
# ANALYSIS OF DEFECT IN LBO INSPECTION OF PT. GB INDONESIA BY THE IMPLEMENTATION OF SIX SIGMA METHODOLOGY

**By:**
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# THESIS ADVISOR
# RECOMMENDATION LETTER

This thesis entitled **"Analysis of Defect in LBO Inspection of PT. GB Indonesia by the Implementation of Six Sigma Methodology"** prepared and submitted by **Desire Natalia Sabathieni** in partial fulfillment of the requirements for the degree of Bachelor Degree in the Faculty of Engineering has been reviewed and found to have satisfied the requirements for a thesis fit to be examined. I therefore recommend this thesis for Oral Defense.

**Cikarang, Indonesia, January 28th, 2017**

**Ir. Andira Taslim, M.T**

# DECLARATION OF ORIGINALITY

I declare that this thesis, entitled **"Analysis of Defect in LBO Inspection of PT. GB Indonesia by the Implementation of Six Sigma Methodology"** is, to the best of my knowledge and belief, an original piece of work that has not been submitted, either in whole or in part, to another university to obtain a degree.

**Cikarang, Indonesia, January 28th, 2017**

**Desire Natalia Sabathieni**

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# ABSTRACT

Quality is the essential thing that should become a concern of every manufacturing industry. The quality of a product is one thing that determine the customer satisfaction and company's profit. In order to ensure the quality of the product, an inspection must be done to every production process. This research analyze about the defect quantity that found in the LBO Inspection of PT. GB Indonesia, the largest toy manufacturer in the world. Currently, the quantity of defect that found in the LBO Inspection is increase from January to June 2016. The LBO Inspection done in the end of production line or secondary area. Actually, the defect product that found in the pack out area must not be passed from primary area. It is mean that the inspection that has been done in the primary area is not going well. A quality improvement should be done in order to decrease the defect quantity in the LBO inspection. The quality improvement also aim to reduce the losses that made by the defect product. In order to implement the quality improvement, the research to analyze the defect is conducted using six sigma tool which is DMAIC methodology.

Keywords: *Quality Improvement, Defect, LBO Inspection, Losses, Six Sigma, DMAIC.*

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# LIST OF TERMINOLOGIES

| | |
|---|---|
| Six Sigma | : A methodology that used to minimize the variability, measure defect and improve the products, processes or services |
| DMAIC | : Stands for Define, Measure, Analyze, Improve and Control. It is a data-driven tools and strategy for quality improvement. |
| MSA | : Stands for Measurement System Analysis. One of six sigma tools that used to know the variability in the measurement system. |
| LBO | : Lot Buy Off Inspection. It is a visual inspection that is done by PT. GB Indonesia, to review the aesthetic performance of the product after the production. |
| OPI | : Open Package Inspection. It is a kind of inspection that is done to check the quality of the toy by test the product function. |
| FEP | : Final Engineering Pilot. It is the second step of product development in PT. GB Indonesia |
| PP | : Production Piloting. It is the last step of product development, before it allow to run in the production. |

| | |
|---|---|
| DPM | : It is a term for Defect per Million, means that the number of defect that may be found in every million product that produce. |
| Aesthetic Recalibration | : It is an activities to recalibrate the measurement of aesthetic defect on the product |
| Contamination Paint | : It is a defect where a product is contaminated by paint or ink that is not belong to the product. |
| Dirty | : It is a defect where the product contaminate by the dirt and left the dirty sign. |
| Scratch | : It is a defect where the product get scratched that may caused by any sharp tools. |

# CHAPTER I
# INTRODUCTION

## 1.1.Problem Background

In this era of globalization, the business competition between companies especially for manufacturing industry is getting tighter. The tight competition that happen makes almost all the companies in the world compete to provide the best product that can fulfill and satisfy the customer's demand. GB, inc. is one of the company that always try to increase the company performance in order to keep its existence in the business world. GB, inc. is a multinational company which also categorized as the world largest toy manufacturer based on the revenue of the company. This company has been established since 1945 and its headquarter office located in El Segundo, California, United States. In order to support the production processes, the company built several factories in several regions. One of the factory of GB, inc. is located in Indonesia and called as PT. GB Indonesia. PT. GB Indonesia located in the area of Jababeka Industrial Park, Cikarang – Bekasi. It has two plants which are west plant and east plant. The west plant are used to produce the die cast product such as toy car and the east plant used to produce molded toy such as dolls. The dolls that produced by PT. GB Indonesia is a popular toy that is not only idolized by children but also by adults, some adults usually are the collector of the dolls that produced by PT. GB Indonesia.

In order to keep satisfying the customer, the quality of all the products that produced by the company should be ensured before it being delivered to the customer. Quality control is exist to ensure the quality of the product that produced by the company. In order to ensure the quality of the company, there are many activities that done by the quality department and one of them is inspection. In PT. GB Indonesia, the quality control do inspection to every kind of toy that produced. There are two kind of inspection that done by the Quality control in the end of

production line (*pack out area*), those are LBO inspection and OPI. LBO or Lot Buy Off is a visual inspection that done by only review the aesthetic performance of the toy, while OPI or Open Package Inspection is an inspection that done by open the toy package and test the product function.

Currently, it is found that the aesthetic become the biggest issue in the products of PT. GB Indonesia. Aesthetic is one element that affect the quality performance of the product. It can affect the sale price of the toy, because the sale price of the toy mostly depend on its aesthetic performance. The better the aesthetic performance, the higher the price will be. From the historical data that has been collected, it is found that the biggest failure contribution that happen in the development processes is aesthetic defect. It is also known that the number of defect that done in the inspections increase significantly, especially in lot buy off inspection, which means that aesthetic defect is potentially occur in the production line. It is known that the DPM increase significantly and exceed the tolerance given by the company which is 1000 ppm. The increase of defect number in the production means that the quality performance of PT. GB Indonesia is getting poorer. In order to reduce the aesthetic issue, this research is aim to reduce the number of defect, especially for aesthetic defect, by analyzing the defect that found in the LBO inspection of PT. GB Indonesia.

Six sigma is a set of technique that used for process improvement, and used to ensure the quality of product by identifying the deviation & defect and eliminate it. It also used to reduce the variability in the manufacturing or business process. In this research, the six sigma approach is used to analysis the defect by using several six sigma tools. DMAIC method is a systematic tool in six sigma that chosen as the methodology that used to implement the project of this research. It has five phases which are define, measure, analyze, improve and control. . This methodology will lead to define the root cause of the problem and the corrective action that needed for the improvement. The other six sigma tools will also be used

to support the analysis that done in this research such as measurement system analysis, Pareto chart, why analysis, fishbone diagram etc.

### 1.2.Problem Statement

The background of the problem leads into the statement below:

- How to reduce the number of defect in LBO inspection?
- How to reduce the aesthetic issue in PT. GB Indonesia?

### 1.3.Objective

There are several objective of this project, which are:

- To reduce the defect quantity in the LBO inspection.
- To reduce the aesthetic issues that commonly occur in every production of toy.

### 1.4.Scope

Due to the limitation of time, there are some scopes for this project:

- The project is conducted during August – November 2016.
- The Measurement System Analysis is done to quality appraiser primary area.
- The defect analysis only done in LBO Inspection.
- The category of defect that being analyzed only Dirty, Scratch and Contamination Paint.

### 1.5.Assumption

Some assumptions have to be made in order to cover the project, which are:

- Poor measurement system cause the quantity defect increase
- All the quality appraiser have the same duration of work
- Production Price per each toy = $2.5 USD

### 1.6.Research Outline

**CHAPTER I** **Introduction**

This Chapter consist of Problem Background, Problem Statement, Objective, Scope and Assumption as the introductory of this project.

**CHAPTER II** **Literature Study**

This chapter delivers some fundamental knowledge about Six Sigma methodology, DMAIC tools, Measurement System Analysis tools, Minitab and some terms that used in running the project.

**CHAPTER III** **Research Methodology**

This chapter gives a short explanation of the steps taken in the whole process of conducting the project.

**CHAPTER V** **Data Collection & Analysis**

This chapter consists of all the data collected which used on conducting the project and the method that used for analysis.

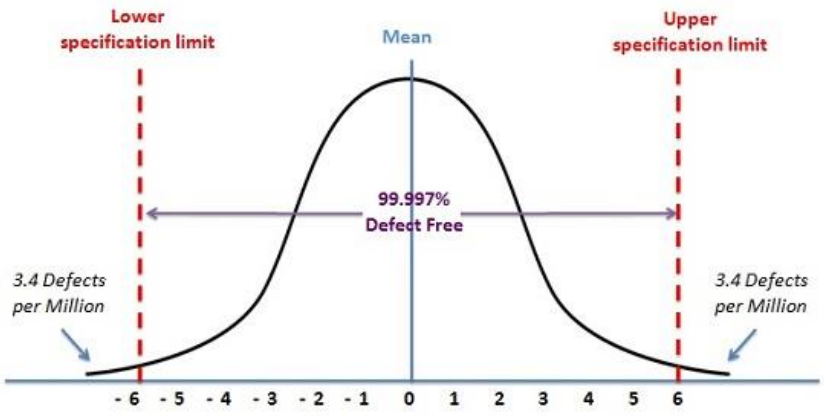
**CHAPTER VI** **Conclusions and Recommendation**

The conclusion of the project and also the suggestion for future research are included in this chapter.

# CHAPTER II
# LITERATURE STUDY

## 2.1.Six Sigma

According to Pyzdek (2003), Six Sigma is an exact, focused and highly effective implementation of proven quality's principle and technique. Six Sigma was firstly introduced on 1986 by engineers that worked in Motorola named Bill Smith and Mikel Henry, it is a set of tools and technique that used to improving the existing process. On 1990, General Electric Company was the first who put practice of Six Sigma methodology. The Sigma (σ) itself is usually used to measure the variability of any process by the statistician in the world. The implementation of six sigma methodology is to minimizing the variability in the process, measure the existing defect and improve the process, product or services of the company. Six sigma has purpose to reduce the defect until 3.4 defects per million opportunities, however, that does not mean that every process improvement that implement by six sigma should reach this level.




*Source: lablean.blogspot.co.id*

**Figure 2.1 Six Sigma**

Nowdays, Six sigma is not only implemented in the manufacturing processes but also in other business processes or industries. Many company use six sigma as the driven-tools for the company process improvement to help the company increase the quality performance and fulfill the customer demand, every six sigma project has the defined steps and specific target value. Six Sigma also known as comprehensive system, means that the six sigma is strategy, discipline, and tools to achieve and support the success of business. Six sigma called as strategy because it is concern to the customer satisfaction improvement, called as discipline because six sigma follows the formal model which is DMAIC methodology, and called as tools because the six sigma used with the other tools such as Pareto chart, Fishbone diagram and others.

The success of business performance and the improvement of quality depend on the capability to identify and solving problem. On the implementation of six sigma, there are 5 levels of Six Sigma certification to certify the capability of every team's member, those are:

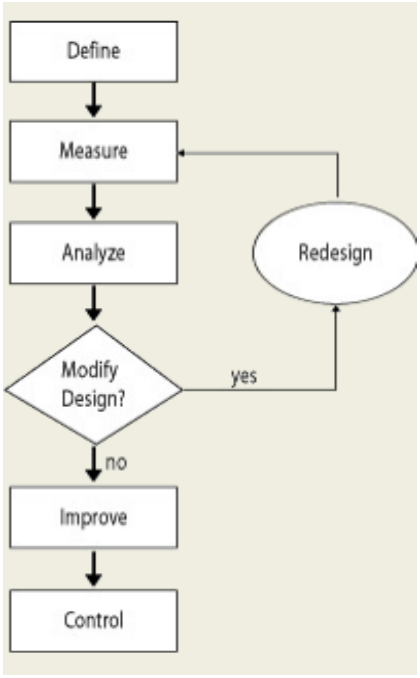
- Lean Six Sigma Black Belt
- Lean Six Sigma Green belt
- Lean Six Sigma Master Black Belt
- Lean Six Sigma Yellow Belt
- Six Sigma lean & DFSS


*Source: slideshare.net*

**Figure 2.2 Six Sigma Training Level**

## 2.2.DMAIC Methodology

DMAIC is a methodology that stands for Define, Measure, Analyze, Improve and Control, it is a quality data-driven tools and strategy to improve the process. DMAIC is included as one of six sigma tools, but it also can be applied as standalone quality improvement procedure or other process improvement. A DMAIC project typically runs for a relatively short duration compare to the product development project or operation line management (Kabir & Lutfi, 2013). DMAIC methodology consist of five phases or steps. All the steps are required to be performed such as shown on the flowchart below:




*Source:* asq.org

**Figure 2.3 Flow Chart of DMAIC Method**

- **Define**

Define phase is the first step in DMAIC methodology, this step aim to identify more specific the problem background, resources, project timeline, project scope and the objective. In the Define phase, the current condition of something that would like to be observed such as the Voice of Customer (VOC) & Critical to Quality (COQ) should be known. The tools that usually used in this phase is Project Charter and Pareto chart.

- **Measure**

Measurement phase is the second step of DMAIC methodology that has objective to establish the current baseline of process improvement. Beside that this phase works for documenting the current process and validate how it measure. The metric baseline of performance in measurement phase will be compared to the performance metric baseline after improvement to see whether there is a significant differenced or not, and to know whether the objective has been meet or not. Generally, there are several tools of six sigma that can be used in measurement phase such as basic Pareto chart, process flowchart, trend chart, Gage R&R and process capability measurement.

- **Analyze**

Analyze phase as the third step of DMAIC method has purpose to identify, validate and select the root cause problem to be eliminated. Generally, there will be no more three causes that must be controlled in order to reach the objective. In order to validate the root cause, the team can;

- List and Prioritize the potential causes of the problem
- Prioritize the root causes to pursue the step of improvement.
- Identify how the input process (X) will affect the output process (Y)
- Create the specific process map to help pin-point the process of rot cause reside and what the things that contribute to the occurrence of the problem.

In Analyze phase, there are number of tools that is used to define and identify the root cause of the problem. The most common tools that are used are Pareto Chart, Fishbone Diagram, Why Analysis, Hypothesis Testing, Regression Analysis, Time Series Plot, Multi-Vari Analysis, Histogram, Scatter Diagram, Tree Diagram, FMEA, etc. Actually, not all the tools should be used in conducting the improvement project. The tools that is used depends on the needs of the team on describing the root cause of the problem.

- **Improvement**

The improvement phase in DMAIC method aim to identify, test and apply a solution to the problem. The strategy or improvement of the project will depend on the problem that confronted. In the improvement process, the team should find the creative ways to solve the problem and to prevent the probability of problem to be occurred again. In improvement phase, it is good for the team to do brainstorming. The six sigma tools that is commonly used in this phase such as Regression Analysis, Hypothesis testing, Design of Experiment (DOE) and Kaizen.

- **Control**

Control phase is the last step of DMAIC method, this phase is aim to ensure whether the improvement meet its success or not by controlling the after improvement process. In this phase Control plan can be made to know what is needed to keep the improved process at its current level, there are several tools also can be used such as Statistical Process Control (SPC), 5S, Mistake Proofing (Poka Yoke), etc.

### 2.3.Defect Definition

Defect is condition of a product when it does not meet its specification. The specification is does not need to be below the expected level, the over-estimated level of specification is also considered as defect. Naturally, defect in the system should be eliminated because the number of defect is also determining the number of efficiency of the system. If a product produces a noncompliant condition, it is called a defective product (Gygi et al., 2012).

Defect is classification of some product that not in accordance with the standard quality set by a company. With the damaged and defect products, the company losses in the production process, it is because the product is not fit for sale at a predetermined price the company. Defect can also be interpreted as a defective product but technically and economically it can be used to make improvements into products that comply with the quality standards that have been set, but it can improve or add to the cost of production.

## 2.4.Measurement System Analysis

Measurement System is an important thing that should be possessed by any manufacturing company. Measurement System is illustrated as lenses, if the lenses are poor and incorrect, the vision will get blurred. Measurement system allows the people to "see" the process of the production, when the measurement system is poor, the people will lose the ability to make a decision of how to improve the process. Measurement System Analysis (MSA) is one of quality tools in six sigma methodology that will help the people to ensure whether the measurement system of its company has meet its standard and requirement or not. MSA based on the philosophy that measurement error marks true process error (Harry&Lawson, 1992).

Every manufacturer has its own production process, and every process will produce product or services. In order to fulfill the customer demands and satisfaction, each product or service might have the standard and requirement. The requirement of a product must be measured, and sometimes the measurement will be vary that make a variation in its result. The variation in the measurement system can be analyzed using measurement system analysis (MSA), and this tools will lead the people to a decision making of how to reducing the variation that happened in a measurement system. A manufacturer want that the variation coming from the process, and less from the measurement system. In order to know the variation of whole production, below formula can be used:

$$\sigma^2_{\text{total}} = \sigma^2_{\text{Process/Part/Services}} + \sigma^2_{\text{ Measurement System}} \qquad (2\text{-}1)$$

The measurement process is important because from a measurement system, the people can verify the product/process conformity to the specification and the variation that is found in the measurement system can affect the decision that will be made. Measurement System Analysis (MSA) can be conducted for two categories of data which are Continuous data or Discrete Data.

In the measurement system, there are two common key measure that associated which are Accuracy and Precision. Both Accuracy and Precision are two different things, each of them is independent property.

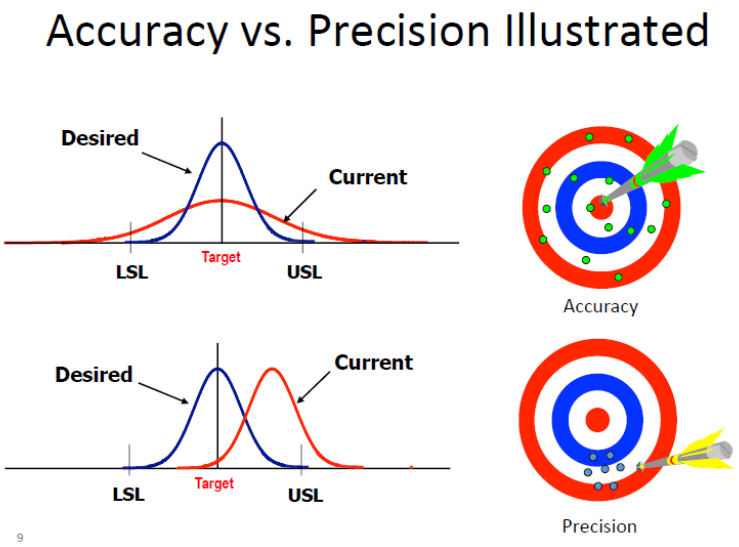



**Figure 2.4 Illustration of Accuracy vs Precision**

Sometimes it is found a set of data that accurate yet not precise, or precise yet inaccurate, or even sometimes it is found a set of data that neither accurate nor precise. However, in order to have a good measurement system, the data should be both accurate and precise. Not only an accurate and precise measurement system, but a good measurement system also should able detect small change in the process (good discrimination), produce the same result in the future when a measurement system applied to the same items of interest (stability), and linear.

In the measurement system analysis, there are several terms that should be known, those are;

- **Bias**

Bias is a term that given to a distance between the true value ("right" answer) and observed average measurement.

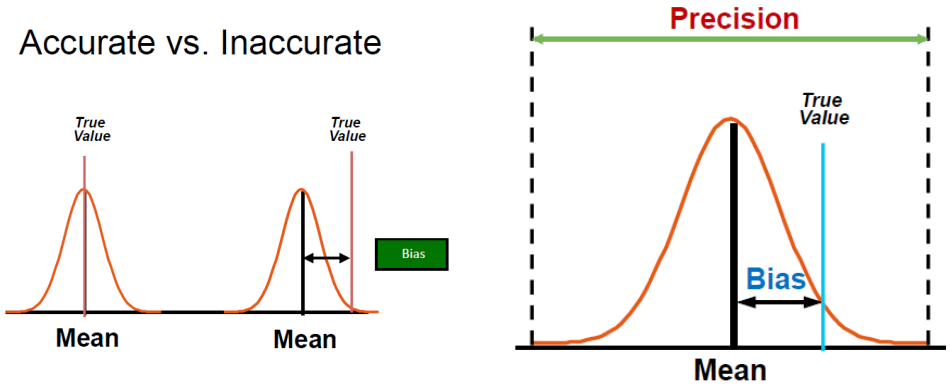



**Figure 2.5 Example of Bias**

- **Discrimination**

Discrimination is tha capability to detecting any small change in characteric. The unacceptable discrimination will not be able to identify the process variation or even quantify the characteristic value of individual part.

- **Stability**

Stability is the ability of any measurement system which produce the same result or value when measure the same value over time. If the measurement does not change or drift over time, the instrument will considered as stable.

The picture below shows the example of a stable and non-stable measurement system;

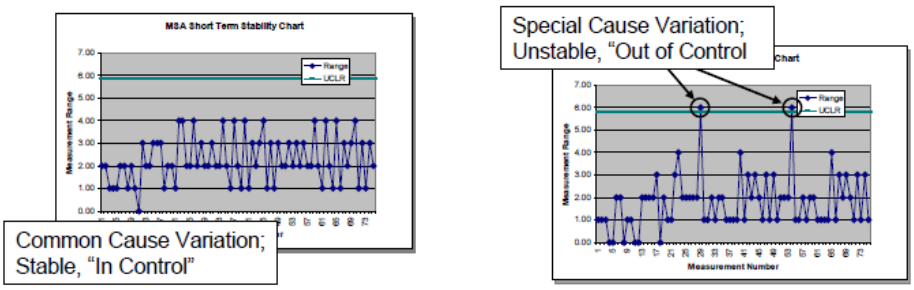



**Figure 2.6 Example of Stable and Non-Stable Measurement Result**

Basically, in the statistical process control chart, stability means as the absence of special cause variation or can be called as "in control" value, while the unstable measurement system is the measurement result that has "out of control" value.

- **Linearity**

Linearity is consistency of bias over measurement range; a slope between the average measured and tru value is perfect. The measurement will see the difference of bias over the range measurement, if the measurement priduce the same bias over time, it means that the linearity is good.

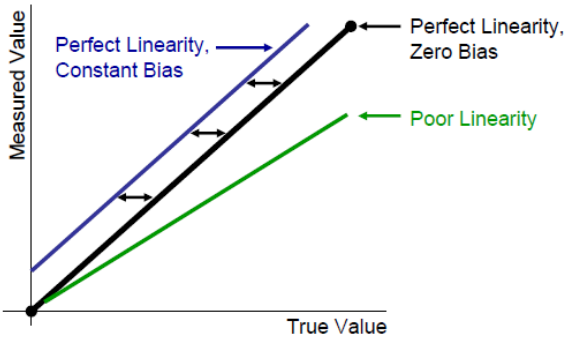



**Figure 2.7 Example of Linearity in Bias**

- **Repeatability**

Repeatability is related to the consistecy of an appraisser on measuring the same part for multiple time with the same measure instrument and get the same value or result. The repetability is related with the standard deviation of measured values.

- **Reproducibility**

Reproductibility is when different appraisser measure the same part (sample) with the same measurement instrument and get the consistent measurement result or value. The reproducibility related to the standard deviation of the distribution of appraiser average.

The figure 2.7 shows the percentage of R&R (repeatability and reproducibility) in the measurement system;

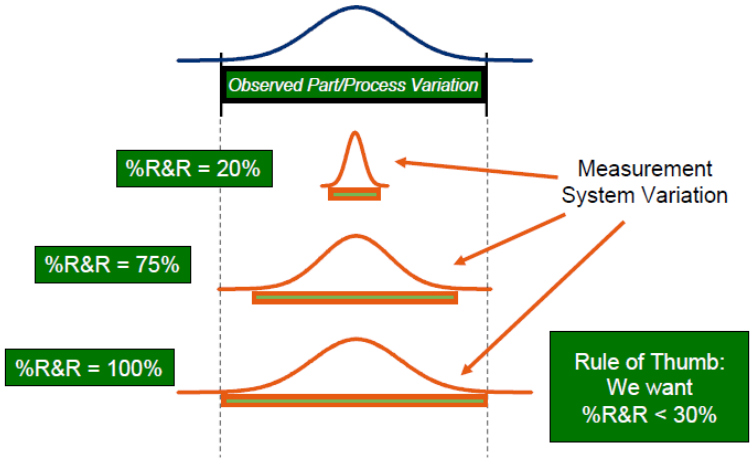



**Figure 2.8 Percentage (%) of Repeatability & Reproducibility**

- **Gage R&R**

Gage R&R is a study that will help the people to investigate the variability that exist in the measurement system. The study of gage R&R will help the people to ensure whether the measurement system variability smaller than the process variability or not, to know the total variability that exist caused by the differences of operator and also ensure whether the measurement system able to discriminate between different parts.

Generally, there are three types of gage R&R study that can be implemented, those are;

❖ **Crossed Gage R&R study**

This is the study when each operator will measure the each sample in multiple times. The sample that has been measured by the first operator can be measured again by another operator, because this measurement is not destructive. In example, measurement using caliper, etc. This study can be used to know the number of process variation due to the variability of measurement system. In order to perform this study in Minitab (Statistical tool), choose **Stat > Quality Tools > Gage Study > Gage Study (Crossed).**

- **Nested Gage R&R**

  This study is performed when there will be only one operator that measure each part because the part is easily to be damaged. This study called as nested because one or more factor will be nested by the another nested. This study can be performed using Minitab by choose **Stat > Quality Tools > Gage Study > Gage Study (Nested).**

- **Expanded Gage R&R Study**

  This study is a Gage R&R study that can be performed when the condition are;

  - More than one factors are exist, usually operator, gage and part
  - Fixed and random factors
  - The combination of both nested and crossed factor
  - An unbalance design.

  In order to perform this study by using Minitab, choose **Stat > Quality Tools > Gage Study > Gage Study (Expanded).**

By use the ANOVA (Analysis of Variance) in Minitab/stastistical tools, Gage R&R will help the people to know the variation of sample parts, the variation between operator, variation of measurement instrument and the interaction between the operator towards the sample part.

On 2010, Automotive Industry Action Group (AIAG) establish a standard to know whether the measurement system that has been implemented is acceptable or not. It is known that if the percentage of variation still less than 10%, it means that the measurement system still acceptable. In order to evaluate the process variation that exist, the total of gage R&R contribution can be compared to the several standard that mentioned on the below table;

**Table 2.1 Standard Variance of Gage R&R Based on AIAG's Policy**

| Percentage of Variance Components | Acceptability |
|---|---|
| Less than 10% | The measurement system is acceptable |
| Between 10% and 30% | The measurement system is acceptable depending on the application, the cost of the measurement device, cost of repair, or other factors. |
| Greater than 30% | The measurement system is not acceptable and should be improved. |

### 2.4.1.Guidance for Implement the Measurement System Analysis

In order to implement the Measurement System Analysis (MSA) or the Gage R&R study, there are several tools that should be prepared and steps that should be followed such as below:

a. Determine the number of operators, sample parts, and the number of repeat reading. Actualy, the higher the number of sample parts and repeat reading, the higher the level of confidence will be. However the number should be balance with cost, time and disruption that get involved.
b. Choose the operators who are usually perform the measurement and know about the measurement instrument and procedure.
c. Ensure that a set of documented measurement procedure that can be followed by all appraisers is available.
d. Select a sampe part that can represent the entire process spread.
e. Ensure that the measurement instrument has adequate resolution or fulfilled the requirement.
f. The part sample should be numbered, the measurement should be taken in random order with the unknown order by the appraiser. The third party should record the measurement result, the appraiser and the number of trial.

### 2.4.2.Measurement System Analysis for Continuous Data

Measurement System Analysis for continuous data is a measurement system that is conducted for any product or process that can be measured and has numerical result.

The figure below will shows the source in continuous data measurement that make a variability for the measurement system;

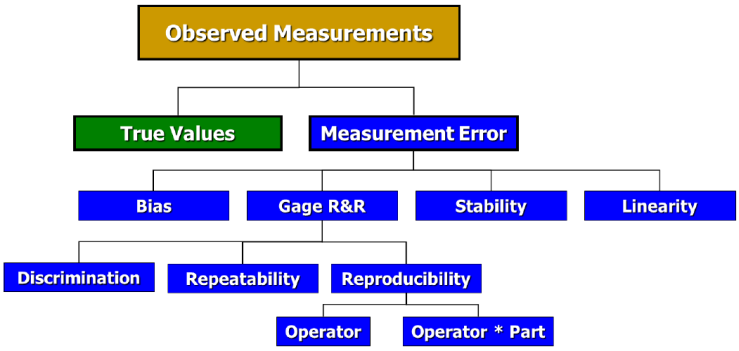



**Figure 2.9 Source of Measurement System Variability in Continuous Data**

The figure above shows that the variability in measurement system comes from the operator that asses the part of the product.

In Gage R&R of continuous data, there are G R&R six pack that will shows the result of the measurement system analysis, those are;

- **Gage R&R relationship**

A measurement system will be called as a good system is the result of the measurement is consistent within appraiser (repeatability) and also consistent between the appraisers (reproducibility). A gage will only valid to detect part-to-part variation when the variability of measurement system is smaller if it compared to the process or tolerance range.

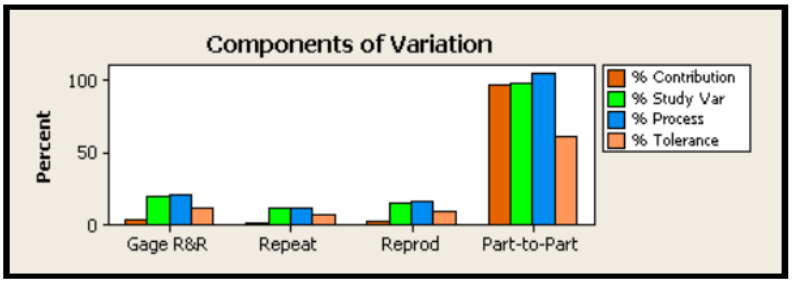



**Figure 2.10 Components of Variation**

The percentage of variation that consumed by %R&R will define whether the measurement system is good and can detect part-to-part or not.

- **R-Chart By Operator**

The repeatability of an operator can be seen by a special chart that shown the differences measurement of one operator towards a part sample. If the highest result of measurement does not exceed the UCL and the smallest result does not exceed the LCL, or called as in control. Then the operator and Gage can be considered to be repeatable.

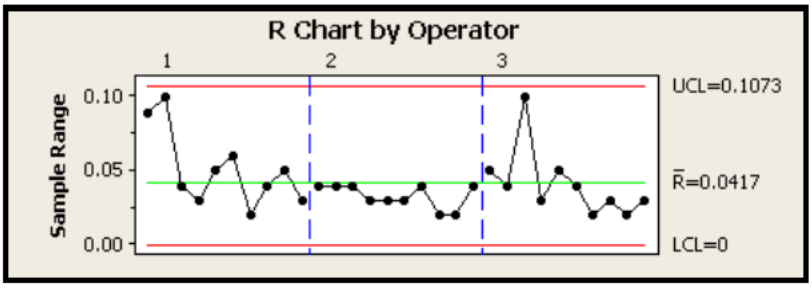



**Figure 2.11 Example of R-Chart by Operator**

- **X-Bar Chart by Operator**

The X-Bar Chart shows the variance that exist for gage. The good situation is when the gage variance is much smaller than the variability of the parts. Therefore, the chart should plots consistently go outside the UCL and LCL. In this chart, it should be at least 50% of the point outside the control limit.

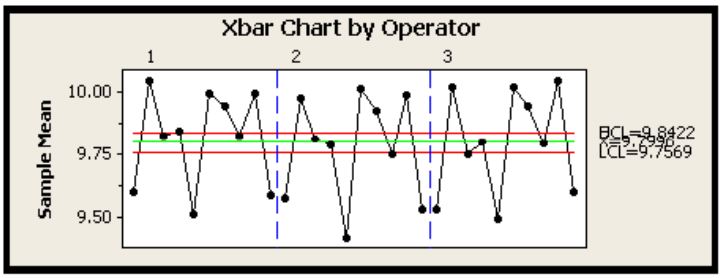



**Figure 2.12 Example of X-Bar Chart by Operator**

- **Response by Part**

This graph will shows the data from all sample parts that measured by all operator. The data that plotted may be vary, it shown from the smallest dimension and the largest dimension. The part should be in tolerance and out of the tolerance if the process makes them. If there is a big spread over the operators toward the parts, it can be because the poor candidate or an unclear parts.

