as well as the recycling process of waste that has been produced so that it can be utilized for other purposes without reducing the production commonly called recycle. Liquid waste treatment conducted at PT. Astra Honda Motor Indonesia in machining section is with internal processing in collaboration with UPL section, PUT to manage liquid waste produced from the process of machining production.

## C. B3 liquid waste management

The production operators in the field need to know include:

- a) **Reduction:** As a step to minimize the quantity of liquid waste
- b) **Research and Collection:** This research and collection is internal.
- c) **Temporary Storage:** Using drums that have been provided.
- d) **Transportation:** Transportation from the place / warehouse of temporary storage of waste B3 PT. Astra Honda Motor Indonesia to the processing or utilization to third parties that have had the legal aspects of KLH. In internal transportation itself that needs to be considered is a waste document in the form of a waste receipt letter.
- e) **Licensing and Supervision:** According to PP No. 18 of 1999 Jo PP No.85 of 1999 (Licensing is a means of control of producers and waste managers in compliance with environmental regulations. It is appropriate that every business entity conducting waste management activities must have permission from the head of the responsible agency).

## D. Industrial liquid waste treatment in machining

- 1) The way of Physics, namely the treatment of liquid waste with several stages of activity process include:
  - a) **Screening process,** or so-called screening process that is to set aside suspended materials that are large and easy to settle.
  - b) **Flotation process,** i.e. by setting aside the floating material so as not to interfere with the next process and in the flotation process is based on the difference in particle density with the help of air bubbles.
  - c) **Filtration process,** i.e. setting aside, all particles suspended from the water or clogging the membrane / sheet separator to be used in the process (osmosis) called mixing between two kinds of liquid through the cell wall or membrane.

- d) Adsorption process, which is to set aside liquid waste pollutant compounds, especially if desired to reuse the waste water, usually using activated carbon.
  - e) Reverse osmosis process (membrane technology), which is the process of re-utilizing wastewater after being processed beforehand and done with several stages of process activities and this technology is expensive therefore usually this technology is applied to small processing units.
- 2) Chemical method, which is a process of wastewater treatment done to remove particles that are difficult to settle (colloidal), heavy metals, toxic organic substances with the addition of certain chemicals required. Chemical methods include coagulation, oxidation of organic pollutants with lemon reagents, organic pollutants with ultraviolet light etc.
  - 3) Biological methods, processing with this biology by using biota live or microbes that serve to decompose contaminants in liquid waste. The process of biology includes aerobic, anaerobic, facultative.

#### IV. CONCLUSION

As for the development of technology today is increasingly advanced, this modern era makes human life can not be separated from the use of machines, one of which is the use of machines in the field of manufacturing.

The machine commonly used in the manufacturing industry today is CNC (Computer Numerical Control) machines. The CNC machine is able to create complex and precise workpieces in a relatively short time. In the machining process there is a workpiece or so-called coolant is one of the things that must be considered.

Coolant should be considered replacement because the use of coolant too long will result in quality & nbsp coolant decreases. In this study made a tool to process used coolant so that it is safe to be disposed of to the surrounding environment, The byproducts of all parts in the production process produce waste, both useful waste where it can be recycled or waste that is useless for the management of liquid waste B3 PT. Astra Honda Motor Indonesia covers the monitoring and collection, internal transportation, utilization, temporary storage, and licensing and supervision.

#### REFERENCES

- [1] Notoadmodjo, Soekidjo, "Education and Health Behavior Jakarta Rineka Cipta," 2003.
- [2] Peraturan Pemerintah No 85 Tahun 1999 Tentang : "Perubahan Atas Peraturan Pemerintah No 18 Tahun 1999 Tentang Pengelolaan Limbah Bahan Berbahaya Dan Beracun," 1999.
- [3] Casey R R, Syafrudin. 2010. Implementation of Hazardous Waste Management at Toyota Astra Motor Manufacturing Indonesia. Journal of Hazardous and Toxic Waste, Vol 7 (no.2 September 2010)
- [4] Haz-01, "Management of Hazardous and Toxic / B3 Waste," 2015.
- [5] I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.
- [6] Sari, Pamella. 2010. Job Training Report: "Application of Hazardous Waste Management, Pusdiklat
- [7] Setya, "waste management and management," 2010.
- [8] Pollution Control. Journal of Environmental Biology, Industry and Health, Vol. February 6 (2) [2019]
- [9] Veza A, and Ruslan A G. 2019. Management of Lubricant Oil Waste as an Environmental
- [10] Ari, S,H,"Application Of Electrocoagulation Methods In Coolant Waste Processing", 2017.
- [11] Pt.SAKA, "detail of industrial wastewater", 2015.
- [12] Bisono, "Coolant Waste Treatment in CNC Machining Process Using WWTP," Journal of Mechanical Engineering Vol 6 No 2 2017: Journal Volume 6, No.2 2017