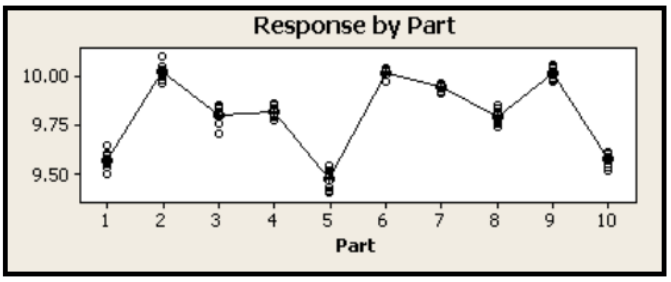



**Figure 2.13 Example Graph of Response by Part**

- **Response by Operator**

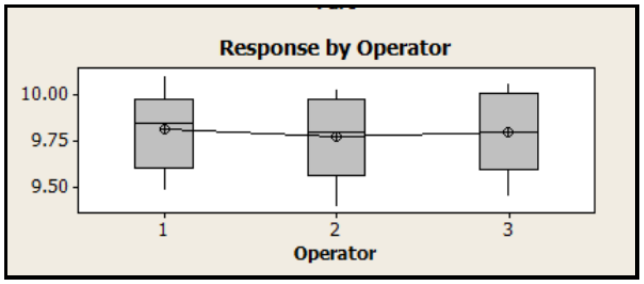



**Figure 12.14 Example Graph of Response by Operator**

The graph above shows the response of each operator towards the ten sample that has given to be measured. The line that crossed all of chart connect the average of ten sample that has been measured by each operator. This graph used to see the percentage of each operator capability on measuring the sample close to the right answer.

- **Operator*Part Interaction**

This graph will show the interaction of operator to the part. If the line that connect the average of part measurement significantly diverged, then it means that there are relationship between the operator who do the measurement and the part that being measured. The significant diverge means not good to the measurement system, and this things should be investigated later.

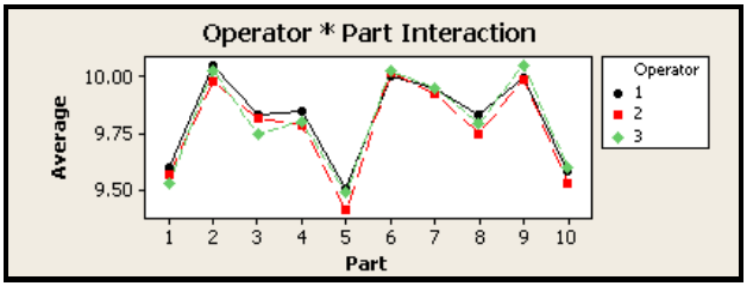



**Figure 2.15 Example Graph for Operator*Part Interaction**

### 2.4.3.Measurement System Analysis for Discrete or Attribute Data

An error in the measurement system is a thing that cannot be avoided by the people, especially in Industry. The variation that exist in a measurement system caused by the system of the measurement itself. The most problematic measurement happen when the people should measuring something that result attribute data which rely on the human judgment such as “good or bad” or ‘pass or fail”. This thing happened because it is hard to have the same definition of “good or bad” between all the appraisers. However, this thing is usually happen in the industries. In example an operator should determine whether the lenses is defect free or not using a powered microscope. Therefore, it is very important to qualify whether the measurement system already good or not.

In order to analyze the measurement system that has result in attribute data, it is suggested to implement the attribute agreement analysis or usually called as attribute gage R&R study to evaluate the agreement of subjective nominal rating or ordinal rating by multiple appraiser and deciding how likely the measurement system towards the specific parts.

The implementation of Attribute Agreement Analysis is aim to;

- Ensure whether the appraiser agree with himself on the trials
- Ensure whether the appraiser agree with the master standard on the trials
- Ensure whether all the appraisers are agree with themselves (within appraiser) and other (between appraiser) on the trials, and
- Ensure whether all the appraiser agree with themselves, other appraiser and the standard.

In the implementation of Attribute Agreement Analysis, there are several ways that can be followed. First, Choose several operators that want to be assessed. Second, choose the sample parts that want to be the master or standard of the measurement. Third, numbering all the sample defect in order. Forth, do the trials to the appraiser 3 times by the random order of defect samples that is unknown by the appraisers.

Worksheet 1 ***

| | C1 | C2-T | C3-T | C4-T | C5-T | C6-T | C7-T | C8-T | C9-T | C10-T | C11-T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | sample | Inspector 1-1 | Inspector 1-2 | Inspector 1-3 | Inspector 2-1 | Inspector 2-2 | Inspector 2-3 | Inspector 3-1 | Inspector 3-2 | Inspector 3-3 | Answer |
| 1 | 1 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept |
| 2 | 2 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept |
| 3 | 3 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept |
| 4 | 4 | Accept | Accept | Accept | Reject | Reject | Accept | Accept | Accept | Accept | Accept |
| 5 | 5 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Reject | Reject | Accept |
| 6 | 6 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Reject |
| 7 | 7 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Reject |
| 8 | 8 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Reject |
| 9 | 9 | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Accept | Reject |
| 10 | 10 | Reject | Reject | Reject | Reject | Reject | Accept | Accept | Accept | Reject | Reject |

**Figure 2.16 Example of Attribute Data of MSA**

The figure above is one example of measurement result in attribute data, the column two until ten shows the attribute data result from the implementation of measurement system analysis towards three appraisers with three trial of measurement. While the last column shows the master standard for the measurement (or right answer).

After the data of all trial has been input into statistical tool which is MINITAB, the attribute agreement analysis tools can be used by choose ***Stat*> *Quality Tools*> *Attribute Agreement Analysis.***

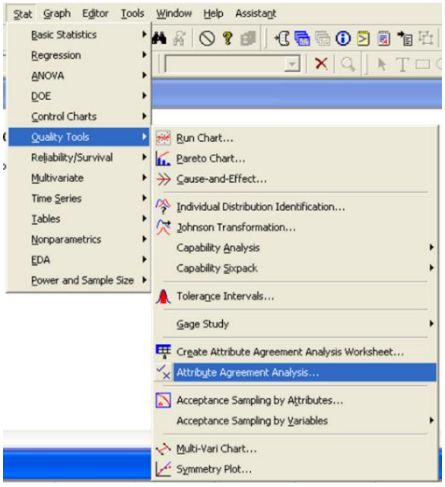



**Figure 2.17 Step of Using Attribute Agreement**

Then, after choose the attribute agreement analysis, choose the multiple column like the picture on below and fill it with the column that consist of measurement result.

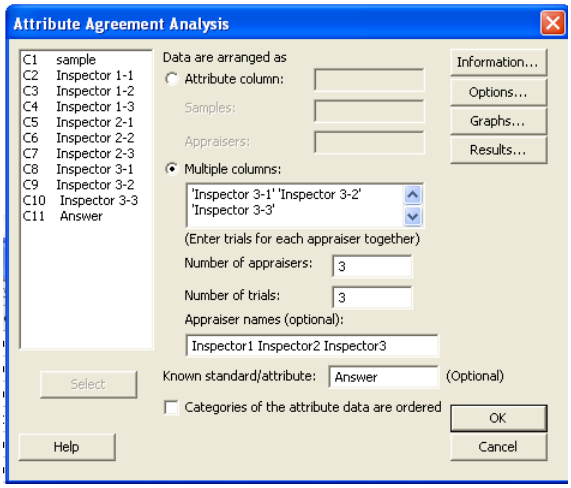



**Figure 2.18 Attribute Agreement Analysis on MINITAB**

After that fill the number of appraisers and trials based on the actual implementation of Measurement System Analysis (MSA), Fulfilled the inspector name by the appraisers' name and fill the known standard/attribute with the column that consist the right answer of each sample part.

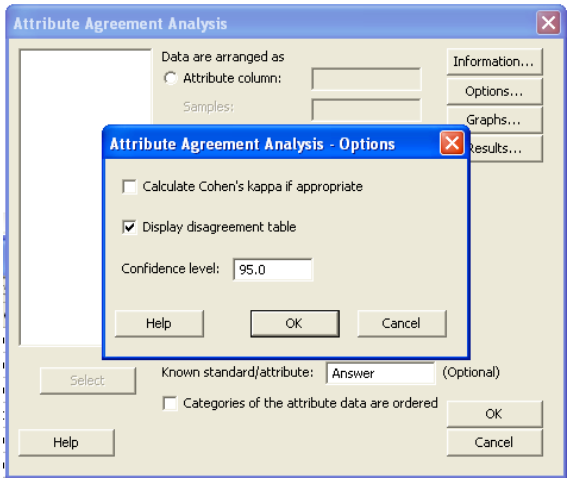



**Figure 2.19 Confidence level of Attribute Agreement Analysis**

Before click OK, the kappa value or confidence level of the analysis should be mentioned by choose option > Checklist Display Disagreement Table > define the confidence level and click OK. Generally, the confidence level should be 100%, but it also can be only at least 90%. On the figure above, the confidence level determined as 95%.

After all the data has been input and the confidence level has been defined, the MINITAB will help to analyze the data and give result such as:

- **Within Appraiser**

**Attribute Agreement Analysis for Inspector 1-, Inspector 1-, Inspector 1-, ...**

**Within Appraisers**

Assessment Agreement

| Appraiser | # Inspected | # Matched | Percent | 95% CI |
|---|---|---|---|---|
| Inspector1 | 10 | 10 | 100.00 | (74.11, 100.00) |
| Inspector2 | 10 | 8 | 80.00 | (44.39, 97.48) |
| Inspector3 | 10 | 8 | 80.00 | (44.39, 97.48) |

# Matched: Appraiser agrees with him/herself across trials.

Summary result:
✓ Inspector 1 : 100% consistent
✓ Inspector 2 : 80% consistent
✓ Inspector 3 : 80% consistent

Fleiss' Kappa Statistics

| Appraiser | Response | Kappa | SE Kappa | Z | P(vs > 0) |
|---|---|---|---|---|---|
| Inspector1 | Accept | 1.00000 | 0.182574 | 5.47723 | 0.0000 |
| | Reject | 1.00000 | 0.182574 | 5.47723 | 0.0000 |
| Inspector2 | Accept | 0.42308 | 0.182574 | 2.31729 | 0.0102 |
| | Reject | 0.42308 | 0.182574 | 2.31729 | 0.0102 |
| Inspector3 | Accept | 0.25926 | 0.182574 | 1.42002 | 0.0778 |
| | Reject | 0.25926 | 0.182574 | 1.42002 | 0.0778 |

**Figure 2.20 The Percentage Result of Within Appraisers**

The figure above shows the percentage of measurement result within each appraiser. The percentage define the consistency of each appraiser towards

their answer in three time of trials. As it shown above that inspector 1 consistent 100% on their measurement while the inspector 2 and inspector 3 only consistent 80%.

- **Each Appraisers VS. Standard**

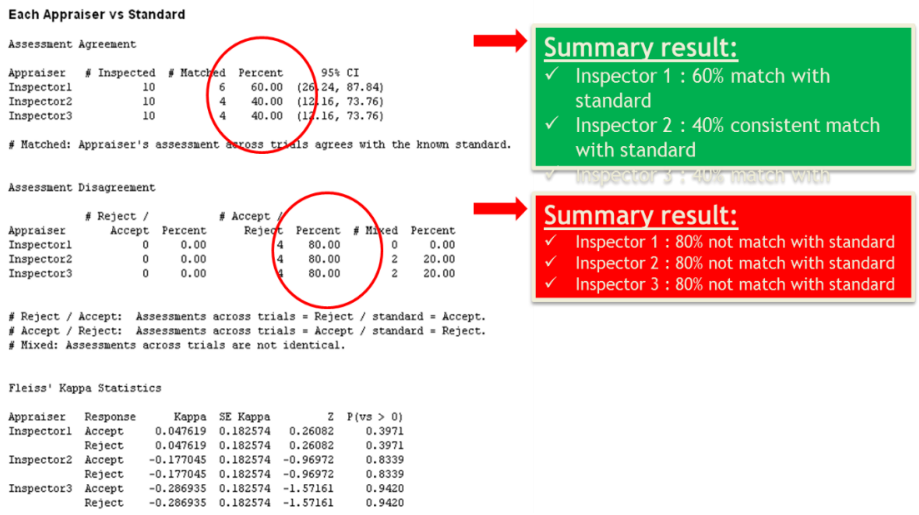



**Figure 2.21 The Percentage of Each Appraiser VS. Standard**

Assessment agreement shows the comparison of each appraiser that matching with the correct answer, while the assessment disagreement is to compare each appraiser answer that do not match with the correct answer.

- **Between Appraisers**

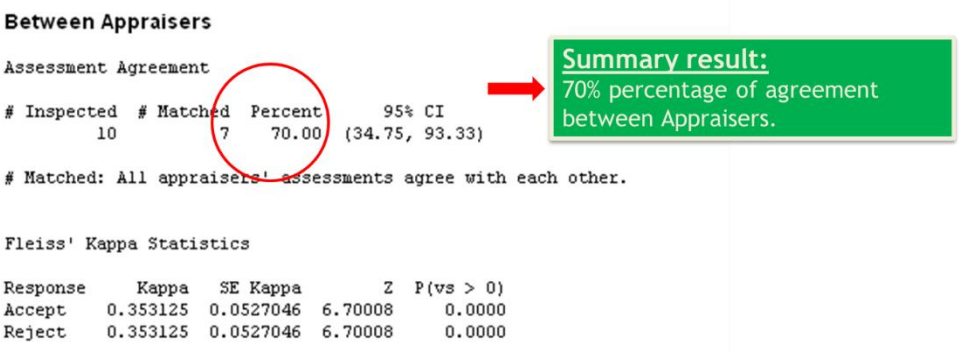


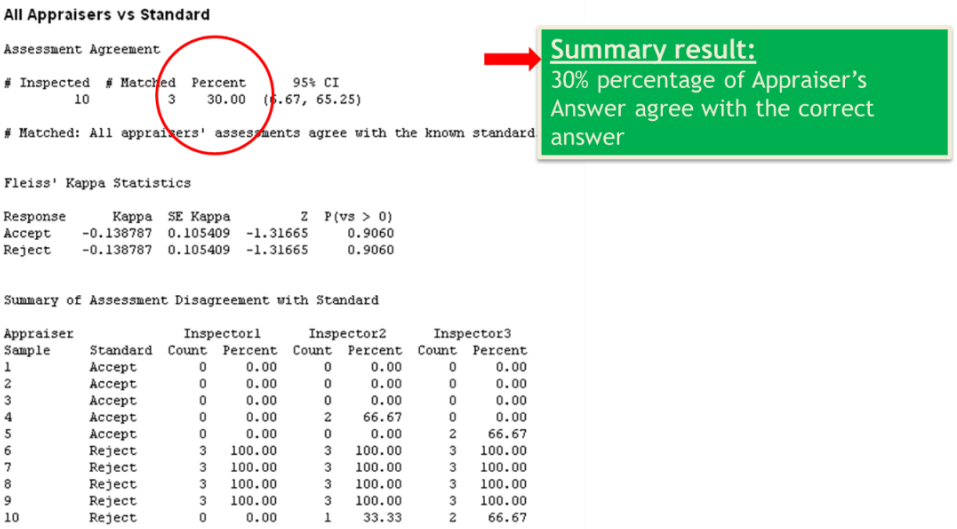

**Figure 2.22 The Percentage of Between Appraisers**

The figure above define the percentage of between appraisers. The percentage of between appraisers in this Measurement System Analysis is

70%. The Between appraisers percentage aim to define how many percent one appraiser with the other appraiser have the same perspective toward the defect sample. The figure above shows that the same perception of one appraiser toward the other only 70%. It means that all the appraiser need to be trained to have the same perception.

- **All Appraisers VS. Standard**

Lastly, the things that should be known in Attribute Agreement Analysis is the percentage of al appraisers VS. Standard. It is define whether all the answer of the appraiser is accurate with the standard or not just like the figure below.



All Appraisers vs Standard

Assessment Agreement

| # Inspected | # Matched | Percent | 95% CI |
|---|---|---|---|
| 10 | 3 | 30.00 | (6.67, 65.25) |

# Matched: All appraisers' assessments agree with the known standard.

Summary result:
30% percentage of Appraiser's Answer agree with the correct answer

Fleiss' Kappa Statistics

| Response | Kappa | SE Kappa | Z | P(vs > 0) |
|---|---|---|---|---|
| Accept | -0.138787 | 0.105409 | -1.31665 | 0.9060 |
| Reject | -0.138787 | 0.105409 | -1.31665 | 0.9060 |

Summary of Assessment Disagreement with Standard

| Appraiser | | Inspector1 | | Inspector2 | | Inspector3 | |
|---|---|---|---|---|---|---|---|
| Sample | Standard | Count | Percent | Count | Percent | Count | Percent |
| 1 | Accept | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 2 | Accept | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 3 | Accept | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| 4 | Accept | 0 | 0.00 | 2 | 66.67 | 0 | 0.00 |
| 5 | Accept | 0 | 0.00 | 0 | 0.00 | 2 | 66.67 |
| 6 | Reject | 3 | 100.00 | 3 | 100.00 | 3 | 100.00 |
| 7 | Reject | 3 | 100.00 | 3 | 100.00 | 3 | 100.00 |
| 8 | Reject | 3 | 100.00 | 3 | 100.00 | 3 | 100.00 |
| 9 | Reject | 3 | 100.00 | 3 | 100.00 | 3 | 100.00 |
| 10 | Reject | 0 | 0.00 | 1 | 33.33 | 2 | 66.67 |

**Figure 2.23 The Percentage of All Appraiser VS. Standard**

The percentage on above shows the result whether the appraiser agree with the standard answer or not. Even though the percentage within appraiser is high, but does not mean that the answer of the appraiser is right. The percentage above which is 30%, it means that the definition of accepted or rejected defect based on the appraiser really different between the standard. Therefore, it is good for the appraiser to be re-trained before perform the other measurement in order to make the measurement system better.

The result of Attribute Agreement Analysis will be summarize up on a scatter chart like the figure below;

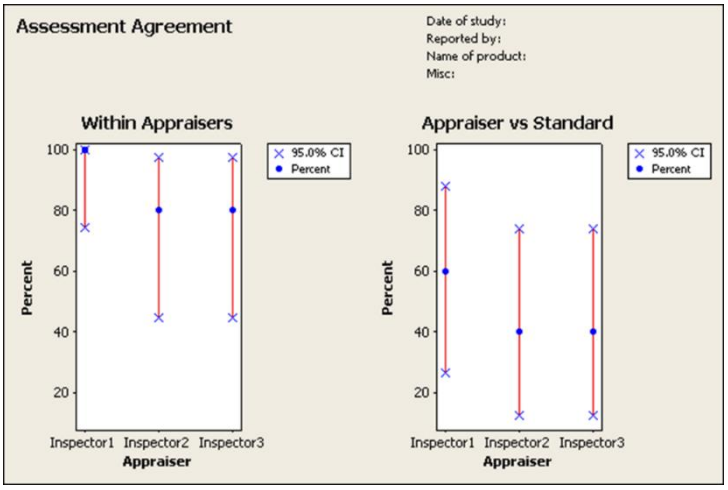


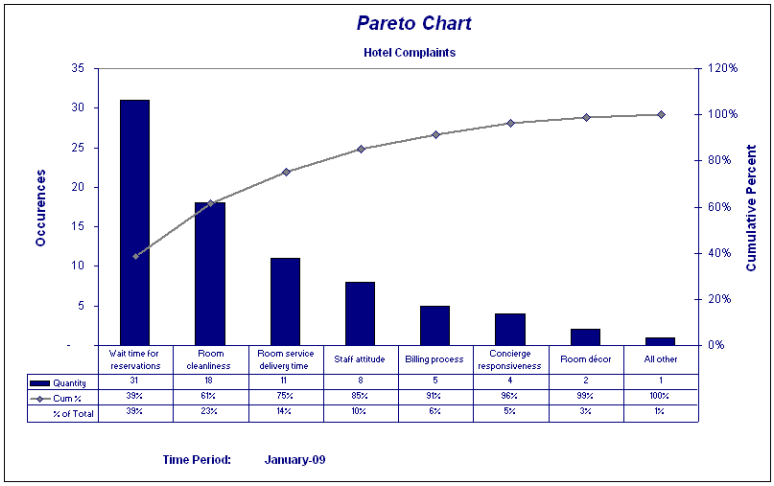

**Figure 2.24 MSA Graph of Attribute Agreement Analysis**

## 2.5.Pareto Chart

Pareto Chart or usually also called as Pareto Distribution Diagram which is named after Vilfredo Pareto, is a chart that consist of two element which are bar and line graphs. The descending order of bar represented the frequency of occurrence or it can also represent the cost, time or any other unit measure. In the other side, the line graph represent the percentage of total number occurrence. Pareto Chart is one of the most useful of the seven major SPC problem-solving tools (Grzegorzewski, 2012). It is usually graph with ordered bar from the highest frequency to the lowest one, the highest frequency commonly represent the most critical problem that exist or the main cause of the problem. The Pareto Chart has its principle which depict a phenomenon where 80 percent of variation observed can be represented by 20 percent of the cause of the variation. The descending order of bar in Pareto chart will help the people to get easy to determine the most influential thing that cause the problem, thus, the people can focus only to small number of problem that should be tackled.

Pareto chart has its best to use when the people need to analyzing the frequency data of a problem or causes in a process, when people would like to focus on the

most significant cause or problem that should be tackled from various number of problem and when the people would like to represent the data to the other people in easy way.




*Source:* moresteam.com

**Figure 2.25 Example of Pareto Chart**

In conduct a Pareto chart, there are some steps or procedures that can be followed as below:

- Elaborate a list of problem, causes or anything that want compared.
- Determine what measurement want to be used on define the problem (Such as Cost, Time, Frequency, etc)
- Decide the timeframe of collecting data that want be presented in Pareto Chart (Ex: A day, a week or month)
- Sum up the total measurement of each category
- Decide the good scale for each measurement that has been collected
- Construct a bar graph for each category and make the highest one on the left and smallest one on the right.
- Calculate the cumulative percentage of each category and conduct the line graph.
- Analyze and identify the data that has been presented in the Pareto Chart for further action.

## 2.6.Why Analysis

Why Analysis is a root cause analysis tool for problem solving. This tool helps identify the root cause or causes of a mismatch on the process or product. Why analysis can be a method to brainstorm. Ask "why" for many times can help to identify root cause of the problem. In theory, after ask "why" five times, one of question can define the root cause (Mahto, Dalgobind and Anjani Kumar, 2008). Common steps when performing root cause analysis with why analysis:

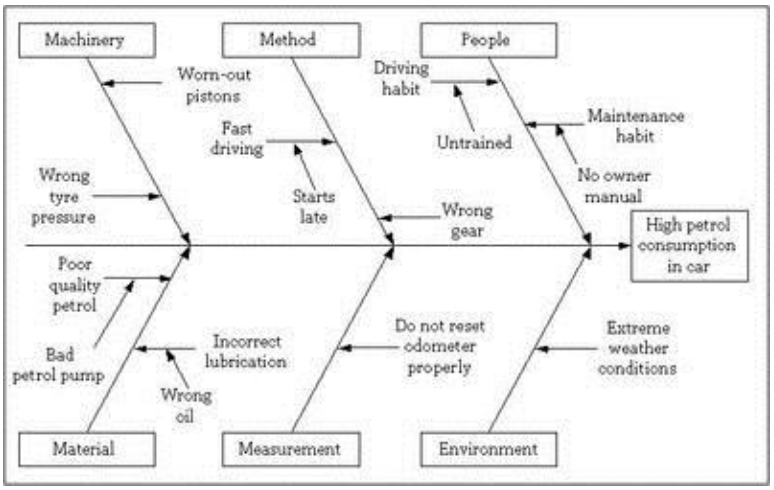
1. Determine the problem and the problem area
2. Gather a team to brainstorm so that can have different views, knowledge, experience, and a different approach to the problem
3. Perform Gemba (to the field) to see the actual area, the actual object, with actual data
4. Start asking using 'Why'
5. After arriving at the root of the problem, test each answer from the bottom of whether the response will affect the result in the upper level.
6. In general, the solution does not lead to blame to a person but how to perform a system repair or procedure.
7. If the root cause is already known then immediately identify and implement solutions.
8. Monitor continues its performance to ensure that the problem does not happen again.

## 2.7.Fishbone Diagram

Fishbone Diagram or usually called as Ishikawa diagram is a diagram which identify the specific causes of an event. This diagram was first published by Kaoru Ishikawa in 1968. Generally, this diagram used for prevent the defect and also develop the quality of product. Ishikawa or Fishbone diagram can help to identify the significant factors which give effects toward an event. Fishbone diagram distinguished into two part which are fish-head and fish-bones. The fish-head usually always placed in the right place. In this part, the event which caused by causes that will be written in fishbone is shown, the event usually shows the problem or the topic which the cause is going to be identify.

In the fish-bone part, the causes of the problem or the topic is identified and written. The causes divided into 5M and 1E which are:

- Man : is all the people that getting involved in the process
- Method : about how the process is done, the specific needs of the process, such as procedure, rules, etc.
- Material : All the material needed to run the process, such as raw material, pen, paper, etc.
- Machine : All the machine, equipment, computer and other things which needed to the job.
- Measurement : the way to collect the data which will be used to determine the quality of the process.
- Environment : The condition of work place, such as temperature, noise level, etc.




*Source:* discover6sigma.org

**Figure 2.26 Example of Fishbone Diagram**

Fishbone diagram usually used when the brainstorming session of the team. This diagram has nearly unlimited application in the research, manufacturing, marketing, office operation and so forth (Hekmatpanah, 2011). There are several steps or procedure that can be followed to conduct the fishbone diagram;

- State the main problem that want to be elaborated

- Decide the general factors that cause the main problem, if it hardly to be define, distinguish it into several categories;
    - Man
    - Material
    - Measurement
    - Method
    - Machine, and
    - Environment
- Write the category of causes in each branch of fishbone.
- Do the brainstorm of each category by using why analysis to elaborate more detail the factors or causes of the problem.
- Analyze the Fishbone Diagram

### 2.8.Check Sheet

According to Tague (2005), Check Sheet or also called as defect consecrations diagram is a structured and prepared form that used to collecting and record the data. This tool can be widely used for many purposes. Basically, the format of check sheet is a table or diagram. A check list will enable the people to count the frequency of an event or action in a specified time. It also enables record the data in systematic, waiting until the result being summarized, extract pattern and make conclusion (Leebov., 1991).

| Defect Types? Event occurrence | Events | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Sun | Mon | Tue | Wed | Thur | Fri | Sat | |
| Supplied parts rusted | | ✓✓✓ ✓✓✓ ✓✓ | ✓✓✓✓ ✓ | ✓✓✓✓ | ✓✓ | | | 19 |
| Misaligned Weld | | | ✓✓✓ | | | ✓✓ | | 5 |
| Improper Test Procedure | | ✓ | | ✓✓ | | | | 3 |
| Wrong Part Issued | | | | | ✓✓ | | | 2 |
| Film on Parts | | | | ✓✓✓✓ | | ✓✓ | | 6 |
| Voids in Casting | | | | | | | | 0 |
| Incorrect Dimensions | | | | | | | | 0 |
| Adhesive Failure | | | | | ✓ | | | 1 |
| Masking Insufficient | | | | | | | | 0 |
| Spray Failure | | | | ✓✓✓✓ | | | | 4 |
| *Total* | | *9* | *8* | *14* | *5* | *4* | *0* | *40* |

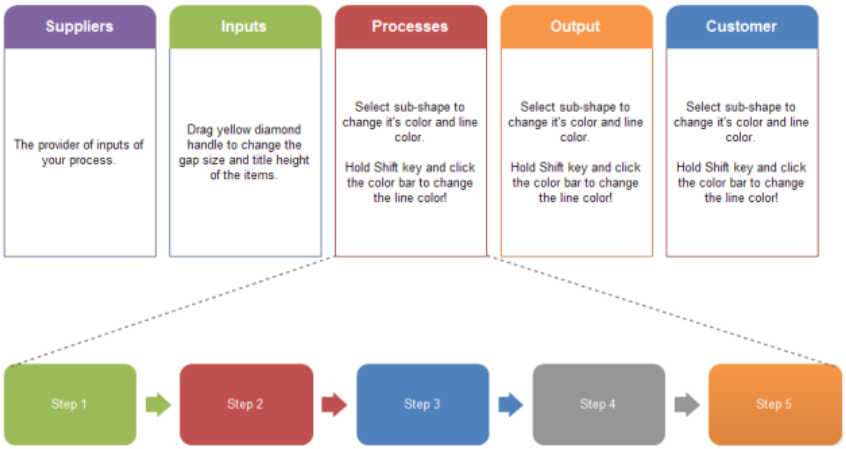
*Source: business-online-learning.com*

**Figure 2.27 Example of Checksheet**

The check sheet can be used when it comes to observe the same person, people or location repeatedly. It also can be used when observe and collecting data of frequency of problem, event, activity or defect. It also usually use for production process.

### 2.9.SIPOC Diagram

SIPOC Diagram is one of six sigma tools that often used in the Define phase. This tool used to define more clearly the scope of the research. It is often used to identify the relevant elements of a business process prior by Six Sigma Black Belt to launch an improvement for that process (Radziwill, 2011). SIPOC itself stands for Supplier, Input, Process, Output and Control. The SIPOC Diagram help to define clearly the supplier of the process, the inputs, what are the processes that passed, the output of the process and the people who become the customer of the output that produced. The figure below shows the example or guideline of SIPOC Diagram:




*Source: edraawsoft.com*

**Figure 2. 28 SIPOC Diagram**

# CHAPTER III

# RESEARCH METHODOLOGY

The methodology of this thesis will be described through the following figures below:

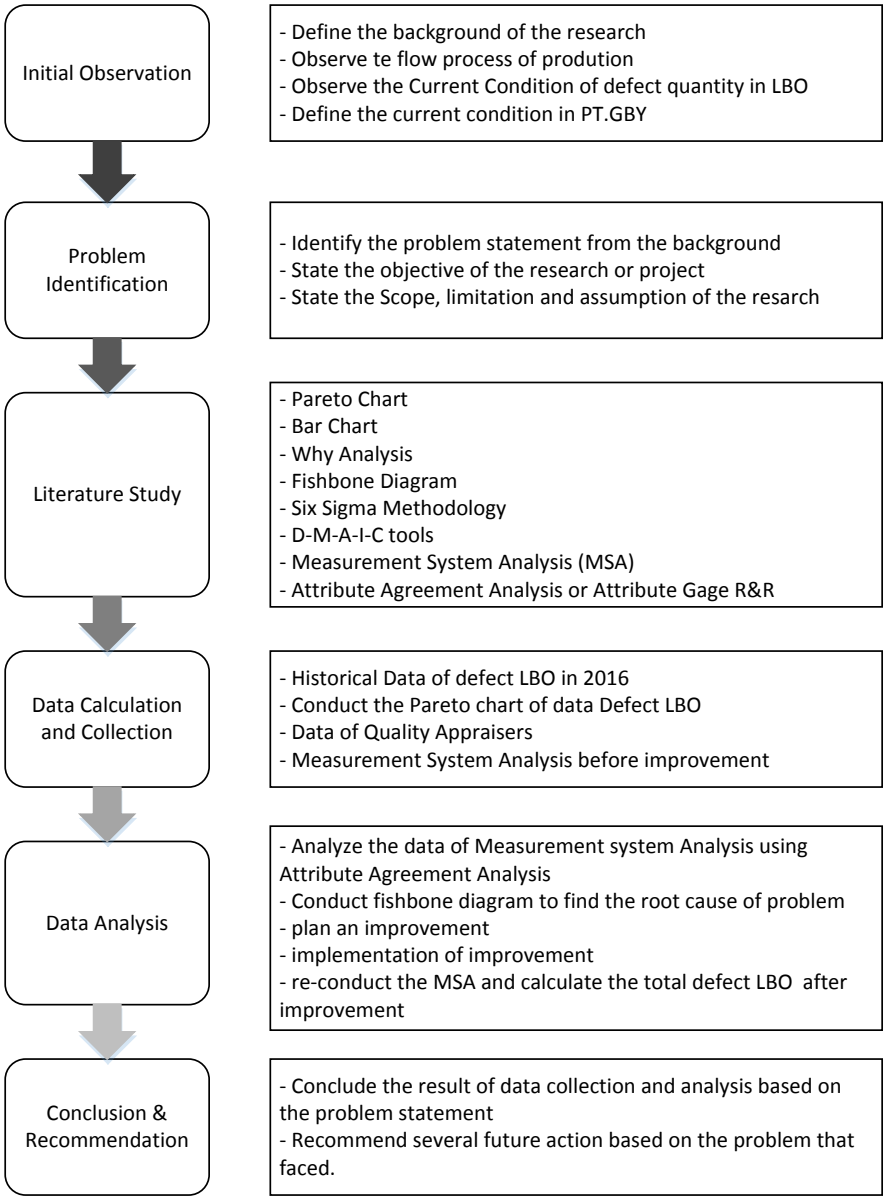



**Figure 3.1 Research Methodology**

### 3.1.Initial Observation

The initial observation of this research by state the problem background of this research. The problem background contain of the reason of why the research should be done. The current condition of the company or the business will be define briefly in the problem background in order to make the reader understand about the current situation that happen. As this research will discuss about the defect analysis. Therefore, in the initial observation the historical data of defect should be collected in order to make it to be observed. Besides the data of defect, the flow process of the production should be understood in the first observation in order to make the decision easier, what are the corrective action and improvement that should be done.

### 3.2.Problem Identification

After the problem background has been stated in the initial observation, in the problem identification phase, the more specific problem will be stated. In this research the problem is about the highest issue that caused by the aesthetic defect and the high quantity of defect that found in the LBO inspection, the quantity of defect exceed the tolerance given by the company which is 1000 ppm. Therefore, the objectives of this research are to reduce the number of defect per million and reduce the aesthetic issue in PT. GB Indonesia. As the research time is limited, therefore some scope made for this research; the MSA only done in the primary process area, the defect analysis only done for defect found in the LBO inspection and the historical data only collected from the January 2016 to June 2016.

### 3.3.Literature Study

In order to done this research, there are several literature studies that used. Literature study is a review of theoretical or methodological literature that used on doing this research. The literature study might come from book, journal or any article in the internet, etc. In this study the literature study that being used are;

- Six Sigma
- DMAIC methodology for the problem solving methodology.

- Measurement System Analysis (MSA) to analyze the capability of the human resources, especially in the quality control division.
- Attribute Agreement Analysis to analyze the attribute data that collected from the MSA towards the quality appraisers.
- Pareto Chart
- Fishbone Diagram, etc.

### 3.4.Data Collection and Calculation

As this research using DMAIC methodology, the data collection and calculation will be defined in the define phase and measurement phase. The data that collected for this research are the company background, flow process of production, historical data of defect LBO inspection, data of quality appraisers, and the measurement system analysis result. The data that has been collected and calculated will be used for further action which are analysis and improvement.

### 3.5.Data Analysis

In this phase, the data that has been collected and calculated will be analyzed. In the data analysis the data will be analyze by using Pareto chart and root cause analysis tools which is fishbone diagram, after the data has been analyzed and the root cause is found, then there will be a corrective action and improvement. In this research the improvement that is done is by doing aesthetic recalibration project and re-trained the quality appraisers. In order to know whether the improvement give impact to the defect reduction or not, in the control phase, the MSA will be re-conducted again.

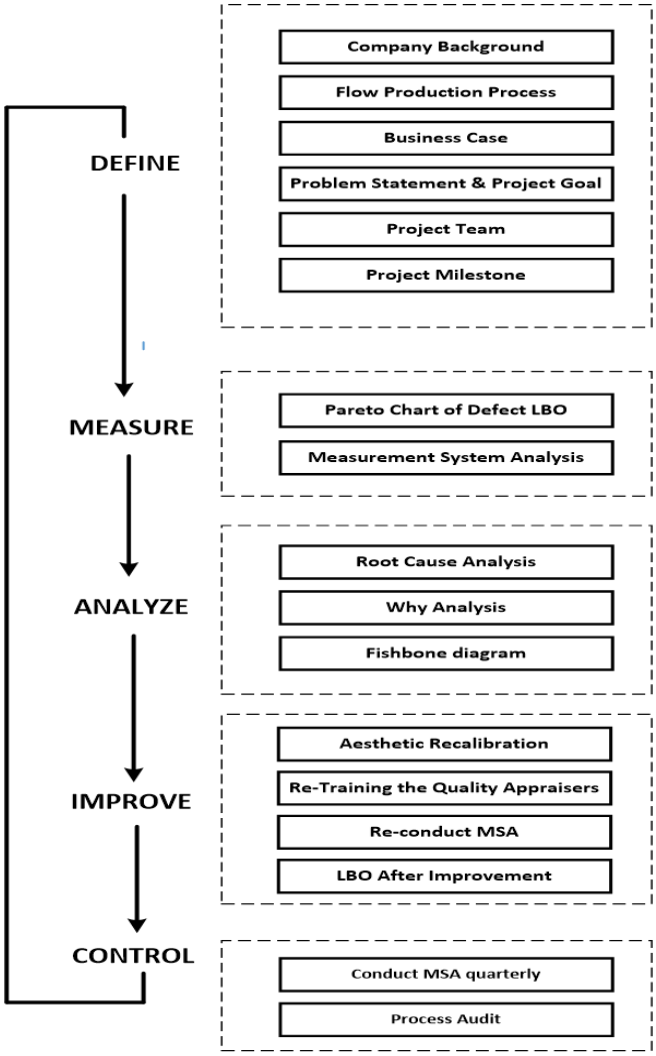



**Figure 3.2 Flow of DMAIC Methodology of the Research**

## 3.6.Conclusion

The conclusions started by giving the result of analysis and improvement. The conclusion will give a brief explanation which answer the research question which is stated in problem statement chapter I. Finally, the quantity of defect LBO inspection and MSA result of before and after improvement can be compared and the conclusion is being made. In the end, the recommendation will be given for further research.

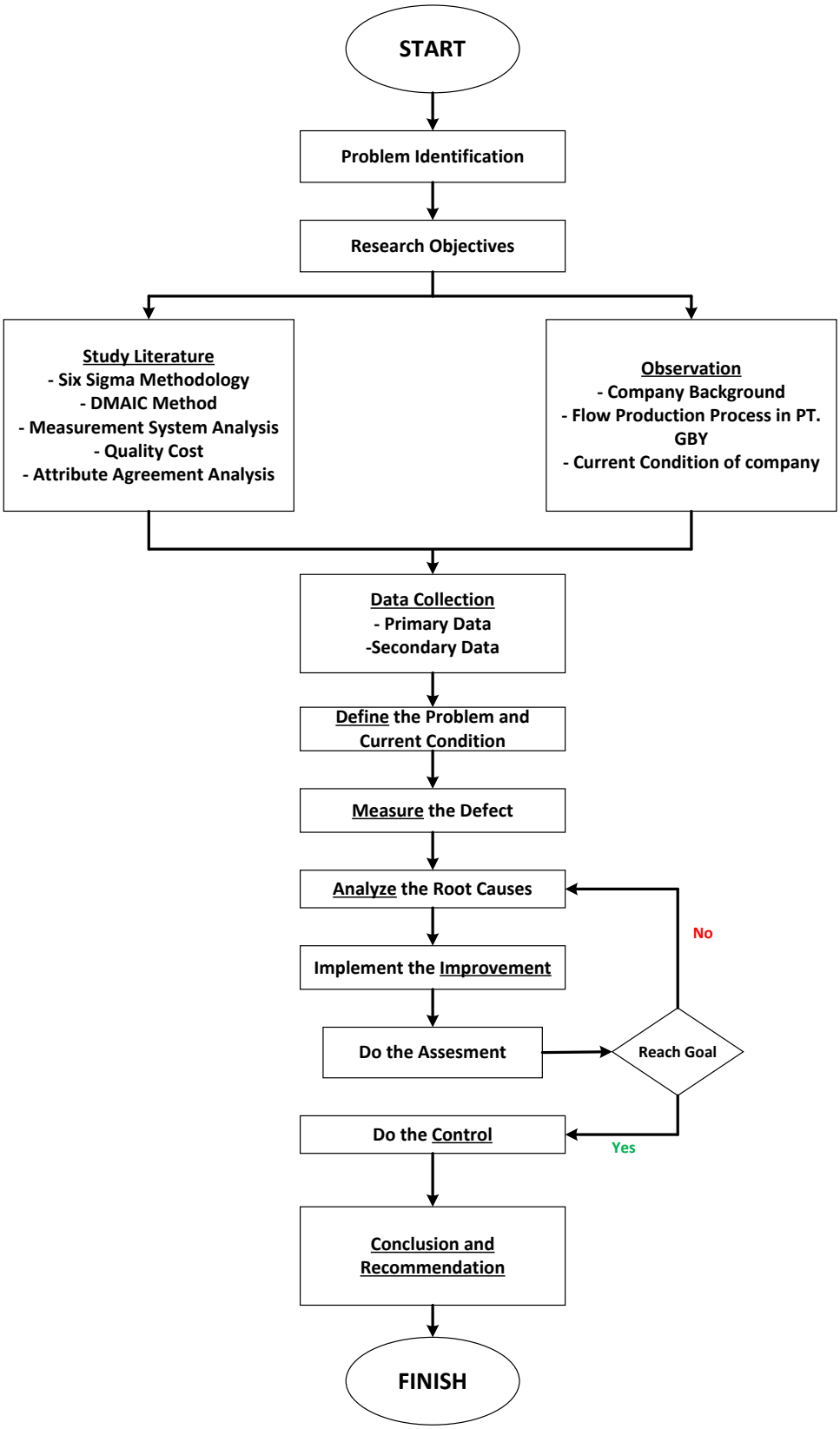



**Figure 3.3 Flow Diagram of Research**

# CHAPTER IV
# DATA COLLECTION AND ANALYSIS

## 4.1.Company Profile

GB, Inc. is an America Multinational company which has established since 1945 by Harold "Matt" Mason and Eliot Handler. This company has its headquarter in El Segundo, California. In the first year of its business, GB, Inc. was a company which sold picture frame then developed to sell dolls furniture. In 1947, due to the poor health, Matson share the company to Handler and then Handler's wife took over the roles of Matson. Ukulele is the first toy that produced by GB, Inc. and it named as Uke-A-Doodle. On 1955, GB, Inc. was the first sponsor for a cartoon named Mickey Mouse Club and it start to sell the best seller toy of the company which is Barbie since 1959.

The doll that is produce by GB, Inc. has a high selling price for each item. One thing that become the sale value is the aesthetic appearance of the doll. Recently, the Barbie doll is not only made as a toy for the kids but it also produce for the adults who interest with the doll and become the collector of it. It is found that on 2014, GB, Inc. was ranked 401 in 500 fortunes list and based on its revenue GB, Inc. categorized as the world biggest toy manufacturer. As one of the biggest toy manufacturers, GB, Inc. has established its subsidiaries in 40 countries to fulfill the demand and export the product to more than 150 nations. One of the GB, Inc. Subsidiaries is PT. GB Indonesia which located in the West of Java. PT. GB Indonesia has two plants which placed in Jababeka – Cikarang Baru. In Indonesia, the factory has started running since 1992 and produce more varied products such as Barbie, Hot Wheels, Fisher Price, Monster High, Ever After High and American Girl. Now days, PT GB Indonesia employ more than 4000 workers both in office and production line in order to fulfill the customer demand and achieve its goal.

### 4.1.1.Department in PT. GB Indonesia

As a big company, PT. GB Indonesia has an organizational structure to support the work system of PT. GB Indonesia. PT. GB Indonesia has 9 main departments which are Manufacturing Fashion Dolls Department, Manufacturing Die Cast Department, Engineering Department, Finance & IT Department, Human Resources Department, Quality Department, Materials Department, EHS & Government Relation Department, and Lean Supply Chain Department. The figure below shows the organization chart of PT. GB Indonesia.

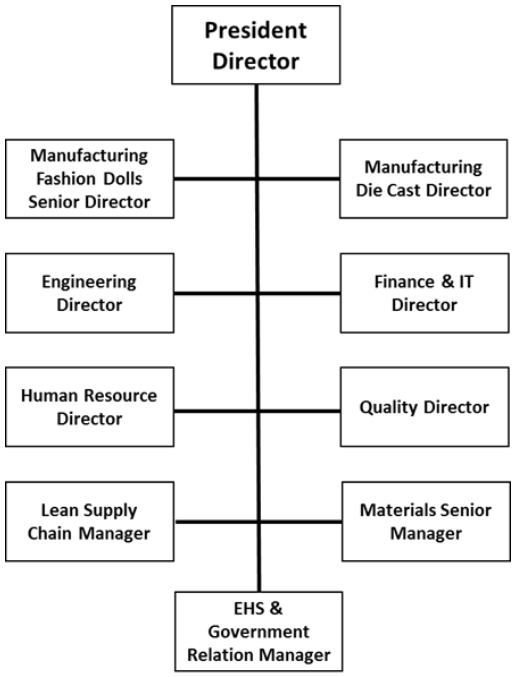



**Figure 4.1 Departments in PT. GB Indonesia**

### 4.2.Production Flow of PT. GB Indonesia

PT. GB Indonesia has two plants which are West Plant which located in Jababeka I and East Plant located in Jababeka II. Currently, the West Plant used to produce the Die Cast product such as Hot Wheels while the East Plant used to produce some kind of Dolls such as Barbie, Fisher Price, Monster High, etc. This Research was done in the east plant of PT. GB Indonesia. The production process in PT. GB Indonesia east plant divided into two processes, Primary Process and Secondary

Process. The Primary process is the beginning process that starts from the raw material, while the secondary process is the continuous process after the assembly. The process which included in primary process is rotocast, molding, tampo, painting and torso assembly. While the process that included as secondary process is the rooting & grooming process, packaging and pack out. Beside the primary and secondary processes, costume of the doll made in soft good area. The figure below shows the overview of production flow in PT. GB Indonesia

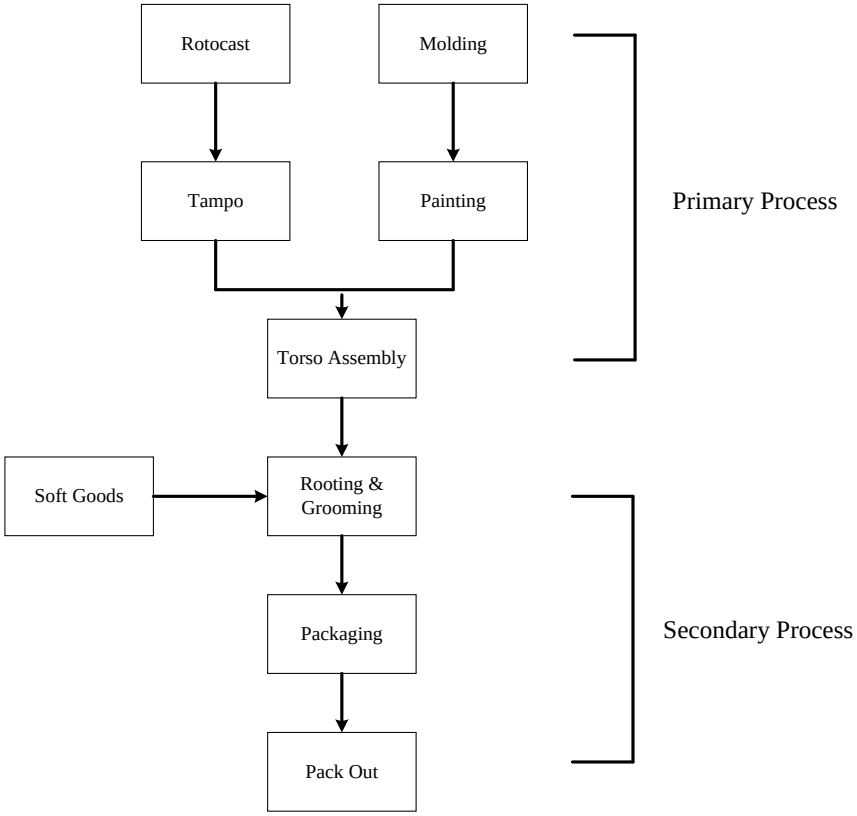



**Figure 4.2 Flow Production Process of GB Indonesia**

*Rotocast* : is casting process of forming the head of the dolls

*Molding* : is a process to mold the parts of the dolls include arms, legs, torso, connector, and the accessories of the dolls.

*Tampo* : is the process of painting the face of the doll. This process using such a printing painting, the face of the dolls will be made only by pressing the machine.

*Painting* : it is the process of coloring up the parts that has been molded. The painting method usually done by spray the parts.

*Torso Assy* : this is the process where all the part of the dolls which are head, torso, arms and legs is being assembled. The assembly process done by the machine and it use solvent to glue the torso.

*Rooting & Grooming* : is the process where the operators arrange the doll's hair.

*Packaging* : is the process where the doll and the accessories are being put into one package or box.

*Pack out* : is the final process of the production. It is the process where the toy that has been package will be put into the master carton.

### 4.3.DMAIC (Define, Measure, Analysis, Improve and Control) Methodology

This research was done by using a Six Sigma approach which is DMAIC (Define, Measure, Analyze, Improve and Control) tool. This approach is a well-structured methodology that usually used to reducing the variation, measure defects and improve the quality of a product, process or service. As it mention above that DMAIC methodology is divided into five phases. The first two phases which are define and measure phases will consist of the data collection that is needed in this research, while the other three phases of DMAIC methodology which are Analyze, Improve and Control will consist of the data analysis and result of this research.

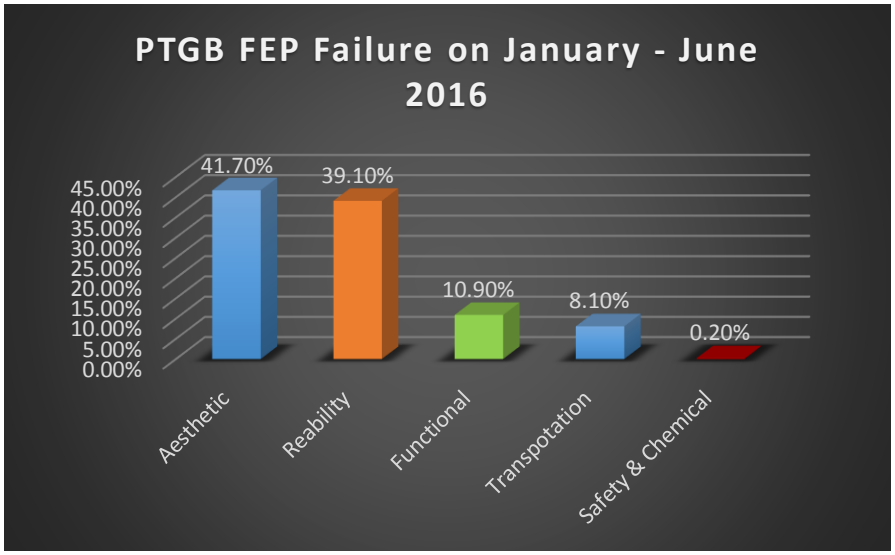
#### 4.3.1.Define Phase

The Define Phase is the first step in the DMAIC methodology. In this phase, the project charter of this research will be explained, the project charter will define the business case that become the reason why this research is being conducted, define the scope and also goal of this research and also introduce the people that get involved to reach the goal of the project.

#### 4.3.1.1.Business Case

As it has been mentioned before that PT. GB Indonesia is a part of the world biggest toy manufacturer. In order to satisfy the customer that spread around the world, PT. GB Indonesia always try to improve the performance especially from the quality of the product. One product that produce by PT. GB Indonesia is a mini doll that has a high price based on its aesthetic performance. The value of this kind of toy is exist more from the aesthetic performance than its function. The aesthetic value of the doll will give impact to the sale price of the toy. The better the aesthetic performance of this toy, the higher the sale price will be. Hence, the aesthetic value always become one of the concern for the manufacturer on producing this kind of toy. In order to ensure that the product of PT. GB Indonesia that delivered to the customer has a good quality, PT. GB Indonesia has a special department to focus on the product quality which is quality department. The quality department will ensure the quality of the product from the vendor, development until the production process.

Before the factory produce the product that will be delivered to the customer. The toy should pass the development process first in order to know what are the issues or failure that may exist in the toy. In the development process the quality members that get involved is the quality engineer division. There are several stages of the development process in PT. GB Indonesia which are EP (Engineering Piloting) stage, FEP (Final Engineering Piloting) stage and PP (Production Piloting) stage. The EP stage is the very first stage of the development process where in that stages, all the part will be tested and improved. In the FEP and PP stage the manufacture will try to produce the toy in a larger quantity as the trial before the toy really get in into the production line. The failure in FEP & PP stage categorized into five categories which are aesthetic, reliability, functional, transportation and safety & chemical issues and based on the historical data that existed in the PT. GB Indonesia archives, as shown on the figures below, the biggest issues that exist both in the FEP stage and PP stage come from the aesthetic defects.



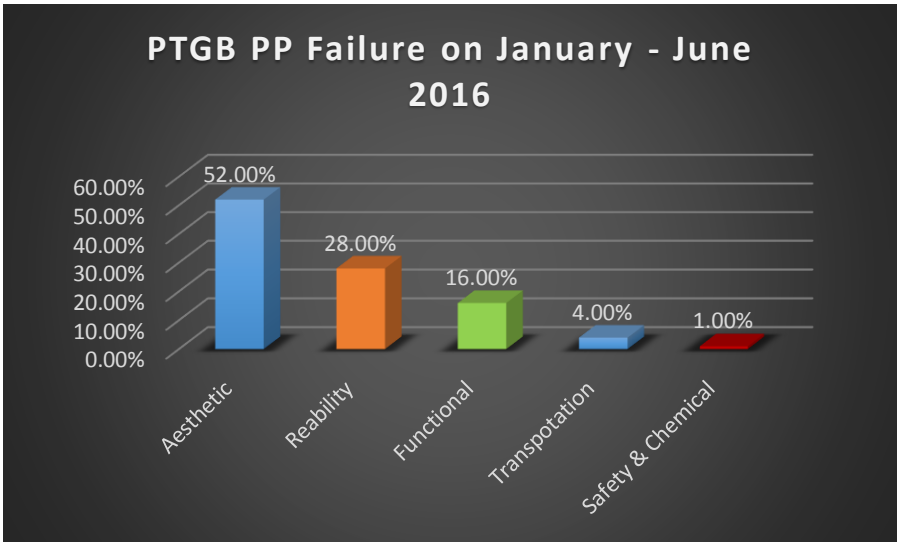




**Figure 4.3 & 4.4 Bar chart of PT. GB FEP & PP failure on January – June 2016**

The figures above show that aesthetic defect has the highest contribution on the FEP and PP failure, where it contributes 41.7% in the FEP stage and 52% in the PP stage. This issues should be a concern for the manufacturer since the sale price of the toy is mostly based from its aesthetic value.

In the production process, in order to ensure the quality of the product, the quality control division do the daily inspection. The inspection should be done to every kind of toy that produce in that day and it is done in the last section of production

which is pack out area. There are two type of inspection that is done by the quality control in the pack out area which are LBO (lot by off) inspection and OPI (open package inspection). The LBO inspection is a visual inspection that is done to inspect the toy visually or from its aesthetic performance, while the OPI is the inspection that is by opening the package of the toy and test the toy's function. The number of sample size that is taken for inspection is depend on the lot of production in that day. In every inspection not all the toy will pass the standard of quality, it is often that some of the toy in the inspection is the defect product. The figure below shows the number of defect that is found both in the LBO and OPI inspection from January to June 2016.

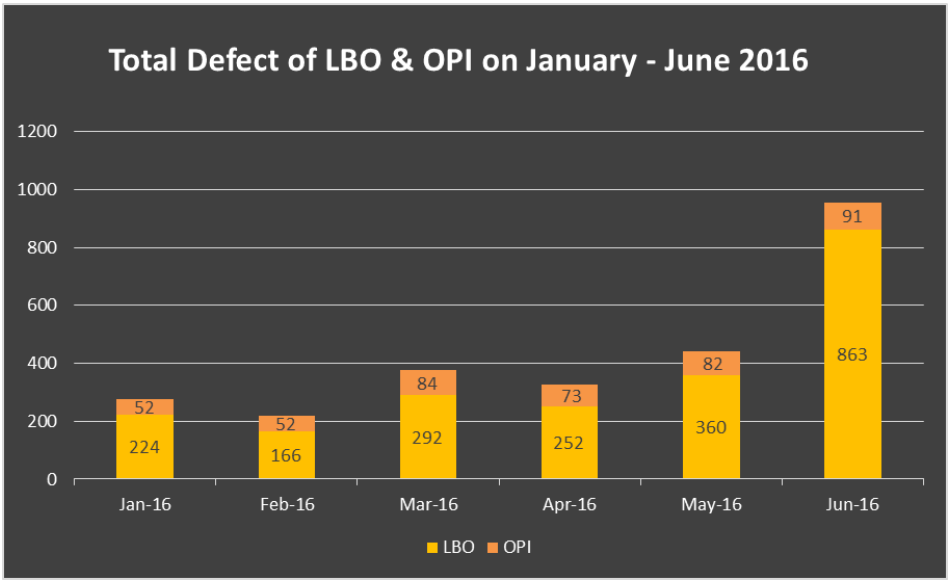



**Figure 4.5 Bar Chart of Total defect in LBO & OPI from January – June 2016**

The data that shown on the figure above define that the number of defect product that is found in the inspection is always increase from January to June 2016, and the defect product that comes from visual inspection which is LBO inspection contribute more than the other inspection. It means that the highest defect product that is found is also aesthetic defect.

### 4.3.1.2.Problem Statement and Goal of the project

From the business case that has been explained on above, the current situation of the total defect that exist from development process and production process are known. Both from the FEP & PP failure and also from the inspection that is done in the production, it is known that the type of defect that has a highest contribution to it is the aesthetic defect. Therefore, the **aim of this research is to reduce the number of defect from aesthetic side especially in LBO inspection to 1000 ppm** by conducting the defect analysis and aesthetic recalibration project.

### 4.3.1.3.S-I-P-O-C Diagram

In this research the customer of the process is the internal customer, which mean that the customer still included in the company. The table below briefly explain the SIPOC of this research.

**Table 4.1 SIPOC diagram**

| SUPPLIER | INPUT | PROCESS | OUTPUT | CUSTOMER |
|---|---|---|---|---|
| Primary Area | Raw Material :<br>Platisol<br>Hairgroom<br>Paint<br>Glue | - Molding<br>- Painting<br>- Rotocast<br>-Tampo<br>-Torso Assembly | - Assembled toys that have been packaged | Secondary Area (pack out) |

Since this research is done to analyze the defect of LBO inspection that is done in the pack out area, therefore the customer is the secondary area, more specific pack out area and it is categorized as internal customer. The output that received by the customer is the complete toy that has been packaged. Before it become the output, the toy should pass several processes which are molding, roto-casting, tampo, painting and torso assembly. The process that has passed just change the raw material which are as input of the process, the raw materials for the toy are plastisol, hair groom, paint, glue, etc. As it starts processing from the primary area, therefore, the primary area is the supplier of this process.

#### 4.3.1.4.Project Team and Timeline

This research or project conducted through five phases of DMAIC Methodology from August 2016- September 2016 and involving some people. Below is the people that getting involved:

Supervised by : Head of Quality Department (Black Belt Level)

Leader : Manager of Quality Engineering (Green Belt Level)

Team Member :- Quality Control Manager (Green Belt Level)

- Product Engineer Manager
- Senior Product Engineer
- Quality Engineer
- Supervisor of Quality Control
- Supervisor of Laboratorium
- Leader of Mechanical Lab
- Engineering Member

### 4.3.2.Measure Phase

Measure phase is the second phase of DMAIC methodology. In this phase, the current condition or the baseline performance of defect in LBO inspection will define more clearly, the DPM (*Defect per Million*) will be calculated and the defect will be define into some categories in order to make the analysis of the root cause get easier. In the other side, the measurement system also will be analyzed in this phase, in order to know whether the measurement system already good enough or not.

#### 4.3.2.1.Baseline Performance

The measurement phase of DMAIC methodology aim to deliver the baseline performance of the process. Previously it is know that the main problem of the research is the increase of defect product that produced especially in aesthetic defect. In this research, the goal is to reduce the total defect product in the LBO inspection. Before the root cause of the problem being analyzed, the baseline

performance of the inspection should be known. The data of baseline performance collected from the historical data of the company that saved in the archived. The following figure shows the increase of the total defect product in LBO inspection from January – June 2016.

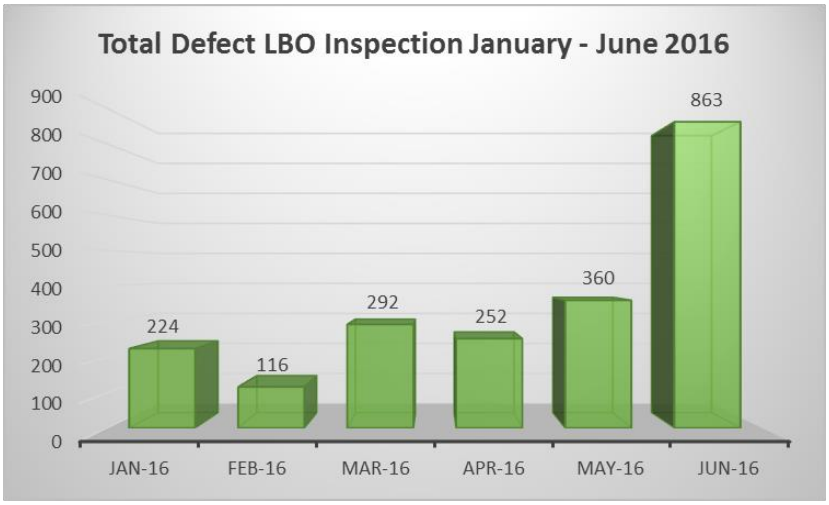



**Figure 4.6 Total Defect LBO Inspection January – June 2016**

From the data that shown above it is found that the number of defect that is found in January to February decrease, but March to June 2016 the defect number increase from 224 defects up to 863 defects on a month. Those number is the total defect which found from different sample size by each month. The table below shows more detail the total defect from January to June 2016 and the sample size of toy that is taken in the LBO inspection by each month.

**Table 4.2 Defect LBO Inspection from January – June 2016**

| LBO | Jan-16 | Feb-16 | Mar-16 | Apr-16 | May-16 | Jun-16 |
|---|---|---|---|---|---|---|
| **Defect** | 224 | 166 | 292 | 252 | 360 | 863 |
| **S/S** | 143,653 | 128,301 | 153,096 | 136,333 | 149,751 | 294,305 |
| **ppm** | 1559 | 1294 | 1907 | 1848 | 2404 | 2932 |

On the table it is shown that on January the defect found are 224 defects from 143,653 toys that are taken in the LBO inspection. On February it is only found

166 toys from 128,301 sample size. However, when it comes from March to June, it is found that the number of defect is increase again from 292 defects per 153,096 sample size, to 863 defects per 294,305 sample size that are taken in LBO inspection. From the data of total number of defect and the number of sample size that is taken, the company can know the estimate defect that might be found in every millions of production by using following formula;

$$DPM\ (Defect\ per\ Million) = \frac{Total\ number\ of\ defect}{Sample\ Size}\ x\ 1{,}000{,}000 \qquad (4-1)$$

Then, it is found that the DPM from January 2016 to June 2016 will be:

- $DPM\ January\ 2016 = \frac{224}{143{,}653}\ x 1{,}000{,}000 = 1559\ ppm$
- $DPM\ February\ 2016 = \frac{166}{128{,}301}\ x\ 1{,}000{,}000 = 1294\ ppm$
- $DPM\ March\ 2016 = \frac{292}{153{,}096}\ x\ 1{,}000{,}000 = 1907\ ppm$
- $DPM\ April\ 2016 = \frac{252}{136{,}333}\ x\ 1{,}000{,}000 = 1848\ ppm$
- $DPM\ May\ 2016 = \frac{360}{149{,}751}\ x\ 1{,}000{,}000 = 2404\ ppm$
- $DPM\ June\ 2016 = \frac{863}{294{,}305}\ x\ 1{,}000{,}000 = 2932\ ppm$

The calculation above is the detail information about the Defect per Million each month. It is found that not only the number of defect that is increase but the opportunity of defect found in the production is getting higher as it shown on the following figure;

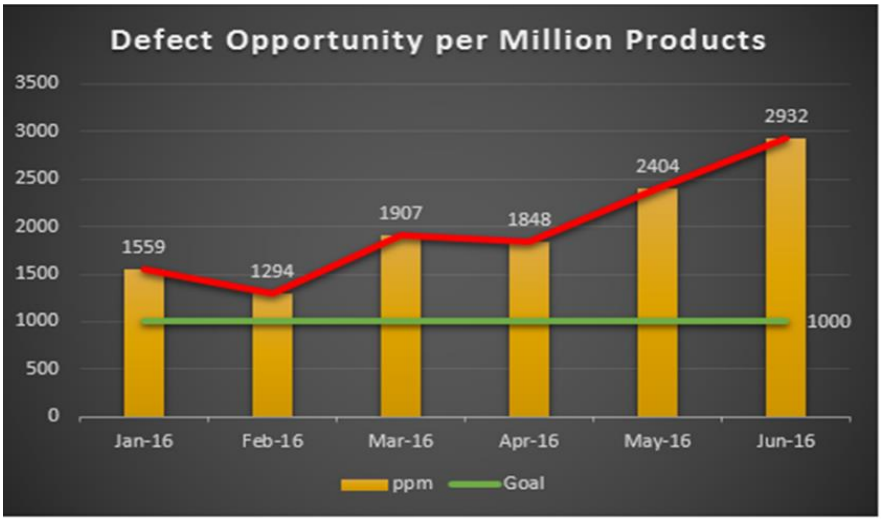



**Figure 4.7 Defect per Million Products**

Currently, the goal or the standard of defect tolerance in PT. GB Indonesia is only about 1,000 ppm which means that only 1,000 units of defect products in every million products that is produce by the company allowed. However, based on the data above it is found that the defect products still not reach the standard or tolerance that is stated by PT. GB Indonesia. The increase of total defects product in LBO inspection means that the quality performance of PT. GB Indonesia is getting worse from January 2016 to June 2016.

#### 4.3.2.2.Defect Category

In order to satisfy the customer demand, the manufacturer should produce good products which passed the quality standard. The product that being observe in this research is toys which produce by PT. GB Indonesia, and more specific is a mainline doll in east plant of PT. GB Indonesia. A definition of a good product for the mainline doll is when it is free from the defect. There are many kind of defects that may exist in the mainline doll, but in in this research the defects that will be mention are only the top ten defect in LBO inspection. In the previous data, it can be seen that the highest total defects exist on June 2016, therefore, the data of top ten defect category on June 2016 will be defined. The table below shows the data of top ten defect that exist in LBO inspection on June 2016.

**Table 4.3 Top 10 Defect in LBO inspection on June 2016**

| Defect Category | Total Defect |
|---|---|
| Black spot | 25 |
| Contamination paint /ink | 65 |
| Dirty | 104 |
| Fly away / loose / messy hair | 44 |
| Improper costume | 28 |
| Improper dress | 33 |
| Mismatch insert | 30 |
| Scratch | 74 |
| Unsealed | 28 |
| Wrong Part | 26 |

As it shown on the table above that the top ten defect categories that often occur in the LBO inspection are black spot, contamination paint/ink, dirty, fly away/loose/messy hair, improper costume, improper dress, mismatch insert, scratch, unsealed and wrong part. Those ten defect categories is categorized as aesthetic defect. Through these categories, the analysis of problem root cause can be done. However, since the research time is limited, in this research there will be only three defect category that will be discussed. In order to choose the three defect category that will be discussed, a Pareto chart is being conducted to know the three highest defects that usually occur. The following figure is the Pareto chart of top ten defect in LBO inspection on June 2016.

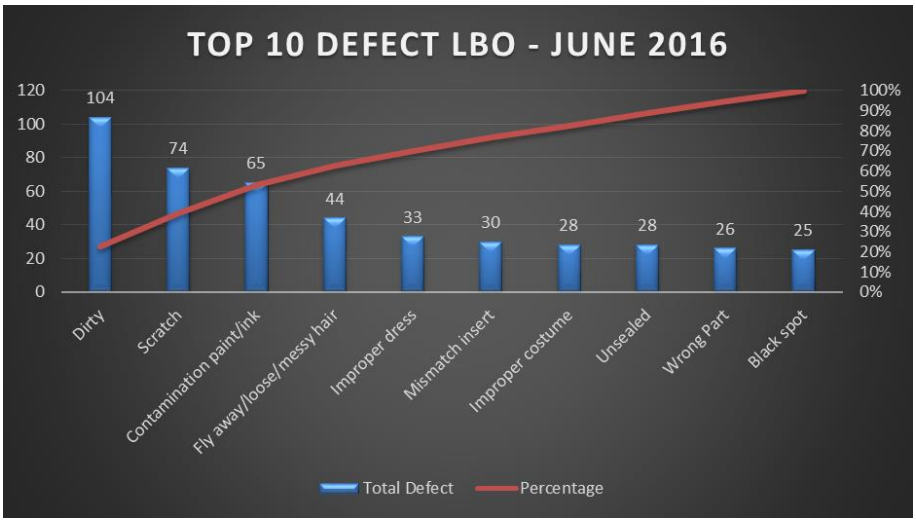



**Figure 4.8 Pareto Chart of Top 10 defect**

After the Pareto chart has been conducted, the top three defects in LBO that often occur are known. Based on the figure above, it is known that the three defects that have highest defect quantity are Dirty defect, Contamination paint/ink defect, and Scratch defect. On June 2016, from 863 defects found, 104 defects are the dirty defect, 74 defects are the scratch defect and 65 are contamination paint defect. Later, those three top defect will be analyzed by the researcher in order to know the root cause of the problem and decided the continuous improvement for the problem.

#### 4.3.2.3.Measurement System Analysis to the Quality appraiser

Measurement System Analysis (MSA) is one of analytical tool of six sigma that used to ensure the existing measurement system that has been implemented. It used to ensure whether the measurement system has fulfill the standard and requirement or not. On define phase, the problem that will be discussed in this research has been explained. The problem is that the defect that commonly occur is the aesthetic defect, and it is known that the defect that found in the LBO inspection is increase. The increase of defect number is caused by some factors that will be analyze in the next phase. However, it is found that the defect that found might be already exist since in the primary area, but it is still pass to the secondary area. Or sometimes the product that found as defect only consist a minor or observation defect. These things might be happened because the appraiser still cannot successfully define whether it is a major defect, minor defect.

In this research, the quality appraisers are the measure instrument. The quality appraisers are going to be assessed through this measurement system analysis. Since the product will be measured through it aesthetic performance and will resulting attribute data (*good product* or *defect product*), therefore the analysis will be done by *Gage R&R attribute agreement analysis*. In order to implement the MSA, there are several steps that should be followed. The figure below shows the flow of the measurement system analysis:

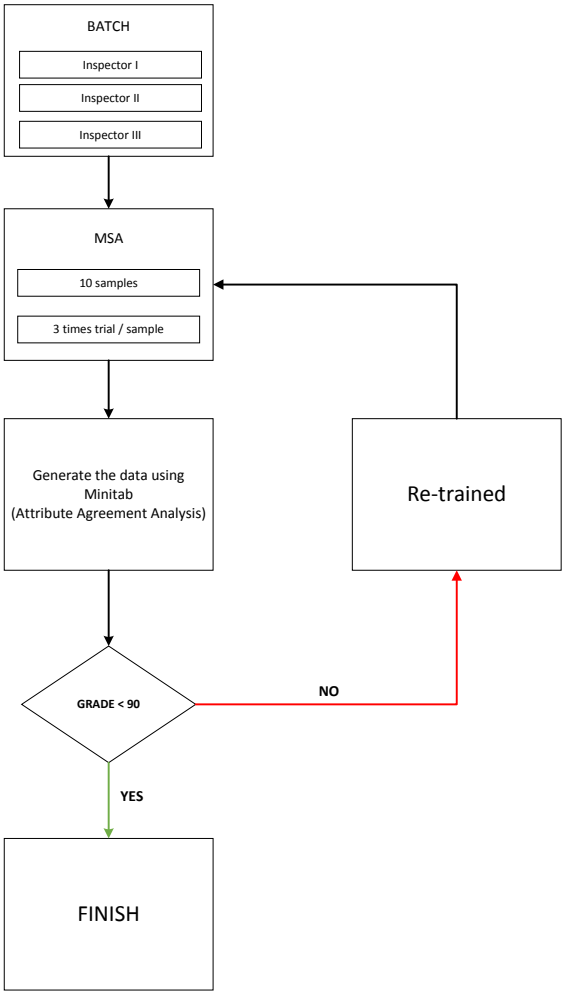



**Figure 4.9 Flow of Measurement System Analysis (MSA)**

The flow chart above is the flow of MSA that is implemented in PT. GB Indonesia. The company decided that each batch of MSA will only consist of around three inspectors/appraisers and the number of sample that will be measured is ten samples. From the sample that exist, five among them are defect products and the other five are good. Before the MSA done to each appraiser, the appraiser will be given a standard product to be reviewed, thus they will know the standard condition for the toy to be passed. Each appraiser will be test three times. The first round of test, the samples will be given based on order number, but in the second and third the samples are given in random order. In this research, the supervisor will randomize the sample as the table below:

**Table 4.4 MSA Test Sheet**

| Test 1 | Answer | Test 2 | Answer | Test 3 | Answer |
|---|---|---|---|---|---|
| 1 | | 9 | | 4 | |
| 2 | | 7 | | 1 | |
| 3 | | 5 | | 6 | |
| 4 | | 3 | | 3 | |
| 5 | | 1 | | 8 | |
| 6 | | 10 | | 5 | |
| 7 | | 8 | | 10 | |
| 8 | | 6 | | 7 | |
| 9 | | 4 | | 2 | |
| 10 | | 2 | | 9 | |

The supervisor will give the sample in 3 batches and the random order of the product should be only known by the supervisor. The appraiser will determine the samples whether it is reject or accept (attribute samples) and then the supervisor will write down the answer with 1 or 0, those two number stands for:

- 1 = Accept Product
- 0 = Reject Product

The duration given to each appraiser to measure each toy is 15 seconds/toy. Then, all the answer of the appraiser will be analyze using statistical tool software, which is Minitab, using attribute agreement analysis. The use of this toll is to know whether the appraiser has met the standard or not.

In this case, the appraiser that is going to be analyzed is the appraisers in the primary process area which include as Molding area, Torso Assembly area and Painting area. The total appraisers that will be tested is 17 people. In the molding area there are only 3 persons that will be tested, in this area the measurement system analysis (MSA) will be conducted by the QC leader named Tri Urip. In the torso assembly area, there are 9 persons that will be tested and will be led by QC

leader named Juju. Then, in the painting area there are 5 persons that will be tested and will be led by QC leader named Anton.

#### 4.3.2.3.1.Measurement System Analysis in Molding Area

The Measurement System Analysis in Molding Area was conducted on August 15th, 2016. Led by QC leader of this area, then the approved sample given to each appraiser to analyze and understand the accept condition for a product to be passed. The below table is the right answer for the test based on the approved sample.

**Table 4.5 Standard Answer for MSA in Molding area**

| No | Answer Key |
|---|---|
| 1 | PASS |
| 2 | REJECT |
| 3 | PASS |
| 4 | PASS |
| 5 | REJECT |
| 6 | REJECT |
| 7 | PASS |
| 8 | REJECT |
| 9 | REJECT |
| 10 | PASS |

The analysis done to three appraisers in molding area whose name are Rohimah, Fitri and Rita. Each appraiser measures the product three times in three different order, and the result of each appraiser is given in the tables below;

**Table 4.6 Answers of All Appraisers in the Molding Area**

| sample | Rohimah1 | Rohimah2 | Rohimah3 | Fitri1 | Fitri2 | Fitri3 | Rita1 | Rita2 | Rita3 | Answer |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

The table above is containing of all the appraiser's answer that have been compiled into one and the last column is the standard or the right answer for the test. After all the answer compiled into one in Minitab, then the team use the analysis tool that is provided in that statistical tool software.

Since the answer is an attribute data, then the tool that will be used is attribute agreement analysis tool. The first step is by choose Stat > Quality Tool > Attribute Agreement Analysis. Then, choose multiple columns and fill the blank box with all the answer of the appraiser. Fill the number of appraiser based on the total appraiser tested, in this analysis there are 3 appraisers and the number of trials is 3 times. Then, fill the known standard/attribute with the given answer. The detail shown on the following figure;

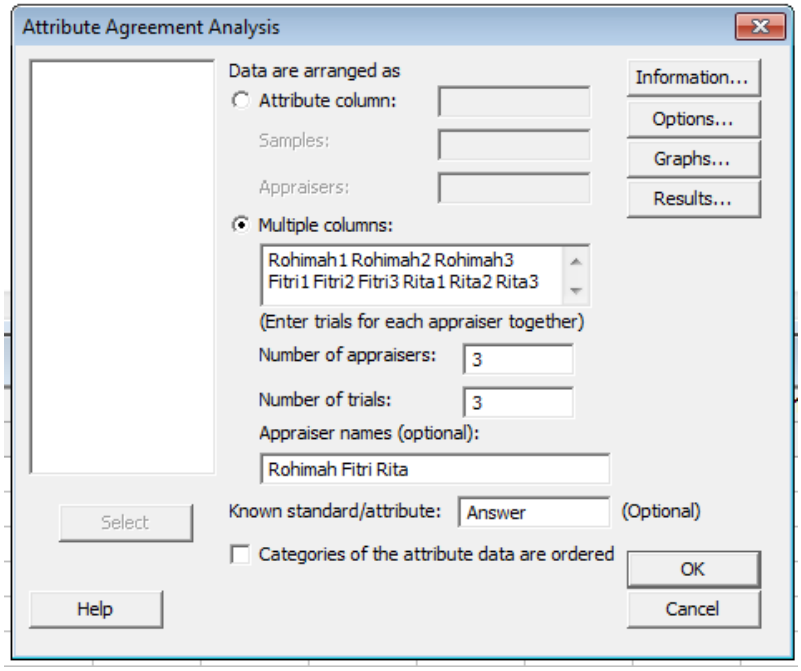



**Figure 4 .10 Attribute Agreement Analysis Tool for Molding Area**

After input all the data in the Attribute agreement Analysis tool of Minitab, then click OK in order to get the result of analysis.

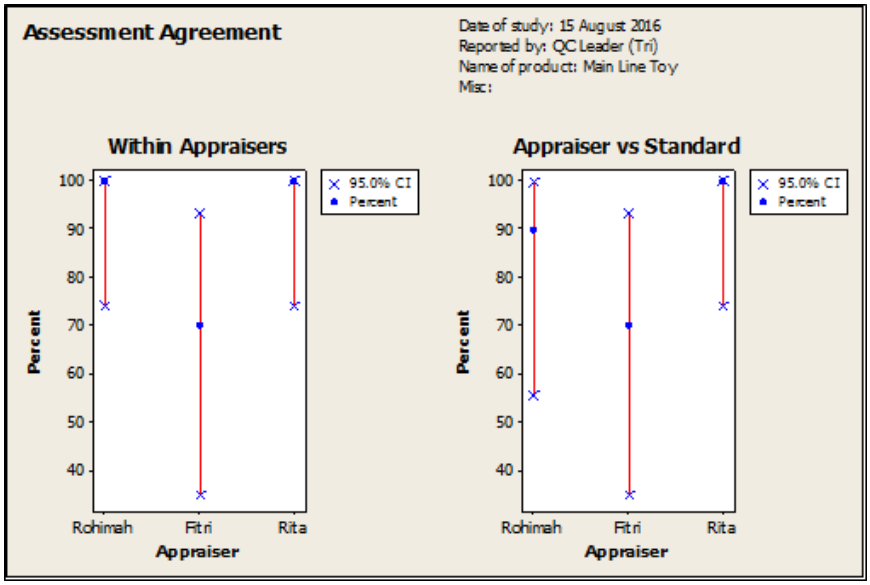



**Figure 4.11 Graph of Assessment Agreement Molding Area**

The figure above shows the result of measurement system analysis towards the appraisers in molding area. The graph shows the assessment agreement of Within Appraiser (WA) and Appraisers vs Standard. The Within Appraisers graph shows of how many percent each appraiser is consistent with the answer of themselves. It can be seen that the appraiser one and three which are Rohimah and Rita is 100% consistent with their answer, in other side the consistency of Fitri with herself only 70%. If it seen from the next graph which is the graph that shows how the answer of each appraiser meet the standard, it is known that the only person in molding area that pass 100% or can measures all the product with the same result as the standard is Rita, while Rohimah only get 90% answer that met the standard and Fitri as same as the within appraisers, 70% result of fitri's measurement met the standard.

The Minitab not only analyze the *within appraiser* (WA) assessment agreement and *each appraiser vs standard* (EA) assessment agreement, but also the other agreement such as *between appraisers* (BA) *and all appraisers vs standard* (AA) assessment agreement that summarized on the table below;

**Table 4.7 Summary Result of MSA in Molding Area**

| Date | Batch | Inspector Name | First Grade (%) | | | | | Need UP Training |
|---|---|---|---|---|---|---|---|---|
| | | | WA | Goal | EA | BA | AA | |
| 15/08/16 | 1 | Rohimah | 100% | 90% | 90% | 70% | 70% | NO |
| 15/08/16 | | Fitri | 70% | 90% | 70% | | | YES |
| 15/08/16 | | Rita | 100% | 90% | 100% | | | NO |

The result on the table above shows that the percentage of assessment agreement for between appraisers is only 70 %, and so with the all appraisers vs standard. Since the company set that the grade that should be fulfilled by each appraiser to pass the test is 90%, therefore the second appraiser which is Fitri should be re-trained by the quality control supervisor because the total grade of her is only 70%, which means minus 20% from the standard or goal. Since the most important is the assessment agreement of how each appraiser measurement result met the given standard. Therefore, the consideration of whether the appraiser need to be trained or not is depending on the result of EA assessment agreement like shown on the figure below.

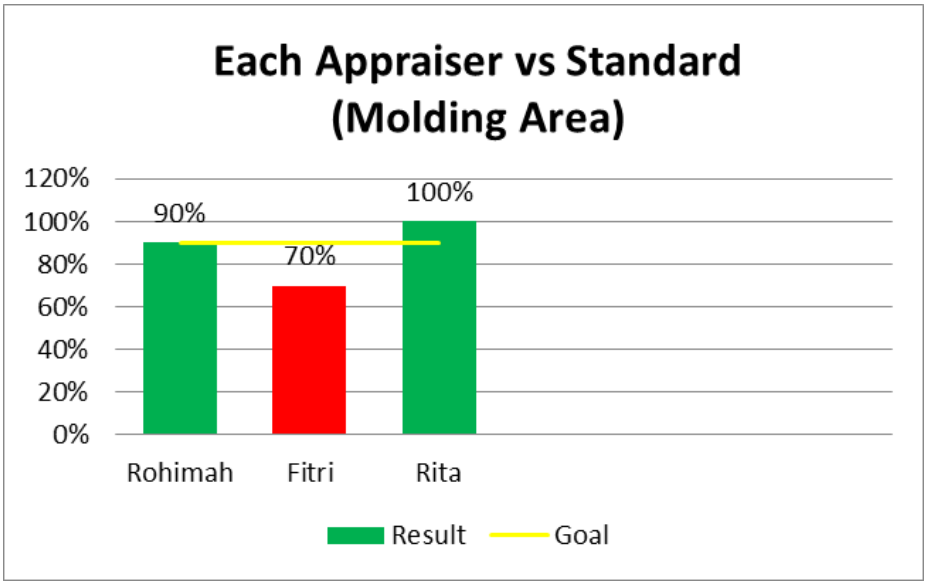



**Figure 4.12 Histogram of Each Appraiser vs Standard Score in Molding Area**

#### 4.3.2.3.2.Measurement System Analysis in Painting Area

The second area is Painting area. In this area, the measurement system analysis (MSA) was done on august 15th, 2016. The MSA led by the quality control leader who has in charge in that area named Juju. As same as the molding area, before the leader conduct the MSA toward each appraiser, the leader gives the approved sample to each appraiser to be analyzed. Thus, each appraiser will know the standard of a product to be passed. There are ten products that will be given to each appraiser, five among them are defects while the other five are the approved ones. The table below contain of the right answer of the MSA in painting area.

**Table 4.8 Standard Answer for Painting Area**

| No | Answer Key |
|---|---|
| 1 | REJECT |
| 2 | PASS |
| 3 | PASS |
| 4 | REJECT |
| 5 | REJECT |
| 6 | PASS |
| 7 | REJECT |
| 8 | PASS |
| 9 | PASS |
| 10 | REJECT |

In the painting area, there are five appraisers tested using measurement system analysis, as the agreement that one batch of MSA will only contain no more than three people, therefore, in this area the MSA divided into two batches. Just as same as the previous one, each appraiser will be given 10 products to be measured and 15 seconds as the time for each product to be measured. The test will be conduct three times for each appraiser and it will be conducted in different order. After all the appraisers have been tested, each appraiser has their own answer just like shown on the tables below:

- **First Batch of MSA in Painting Area**

**Table 4.9 Answers of Appraisers in Painting Area**

| sample | Nurul1 | Nurul2 | Nurul3 | Sutarini1 | Sutarini2 | Sutarini3 | Poni1 | Poni2 | Poni3 | Answer |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

The table above is the answer of three appraisers in painting area and the last column consist of the right answer as the standard. The data will be input to Minitab and analyzed using attribute agreement analysis. The analysis can be done by choose Stat > Quality Tools > Attribute Agreement Analysis. Then, choose multiple columns and fill the blank box with all the answer of the appraiser. Fill the number of appraiser based on the total appraiser that is tested, in this analysis there are 3 appraisers and the number of trials is 3 times. Then, fill the known standard/attribute with the given answer. After input all the data in attribute agreement analysis tool box, then click OK to get the result.

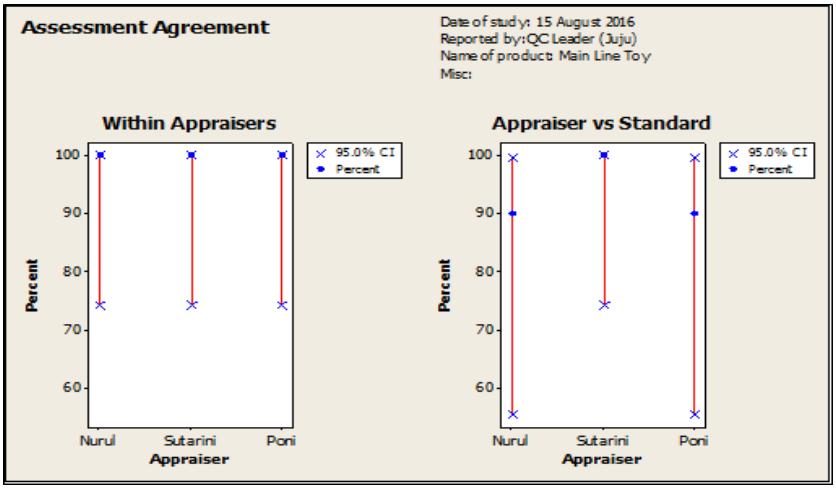



**Figure 4.13 Graph of Assessment Agreement I in Painting Area**

The graph on above shows the result of analysis that has been done by statistical tool software which is Minitab. The figure contains of two graphs which are *Within Appraiser* assessment graph and *Appraiser vs Standard* assessment graph. In *Within Appraiser* graph it is shown that the three appraisers reach 100%, which means that all the appraisers, Nurul, Sutarini and Poni are consistent with their answer on the three test that have been conducted. However, even though the entire appraisers have consistent answer, it does not mean that all the answer are right. The *Appraiser vs Standard* graph show that both Nurul and Poni's answer only met 90% to the standard while Sutarini answer the test with 100% correct or met the standard.

- **Second Batch of MSA in Painting Area**

After analyze the first three appraiser, the other two appraiser's answer are also will be analyzed using Minitab, the answer of Budi and Etik compiled into one Minitab together with the standard answer like shown on the table below:

**Table 4.10 Answers of Appraisers in Painting Area**

| sample | Budi1 | Budi2 | Budi3 | Etik1 | Etik2 | Etik3 | Answer |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

The first column contains of number sample of product that has been tested. The second column until the seventh column contains of the test result of Budi and Etik for three times testing, while the last column contain of the right answer as the basis or standard of this test. As same as before, this data will be analyzed using Minitab by choose Stat > Quality Tools > Attribute agreement analysis on that statistical software.

Then, fill the Attribute Agreement Analysis box that shows up by choose the multiple column and fill it with the column that contain all the answer of the appraiser, fill the number appraiser with 2 and the number of trials with three. Then, fill the standard/attribute with the column that contain the right answer, and if all the blank space has been filled, click OK to know the result.

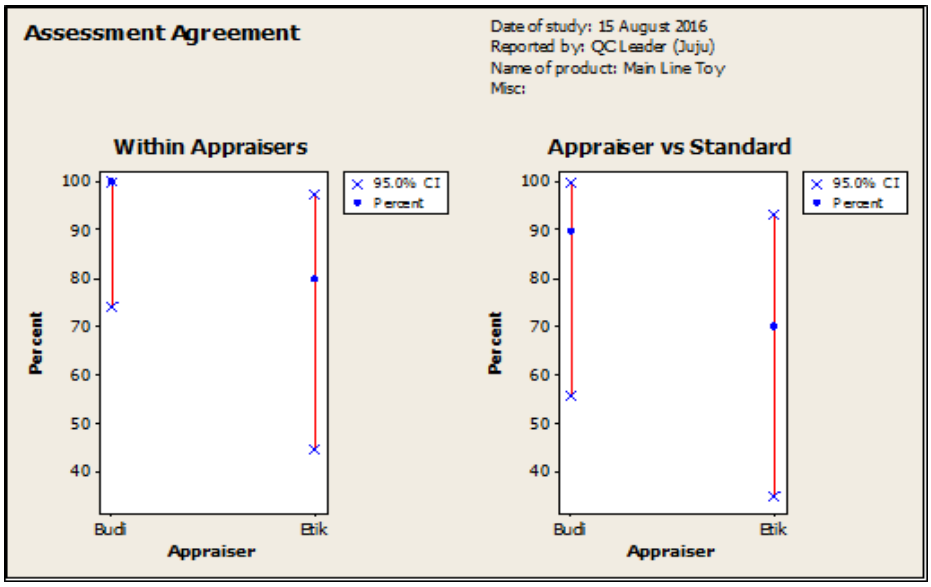



**Figure 4.14 Graph of Assessment Agreement II in Painting Area**

The figure above is the result of batch two test in the painting area, the test is only done for two people which are Budi and Etik. Different with the batch one result that shows good results. The second one shows that Etik does not fulfill the requirement or reach the goal since the percentage in Within Appraiser assessment is only 80% which means that Etik did not really consistent with the answer and also Etik's answer only met 70% with the standard answer. In the other side, Budi still have a consistent answer and met the standard to 90%. As the MSA for molding area, the Minitab not only analyze the percentage of *Within Appraiser* and *Appraiser vs Standard*, but also the *Between Appraiser* and *All Appraiser vs Standard*. All the result is summarized into one table, like shown on below;

**Table 4.11 Summary Result of MSA in Painting Area**

| Date | Batch | Inspector Name | Grade (%) | | | | | Need UP Training |
|---|---|---|---|---|---|---|---|---|
| | | | WA | Goal | EA | BA | AA | |
| 15/08/16 | 1 | Nurul | 100% | 90% | 90% | 90% | 90% | **NO** |
| 15/08/16 | | Sutarini | 100% | 90% | 100% | | | **NO** |
| 15/08/16 | | Poni | 100% | 90% | 90% | | | **NO** |
| 15/08/16 | 2 | Budi | 100% | 90% | 90% | 80% | 70% | **NO** |
| 15/08/16 | | Etik | 80% | 90% | 70% | | | **YES** |

The result of the table above shows the summary of agreement assessment of five appraiser in painting area. The result of *Between Appraiser* assessment and All *Appraiser vs Standard* assessment are distinguished into two batches. The first batch has a good result which is 90% both in *Between Appraiser* and *All Appraiser vs Standard*, it is mean that the answer between appraiser is 90% the same and also all the answers of the appraisers are 90% met the standard. Meanwhile, in the second batch, the percentage *Between Appraiser* 80% which means the appraiser has same agreement towards the product sample only 80% and the percentage of *All Appraiser vs Standard* only 70% which means that the answer of the appraiser only met 70% to the standard.

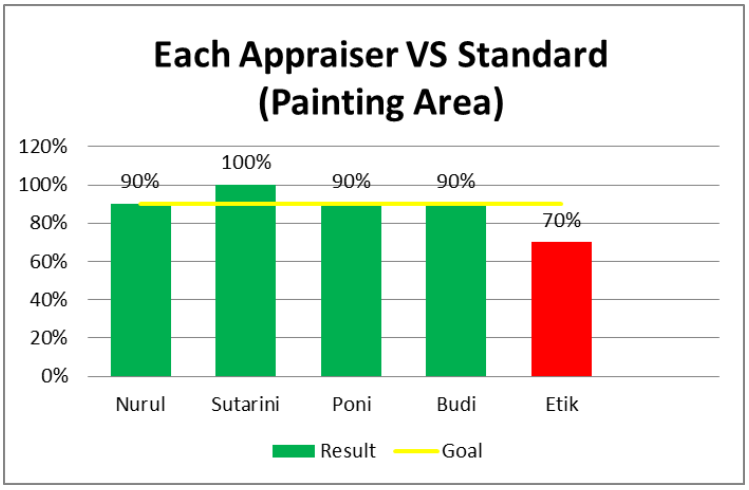



**Figure 4.15 Histogram of Each Appraiser VS Standard Score in Painting Area**

The most important result that should be seen is the *Each Appraiser VS Standard* assessment. This assessment shows how each appraiser's answer towards the

standard answer, whether the appraiser answer as the standard or not. The company has decided that the minimum grade for each appraiser to be passed is 90. The figure above shows that almost all the appraiser passed the test, except Etik. Etik only got 70% as her grade in this measurement system analysis, this assessment means that Etik only answer 70% right based on the standard answer. Therefore, there should be a corrective action for Etik in this issue.

#### 4.3.2.3.3.Measurement System Analysis in Torso Assembly Area

The measurement system analysis in Torso Assembly (TA) area was conducted on August 16th, 2016. This analysis was led by the quality control leader in that area named Anton. In Torso Assembly area, the total appraisers that are going to be tested is greater than the total appraisers in molding or painting area. There are 9 appraisers tested in torso assembly area. Those appraisers named Puput, Naani, Yuliani, Durotul, Indah, Ratna, Sriyani, Sahiroh, and Suci. Since it suggested that each batch of measurement system analysis only consist of three appraisers, then the MSA in Torso assembly area is divided into three batches. Same as before, each appraiser given the sample of approved sample to be analyzed, thus the appraisers know the standard condition of a product to be approved or passed the production line. The table below contains the standard or right answer for testing in torso assembly area. There are 10 sample products tested, five among them are defect product and the other five are the approved ones.

**Table 4.12 Standard Answer for Torso Assembly Area**

| No | Answer Key |
|---|---|
| 1 | REJECT |
| 2 | PASS |
| 3 | PASS |
| 4 | REJECT |
| 5 | REJECT |
| 6 | PASS |
| 7 | REJECT |
| 8 | PASS |
| 9 | PASS |
| 10 | REJECT |

Each appraiser will be tested three times and the leader gave the products in random order on each test. The appraiser can measure the product by giving answer whether it is a reject product or approve product. Later, the answer will be convert into number, 1 for the approved or "pass" product and 0 for defect or "reject" product. Then, the tables below show the result of the test:

- **First Batch Test in Torso Assembly Area**

**Table 4.13 Answers of All Appraisers Batch I in TA Area**

| Batch | sample | Puput1 | Puput2 | Puput3 | Nani1 | Nani2 | Nani3 | Yuliani1 | Yuliani2 | Yuliani3 | Answer |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The table above contain of the answer of the first three appraisers in torso assembly area from three times testing that has been compiled into one table, in the last column of the table, it contains the standard answer of the test. The answer will be input to the Statistical software which is Minitab, thus it will be analyzed. By using Minitab, the analysis can be done by choose Stat > Quality Tools > Attribute Agreement Analysis. In the Attribute Agreement Analysis tool box, there are several requirements that should be filled.

Since there are many columns that want to be analyzed in this data, therefore choose the multiple columns instead the attribute column. Then fill the blank space of multiple columns with the columns that contain the answer of appraisers. Next fill the blank space of number of appraisers and trials with 3 and fill the name of appraiser based on the name of people that being tested. Last, choose the column that contain the right answer as the standard/attribute. After all the requirements in

the Attribute Agreement Analysis have been filled, click OK to know the result of analysis.

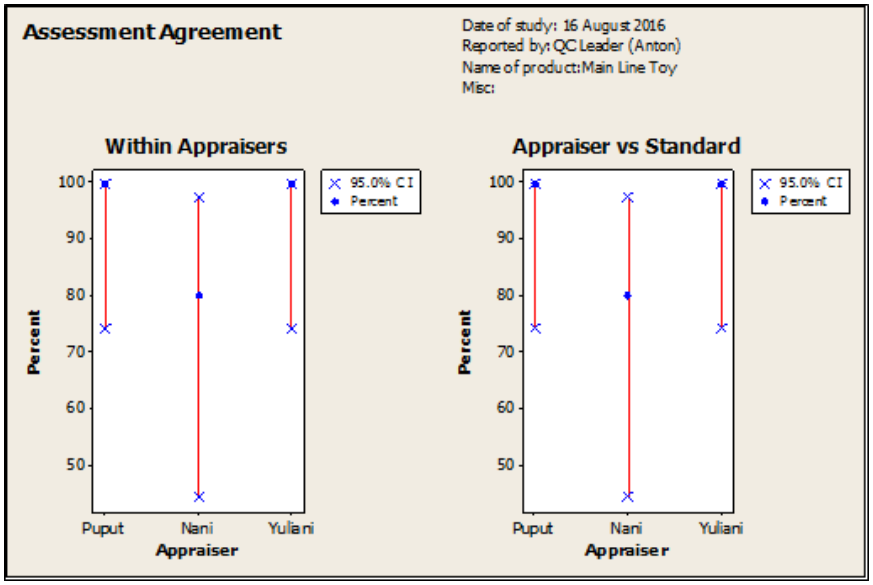



**Figure 4.16 Graph of Assessment Agreement Batch I in TA Area**

The figure above is the assessment agreement for the first three appraisers in the torso assembly area. The figure above contain of the Within Appraiser graph and Appraiser vs Standard graph of Puput, Nani and Yuliani. Both in the Within Appraiser and Appraiser vs Standard graph, it shows that Puput and Yuliani have good consistency on their answer toward the product and also all the answer 100% met the standard answer, which mean that both the answers of Puput and Nani are correct. However, Nani only get 80% both in Within Appraiser and Appraiser vs Standard assessment. It means that Nani has not passed the test, since Nani did not consistent with her answer and did not met the standard answer.

- **Second Batch Test in Torso Assembly Area**

After done with the first three appraisers in the first batch of testing in torso assembly area, the second batch of measurement system analysis in torso assembly was conducted. On the second batch, the measurement system analysis still led by Anton as the QC leader who has responsibility in that area. The other three

appraisers that joined this second batch of measurement system analysis are Durotul, Indah and Ratna. Just as same as previous batch, each appraiser given the approved sample to be analyzed, thus before doing the MSA, each appraiser has a vision and understand about the standard condition of a product to be approved or can passed the production line.

After each appraiser given time to have an understanding of an approved product, each appraiser tested three times in different order of product in each test. In the test, each appraiser given 15 seconds to measure each product. After that, the three appraisers in the second batch been tested. The table below is containing the answer of all first batch appraisers in Torso Assembly area that has been compiled and the last column contains the standard answer of the test in assembly area.

**Table 4.14 Answers of All Appraisers Batch II in TA Area**

| Batch | sample | Durotul1 | Durotul2 | Durotul3 | Indah1 | Indah2 | Indah3 | Ratna1 | Ratna2 | Ratna3 | Answer |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 7 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 9 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

In order to analyze all the answer of second batch appraiser in assembly area, the statistical tool software which is Minitab will be used. As it mention before that the data is categorized as attribute data, therefore the analysis will be done by using attribute agreement analysis. After input the data as in the Table 4.21, choose Stat > Quality Tools > Attribute Agreement Analysis. In the Attribute Agreement Analysis tool box, there are several requirements that should be fulfilled. After all the blank spaces in attribute agreement analysis tool box has been filled with the correct information, then click OK to get the result

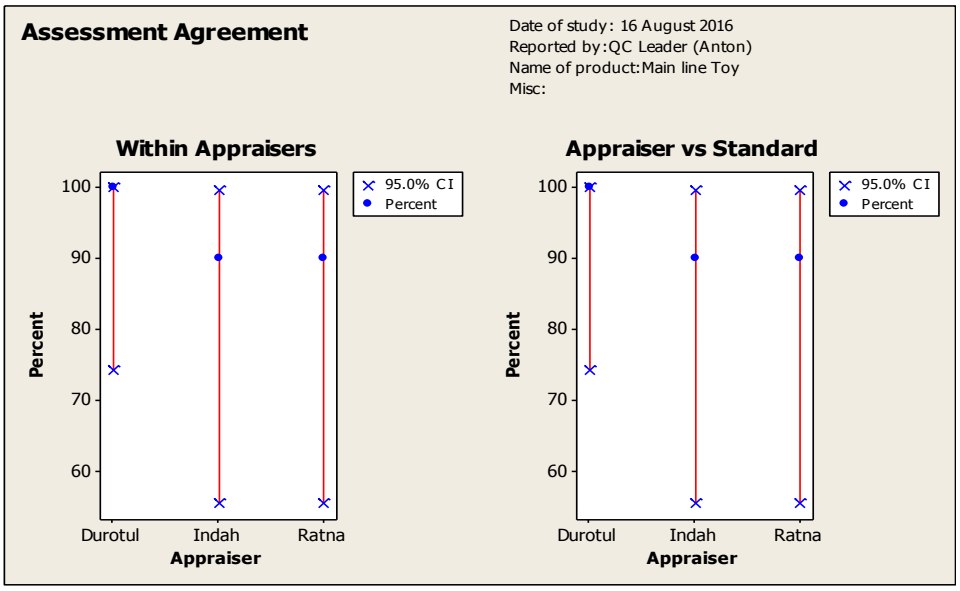



**Figure 4.17 Graph of Assessment Agreement Batch I in TA Area**

The figure above is the result of the attribute agreement analysis in Minitab. The figure consists of two graphs which are Within Appraiser graph and Appraiser vs Standard graph. Within Appraiser graph shows that all the appraiser pass the goal that has been decided by the company with Durotul is 100% consistent with her answer and both Indah and Ratna 90% consistent with her answer. Just as same as the Appraiser vs Standard graph, Durotul answer is 100% correct to the standard answer, while Indah and Ratna only 90% correct.

- **Third Batch Test in Torso Assembly area**

This third batch is the last batch of MSA in torso assembly area. The MSA still lead by Anton as the QC leader in torso assembly area. In the third batch there are three appraisers that have been tested which are Sriyani, Sahiroh and Suci. As the previous one, each appraiser will pass three tests with random order of product given by the leader. Each product will be measured in 15 seconds. After the entire appraiser tested, here are the results of third batch MSA in torso assembly;

**Table 4.15 Answers of All Appraisers III in TA Area**

| Batch | sample | Sriyani1 | Sriyani2 | Sriyani3 | Sahiroh1 | Sahiroh2 | Sahiroh3 | Suci1 | Suci2 | Suci3 | Answer |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

After all the data have been completed and compiled as on the table above, the statistical tool software, which is Minitab will help the team to analyze the data by choose Stat > Quality Tools > Attribute Agreement Analysis. After that, the attribute agreement analysis tool box will appear, and there are some blanks spaces that should be filled. After all the information needed in the tool box has been filled, click OK to know the result..

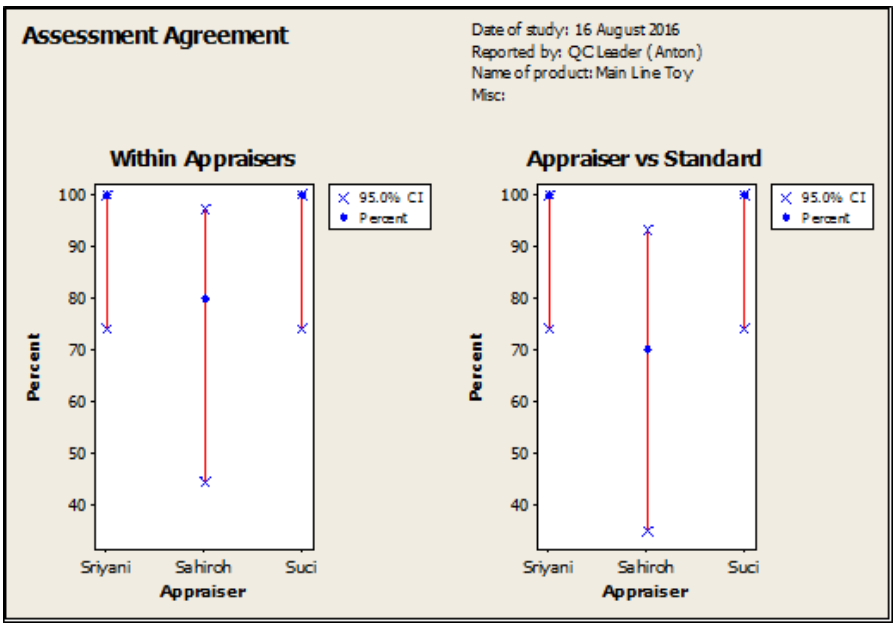



**Figure 4.18 Graph of Assessment Agreement Batch III in TA Area**

The figure above is the result of analysis that done by using Minitab. The figure above contains the assessment agreement that consist of two graphs which are

*Within Appraiser* graph and *Appraiser vs Standard* graph. Both the *within appraiser* and *appraiser vs standard* graph shows that the appraisers named Sriyani and Suci have passed the test perfectly since both of them reach 100% in those two assessment. It means that both Sriyani and Suci are consistent with their answer and also the answer of those two appraiser met the standard answer or it can be said that they answer the test correctly. However, it different with Sriyani and Suci, Sahiroh did not pass the test since the analysis shows that Sahiroh only 70% consistent with herself and also Sahiroh only answer the test correctly 70%.

The Minitab statistical tool not only define the percentage of within *appraiser assessment* and *appraiser vs standard* assessment, but also the *between appraiser* and *all appraiser vs standard.* The following table shows the summary of the analysis result of all appraisers in torso assembly area.

**Table 4.16 Summary Result of MSA in Torso Assembly Area**

| Date | Batch | Inspector Name | First Grade (%) | | | | | Need UP Training? |
|---|---|---|---|---|---|---|---|---|
| | | | WA | Goal | EA | BA | AA | |
| 16/08/16 | 1 | Puput | 100% | 90% | 100% | 80% | 80% | NO |
| 16/08/16 | | Nani | 80% | 90% | 80% | | | YES |
| 16/08/16 | | Yuliani | 100% | 90% | 100% | | | NO |
| 16/08/16 | 2 | Durotul | 100% | 90% | 100% | 80% | 80% | NO |
| 16/08/16 | | Indah | 90% | 90% | 90% | | | NO |
| 16/08/16 | | Ratna | 90% | 90% | 90% | | | NO |
| 16/08/16 | 3 | Sriyani | 100% | 90% | 100% | 70% | 70% | NO |
| 16/08/16 | | Sahiroh | 80% | 90% | 70% | | | YES |
| 16/08/16 | | Suci | 100% | 90% | 100% | | | NO |

The assessment for all appraisers in three batched is shown above. The result shows that on the first batch, Puput and Yuliani has a good grade which is 100% for the within appraiser assessment and Appraiser vs standard assessment. However, Nani only got 80% which mean she has to be trained again to pass the minimum grade which is 90%. In the first batch, the percentage of both between appraiser assessment and all appraiser vs standard assessment is 80 %.

In the second batch of test there are Durotul, Indah and Ratna. All the appraisers have passed the test well by getting 100% as the WA and EA assessment for Durotul, and 90% as the WA and EA assesment grade for Indah and Ratna. In this batch, the percentage of BA assessment and AA assessment are same with the first batch, which is 80%. The third batch as the last batch consist of Sriyani, Sahiroh and Suci. The result shows that both Sriyani and Suci got a good grade, which is 100% for WA and BA assessment, while Sahiroh only get 80% for WA assessment and Suci only get 70% for BA assessment, which means that Sahiroh did not pass the minimum grade. The analysis result also shows that the percentage of BA and AA assessment in the third batch is lower than the previous ones, on the third batch the percentage only 70%.

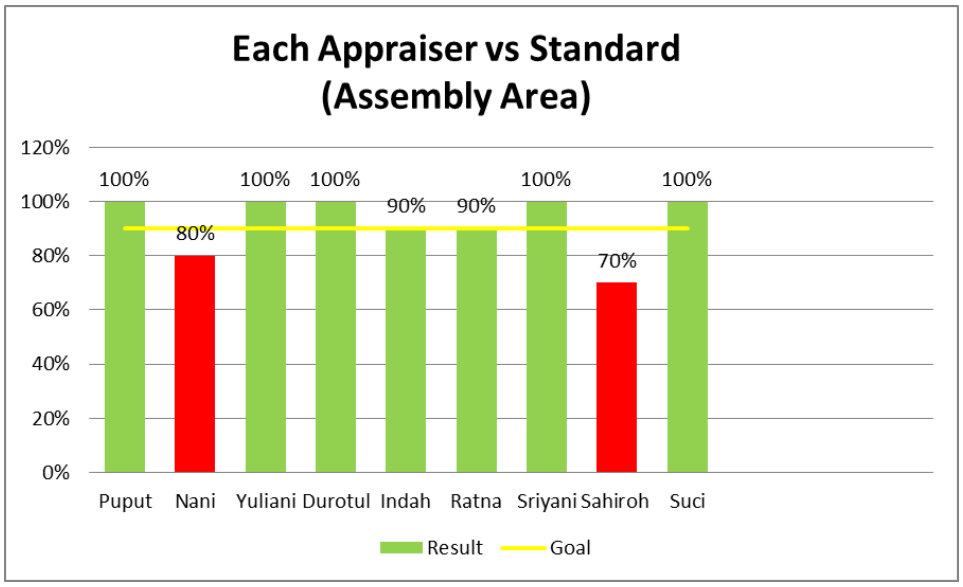



**Figure 4.19 Histogram of Each Appraiser VS Standard Score in Area**

- **Summary Result of MSA**

The Measurement System Analysis in Molding, Painting and Torso Assembly area has been done. The table below shows the summary result of each appraiser towards the standard given. From 17 people that has follow the test, it is found that there are 4 people did not meet the standard and did not pass the test.

**Table 4.17 Summary of MSA result in Molding, Painting and Assembly Area**

| No | Names | Area | First test | Result |
|---|---|---|---|---|
| 1 | Rohimah | Molding | 90% | PASS |
| 2 | Fitri | Molding | 70% | FAILED |
| 3 | Rita | Molding | 100% | PASS |
| 4 | Nurul | Painting | 90% | PASS |
| 5 | Sutarini | Painting | 100% | PASS |
| 6 | Poni | Painting | 90% | PASS |
| 7 | Budi | Painting | 90% | PASS |
| 8 | Etik | Painting | 70% | FAILED |
| 9 | Puput | Assembly | 100% | PASS |
| 10 | Nani | Assembly | 80% | FAILED |
| 11 | Yuliani | Assembly | 100% | PASS |
| 12 | Durotul | Assembly | 100% | PASS |
| 13 | Indah | Assembly | 90% | PASS |
| 14 | Ratna | Assembly | 90% | PASS |
| 15 | Sriyani | Assembly | 100% | PASS |
| 16 | Sahiroh | Assembly | 70% | FAILED |
| 17 | Suci | Assembly | 100% | PASS |

Based on attribute agreement analysis that has been done towards all the appraiser, it can be concluded that there are still some of the appraiser that are not passed the standard. The failure of the appraiser on this test is because there are still imperceptions definition of defect between the appraiser and the standard. The failure conclude that the measurement system that is implemented is still poor, since not all the appraiser can reach 90%.

From the measurement phase that has been done on doing this research, it can be concluded that the top three defects that have highest contribution on the increasing of defect quantity are dirty, scratch and contamination. In the other side, the increase of defect quantity also can be happened because of the poor measurements system.

### 4.3.3.Analysis Phase

In the analysis phase, the data that has been collected before which is the defect data of LBO inspection will be analyzed. Previously, it is known that on June 2016, the total defect that found in LBO inspection significantly increase. It is found that there are 863 defect product in June, which mean that the opportunity of there are defect in a million product is about 2932 products. This thing become the problem for the company since the company only allow 1000 defect product per million product that being produced.

In order to solve this, why analysis tool and cause-and-effect diagram tool or usually called as fishbone diagram will be used to find the root cause of the problem. Before the root cause analysis is done, it is known that the three highest defects that occur in the LBO inspection on June 2016 are dirty, scratch and contamination paint. Therefore, those three highest defect are the main defect that will be analyzed in this research.

#### 4.3.3.1.Why Analysis

Why Analysis is one of analytical tools in six sigma methodology that used to do the root cause analysis, it is used to know the cause and effect of a problem. Why analysis done by keep asking why the problem exist until it is found that there is no any other answer to keep asking why. In this research, why analysis is one of the analytical tools or brainstorming tool that used to find the root cause of the problems. There are three problem that are going to be analyzed which are the dirty defect, scratch defect and contamination paint that exist in the pack out area (LBO Inspection). The following tables are the why analysis of the three top defects that has been done for this research which are for dirty, scratch and contamination paint defect.

- **Dirty Defect**

**Table 4.18 Why Analysis of Dirty Defect**

| Problem | Main Cause | Why? | Why? | Why? | Why? | Why? |
|---|---|---|---|---|---|---|
| Dirty Defect | Man | Dirty Hands of Operator | Lack of awareness of cleanliness | Lack of discipline | Not follow procedure | Procedure not being attached |
| | | Imperceptions of defect category | Do not understand the defect criteria | lack of knowledge | Lack of training | |
| | | No attention with work result | No sense of belonging | Bad work culture | | |
| | Machine | Dirty Machine | Smear Oil | Does not clean up the machine after maintenance | Unfollow procedure | |
| | | | Dusty | No regular cleaning | Unscheduled cleaning time for machine | |
| | Measurement | Poor measurement system | Does not reach standard | Imperceptio ns between appraiser | Unclear defect criteria | No exact requirement (zone / dimension) on defect criteria |

The table 4.18 is the result of why analysis that has been done for dirty defect that occur in the product that has been packaged. There are three main factors that cause the dirty defect which are man, machine and measurement. From the man factor the problem is because the dirty hand of the operator and the imperceptions of defect criteria, it is found that the dirty hand that touch the product caused by the un-existing procedure in the work area that can remind the operator to keep the cleanliness and the cause of imperceptions of defect category is because the unclear criteria of defect category. In the other side, the operator sometimes does not care with the work result of their work that make the defect can pass to the packaging.

Second, the factor that cause the dirty defect is the unclean machine that may caused by several things. The unclean machine may cause by the dust that tacked on the machine or smear oil that remain around the machine area after the maintenance. This thing might exist because the poor maintenance that done to the machine. The people who is responsible for the maintenance did not follow the existing procedure and there is no schedule of regular machine cleaning. Third, the factor that cause the dirty defect is the poor measurement system that now implemented based on the measurement system analysis that has been done previously. The poor measurement system caused by there is no clear guidance of defect criteria that make the people in one perception on deciding whether the product is defect or not.

- **Scratch Defect**

**Table 4.19 Why Analysis of Scratch Defect**

| Problem | Main Cause | Why? | Why? | Why? | Why? | Why? |
|---|---|---|---|---|---|---|
| Scratch | Man | Imperception of defect category | Do not understand the defect criteria | Lack of knowledge | Lack of training | |
| | | No attention with work result | No sense of belonging | Bad work culture | | |
| | Machine (equipment) | Scratch by the tools | Wrong position | Do not follow procedure | Undisciplined | |
| | | Sharp point on machine | No warning sign | | | |
| | Measurement | Poor measurement system | Does not reach standard | Imperceptions between appraiser | Unclear defect criteria | No exact requirement (zone/ dimension) on defect criteria |
| | Method | Life test | Move many times | Friction | | |

The table on above is the why analysis that have done for analyze the root cause of scratch defect. There are three factors that cause the scratch defect which are man, method and machine. From the Man factor it finally known that the cause of scratch defect are because the man that get involved in the production process lack of awareness and discipline that caused by there is no strict rules to them and lack of training and also the imperceptions of defect category that caused lack of training make the increase of dirty defect in pack out inspection.

The second factor that cause the scratch defect based on the why analysis that has been done is the method. In order to ensure the quality of the product, a testing should be conduct, sometimes the life test or function test may cause the scratch to the product. Then, the third factor is the measurement system. Based on the result of measurement system analysis on previous phase, it is known that the measurement system still poor due to the unclear criteria of defect category.

- **Contamination Paint Defect**

The table 4.20 is the result of why analysis that has been done for the contamination paint defect. There are four factors that caused the contamination paint on the product which are Man, machine, measurement and material. From the machine or equipment factor, the contamination paint happened because the miss position tool when doing the paint spray. The miss position tool is because the operator often unfollow the existing procedure. The second factor that cause the defect is because the material that contaminated by operator's hand.

The other factors is just as same as the previous defect which are that the defect caused by imperceptions of defect criteria between the inspector and the poor measurement system that because there is no clear guidance for the defect criteria.

**Table 4.20 Why Analysis of Contamination Paint Defect**

| Problem | Main Cause | Why? | Why? | Why? | Why? | Why? |
|---|---|---|---|---|---|---|
| Contamination Paint | Machine (tools) | Paint mask contaminated | Paint mask over sprayed | Wrong position | Does not read the procedure | |
| | Material | Contaminated material | Operator's hand contaminated | Does not follow operation procedure | Undisciplined | Lack of training |
| | | | Contaminated ink | Wrong position / placement | | |
| | Man | Imperceptions of defect category | Do not understand the defect criteria | Lack of knowledge | Lack of training | |
| | | No attention with work result | No sense of belonging | Bad work culture | | |
| | Measurement | Poor measurement system | Does not reach standard | Imperceptions between appraiser | Unclear defect criteria | No exact requirement (zone/ dimension) on defect criteria |

### 4.3.3.2.Cause and Effect Diagram

Cause and Effect Diagram is also one of analytical tools in six sigma methodology that used to find the root cause of the problem. The cause and effect diagram usually called as fishbone diagram because its shape that similar to the bones of the fish. This tools is used to define the relation between the factors to the problem. Generally, the main problem will be placed on the head of fish bone and the factors placed in each side of the fish bones and the factors that caused the problem may categorized as Man, Material, Machine, Method and Environment. Previously, the why analysis has been done in order to know the root cause of the problems by asking why. Here, all the questions and answers in the why analysis will be concluded and represents into a fishbone diagram. Following are the fishbone of

each defect category that discussed in this research which are dirty, scratch and contamination paint.

- **Dirty Defect**

Dirty defect is a defect where the toy is contaminated by the dirt that might be caused by several factors. The cause and effect diagram on below shows the factors that cause the dirty defect in this case:

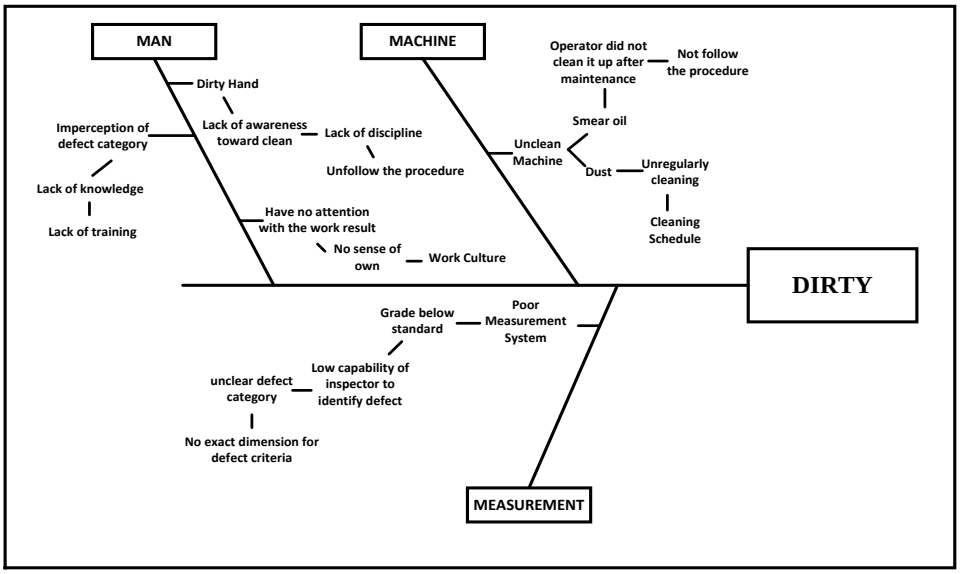



**Figure 4.20 Fishbone Diagram for Dirty Defect**

Based on Figure 4.20 it is known that the dirty defect of the toy caused by following factors:

**1.)Man**

Man is the main factor that cause the dirt on product and make the product become defect. The unclean hand of the operator might left the dirt on the product. The unclean hand of the operator is cause by the lack of awareness toward the cleanliness by the operator even though the standard of work procedure has been put around the work area. In other side, the dirty defect might exist because the

operator have less attention to the result of the work. Thus, the defect product that should not be passed until the packaging session can be passed.

Moreover, the imperceptions of defect category between the quality appraisers become one factor of the increase dirty defect in the LBO inspection process. The imperceptions make the major defect that has been found since in the primary area might be conclude as minor defect by the appraiser and keep it pass to the secondary area or the minor defect that found might be conclude as major, thus its increase the defect product in LBO.

**2.) Machine**

The second factor that may cause the dirty defect is the machine that produce the toy. The problem that come from the machine might not always about it engine or the way it produce the toys. The unclean machine also can become the cause of the dirty defect, the remaining oil after maintenance that exist around the machine area contaminate the toys produced and make left the dirt on the toy. This things happen because the one who do the maintenance to the machine is often forget to clean up the area.

**3.) Measurement**

Measurement is another factor that cause the increase of dirty defect product in the LBO inspection. In this research the thing that being measured is its aesthetic performance. There should be a clear standard of measurement to categorize whether a product is contain the major defect or minor defect. The poor measurement system make a variation of the appraiser's perception that also make the defect product.

- **Scratch Defect**

Scratch Defect is a defect that exist on the toys in form of line, it usually caused by a friction between the toys with another thing. The detail root cause of scratch defect defined on the cause-effect diagram on the figure below.

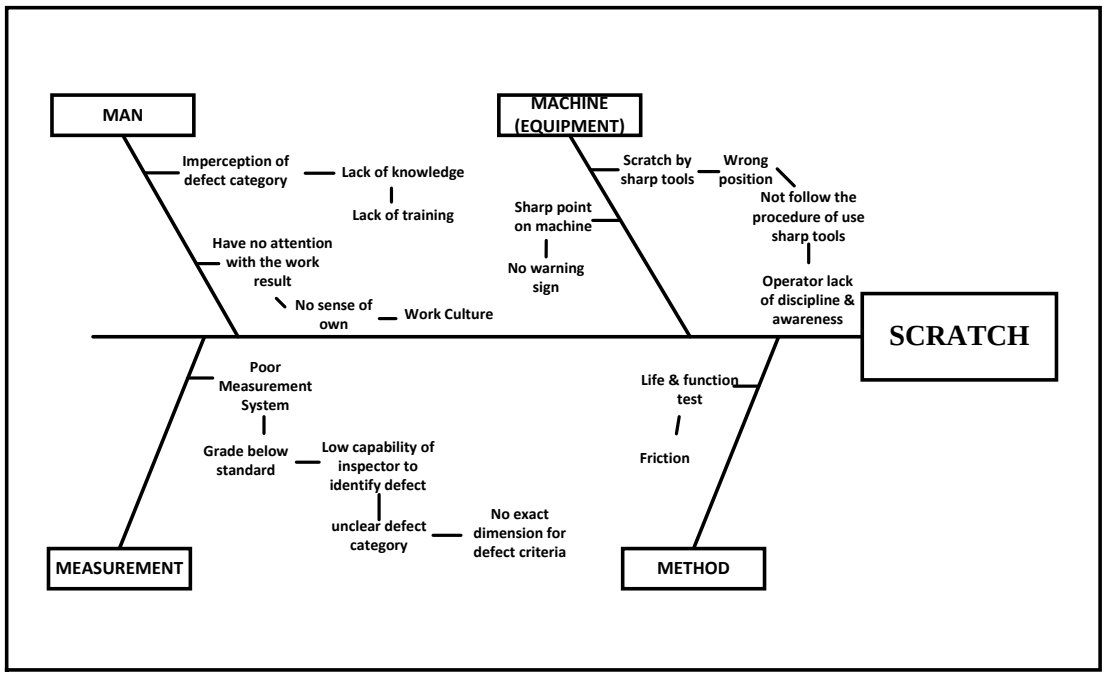



**Figure 4.21 Fishbone Diagram for Scratch**

Based on the figure 4.21, the scratch defect that exist on the toys caused by several following factors:

**1.)Man**

In this problem, man is also act as the main factor that cause the defect. As it shown on the fishbone, the existing defect product that contain scratch in LBO is because the lack of attention toward the work result by the operator. Moreover, just as same as the previous one, the imperceptions of defect category by the appraiser make the increase of defect product that found in the LBO inspection.

**2.)Machine or Equipment**

Simply known that a scratch defect on the product might exist because scratched by the sharp tools that exist around the work area. Sometimes the scratch exist because the operator not use the tools that is suggested by the company. The operator not follow the standard procedure because the operator lack of awareness toward the work result. The sharp point that exist on the machine also can be cause

of scratch defect, this is because there is no warning sign on the sharp point on the machine that make the operator does not be careful and make the product get scratched.

**3.)Method**

Another factor that may cause the scratch defect is the testing method. There are some testing that passed by the products and two of them are function test and life test, this test sometimes left the scratch on the product because the friction between two part of the product.

**4.)Measurement**

Measurement is another factor that cause the increase of dirty defect product in the LBO inspection. In this research the thing that being measured is its aesthetic performance. There should be a clear standard of measurement to categorize whether a product is contain the major defect or minor defect. The poor measurement system make a variation of the appraiser's perception that also make the defect product.

- **Contamination Paint Defect**

The third top defect after dirty and scratch defect is contamination paint. This defect exist when the toy contaminated by paint in any area. Following cause and effect diagram shows the factor and the root cause of the contamination paint defect.

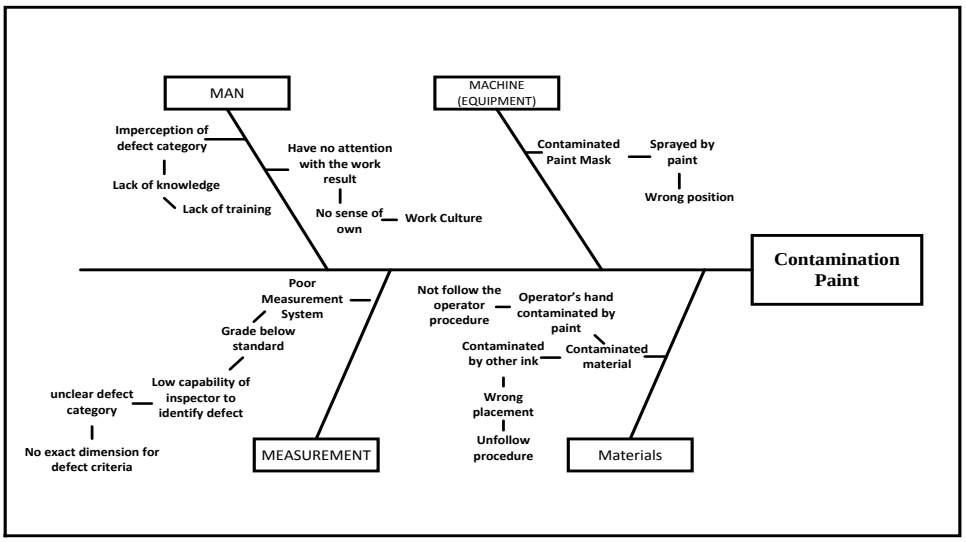



**Figure 4.22 Fishbone Diagram for Contamination Paint Defect**

Based on the cause and effect diagram that shown in the Figure 4.22, the factors that become the cause of the defect are as below:

### 1.) Man

Just as the other two previous defects, Man is always become factor that caused the product become defect. For the contamination paint, the product become defect because the operators are not being careful on doing the toy painting. Therefore, it can make the paint contaminate the other area of the toy's part that is no need to be painted. The operators also not pay attention with the work result in the painting area. If it already contaminated in primary area, it supposed not to pass to the pack out area. Moreover, there's imperceptions of defect category by the inspectors because the inspectors are lack of knowledge about the defect tolerance that is allowed by the quality standard. The error that is done by the human resources seems like simple, however, it can contribute many losses for the production.

### 2.) Material

The material that used to produce the toy's part has been contaminated by the other paint, the contamination might be happen because the remaining paint that exist on the tooling or in the hand of the operator. The contamination paint also can be done

because the material has contaminated by other ink when it pass the painting process, this is because the ink was placed on the wrong place and contaminated the other material. The wrong placement of the ink happened because the operator does not follow the procedure.

**3.)Machine or Equipment**

The other factor that cause the contamination paint is the equipment that used in the painting process. In the painting process, the toy painted with spray and in order to form the wanted shape, it painted using the paint mask and sprayed. Sometimes the wrong position of paint mask cause the mask also being sprayed and make the other next part contaminated by paint.

After the root cause analysis is done by using the cause and effect or fishbone diagram. The root causes of the problems being known. From all of the top three defects, it is found that there is one root-cause that exist in all defect, which is from the man and measurement factor. The man that work, more specific the inspector in the primary area have different perception of the defect category that cause by the poor measurement system of defect category. The inspector passes the defect product that should not be passed to the secondary area or pack out area. These things are a problem since it increases the defect product in the output and also make losses in term of the labor cost and raw materials that used for the packaging process. In order to solve these problem, there should be corrective action that taken and will be discussed in the improvement phase.

**4.3.3.3 Analysis for Improvement**

Previously, the root cause of the problems had been analyzed by using why analysis and cause and effect diagram. After the root causes have been known, the improvement should be made to reduce and eliminate the problem that exist which is the defect. 5W and 1H used to analyze and determine the improvement that needed and the people that take in charge for the improvement. The table below

shows clearly the improvement needed for each problem in the cause and effect diagram analysis.

**Table 4.21. 5W1H Analysis**

| What? | Why? | Where? | Who? | When? | How? |
|---|---|---|---|---|---|
| The operator often not follow the procedure | The procedure are not attached or the operator lack of training | Each of work area | Human Resources Department | Every time there is new hired worker | Conduct Training |
| Bad Work Culture | Lack of harmony in social relationship | Between Division | Human Resources Department | Every time | Build a good working culture |
| Unregularly machine's Cleaning time | No maintenance schedule for machine | Each Machine | Maintenance from Engineering | Weekly | Conduct a regular cleaning |
| No exact requirement for defect criteria | No dimension or zone | QC Inspector | Quality Department | Every time | Make a new booklet by Aesthetic Recalibration |
| Ununiformed perception of defect criteria | Lack of training | QC Inspector | Quality Department | Every time there is new hired worker | Conduct Uniform Perception Training |

Table 4.21 is the 5W1H analysis that done based on the problem on the root cause analysis. 5W stands for What, Why, Where, Who, and When. While the 1H stands for How. In this analysis, the what column contains the problem that are going to be eliminate, it comes from the root causes in the cause effect diagram. The why column contains about the possible reason why the problem exist. Where column contains about the area or the people that need to be improved. Who column contains about the people who take in chare or responsible for the improvement. When column contains about the time the improvement needed to be implemented. The last one is how column, it contains the about the improvement needed to solve or eliminate the causes that exist.

### 4.3.4.Improvement Phase

Improvement phase is the last two phase in the DMAIC methodology. This phase will contain about the corrective actions that is taken in order to solve the existing issues. Due to the limited amount of time, not all the defect can be analyzed and solved, therefore based on the measurement and analysis phases that have been done, there are three defect that being analyzed to know the root cause of the problem. After it being analyzed, there are some factors that caused each defect category such as man, machine, method, material and environment. From the root cause analysis that has been done by using cause and effect or fishbone diagram, it is known that many root causes that make the defect exist. However, not all the root cause can be solved due to several limitation. For the problem such as the unfollowed procedure or something like that, actually the company already make the standard of operation. However, there are still many operator that did not follow it.

From all three defects, man and measurement become the main factors that cause the problem, and all the cause and effect diagram mention the same cause which is there is an imperceptions of the defect category and poor measurement system. The poor measurement system is because the imperceptions of defect category that caused by the inspector whom lack of knowledge or because the defect category guidance still unclear. In order to solve this thing, the company especially from quality department decided to conduct a project which is aesthetic recalibration project and do other improvements that can support the team to eliminate the factor that exist in the root cause analysis.

#### 4.3.4.1.Aesthetic Recalibration Project

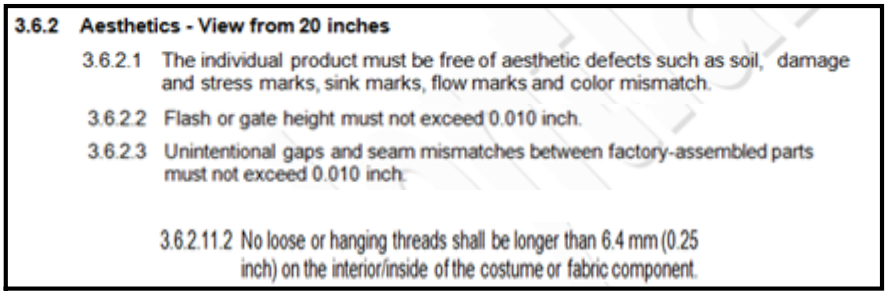
Aesthetic Recalibration Project is a project that conducted by quality department in order to define more clearly about the defect category for the mainline toy. This aesthetic recalibration project was conducted through several phase which are preparation phase which consist of the meeting for aesthetic review, project scheduling, and collecting and measure the defects. Then, after all the defects have

been prepared, the analysis phase will be conduct by arranging a weekly meeting that will involve the quality, engineering, product engineer and production people. The figure below shows the timeline of the aesthetic recalibration project.

| | 27-Aug | 3-Sep | 10-Sep | 17-Sep | 24-Sep | 1-Oct | 8-Oct | 15-Oct | 22-Oct | 29-Oct | 5-Nov | 12-Nov |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aesthetic Review Event at PTMI | | | | | | | | | | | | |
| | actual | | | | | | | | | | | |
| High Level Summary | | | | | | | | | | | | |
| | | actual | | | | | | | | | | |
| All Reviewed samples documentation | | | | | | | | | | | | |
| | | | actual | actual | | | | | | | | |
| Call 1 (Concept agreement) | | | | | | | | | | | | |
| | | | actual | | | | | | | | | |
| Weekly update (Con. Call) | | | | | | | | | | | | |
| | | | | actual | actual | actual | actual | | | | | |
| Finalize booklet batch 1 for all area | | | | | | | | | | | | |
| | | | | | | | actual | actual | | | | |
| Finalize and upload (Con. Call) | | | | | | | | | | | | |
| | | | | | | | | actual | | | | |
| Live document<br>Booklet will be updated every month to capture additional defect type | | | | | | | | | | | | |

**Figure 4.23 Timeline of Aesthetic Recalibration Project**

Currently, PT. GB Indonesia use the aesthetic requirement that is exist on every PRD (Product Requirement Design), the requirement on PRD that used to define that the product is a defect product is not so clearly. The requirement is on following pictures:



**3.6.2 Aesthetics - View from 20 inches**

3.6.2.1 The individual product must be free of aesthetic defects such as soil, damage and stress marks, sink marks, flow marks and color mismatch.

3.6.2.2 Flash or gate height must not exceed 0.010 inch.

3.6.2.3 Unintentional gaps and seam mismatches between factory-assembled parts must not exceed 0.010 inch.

3.6.2.11.2 No loose or hanging threads shall be longer than 6.4 mm (0.25 inch) on the interior/inside of the costume or fabric component.

**Figure 4.24 Aesthetic Requirement on PRD (Product Requirement Design)**

On 3.6.2.1, it is only state that the product should be free from aesthetic defects such as mentioned on above, if PT. GB Indonesia follow this requirement only, all the part that that contain anything that fall in to that will be considered as defect.

And also on 3.6.2.2 and 3.6.2.3, it is only mentioned the dimension tolerance of several defect which means that any product that fall into those category will be considered as defect without see the defect area or the number of defect that existed in the product.

The unclear definition of aesthetic defect sometimes makes a different perception between the inspector and the quality team. Since the inspector lay on the requirement that available on the PRD, it can be found that sometimes the major defect that categorized by the quality department concluded as minor defect by the inspector, or it can be the opposite. This imperceptions can give the big impact toward the production because if the minor defect concluded as major by the inspector, the inspector might hold the production which will waste the time for lead time and the labor cost only for waiting. In other case, if the inspector conclude the major defect as minor, it can make many issue such as wasting labor cost and production time that used only for package the defect product, raw material that used for defect product and increase the defect product that found in the inspection, especially LBO inspection. Therefore, in order to overcome these cases, aesthetic recalibration project implemented in order to align the perception of defect category by make the category into a clearer definition.

AG as one part of GB, Inc. has an approach on define the defect category by separate it into several zone. This is a good approach that also can be used by PT. GB Indonesia in define the category into major defect, minor defect or only observation. Therefore, in this Aesthetic Recalibration Project, the defect will be define by four category which are zone (as it was implemented by AG), contrast, number and the dimension of the defect. Since on the measurement phase it is stated that the three highest defects are dirty, contamination paint and scratch which is mostly happen in the molded part of the toy, therefore, in this thesis the zone that will be defined only for the roto-head and torso. For the roto-head the zone divided into 4 areas which are zone 1a, zone 1b, zone 1c and zone 1d. The clearer zone of roto-head area is define on the picture below:

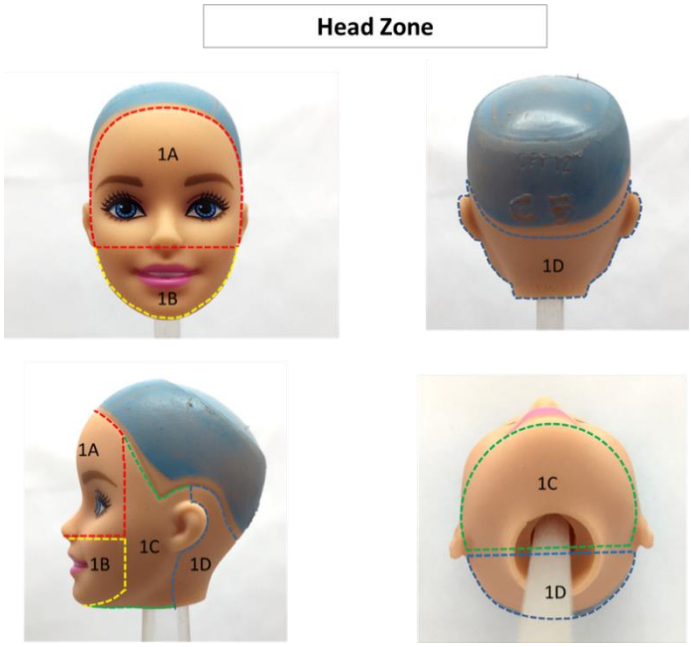



**Figure 4.25 Zone Classification on Head**

The area divided into visible and invisible area. The zone 1a, zone 1b and zone 1c are the visible area, the defect in those areas is not acceptable, or if it is acceptable, the tolerance is depend on the number and the dimension of the defect. Zone 1d is the invisible area, and in most of the toy, that area will be covered by hair, therefore any defect in that area will be acceptable or classified as observation. As it define as the zone, the tolerance of zone 1a will be lesser than the 1b and so on with the zone 1c and zone 1d.

The second scope is the torso of the toy, different with the roto-head that separated into four zones, the zone classification in the torso of the toy only divided into two zone, which are zone 2 for the area that is visible and zone 3 for the area that is invisible or covered by the costume. The picture below shows more clearly about the area of zone 2 and 3 on the torso.

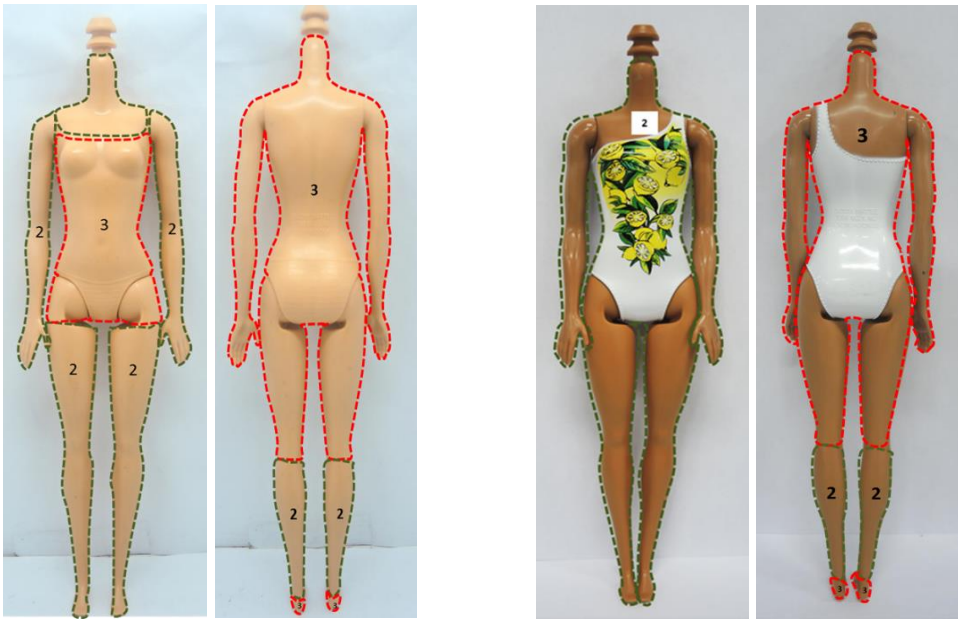



**Figure 4.26 Zone Classification on Torso**

There are two types of torso, the standard one and the painted torso. For the painted torso, all area in the front torso will be classified as zone 2, while for the standard one, the area in front of the torso that already signed by red line classified as zone 3. These classification was made since the painted torso will not be covered by costume. After the zone classification has been made, the other element that should be consider is the number, dimension and the contrast of the defect. In order to define it, many samples are collected, categorized and measured. Thus, the project team can make a conclusion whether the defect is major, minor or observation by see the data that is gotten from the sample of defect.

The defect was collected by the inspector of quality that work in the production line, then the defect product will be collected by the team of aesthetic recalibration project and each defect in the products will be measured. In the weekly meeting, all the people that involved will review each product and classify it into major, minor or observation based on four elements that has been mentioned before which are zone, dimension, contrast and number of defect. After some weekly meeting, then the quality can categorized some defect and make a booklet of it. From all the

defects that has been defined, the table below shows the detail classification for the top three defects that discussed in this research.

**Table 4.22 Defect Booklet of Aesthetic Recalibration Project**

| Type of defect | Measurement | Zone | |
|---|---|---|---|
| | | 2 | 3 |
| Dirty | Ø > 1/16 " | Not-Acceptable | Not-Acceptable |
| | Ø < 1/16 " | Acceptable | Acceptable |
| | Covered by costume | Acceptable ≤ 1/8" | Acceptable ≤ 1/8" |
| Scratch Paint | Area peel off | Ø > 1/16" =Not-Acceptable<br>Ø ≤ 1/16" = acceptable | Ø > 1/8" = Not-Acceptable<br>Ø ≤ 1/8" = acceptable |
| | Line scratch peel off | > 3/8 " = Not-Acceptable<br>≤ 3/8 "= acceptable | > 3/4" = Not-Acceptable<br>≤ 3/4" = acceptable |
| Scratch | Contrast<br>(scratch mark deep and contrast color residue compared to base color) | > 3/4" = Not-Acceptable<br>≤ 3/4" = acceptable | >1" = Not-Acceptable<br>≤ 1" = acceptable |
| | Non-Contrast<br>(scratch mark light (not deep) residue from scratch has a similar color compared to base color) | >1" = Not-Acceptable<br>≤ 1" = acceptable | >1 1/4" = Not-Acceptable<br>≤ 1 1/4" = acceptable |
| Contamination Paint | Ø > 1/16 " | Not-Acceptable | Not-Acceptable |
| | Ø < 1/16 " | Acceptable | Acceptable |
| | Covered by costume | Acceptable Ø ≤ 1/8" | Acceptable Ø ≤ 1/8" |

The Table 4.34 is the result of Aesthetic Recalibration Project, the result of this project is actually a new booklet that guide every person that found the defect has an align perception by following the criteria that has been made. Table 4.34 only mention 3 type of defects that discussed in this research which are dirty, scratch (divided into scratch and scratch paint) and contamination paint. In the measurement and zone columns, the detail criteria to define whether the defect is not-acceptable or acceptable. The not acceptable defect means the defect on the product is major, while if it acceptable, it means that the defect might be minor defect or only observation.

#### 4.3.4.2.Uniform Perception Training

In order to solve the problem that exist and aligning the perception, the other improvement or further action that is done after finish the Aesthetic Recalibration Project is re-training the quality appraiser. The training that conducted is called as Uniform Perception training. In this training, the quality appraiser will be trained to understand more clearly about the new criteria of a defect product for each defect type as the result of aesthetic recalibration project. The aesthetic recalibration project result is a new booklet of defect categories and criteria, which already agreed by the quality team in PT. GB Indonesia and the center office from El Segundo. The training was done in 2 days, by showing the sample of each defect type with its zone, dimension, etc. In order to ensure whether the training is effective, a little test was being conducted in the second day of training.

#### 4.3.4.3.Proposed Improvement

- **Make a Cleaning Schedule**

On the analysis phase it is mention that the dirty defect caused by the unclean machine that irregularly cleaning by the maintenance. The cleaning schedule might already exist, however it is not for the machine. Therefore, it is suggested to make a regular cleaning time for each machine to reduce the dirty defect that caused by the unclean machine, tools or work area.

- **Attach SOP in every work area**

Actually, the SOP (Standard Operation Procedure) has been made for every work area or even for work activity in PT. GB Indonesia. However, this procedure sometimes does not being followed by the workers. This might be happened because the SOP does not attached around the work area. Therefore, in order to make the operator follow the procedure that has been made, it is suggested to do the audit for every work area and attached the SOP if it does not exist.

- **Character Building Training**

Beside from the technical reasons, the defect product exist mostly caused by the ma factor. This is because there is no good work culture that make the worker especially operator realize that the result of their work can impact the company profit. Therefore, there should be a training for character building and the company should build a good culture.

#### 4.3.4.4.Measurement System Analysis after Improvement

Previously, a measurement system analysis was conducted in the measure phase in order to know whether the measurement system that implemented is already good or not. Unfortunately, it is found that some of the appraisers did not met the standard which is 90, it means that the existing measurement still poor. Aesthetic recalibration project was conducted in order to repair the measurement system to the aesthetic defect. This project aim to make a guideline of defect category, to make the criteria of a product defect clearly. In order to know whether the project that has been done make the measurement system become better or not, a measurement system analysis after improvement is conducted.

After the new guideline has been made and the appraisers has been re-train through uniform perception training. Then, these are the result of MSA of each appraiser.

**Table 4.23 Result of MSA After Improvement**

| No | Name | Area | First test | Result | Test After Improvement | Result |
|---|---|---|---|---|---|---|
| 1 | Rohimah | Molding | 90% | PASS | 100% | PASS |
| 2 | Fitri | Molding | 70% | FAILED | 100% | PASS |
| 3 | Rita | Molding | 100% | PASS | 100% | PASS |
| 4 | Nurul | Painting | 90% | PASS | 100% | PASS |
| 5 | Sutarini | Painting | 100% | PASS | 100% | PASS |
| 6 | Poni | Painting | 90% | PASS | 100% | PASS |
| 7 | Budi | Painting | 90% | PASS | 90% | PASS |
| 8 | Etik | Painting | 70% | FAILED | 100% | PASS |
| 9 | Puput | Assembly | 100% | PASS | 100% | PASS |
| 10 | Nani | Assembly | 80% | FAILED | 100% | PASS |
| 11 | Yuliani | Assembly | 100% | PASS | 100% | PASS |
| 12 | Durotul | Assembly | 100% | PASS | 100% | PASS |
| 13 | Indah | Assembly | 90% | PASS | 90% | PASS |
| 14 | Ratna | Assembly | 90% | PASS | 100% | PASS |
| 15 | Sriyani | Assembly | 100% | PASS | 100% | PASS |
| 16 | Sahiroh | Assembly | 70% | FAILED | 90% | PASS |
| 17 | Suci | Assembly | 100% | PASS | 100% | PASS |

The table 4.44 contains the result of Measurement System Analysis towards the quality appraiser of primary area after the implementation of the improvement. As it shown in the last column of the table, the result of MSA after implementation is met the standard since all the appraisers passed the goal that has been made. It also means that the measurement system already good to be used as the standard of measure.

### 4.3.4.5.Quantity Defect in LBO Inspection After Improvement

In order to know whether the improvement that has been done give impact to the quantity of defect found in LBO inspection or not, therefore the data of quantity defect in LBO inspection on November 2016 collected. From all the data on November 2016, it can be summarized up into the figure below:

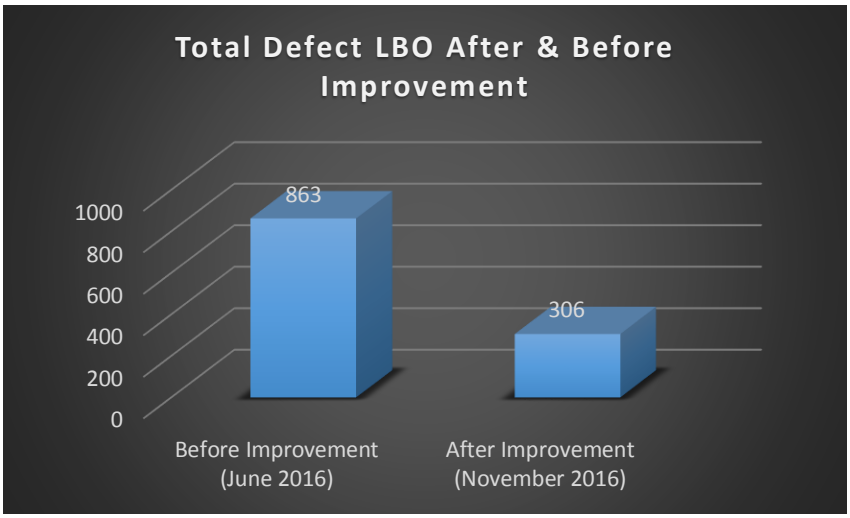



**Figure 4.27 Total Defect LBO Inspection Before and After Improvement**

As it shown on Figure 4.27, the number of defect found in the LBO inspection have significantly decrease from 863 defects product from 294,035 samples on June 2016 (before improvement) to 306 defect products from 216,508 on November 2016 (after improvement). It means that the improvement that was implemented in PT. GB Indonesia is succeed to decrease the number of defect that found in LBO inspection. To know more detail whether the improvement really impact the decrease of defect product, it can be seen through the decrease of defect product per each category. The chart in the figure below shows the defect quantity per category that found after the implementation of improvement in PT. GB Indonesia.

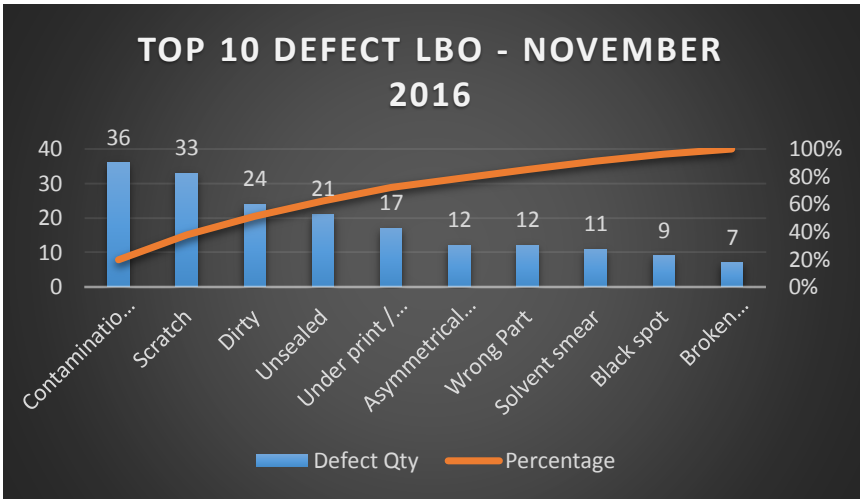



**Figure 4.28 Top 10 Defect LBO on November 2016 (After Improvement)**

Figure 4.28 shows that the top three defect categories are still contamination paint, scratch and dirty. However, the quantity of each defect category is significantly decrease and the dirty defect not become the first top defect anymore, but it become the third top three. The figure below shows the difference of total defect between the top three defect category before improvement which is on June 2016 and after improvement which is on November 2016.

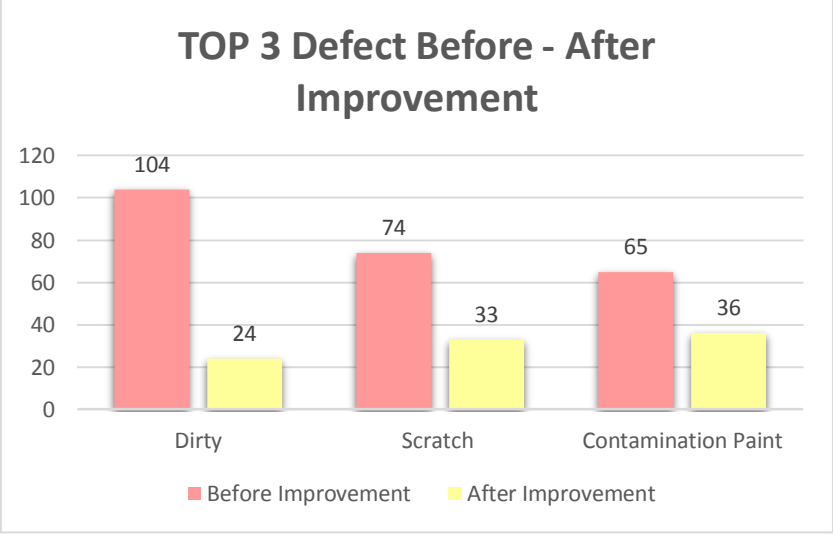



**Figure 4.29 Defect Quantity of Top 3 Defects Before & After Improvement**

The improvement may not fully eliminate the top three defects yet. However, as it shown on Figure 4.29, the total defect of each defect category of top three defect has decrease significantly after the implementation of improvement. The dirty defect has decrease 76.9%, from 104 defects on June 2016 to only 24 defects on November 2104. The Scratch Defect has decrease by 55.4%, from 74 defects found on June 2014 to only 33 defects found on November 2016. And the last, the contamination paint has decrease 44.6 %, from 65 defects on June 2016 to 36 defects on November 2016. These defect may be decrease again by another improvement that will be implemented in the future.

As it stated in the first phase of this research that the aim of this research is to reduce the number of defect that found in the LBO inspection. PT. GB Indonesia has set a goal that the maximum total defect that found in the LBO inspection is only about 1000 ppm. To ensure whether the result of after implementation has reach the goals, therefore the DPM of defect product in November 2016.

$$DPM\ November\ 2016 \qquad = \frac{306}{216{,}058}\ x\ 1{,}000{,}000 = 1416.28\ ppm$$

The Defect Opportunity per Million in November 2016 is 1416.28 product per million which means that in every million products that produced, there might be around 1416 product that categorized as defect product. The DPMO of November 2016 still highest than the tolerance or goal which is 1000 ppm. However, the performance of the production is increase since the DPMO has been reduced from 2932 ppm on June 2016 to 1417 ppm on November 2016.

Even though the result might still not reach the goal which is only 1000 defect product per million product that produced. However, the DPM has been significantly decrease. This might be because it still only a month after the implementation of the improvement. Further, DPM may continuously decrease and

another improvement should be made in order to keep the company continuous to reach the goals.

### 4.3.5.Control Phase

Control phase is the last phase of DMAIC methodology. This phase is aim to ensure whether the project that has been implemented are continuously success to keep the process good or not. In this research, there are two element that should be controlled. The first is the capability of the appraiser or the measurement system and the second is the quantity of defect product in the production.

#### 4.3.5.1.Quarterly Measurement System Analysis

After the improvement has been done, the measurement system has been analyzed again to ensure that the measurement system has met the standard. The capability of the appraisers to identify the defect on product is getting better after the recalibration of the aesthetic measurement. The capability of the human might be changed due to the time, therefore in order to ensure that the measurement system of aesthetic defect still stable, a quarterly MSA should be conduct to control whether the measurement system still met the standard or not.

#### 4.3.5.2.Check List

In order to ensure that the process has follow the existing procedure and will not make an increase to the defect quantity, there should be an audit to the production line. A checklist might help the audit become easier and can control the work system that exist. The following figure shows the proposed checklist that can be used to control or do the process audit.

**Quality Control Checklist**

PT. GB Indonesia

Date :

Line:

Toy Number:

| No. | Checklist | Yes | No | Notes |
|---|---|---|---|---|
| 1 | Measurement system already good | | | |
| 2 | The SOP has been attached in work area | | | |
| 3 | The machine has been clean up | | | |
| 4 | the work area has been clean up | | | |
| 5 | The Working tools have fulfill requirement | | | |
| 6 | The approved sample exist | | | |
| 7 | the line already do 5S | | | |
| 8 | the product has been inspected before it goes to secondary area | | | |
| 9 | | | | |
| 10 | | | | |

Checked by,

Name:

Approved by,

Name:

**Figure 4.30 Quality Control Checklist in PT. GB Indonesia**

The checklist will be done in every time any toy will be produce in a line. Therefore, all the area that will be used for the toy will be checked in order to reduce the defect especially the top three defects which are dirty, scratch and contamination paint.

### 4.3.5.3 Standard Operation Procedure for Inspection Plan

SOP which stands for Standard Operation Procedure is a specific procedure for any operation that describe the activities or task to be done in accordance with the industry regulation, province laws and company standard in running the business. In order to keep the quality of the product good and reduce the defect found in LBO inspection, an SOP was made for the inspection plan from the primary until the secondary area. The SOP used to reduce the variation of work and the work

can be done as the standard. The below figure is the flow chart of inspection plan for quality Control.

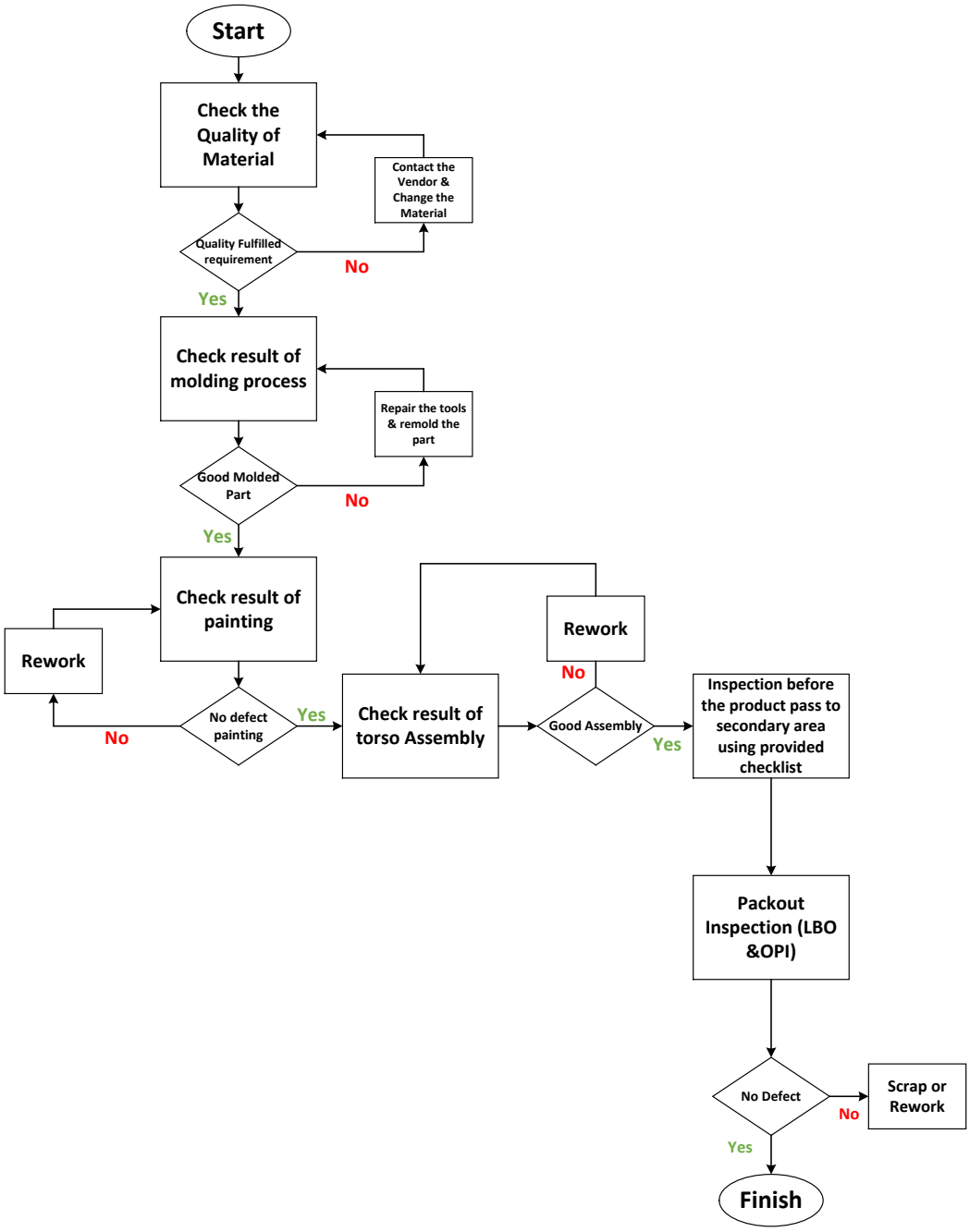



**Figure 4.31 Flow Chart of Inspection Plan**

The flow chart above is the flow of inspection that should be done by the quality control inspector to reduce the possibility of defect occurrence. The flow of

inspection will lead the team to establish the standard operating procedure for the inspection. The figure below is the SOP for inspection that has been made by Quality Control, the procedure consists the information of part to be inspected, inspection type, reference/equipment, sample size, minimum frequency, record and remarks.

**PT. GB INDONESIA WORKING INSTRUCTION**

| | |
|---|---|
| **Doc. Name : QC Inspection Plan** | |
| **Doc. No. :** | **QA/GL/032** |
| **Effective Date :** | **9-Sep-16** |
| **Initiator/Revised by :** | **Approved by** *(direct superior)* **:** |
| ***Andro, Khomsatun, Joko N.*** | ***Elida*** |

| Part to be Inspected | Inspection Type | Reference/ Equipment | Sample Size | Minimum Frequency | Record | Remarks |
|---|---|---|---|---|---|---|
| Raw Material | Audit | GQMP-2090 | 1 pcs/ material | 1 time | QC Server | Make sure the raw material fulfilled the stanndard requirement |
| All Molded Parts | First Shot Sample | Approved Sample | 1 shot/machine | At beginning of shift or change over | QC Server | First shot sample doesn't change, if there aren't change over part, tool change or mold repair |
| All Part Painted Part | First Piece<br>Sample | Approved Sample | 1 part#/ line or machine | At beginning of shift and change over | QC Server | First piece sample doesn't change, if there aren't change over part, tool change or mold repair |
| All Part after Finish Assembly | First Piece<br>Sample | Approved Sample | 1 part#/ line | At beginning of shift or change over | Soft copy (server) | First piece sample doesn't change, if there aren't change over part, tool change or mold repair |
| Secondary Area | Audit | Checklist | 1 line | 1 time | QC Server | Make sure that the condition same as / fulfill the checklist |
| Finished product after production inspection | LBO (main line type) | • Approved Sample and | Refer to LBO sampling plan normal | Per pallet | FTY server | LBO SAMPLING PLAN (NORMAL)<br>• Do tip over test 6 pcs package/inspection<br>Re-audit after rework:<br>Defect aesthetic when LBO, re-audit LBO with tighten sample size<br>LBO -RE-AUDIT SAMPLING PLAN (TIGHTEN) |

**Figure 4.32 SOP for Inspection Plan**

### 4.3.5.4 Control Sheet for defect in LBO inspection

Another thing that should be controlled after the implementation of the improvement is the total number of defect that is found in the LBO inspection. In order to control the number of defect product, a control sheet is used to track the number of defect that is found in the LBO inspection. The existence of the check sheet is to make the inspector more aware to the defect and thinking the way to reduce it. The figure below is the format check sheet of the LBO inspection.

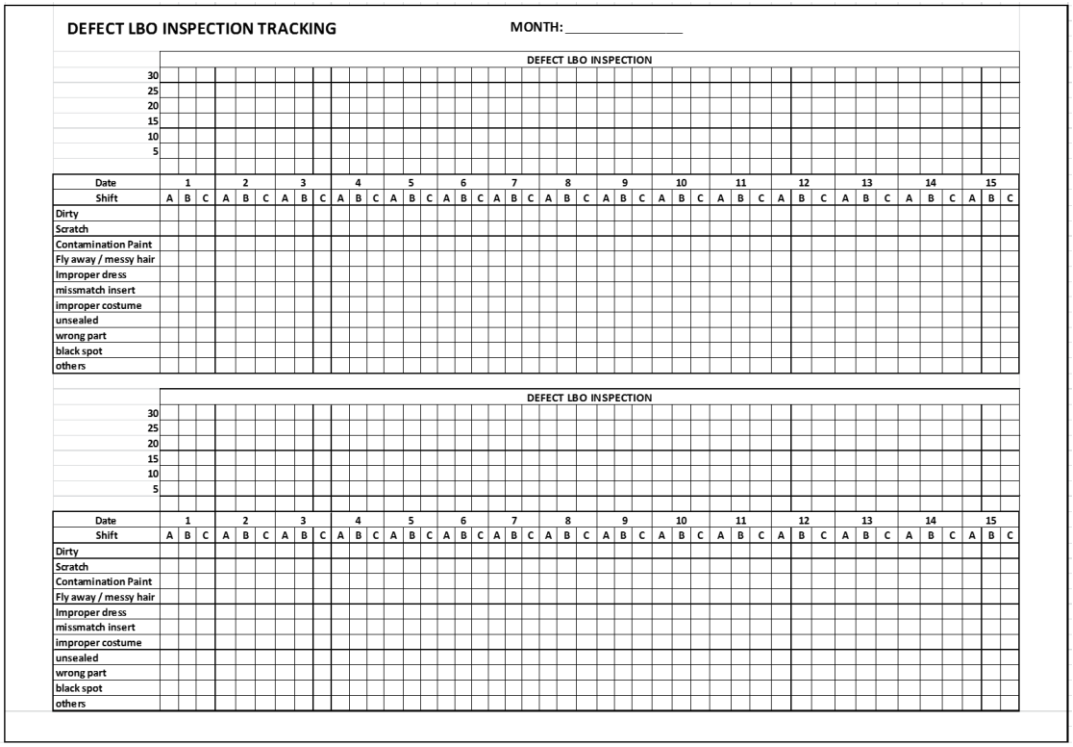



**Figure 4.33 Control Sheet for Defect in LBO Inspection**

After do an improvement to the problem that exist, a control is needed to ensure whether the improvement has impact or not towards the result. A daily tracking of defect is used to control whether the defects that is found still in tolerance or not. After the daily check sheet was filled, the data will be input to the database weekly in order to analyze the performance of the production.

### 4.4. Losses Before and After Improvement

From the Accounting term losses is any cost that produce no benefit or income. The defect analysis does not only aim to reduce the defect quantity but also the losses cost. PT. GB Indonesia produce various of toy in various of production cost per each toy. In this research, the production cost per toy will be assumed based on the average price of all the toy. It is assumed that the production cost for each toy equal to $2.5 USD / product. The production cost already include labor cost, raw material, machine cost, etc. Below is the explanation of losses cost before and after improvement.

- **Before Improvement**

On June 2016, the defect quantity that found in the LBO inspection has increase to 863 defects. This defect that found in the inspection may represent the number of defect that might exist in every million product that produce by calculate the DPM (Defect per Million). Before improvement, it is found that the DPM of PT. GB Indonesia is 2932 ppm. It means that in every million product that produce, the opportunity the product is defect is 2932 products. Therefore the losses will be:

Losses Cost = defect product x production cost per toy (4-2)
= 2932 product x $2.5
= $7330 = Rp. 92.290.000,- / million products

- **After Improvement**

The analysis that has been done make the root cause of defect found and the improvement can be made. After the improvement, the quantity of defect that found in PT. GB Indonesia reduce, and also the losses cost. The data of defect quantity after improvement shows that the DPM reduce to 1417 products.it means the losses after improvement will be:

Losses Cost = 1417 product x $2.5

= $3542.5

= Rp. 46.052.500,- / million products

From the result of calculation on above, it is found that there is the reduction of loss cost after the improvement implemented. The improvement has safe the cost until:

Cost reduction = Loss before improvement – loss after improvement (4-3)

= Rp. 92.290.000 - Rp. 46.052.500

= Rp. 46.237.500 / million products

The improvement can reduce the cost that loss until Rp.46.237.500 per million products that being produce by PT. GB Indonesia

# CHAPTER V
# CONCLUSION AND RECOMMENDATION

## 5.1.Conclusion

In conclusion of this research, the objective of this research which is to reduce the number of defect quantity that found in the LBO inspection has successfully achieved. The increase of defect quantity from January to June 2016 make the company take a corrective action to prevent the continuous increase of quantity on the next months. An analysis toward the defect conducted using six sigma methodology which is DMAIC tools. Through the implementation of six sigma it is found that the main factors that cause the increase of defect are the poor measurement system that made an imperceptions by the quality appraiser. As the improvement of this problem, the Aesthetic Recalibration Project was conducted. And after the improvement has been implemented, the total of defect quantity reduce from 868 defect products to 306 defects product on June. Even though the number of defect has been decreased, the DPMO of product still above the tolerance that made (1000 ppm), the DPMO on November 2016 still around 1416 ppm.

## 5.2.Recommendation

As the research was conducted, there are some recommendation to reduce the aesthetic defect or even eliminate it, the recommendation are:

1. Implement the integration of lean six sigma in the factory, so not only the expert that will get involved to solve the problem but all the people that in charge in the production line have a responsibility to find the root cause of every problem and think about the solution together. The existence of responsibility within all the operator will build a sense of owning. Therefore, it can establish a good culture within the work area and make

all the people, especially the operator aware with the work that done by them and also the result.

2. Conduct another improvement for the defect analysis that may have great contribution in the decrease of defect reduction.

3. Train all the operators that work, not only the quality appraiser, therefore the defect can be identified faster before it turn into the packaging session.

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# APPENDICES

## Appendix 1 –Defect LBO Inspection January – June 2016

| Defect Type Name | Inspection Type Id | Inspection Date | Lots No | Sample Size | Defect Qty |
|---|---|---|---|---|---|
| Missing Printing | LBO | 1/6/2016 0:00 | 2 | 50 | 2 |
| WRONG HEAD | LBO | 1/8/2016 0:00 | 7 | 32 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/8/2016 0:00 | 1 | 32 | 1 |
| Improper Sewn | LBO | 1/7/2016 0:00 | 1 | 0 | 1 |
| Unclear date code (cri) | LBO | 1/9/2016 0:00 | 2 | 0 | 1c |
| Solvent smear | LBO | 1/6/2016 0:00 | 7 | 32 | 1 |
| Solvent smear | LBO | 1/6/2016 0:00 | 2 | 32 | 1 |
| Contamination paint/ink | LBO | 1/7/2016 0:00 | 1 | 50 | 1 |
| Deformed | LBO | 1/7/2016 0:00 | 1 | 50 | 1 |
| Solvent smear | LBO | 1/9/2016 0:00 | 2 | 50 | 1 |
| Smear painted head | LBO | 1/7/2016 0:00 | 4 | 0 | 1 |
| Scratch head/paint (rooting) | LBO | 1/8/2016 0:00 | 1 | 20 | 1 |
| Scratch head/paint (rooting) | LBO | 1/8/2016 0:00 | 7 | 20 | 1 |
| Scratch head/paint (rooting) | LBO | 1/8/2016 0:00 | 5 | 20 | 1 |
| Missing attachment/accesories | LBO | 1/6/2016 0:00 | 1 | 32 | 1 |
| Missing date code (cri) | LBO | 1/6/2016 0:00 | 3 | 20 | 1c |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/8/2016 0:00 | 2 | 32 | 1 |
| Missing paint | LBO | 1/8/2016 0:00 | 3 | 32 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/9/2016 0:00 | 4 | 20 | 1 |
| Mold Mark | LBO | 1/4/2016 0:00 | 1 | 50 | 1 |
| Missing Stitches (rooting) | LBO | 1/4/2016 0:00 | 1 | 20 | 1 |
| Missing date code (cri) | LBO | 1/6/2016 0:00 | 3 | 32 | 1c |
| Missing part | LBO | 1/4/2016 0:00 | 1 | 20 | 1 |
| Missing part | LBO | 1/4/2016 0:00 | 1 | 20 | 1 |
| Missing paint | LBO | 1/5/2016 0:00 | 1 | 32 | 1 |
| Missing paint | LBO | 1/8/2016 0:00 | 2 | 0 | 1 |
| Missing paint | LBO | 1/8/2016 0:00 | 4 | 0 | 1 |
| Delamination I/C | LBO | 1/8/2016 0:00 | 4 | 32 | 1 |
| Missing date code (cri) | LBO | 1/6/2016 0:00 | 1 | 20 | 1c |
| Scratch | LBO | 1/6/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 1/6/2016 0:00 | 4 | 0 | 1 |
| Misposition eye | LBO | 1/6/2016 0:00 | 1 | 0 | 1 |
| Misposition paint | LBO | 1/9/2016 0:00 | 1 | 32 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Dirty | LBO | 1/6/2016 0:00 | 1 | 32 | 1 |
| Wrong assy | LBO | 1/7/2016 0:00 | 3 | 20 | 1 |
| Loose part | LBO | 1/4/2016 0:00 | 2 | 32 | 1 |
| Asymmetrical eye | LBO | 1/8/2016 0:00 | 1 | 32 | 1 |
| Solvent smear | LBO | 1/7/2016 0:00 | 2 | 32 | 1 |
| Material contamination | LBO | 1/7/2016 0:00 | 2 | 0 | 1 |
| Foreign matter | LBO | 1/5/2016 0:00 | 1 | 20 | 1 |
| Foreign matter | LBO | 1/7/2016 0:00 | 6 | 20 | 1 |
| Solvent smear | LBO | 1/7/2016 0:00 | 5 | 32 | 1 |
| Extended periphery | LBO | 1/8/2016 0:00 | 2 | 50 | 1 |
| Dirty | LBO | 1/4/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 1/5/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 1/5/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 1/5/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 1/6/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 1/7/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 1/8/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 1/8/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 1/8/2016 0:00 | 1 | 32 | 1 |
| WRONG HEAD | LBO | 1/8/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 1/7/2016 0:00 | 4 | 20 | 1 |
| Contamination paint/ink | LBO | 1/7/2016 0:00 | 1 | 0 | 2 |
| Improper Sewn | LBO | 1/7/2016 0:00 | 1 | 0 | 1 |
| Loose part | LBO | 1/8/2016 0:00 | 1 | 0 | 1 |
| Come off | LBO | 1/5/2016 0:00 | 3 | 32 | 1 |
| Foreign matter | LBO | 1/7/2016 0:00 | 3 | 32 | 1 |
| Contamination Paint/ink | LBO | 1/8/2016 0:00 | 1 | 50 | 2 |
| Broken blister/IC | LBO | 1/5/2016 0:00 | 3 | 20 | 1 |
| Broken PVC | LBO | 1/9/2016 0:00 | 2 | 32 | 1 |
| Broken J Hook | LBO | 1/9/2016 0:00 | 1 | 20 | 3 |
| Black spot | LBO | 1/4/2016 0:00 | 3 | 50 | 1 |
| WRONG HEAD | LBO | 1/6/2016 0:00 | 2 | 0 | 1 |
| Bending arm/leg/part | LBO | 1/5/2016 0:00 | 1 | 32 | 2 |
| Come off | LBO | 1/8/2016 0:00 | 1 | 0 | 1 |
| Wrong part | LBO | 1/14/2016 0:00 | 1 | 20 | 3 |
| Improper grooming | LBO | 1/15/2016 0:00 | 1 | 32 | 1 |
| Bending arm/leg/part | LBO | 1/15/2016 0:00 | 2 | 32 | 1 |
| Wrong part | LBO | 1/13/2016 0:00 | 2 | 50 | 1 |
| Wrong Part | LBO | 1/15/2016 0:00 | 1 | 32 | 2 |
| Solvent smear | LBO | 1/15/2016 0:00 | 3 | 32 | 1 |
| Smear painted head | LBO | 1/13/2016 0:00 | 1 | 32 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Short shot | LBO | 1/13/2016 0:00 | 1 | 32 | 1 |
| Short shot | LBO | 1/14/2016 0:00 | 8 | 20 | 1 |
| Scratch | LBO | 1/15/2016 0:00 | 3 | 20 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/12/2016 0:00 | 1 | 32 | 1 |
| Peeled off | LBO | 1/12/2016 0:00 | 1 | 20 | 1 |
| Open flap | LBO | 1/13/2016 0:00 | 5 | 20 | 1 |
| Missing part | LBO | 1/11/2016 0:00 | 2 | 32 | 1 |
| Missing part | LBO | 1/12/2016 0:00 | 3 | 20 | 1 |
| Missing part | LBO | 1/13/2016 0:00 | 3 | 20 | 1 |
| Missing attachment/accesories | LBO | 1/13/2016 0:00 | 1 | 50 | 1 |
| Mismatch insert | LBO | 1/13/2016 0:00 | 2 | 32 | 1 |
| Loose part | LBO | 1/11/2016 0:00 | 3 | 32 | 1 |
| Loose part | LBO | 1/11/2016 0:00 | 2 | 32 | 1 |
| Solvent smear | LBO | 1/15/2016 0:00 | 5 | 32 | 1 |
| Improper dress | LBO | 1/14/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 1/12/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 1/12/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 1/14/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 1/14/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 1/14/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 1/14/2016 0:00 | 1 | 32 | 1 |
| Contamination Paint/ink | LBO | 1/15/2016 0:00 | 5 | 0 | 2 |
| Damage/Broken I/C | LBO | 1/15/2016 0:00 | 2 | 32 | 2 |
| Contamination Paint/ink | LBO | 1/11/2016 0:00 | 7 | 32 | 1 |
| Contamination paint/ink | LBO | 1/11/2016 0:00 | 10 | 20 | 1 |
| Contamination paint/ink | LBO | 1/14/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 1/15/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 1/13/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 1/13/2016 0:00 | 2 | 0 | 1 |
| Come Off | LBO | 1/15/2016 0:00 | 2 | 20 | 1 |
| Broken PVC | LBO | 1/13/2016 0:00 | 2 | 32 | 1 |
| Broken J Hook | LBO | 1/12/2016 0:00 | 4 | 20 | 1 |
| Broken J Hook | LBO | 1/12/2016 0:00 | 7 | 20 | 1 |
| Broken J Hook | LBO | 1/12/2016 0:00 | 5 | 20 | 1 |
| Broken J Hook | LBO | 1/12/2016 0:00 | 4 | 0 | 1 |
| Broken J Hook | LBO | 1/12/2016 0:00 | 1 | 50 | 1 |
| Broken J Hook | LBO | 1/13/2016 0:00 | 1 | 20 | 1 |
| Broken J Hook | LBO | 1/13/2016 0:00 | 2 | 20 | 1 |
| Broken J Hook | LBO | 1/13/2016 0:00 | 2 | 20 | 1 |
| Broken J Hook | LBO | 1/13/2016 0:00 | 3 | 20 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Broken J Hook | LBO | 1/13/2016 0:00 | 9 | 20 | 1 |
| Broken J Hook | LBO | 1/14/2016 0:00 | 2 | 20 | 1 |
| Broken J Hook | LBO | 1/14/2016 0:00 | 6 | 20 | 1 |
| Broken J Hook | LBO | 1/14/2016 0:00 | 4 | 20 | 2 |
| Black spot | LBO | 1/12/2016 0:00 | 2 | 20 | 1 |
| Black spot | LBO | 1/13/2016 0:00 | 1 | 32 | 1 |
| Wrong Part | LBO | 1/15/2016 0:00 | 2 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 1/13/2016 0:00 | 1 | 50 | 1 |
| Solvent smear | LBO | 1/20/2016 0:00 | 2 | 32 | 1 |
| Solvent smear | LBO | 1/20/2016 0:00 | 4 | 50 | 1 |
| Smear part | LBO | 1/20/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 1/18/2016 0:00 | 4 | 0 | 1 |
| Scratch | LBO | 1/18/2016 0:00 | 1 | 20 | 1 |
| Scratch | LBO | 1/19/2016 0:00 | 1 | 20 | 1 |
| Scratch | LBO | 1/19/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 1/20/2016 0:00 | 1 | 20 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/19/2016 0:00 | 1 | 0 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 1/21/2016 0:00 | 1 | 32 | 1 |
| Printing/hot stamp defect | LBO | 1/19/2016 0:00 | 1 | 50 | 1 |
| Peeled off | LBO | 1/18/2016 0:00 | 1 | 32 | 1 |
| Peeled off | LBO | 1/20/2016 0:00 | 4 | 20 | 3 |
| Open Sealed | LBO | 1/19/2016 0:00 | 2 | 32 | 1 |
| Open sealed | LBO | 1/21/2016 0:00 | 3 | 20 | 1 |
| Missing part | LBO | 1/20/2016 0:00 | 3 | 32 | 1 |
| Missing paint | LBO | 1/18/2016 0:00 | 1 | 50 | 1 |
| Missing attachment/accesories | LBO | 1/19/2016 0:00 | 1 | 50 | 1 |
| Missing attachment/accesories | LBO | 1/19/2016 0:00 | 1 | 50 | 1 |
| MASK MARK | LBO | 1/19/2016 0:00 | 1 | 32 | 1 |
| Improper/double stitches | LBO | 1/21/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 1/18/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 1/18/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 1/18/2016 0:00 | 2 | 50 | 1 |
| Dirty | LBO | 1/19/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 1/21/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 1/21/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 1/18/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 1/19/2016 0:00 | 3 | 0 | 1 |
| Contamination paint/ink | LBO | 1/21/2016 0:00 | 2 | 20 | 1 |
| Come off | LBO | 1/18/2016 0:00 | 4 | 32 | 1 |

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|---|---|---|---|---|---|
| Come off | LBO | 1/19/2016 0:00 | 5 | 32 | 1 |
| Come Off | LBO | 1/20/2016 0:00 | 6 | 32 | 1 |
| Come off | LBO | 1/20/2016 0:00 | 6 | 20 | 1 |
| Come off | LBO | 1/20/2016 0:00 | 1 | 32 | 1 |
| Broken stitches | LBO | 1/19/2016 0:00 | 1 | 0 | 1 |
| Broken PVC | LBO | 1/19/2016 0:00 | 1 | 32 | 1 |
| Broken J Hook | LBO | 1/20/2016 0:00 | 2 | 50 | 1 |
| Broken J Hook | LBO | 1/20/2016 0:00 | 4 | 32 | 3 |
| Broken J Hook | LBO | 1/20/2016 0:00 | 1 | 0 | 2 |
| Black spot | LBO | 1/20/2016 0:00 | 1 | 32 | 1 |
| Asymmetrical eye | LBO | 1/21/2016 0:00 | 1 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 1/26/2016 0:00 | 3 | 50 | 1 |
| Come off | LBO | 1/28/2016 0:00 | 1 | 20 | 2 |
| Come off | LBO | 1/28/2016 0:00 | 5 | 32 | 1 |
| Contamination paint/ink | LBO | 1/27/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 1/26/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 1/27/2016 0:00 | 1 | 50 | 1 |
| Dirty | LBO | 1/28/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 1/28/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 1/29/2016 0:00 | 2 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 1/26/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 1/29/2016 0:00 | 7 | 20 | 1 |
| Gate remnant | LBO | 1/27/2016 0:00 | 4 | 32 | 1 |
| Improper Dress | LBO | 1/28/2016 0:00 | 1 | 32 | 2 |
| Improper grooming | LBO | 1/27/2016 0:00 | 5 | 32 | 1 |
| Missing paint | LBO | 1/26/2016 0:00 | 4 | 32 | 1 |
| Open flap | LBO | 1/28/2016 0:00 | 3 | 32 | 1 |
| Open sealed | LBO | 1/26/2016 0:00 | 2 | 32 | 1 |
| Open sealed | LBO | 1/26/2016 0:00 | 2 | 50 | 1 |
| Scratch | LBO | 1/27/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 1/27/2016 0:00 | 7 | 20 | 1 |
| Scratch | LBO | 1/27/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 1/28/2016 0:00 | 3 | 20 | 1 |
| Scratch | LBO | 1/28/2016 0:00 | 1 | 20 | 1 |
| Scratch | LBO | 1/29/2016 0:00 | 1 | 32 | 1 |
| Short shot | LBO | 1/29/2016 0:00 | 2 | 50 | 1 |
| Torn/overtrim | LBO | 1/28/2016 0:00 | 5 | 32 | 1 |
| Unclear date code (cri) | LBO | 1/28/2016 0:00 | 1 | 32 | 1c |
| Wrong assortment | LBO | 1/29/2016 0:00 | 2 | 32 | 1 |
| WRONG HEAD | LBO | 1/29/2016 0:00 | 1 | 32 | 1 |

| Wrong part | LBO | 1/27/2016 0:00 | 1 | 20 | 1 |
|---|---|---|---|---|---|
| Wrong part | LBO | 1/27/2016 0:00 | 1 | 50 | 1 |
| Wrong Part | LBO | 1/29/2016 0:00 | 3 | 32 | 3 |
| defectTypeName | InspectionType Id | Inspection Date | LotsNo | Sample Size | Defect Qty |
| Come off | LBO | 2/4/2016 0:00 | 2 | 20 | 1 |
| Black spot | LBO | 2/2/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 2/2/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 2/3/2016 0:00 | 2 | 0 | 1 |
| Improper Sewn | LBO | 2/3/2016 0:00 | 2 | 50 | 1 |
| Fly away/loose/messy hair | LBO | 2/3/2016 0:00 | 2 | 50 | 1 |
| Dirty | LBO | 2/3/2016 0:00 | 1 | 0 | 1 |
| Black spot | LBO | 2/5/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 2/16/2016 0:00 | 2 | 32 | 1 |
| Black spot | LBO | 2/19/2016 0:00 | 5 | 0 | 1 |
| Broken blister/IC | LBO | 2/15/2016 0:00 | 3 | 20 | 1 |
| Bubble/void | LBO | 2/18/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 2/17/2016 0:00 | 4 | 32 | 1 |
| Come Off | LBO | 2/17/2016 0:00 | 9 | 20 | 1 |
| Come off | LBO | 2/19/2016 0:00 | 4 | 20 | 1 |
| Contamination paint/ink | LBO | 2/17/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 2/19/2016 0:00 | 6 | 0 | 1 |
| Contamination paint/ink | LBO | 2/19/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 2/15/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 2/15/2016 0:00 | 4 | 20 | 1 |
| Dirty | LBO | 2/16/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 2/17/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 2/18/2016 0:00 | 2 | 32 | 1 |
| Expose armature/Thin lining | LBO | 2/15/2016 0:00 | 3 | 20 | 1 |
| Flash/Parting Line | LBO | 2/17/2016 0:00 | 3 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 2/15/2016 0:00 | 1 | 32 | 1 |
| Improper assembly | LBO | 2/17/2016 0:00 | 3 | 32 | 1 |
| Loose part | LBO | 2/15/2016 0:00 | 2 | 32 | 1 |
| Material contamination | LBO | 2/18/2016 0:00 | 3 | 32 | 1 |
| Material contamination | LBO | 2/18/2016 0:00 | 3 | 20 | 1 |
| Material contamination | LBO | 2/18/2016 0:00 | 2 | 20 | 1 |
| Mismatch part | LBO | 2/19/2016 0:00 | 4 | 32 | 1 |
| Missing date code (cri) | LBO | 2/19/2016 0:00 | 3 | 32 | 1c |
| Missing part | LBO | 2/18/2016 0:00 | 3 | 20 | 1 |
| Missing part | LBO | 2/19/2016 0:00 | 3 | 20 | 1 |

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|---|---|---|---|---|---|
| Open sealed | LBO | 2/18/2016 0:00 | 1 | 20 | 1 |
| Scratch | LBO | 2/16/2016 0:00 | 7 | 32 | 1 |
| Scratch | LBO | 2/17/2016 0:00 | 1 | 50 | 1 |
| Scratch | LBO | 2/17/2016 0:00 | 3 | 50 | 1 |
| Scratch | LBO | 2/19/2016 0:00 | 1 | 0 | 1 |
| Sink mark | LBO | 2/17/2016 0:00 | 2 | 50 | 1 |
| Solvent smear | LBO | 2/16/2016 0:00 | 3 | 32 | 1 |
| Solvent smear | LBO | 2/17/2016 0:00 | 3 | 32 | 1 |
| Solvent smear | LBO | 2/18/2016 0:00 | 1 | 32 | 1 |
| Wrong assortment | LBO | 2/16/2016 0:00 | 13 | 20 | 1 |
| Wrong assy | LBO | 2/17/2016 0:00 | 9 | 20 | 1 |
| WRONG HEAD | LBO | 2/15/2016 0:00 | 2 | 20 | 2 |
| Wrong Part | LBO | 2/15/2016 0:00 | 1 | 0 | 2 |
| wrong part | LBO | 2/17/2016 0:00 | 2 | 50 | 1 |
| Wrong part | LBO | 2/18/2016 0:00 | 1 | 20 | 2 |
| Wrong Part | LBO | 2/18/2016 0:00 | 5 | 32 | 2 |
| Wrong part | LBO | 2/25/2016 0:00 | 2 | 32 | 2 |
| Wrinkle | LBO | 2/24/2016 0:00 | 1 | 0 | 1 |
| Unbalance/asymmetrical/mismatch costume | LBO | 2/24/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 2/24/2016 0:00 | 1 | 20 | 1 |
| Over print/over spray | LBO | 2/22/2016 0:00 | 2 | 32 | 1 |
| Over print/over spray | LBO | 2/24/2016 0:00 | 1 | 32 | 1 |
| Open sealed | LBO | 2/22/2016 0:00 | 1 | 20 | 1 |
| Open flap | LBO | 2/23/2016 0:00 | 1 | 20 | 1 |
| Missing part | LBO | 2/22/2016 0:00 | 4 | 20 | 1 |
| Missing part | LBO | 2/23/2016 0:00 | 9 | 20 | 1 |
| Missing paint | LBO | 2/22/2016 0:00 | 1 | 32 | 1 |
| Missing paint | LBO | 2/24/2016 0:00 | 5 | 50 | 1 |
| Missing paint | LBO | 2/24/2016 0:00 | 3 | 20 | 1 |
| Missing paint | LBO | 2/25/2016 0:00 | 3 | 32 | 1 |
| Missing paint | LBO | 2/26/2016 0:00 | 4 | 50 | 1 |
| Missing attachment/accesories | LBO | 2/23/2016 0:00 | 1 | 50 | 2 |
| Missing attachment/accesories | LBO | 2/24/2016 0:00 | 2 | 50 | 2 |
| Missing attachment/accesories | LBO | 2/26/2016 0:00 | 1 | 50 | 1 |
| Misposition paint | LBO | 2/26/2016 0:00 | 1 | 32 | 1 |
| Improper grooming | LBO | 2/24/2016 0:00 | 1 | 0 | 1 |
| Improper dress | LBO | 2/25/2016 0:00 | 1 | 32 | 1 |
| Improper costume | LBO | 2/24/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 2/22/2016 0:00 | 2 | 20 | 1 |

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|---|---|---|---|---|---|
| Improper assembly | LBO | 2/25/2016 0:00 | 7 | 32 | 1 |
| Foreign matter | LBO | 2/25/2016 0:00 | 14 | 32 | 1 |
| Extended periphery | LBO | 2/24/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 2/24/2016 0:00 | 3 | 50 | 1 |
| Dirty | LBO | 2/24/2016 0:00 | 1 | 50 | 1 |
| Dirty | LBO | 2/25/2016 0:00 | 8 | 20 | 1 |
| Dented | LBO | 2/23/2016 0:00 | 2 | 20 | 1 |
| Deformed | LBO | 2/23/2016 0:00 | 1 | 50 | 1 |
| Damage/Broken I/C | LBO | 2/23/2016 0:00 | 2 | 32 | 1 |
| Come off | LBO | 2/23/2016 0:00 | 3 | 32 | 2 |
| Come off | LBO | 2/24/2016 0:00 | 2 | 20 | 1 |
| Come off | LBO | 2/24/2016 0:00 | 2 | 50 | 1 |
| Come off | LBO | 2/25/2016 0:00 | 1 | 20 | 1 |
| Broken stitches | LBO | 2/22/2016 0:00 | 1 | 50 | 1 |
| Broken J Hook | LBO | 2/23/2016 0:00 | 1 | 50 | 1 |
| Black spot | LBO | 2/22/2016 0:00 | 2 | 32 | 1 |
| Wrong Assy | LBO | 3/11/2016 0:00 | 3 | 32 | 1 |
| Wrong Assy | LBO | 3/11/2016 0:00 | 8 | 32 | 1 |
| Wrong date code (cri) | LBO | 3/7/2016 0:00 | 2 | 32 | 4c |
| WRONG HEAD | LBO | 3/7/2016 0:00 | 1 | 0 | 1 |
| Wrong part | LBO | 3/7/2016 0:00 | 6 | 32 | 2 |
| Wrong part | LBO | 3/7/2016 0:00 | 7 | 32 | 2 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 3/15/2016 0:00 | 1 | 32 | 1 |
| Asymmetrical eye | LBO | 3/14/2016 0:00 | 7 | 32 | 1 |
| Asymmetrical eye | LBO | 3/15/2016 0:00 | 4 | 50 | 1 |
| Asymmetrical eye | LBO | 3/16/2016 0:00 | 1 | 20 | 1 |
| Black spot | LBO | 3/14/2016 0:00 | 1 | 20 | 1 |
| Black spot | LBO | 3/15/2016 0:00 | 1 | 20 | 1 |
| Black spot | LBO | 3/15/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 3/16/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 3/15/2016 0:00 | 1 | 0 | 1 |
| Broken J Hook | LBO | 3/14/2016 0:00 | 2 | 20 | 1 |
| Broken part | LBO | 3/17/2016 0:00 | 3 | 20 | 1 |
| Bubbles/water mark/void | LBO | 3/14/2016 0:00 | 2 | 32 | 1 |
| Bulging hair | LBO | 3/15/2016 0:00 | 3 | 32 | 1 |
| Come off | LBO | 3/16/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 3/16/2016 0:00 | 6 | 32 | 1 |
| Contamination paint/ink | LBO | 3/16/2016 0:00 | 1 | 0 | 1 |
| Contamination paint/ink | LBO | 3/18/2016 0:00 | 5 | 20 | 1 |

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|---|---|---|---|---|---|
| Contamination paint/ink | LBO | 3/18/2016 0:00 | 6 | 20 | 1 |
| Deformed | LBO | 3/15/2016 0:00 | 3 | 32 | 1 |
| Deformed | LBO | 3/15/2016 0:00 | 1 | 32 | 1 |
| Deformed | LBO | 3/15/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 3/14/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 3/14/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 3/14/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 3/14/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 3/15/2016 0:00 | 7 | 20 | 1 |
| Dirty | LBO | 3/15/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 3/16/2016 0:00 | 2 | 50 | 1 |
| Dirty | LBO | 3/16/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 3/16/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 3/16/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 3/17/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 3/17/2016 0:00 | 6 | 20 | 1 |
| Dirty | LBO | 3/17/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 3/17/2016 0:00 | 7 | 0 | 2 |
| Dirty | LBO | 3/18/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 3/18/2016 0:00 | 1 | 0 | 1 |
| Flash | LBO | 3/15/2016 0:00 | 1 | 32 | 1 |
| Gap upper/ lower torso | LBO | 3/18/2016 0:00 | 3 | 32 | 1 |
| Improper assembly | LBO | 3/15/2016 0:00 | 7 | 32 | 1 |
| Improper assembly | LBO | 3/16/2016 0:00 | 3 | 0 | 1 |
| Improper assembly | LBO | 3/16/2016 0:00 | 5 | 0 | 1 |
| Improper assembly | LBO | 3/17/2016 0:00 | 1 | 32 | 2 |
| Improper assembly | LBO | 3/18/2016 0:00 | 1 | 0 | 1 |
| Improper costume | LBO | 3/14/2016 0:00 | 1 | 32 | 1 |
| Improper costume | LBO | 3/14/2016 0:00 | 2 | 32 | 1 |
| Improper dress | LBO | 3/17/2016 0:00 | 8 | 20 | 1 |
| Mismatch Color | LBO | 3/16/2016 0:00 | 4 | 0 | 1 |
| Mismatch Color | LBO | 3/17/2016 0:00 | 1 | 32 | 2 |
| Mismatch Color | LBO | 3/19/2016 0:00 | 1 | 0 | 1 |
| Misposition paint | LBO | 3/14/2016 0:00 | 1 | 32 | 1 |
| Misposition paint | LBO | 3/15/2016 0:00 | 2 | 20 | 1 |
| Missing attachment/accesories | LBO | 3/15/2016 0:00 | 2 | 0 | 1 |
| Missing attachment/accesories | LBO | 3/18/2016 0:00 | 2 | 32 | 1 |
| Missing date code (cri) | LBO | 3/18/2016 0:00 | 3 | 32 | 1c |
| Missing paint | LBO | 3/15/2016 0:00 | 4 | 32 | 1 |
| Missing part | LBO | 3/17/2016 0:00 | 3 | 32 | 2 |

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| Missing part | LBO | 3/18/2016 0:00 | 2 | 32 | 1 |
| Needle Hole | LBO | 3/19/2016 0:00 | 1 | 0 | 1 |
| Open flap | LBO | 3/15/2016 0:00 | 7 | 32 | 1 |
| Open flap | LBO | 3/16/2016 0:00 | 5 | 0 | 1 |
| Open flap | LBO | 3/17/2016 0:00 | 7 | 32 | 1 |
| Open sealed | LBO | 3/15/2016 0:00 | 2 | 32 | 1 |
| Overcut hair | LBO | 3/17/2016 0:00 | 2 | 32 | 1 |
| Peeled off | LBO | 3/17/2016 0:00 | 2 | 32 | 1 |
| Scratch | LBO | 3/17/2016 0:00 | 1 | 32 | 1 |
| Solvent smear | LBO | 3/15/2016 0:00 | 4 | 32 | 1 |
| Solvent smear | LBO | 3/17/2016 0:00 | 3 | 32 | 1 |
| Solvent smear | LBO | 3/18/2016 0:00 | 1 | 32 | 1 |
| Torn/overtrim | LBO | 3/15/2016 0:00 | 2 | 0 | 1 |
| Torn/overtrim | LBO | 3/18/2016 0:00 | 3 | 0 | 1 |
| Under/Over printing fabric | LBO | 3/16/2016 0:00 | 2 | 0 | 1 |
| Wrong part | LBO | 3/18/2016 0:00 | 1 | 50 | 1 |
| Asymmetrical eye | LBO | 3/22/2016 0:00 | 5 | 32 | 1 |
| Asymmetrical eye | LBO | 3/24/2016 0:00 | 1 | 32 | 1 |
| Asymmetrical eye | LBO | 3/24/2016 0:00 | 2 | 32 | 1 |
| Black spot | LBO | 3/22/2016 0:00 | 2 | 0 | 1 |
| Black spot | LBO | 3/24/2016 0:00 | 4 | 20 | 1 |
| Black spot | LBO | 3/24/2016 0:00 | 6 | 32 | 1 |
| Broken part | LBO | 3/21/2016 0:00 | 1 | 32 | 1 |
| Broken J Hook | LBO | 3/24/2016 0:00 | 2 | 50 | 1 |
| Broken wall | LBO | 3/21/2016 0:00 | 4 | 32 | 1 |
| Come off | LBO | 3/21/2016 0:00 | 6 | 20 | 1 |
| Contamination paint/ink | LBO | 3/21/2016 0:00 | 2 | 50 | 1 |
| Contamination Paint/ink | LBO | 3/21/2016 0:00 | 4 | 32 | 1 |
| Damage/Broken I/C | LBO | 3/22/2016 0:00 | 1 | 32 | 1 |
| Damage/Broken I/C | LBO | 3/23/2016 0:00 | 3 | 32 | 1 |
| Deformed | LBO | 3/24/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 3/21/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 3/22/2016 0:00 | 1 | 50 | 1 |
| Dirty | LBO | 3/22/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 3/22/2016 0:00 | 6 | 32 | 1 |
| Dirty | LBO | 3/22/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 3/23/2016 0:00 | 6 | 32 | 1 |
| Flash/Parting Line | LBO | 3/24/2016 0:00 | 1 | 50 | 3 |
| Fraying | LBO | 3/21/2016 0:00 | 2 | 32 | 1 |
| Improper dress | LBO | 3/22/2016 0:00 | 4 | 32 | 1 |

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| Improper grooming | LBO | 3/22/2016 0:00 | 2 | 0 | 1 |
| Loose part | LBO | 3/22/2016 0:00 | 4 | 32 | 1 |
| Loose/hanging thread | LBO | 3/22/2016 0:00 | 2 | 0 | 1 |
| Misposition paint | LBO | 3/23/2016 0:00 | 2 | 32 | 1 |
| Missing paint | LBO | 3/21/2016 0:00 | 7 | 32 | 1 |
| Missing paint | LBO | 3/22/2016 0:00 | 1 | 32 | 1 |
| Open sealed | LBO | 3/22/2016 0:00 | 1 | 20 | 1 |
| Open sealed | LBO | 3/23/2016 0:00 | 5 | 32 | 1 |
| Open sealed | LBO | 3/24/2016 0:00 | 2 | 20 | 1 |
| Scratch | LBO | 3/22/2016 0:00 | 8 | 20 | 1 |
| Scratch | LBO | 3/23/2016 0:00 | 2 | 50 | 1 |
| Short shot | LBO | 3/24/2016 0:00 | 1 | 32 | 1 |
| Sink mark | LBO | 3/22/2016 0:00 | 1 | 50 | 1 |
| Smear painted head | LBO | 3/24/2016 0:00 | 1 | 0 | 1 |
| Smear part | LBO | 3/22/2016 0:00 | 4 | 20 | 1 |
| Solvent smear | LBO | 3/22/2016 0:00 | 4 | 20 | 1 |
| Torn/overtrim | LBO | 3/21/2016 0:00 | 2 | 32 | 1 |
| Wrong part | LBO | 3/21/2016 0:00 | 1 | 20 | 1 |
| Asymmetrical eye | LBO | 3/29/2016 0:00 | 1 | 32 | 1 |
| Bending arm/leg/part | LBO | 4/1/2016 0:00 | 3 | 0 | 2 |
| Bending arm/leg/part | LBO | 4/2/2016 0:00 | 5 | 32 | 1 |
| Black spot | LBO | 3/28/2016 0:00 | 3 | 32 | 1 |
| Black spot | LBO | 4/1/2016 0:00 | 1 | 0 | 1 |
| Broken part | LBO | 3/28/2016 0:00 | 4 | 20 | 1 |
| Broken stitches | LBO | 3/30/2016 0:00 | 1 | 32 | 1 |
| Broken stitches | LBO | 4/1/2016 0:00 | 1 | 0 | 1 |
| Contamination on packaging | LBO | 3/28/2016 0:00 | 2 | 20 | 1 |
| Contamination on packaging | LBO | 3/31/2016 0:00 | 3 | 32 | 1 |
| Contamination paint/ink | LBO | 4/1/2016 0:00 | 2 | 32 | 1 |
| Contamination paint/ink | LBO | 4/2/2016 0:00 | 2 | 0 | 1 |
| Damage/lifted/misalignment | LBO | 3/30/2016 0:00 | 2 | 32 | 1 |
| Delamination I/C | LBO | 3/31/2016 0:00 | 3 | 0 | 2 |
| Delamination I/C | LBO | 4/2/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 3/28/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 3/29/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 3/30/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 3/30/2016 0:00 | 2 | 50 | 1 |
| Dirty | LBO | 3/31/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 4/1/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 4/1/2016 0:00 | 1 | 0 | 1 |

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|---|---|---|---|---|---|
| Dirty | LBO | 4/1/2016 0:00 | 1 | 20 | 2 |
| Fly away/loose/messy hair | LBO | 3/31/2016 0:00 | 2 | 50 | 1 |
| Gap insert | LBO | 3/31/2016 0:00 | 4 | 20 | 1 |
| Improper assembly | LBO | 4/1/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 4/1/2016 0:00 | 3 | 32 | 1 |
| Improper assembly | LBO | 4/2/2016 0:00 | 3 | 32 | 1 |
| Improper bun | LBO | 3/29/2016 0:00 | 1 | 50 | 1 |
| Improper grooming | LBO | 3/31/2016 0:00 | 1 | 50 | 1 |
| Improper grooming | LBO | 4/1/2016 0:00 | 1 | 32 | 1 |
| Improper/double stitches | LBO | 3/30/2016 0:00 | 2 | 32 | 1 |
| Missing date code (cri) | LBO | 3/31/2016 0:00 | 4 | 32 | 1c |
| Missing date code (cri) | LBO | 3/31/2016 0:00 | 7 | 20 | 1c |
| Missing paint | LBO | 3/29/2016 0:00 | 1 | 20 | 1 |
| Missing paint | LBO | 3/30/2016 0:00 | 1 | 20 | 1 |
| Missing paint | LBO | 3/30/2016 0:00 | 3 | 50 | 1 |
| Missing part | LBO | 3/28/2016 0:00 | 1 | 50 | 1 |
| Missing part | LBO | 4/1/2016 0:00 | 1 | 0 | 1 |
| Open sealed | LBO | 3/28/2016 0:00 | 7 | 32 | 1 |
| Over print/over spray | LBO | 3/31/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 4/1/2016 0:00 | 3 | 32 | 1 |
| Short shot | LBO | 3/31/2016 0:00 | 1 | 50 | 1 |
| Torn/overtrim | LBO | 4/1/2016 0:00 | 4 | 32 | 1 |
| Unclear date code (cri) | LBO | 4/2/2016 0:00 | 1 | 32 | 1c |
| Under print / Under spray | LBO | 3/29/2016 0:00 | 7 | 20 | 1 |
| Uneven eye | LBO | 3/30/2016 0:00 | 2 | 32 | 1 |
| Wrong assy | LBO | 3/28/2016 0:00 | 6 | 20 | 1 |
| Wrong assy | LBO | 3/30/2016 0:00 | 3 | 20 | 1 |
| Wrong assy | LBO | 4/1/2016 0:00 | 6 | 20 | 1 |
| Wrong part | LBO | 3/31/2016 0:00 | 2 | 20 | 1 |
| Wrong Part | LBO | 4/2/2016 0:00 | 1 | 20 | 1 |
| defectTypeName | InspectionType Id | Inspection Date | LotsNo | Sample Size | Defect Qty |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 4/7/2016 0:00 | 1 | 50 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 4/8/2016 0:00 | 1 | 32 | 1 |
| Asymmetrical cheek blush | LBO | 4/7/2016 0:00 | 1 | 13 | 1 |
| Bending arm/leg/part | LBO | 4/9/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 4/6/2016 0:00 | 2 | 32 | 1 |
| Black spot | LBO | 4/6/2016 0:00 | 1 | 20 | 1 |
| Black spot | LBO | 4/8/2016 0:00 | 1 | 32 | 1 |

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|---|---|---|---|---|---|
| Black spot | LBO | 4/8/2016 0:00 | 4 | 32 | 1 |
| Broken J Hook | LBO | 4/5/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 4/5/2016 0:00 | 3 | 32 | 1 |
| Contamination Paint/ink | LBO | 4/5/2016 0:00 | 2 | 32 | 1 |
| Contamination paint/ink | LBO | 4/7/2016 0:00 | 13 | 32 | 1 |
| Contamination paint/ink | LBO | 4/8/2016 0:00 | 6 | 32 | 1 |
| Contamination Paint/ink | LBO | 4/8/2016 0:00 | 4 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 4/7/2016 0:00 | 2 | 20 | 1 |
| Deformed | LBO | 4/8/2016 0:00 | 2 | 20 | 1 |
| Delamination I/C | LBO | 4/5/2016 0:00 | 7 | 20 | 1 |
| Dirty | LBO | 4/6/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 4/6/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 4/7/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 4/6/2016 0:00 | 1 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 4/7/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 4/9/2016 0:00 | 2 | 0 | 1 |
| Gap part | LBO | 4/5/2016 0:00 | 5 | 20 | 1 |
| Gap part | LBO | 4/6/2016 0:00 | 10 | 20 | 1 |
| Improper grooming | LBO | 4/5/2016 0:00 | 1 | 50 | 2 |
| Loose part | LBO | 4/5/2016 0:00 | 3 | 32 | 1 |
| Loose part | LBO | 4/6/2016 0:00 | 1 | 32 | 1 |
| Loose part | LBO | 4/6/2016 0:00 | 3 | 32 | 1 |
| Loose part | LBO | 4/7/2016 0:00 | 1 | 32 | 1 |
| Missing part | LBO | 4/5/2016 0:00 | 3 | 32 | 2 |
| Missing part | LBO | 4/5/2016 0:00 | 4 | 20 | 1 |
| Missing Printing | LBO | 4/6/2016 0:00 | 3 | 50 | 1 |
| Open sealed | LBO | 4/6/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 4/5/2016 0:00 | 6 | 20 | 1 |
| Scratch | LBO | 4/7/2016 0:00 | 2 | 32 | 1 |
| Solvent smear | LBO | 4/6/2016 0:00 | 1 | 32 | 1 |
| Under print / Under spray | LBO | 4/9/2016 0:00 | 3 | 32 | 1 |
| Uneven Color | LBO | 4/6/2016 0:00 | 2 | 0 | 1 |
| Unfunction | LBO | 4/7/2016 0:00 | 2 | 20 | 1 |
| Weldline/Flow mark/Silver | LBO | 4/6/2016 0:00 | 2 | 20 | 1 |
| Wrong part | LBO | 4/5/2016 0:00 | 4 | 20 | 1 |
| Wrong Part | LBO | 4/6/2016 0:00 | 1 | 20 | 1 |
| Wrong part | LBO | 4/7/2016 0:00 | 1 | 20 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 4/13/2016 0:00 | 1 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 4/16/2016 0:00 | 1 | 50 | 1 |

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|---|---|---|---|---|---|
| Bending arm/leg/part | LBO | 4/14/2016 0:00 | 3 | 32 | 1 |
| Bending arm/leg/part | LBO | 4/14/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 4/11/2016 0:00 | 1 | 20 | 1 |
| Black spot | LBO | 4/11/2016 0:00 | 3 | 32 | 1 |
| Black spot | LBO | 4/12/2016 0:00 | 9 | 32 | 1 |
| Black spot | LBO | 4/13/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 4/13/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 4/11/2016 0:00 | 4 | 0 | 1 |
| Broken stitches | LBO | 4/12/2016 0:00 | 4 | 32 | 1 |
| Broken stitches | LBO | 4/14/2016 0:00 | 3 | 32 | 1 |
| Bubble/void | LBO | 4/13/2016 0:00 | 6 | 20 | 1 |
| Contamination paint/ink | LBO | 4/11/2016 0:00 | 4 | 32 | 1 |
| Contamination paint/ink | LBO | 4/14/2016 0:00 | 4 | 32 | 1 |
| Contamination paint/ink | LBO | 4/15/2016 0:00 | 1 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 4/14/2016 0:00 | 2 | 32 | 1 |
| Deformed | LBO | 4/14/2016 0:00 | 1 | 32 | 1 |
| Delamination I/C | LBO | 4/13/2016 0:00 | 11 | 0 | 1 |
| Delamination I/C | LBO | 4/14/2016 0:00 | 13 | 32 | 1 |
| Dented | LBO | 4/11/2016 0:00 | 4 | 0 | 1 |
| Dirty | LBO | 4/13/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 4/14/2016 0:00 | 8 | 32 | 1 |
| Dirty | LBO | 4/15/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 4/15/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 4/15/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 5/4/2016 0:00 | 4 | 32 | 1 |
| Come off | LBO | 5/7/2016 0:00 | 1 | 20 | 1 |
| Come Off | LBO | 5/7/2016 0:00 | 1 | 20 | 1 |
| Come Off | LBO | 5/7/2016 0:00 | 7 | 20 | 1 |
| Contamination paint/ink | LBO | 5/2/2016 0:00 | 4 | 0 | 1 |
| Contamination paint/ink | LBO | 5/2/2016 0:00 | 1 | 0 | 2 |
| Contamination paint/ink | LBO | 5/3/2016 0:00 | 6 | 32 | 1 |
| Contamination paint/ink | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 5/3/2016 0:00 | 2 | 32 | 1 |
| Contamination paint/ink | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 5/4/2016 0:00 | 1 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 5/4/2016 0:00 | 6 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 5/7/2016 0:00 | 8 | 20 | 1 |
| Deformed head | LBO | 5/2/2016 0:00 | 3 | 32 | 1 |
| Deformed head | LBO | 5/4/2016 0:00 | 4 | 32 | 1 |

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|---|---|---|---|---|---|
| Dirty | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/4/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 5/7/2016 0:00 | 1 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 5/4/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/4/2016 0:00 | 3 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 5/7/2016 0:00 | 1 | 0 | 1 |
| Improper bun | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Improper grooming | LBO | 5/2/2016 0:00 | 2 | 20 | 1 |
| Improper grooming | LBO | 5/3/2016 0:00 | 1 | 0 | 1 |
| Improper grooming | LBO | 5/4/2016 0:00 | 1 | 32 | 1 |
| Improper grooming | LBO | 5/4/2016 0:00 | 1 | 20 | 2 |
| Improper grooming | LBO | 5/7/2016 0:00 | 1 | 32 | 2 |
| Improper grooming | LBO | 5/7/2016 0:00 | 2 | 32 | 1 |
| Improper grooming | LBO | 5/7/2016 0:00 | 1 | 32 | 1 |
| Improper Sewn | LBO | 5/2/2016 0:00 | 2 | 32 | 1 |
| Mismatch insert | LBO | 5/2/2016 0:00 | 4 | 32 | 1 |
| Misposition paint | LBO | 5/2/2016 0:00 | 2 | 0 | 1 |
| Missing date code (cri) | LBO | 5/4/2016 0:00 | 1 | 20 | 1c |
| Missing date code (cri) | LBO | 5/7/2016 0:00 | 1 | 32 | 1c |
| Missing paint | LBO | 5/2/2016 0:00 | 1 | 32 | 1 |
| Missing paint | LBO | 5/3/2016 0:00 | 1 | 32 | 2 |
| Missing part | LBO | 5/2/2016 0:00 | 5 | 20 | 1 |
| Missing part | LBO | 5/3/2016 0:00 | 5 | 20 | 1 |
| Open flap | LBO | 5/3/2016 0:00 | 1 | 20 | 1 |
| Open flap | LBO | 5/4/2016 0:00 | 1 | 20 | 1 |
| Open sealed | LBO | 5/4/2016 0:00 | 2 | 20 | 1 |
| Overcut hair | LBO | 5/3/2016 0:00 | 1 | 32 | 2 |
| Overcut hair | LBO | 5/4/2016 0:00 | 2 | 0 | 1 |
| Peel Off Printing | LBO | 5/3/2016 0:00 | 5 | 32 | 1 |
| Scratch | LBO | 5/4/2016 0:00 | 4 | 32 | 2 |
| Scratch | LBO | 5/4/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 5/4/2016 0:00 | 3 | 32 | 1 |
| Scratch | LBO | 5/4/2016 0:00 | 4 | 32 | 1 |
| Scratch | LBO | 5/7/2016 0:00 | 1 | 0 | 1 |
| Short shot | LBO | 5/3/2016 0:00 | 1 | 0 | 1 |
| Torn/overtrim | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| Unclear date code (cri) | LBO | 5/3/2016 0:00 | 1 | 20 | 1c |
| Unclear date code (cri) | LBO | 5/4/2016 0:00 | 5 | 32 | 1c |
| Under print / Under spray | LBO | 5/7/2016 0:00 | 1 | 50 | 1 |
| Wrong assy | LBO | 5/3/2016 0:00 | 4 | 20 | 1 |

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|---|---|---|---|---|---|
| WRONG HEAD | LBO | 5/7/2016 0:00 | 3 | 32 | 1 |
| Wrong Part | LBO | 5/3/2016 0:00 | 1 | 32 | 1 |
| AESTHETIC I/C (Damage/Milky/Blurred/Stress) | LBO | 5/9/2016 0:00 | 1 | 0 | 1 |
| Asymmetrical eye | LBO | 5/10/2016 0:00 | 3 | 32 | 1 |
| Black spot | LBO | 5/10/2016 0:00 | 2 | 20 | 1 |
| Black spot | LBO | 5/11/2016 0:00 | 3 | 32 | 1 |
| Broken part | LBO | 5/12/2016 0:00 | 1 | 32 | 1 |
| Broken wall | LBO | 5/11/2016 0:00 | 3 | 0 | 1 |
| Bubbles/water mark/void | LBO | 5/13/2016 0:00 | 1 | 32 | 1 |
| Bulging hair | LBO | 5/14/2016 0:00 | 1 | 0 | 1 |
| Come Off | LBO | 5/12/2016 0:00 | 6 | 32 | 1 |
| Come off | LBO | 5/13/2016 0:00 | 5 | 20 | 1 |
| Contamination paint/ink | LBO | 5/10/2016 0:00 | 2 | 32 | 1 |
| Contamination paint/ink | LBO | 5/10/2016 0:00 | 3 | 0 | 1 |
| Damage/lifted/misalignment | LBO | 5/9/2016 0:00 | 5 | 20 | 1 |
| Decal Reject | LBO | 5/13/2016 0:00 | 1 | 20 | 1 |
| Delamination I/C | LBO | 5/12/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 5/9/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/9/2016 0:00 | 8 | 32 | 1 |
| Dirty | LBO | 5/10/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 5/11/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 5/13/2016 0:00 | 1 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 5/11/2016 0:00 | 3 | 20 | 1 |
| Foreign matter | LBO | 5/9/2016 0:00 | 1 | 32 | 1 |
| Foreign matter | LBO | 5/11/2016 0:00 | 6 | 20 | 1 |
| Gap insert | LBO | 5/10/2016 0:00 | 5 | 0 | 1 |
| Gap part | LBO | 5/10/2016 0:00 | 7 | 32 | 2 |
| Gap part | LBO | 5/10/2016 0:00 | 3 | 32 | 1 |
| Gap part | LBO | 5/10/2016 0:00 | 2 | 32 | 1 |
| Gate remnant | LBO | 5/9/2016 0:00 | 8 | 20 | 1 |
| Improper assembly | LBO | 5/9/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 5/12/2016 0:00 | 1 | 0 | 1 |
| Improper assembly | LBO | 5/14/2016 0:00 | 1 | 32 | 1 |
| Improper grooming | LBO | 5/9/2016 0:00 | 1 | 20 | 1 |
| Improper grooming | LBO | 5/13/2016 0:00 | 3 | 32 | 2 |
| Loose part | LBO | 5/11/2016 0:00 | 1 | 20 | 1 |
| Misposition paint | LBO | 5/10/2016 0:00 | 4 | 32 | 1 |
| Misposition paint | LBO | 5/14/2016 0:00 | 2 | 32 | 1 |
| Missing date code (cri) | LBO | 5/12/2016 0:00 | 1 | 0 | 1c |

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|---|---|---|---|---|---|
| Missing paint | LBO | 5/12/2016 0:00 | 8 | 20 | 1 |
| Missing paint | LBO | 5/12/2016 0:00 | 1 | 20 | 1 |
| Missing part | LBO | 5/9/2016 0:00 | 1 | 32 | 1 |
| Missing part | LBO | 5/10/2016 0:00 | 1 | 20 | 1 |
| Missing part | LBO | 5/13/2016 0:00 | 1 | 20 | 1 |
| Open flap | LBO | 5/9/2016 0:00 | 2 | 20 | 1 |
| Open flap | LBO | 5/9/2016 0:00 | 3 | 32 | 1 |
| Over print/over spray | LBO | 5/9/2016 0:00 | 3 | 32 | 1 |
| Over print/over spray | LBO | 5/11/2016 0:00 | 1 | 32 | 1 |
| Over print/over spray | LBO | 5/13/2016 0:00 | 2 | 0 | 1 |
| Over/under # SPI of pheriphery | LBO | 5/13/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 5/10/2016 0:00 | 10 | 32 | 1 |
| Scratch | LBO | 5/11/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 5/11/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 5/12/2016 0:00 | 2 | 32 | 1 |
| Smear painted head | LBO | 5/9/2016 0:00 | 1 | 20 | 1 |
| Solvent smear | LBO | 5/10/2016 0:00 | 5 | 20 | 1 |
| Unclear date code (cri) | LBO | 5/12/2016 0:00 | 3 | 32 | 1c |
| Under print / Under spray | LBO | 5/10/2016 0:00 | 3 | 20 | 1 |
| Under print / Under spray | LBO | 5/13/2016 0:00 | 1 | 32 | 1 |
| Under print / Under spray | LBO | 5/13/2016 0:00 | 2 | 32 | 1 |
| Under print / Under spray | LBO | 5/14/2016 0:00 | 1 | 0 | 1 |
| Unsealed | LBO | 5/10/2016 0:00 | 1 | 32 | 1 |
| White mark | LBO | 5/11/2016 0:00 | 11 | 20 | 1 |
| Wrong assortment | LBO | 5/11/2016 0:00 | 2 | 32 | 1 |
| Wrong assortment | LBO | 5/13/2016 0:00 | 2 | 32 | 1 |
| Wrong assy | LBO | 5/10/2016 0:00 | 2 | 20 | 1 |
| Wrong assy | LBO | 5/12/2016 0:00 | 1 | 20 | 1 |
| Wrong assy | LBO | 5/12/2016 0:00 | 2 | 20 | 1 |
| Wrong assy | LBO | 5/13/2016 0:00 | 4 | 20 | 1 |
| Wrong part | LBO | 5/9/2016 0:00 | 1 | 20 | 2 |
| Wrong Part | LBO | 5/10/2016 0:00 | 2 | 20 | 1 |
| Wrong Part | LBO | 5/12/2016 0:00 | 2 | 20 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 5/20/2016 0:00 | 5 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 5/21/2016 0:00 | 3 | 32 | 1 |
| Broken blister/IC | LBO | 5/21/2016 0:00 | 3 | 20 | 1 |
| Asymmetrical eye | LBO | 5/20/2016 0:00 | 1 | 32 | 1 |
| Asymmetrical eye | LBO | 5/20/2016 0:00 | 1 | 50 | 1 |
| Broken J Hook | LBO | 5/16/2016 0:00 | 3 | 32 | 1 |

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| Broken J Hook | LBO | 5/17/2016 0:00 | 1 | 32 | 2 |
| Broken blister/IC | LBO | 5/16/2016 0:00 | 2 | 20 | 1 |
| Broken blister/IC | LBO | 5/17/2016 0:00 | 3 | 32 | 1 |
| Broken blister/IC | LBO | 5/18/2016 0:00 | 3 | 20 | 1 |
| Bulging hair | LBO | 5/18/2016 0:00 | 5 | 20 | 1 |
| Bulging hair | LBO | 5/20/2016 0:00 | 4 | 32 | 1 |
| Bulging hair | LBO | 5/21/2016 0:00 | 2 | 32 | 1 |
| Color mismatch | LBO | 5/16/2016 0:00 | 4 | 20 | 2 |
| Come off | LBO | 5/19/2016 0:00 | 2 | 0 | 1 |
| Come off | LBO | 5/20/2016 0:00 | 2 | 32 | 1 |
| Come off | LBO | 5/20/2016 0:00 | 8 | 20 | 1 |
| Deformed | LBO | 5/20/2016 0:00 | 10 | 20 | 1 |
| Deformed head | LBO | 5/19/2016 0:00 | 1 | 32 | 1 |
| Deformed head | LBO | 5/19/2016 0:00 | 1 | 0 | 1 |
| Dented | LBO | 5/19/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/16/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/17/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 5/19/2016 0:00 | 5 | 20 | 1 |
| Dirty | LBO | 5/19/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/20/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 5/20/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 5/20/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/16/2016 0:00 | 2 | 50 | 1 |
| Fly away/loose/messy hair | LBO | 5/20/2016 0:00 | 8 | 20 | 1 |
| Foreign matter | LBO | 5/19/2016 0:00 | 1 | 32 | 1 |
| Improper assembly | LBO | 5/18/2016 0:00 | 4 | 0 | 1 |
| Improper assembly | LBO | 5/19/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 5/20/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 5/20/2016 0:00 | 1 | 32 | 1 |
| Improper bun | LBO | 5/17/2016 0:00 | 1 | 0 | 1 |
| Improper dress | LBO | 5/18/2016 0:00 | 2 | 20 | 1 |
| Improper Sewn | LBO | 5/19/2016 0:00 | 1 | 50 | 1 |
| Loose part | LBO | 5/16/2016 0:00 | 4 | 20 | 1 |
| Loose part | LBO | 5/18/2016 0:00 | 2 | 20 | 1 |
| Material contamination | LBO | 5/18/2016 0:00 | 5 | 32 | 1 |
| Mismatch insert | LBO | 5/21/2016 0:00 | 5 | 32 | 3 |
| Mismatch insert | LBO | 5/21/2016 0:00 | 7 | 32 | 2 |
| Misposition eye | LBO | 5/19/2016 0:00 | 3 | 32 | 1 |
| Misposition eye | LBO | 5/19/2016 0:00 | 18 | 20 | 1 |
| Misposition paint | LBO | 5/16/2016 0:00 | 1 | 0 | 2 |

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| Misposition paint | LBO | 5/16/2016 0:00 | 3 | 50 | 4 |
| Misposition paint | LBO | 5/16/2016 0:00 | 4 | 0 | 1 |
| Misposition paint | LBO | 5/16/2016 0:00 | 2 | 0 | 1 |
| Misposition paint | LBO | 5/18/2016 0:00 | 1 | 50 | 1 |
| Misposition paint | LBO | 5/19/2016 0:00 | 1 | 32 | 1 |
| Missing date code (cri) | LBO | 5/20/2016 0:00 | 1 | 50 | 1C |
| Missing part | LBO | 5/19/2016 0:00 | 2 | 0 | 1 |
| Missing part | LBO | 5/20/2016 0:00 | 4 | 20 | 1 |
| Missing Printing | LBO | 5/20/2016 0:00 | 2 | 32 | 1 |
| Open sealed | LBO | 5/21/2016 0:00 | 3 | 0 | 1 |
| Peel Off Printing | LBO | 5/20/2016 0:00 | 6 | 32 | 1 |
| Scratch | LBO | 5/16/2016 0:00 | 3 | 32 | 1 |
| Scratch | LBO | 5/18/2016 0:00 | 4 | 20 | 1 |
| scratch | LBO | 5/18/2016 0:00 | 4 | 20 | 1 |
| Scratch | LBO | 5/18/2016 0:00 | 2 | 32 | 1 |
| Scratch | LBO | 5/20/2016 0:00 | 2 | 20 | 1 |
| Sink mark | LBO | 5/16/2016 0:00 | 2 | 20 | 1 |
| Sink mark | LBO | 5/16/2016 0:00 | 2 | 32 | 1 |
| Under print / Under spray | LBO | 5/16/2016 0:00 | 1 | 20 | 1 |
| Under print / Under spray | LBO | 5/16/2016 0:00 | 4 | 50 | 1 |
| Under print / Under spray | LBO | 5/20/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 5/18/2016 0:00 | 3 | 20 | 1 |
| Unsealed | LBO | 5/18/2016 0:00 | 1 | 20 | 1 |
| Wrong assortment | LBO | 5/18/2016 0:00 | 1 | 32 | 1 |
| Wrong Part | LBO | 5/16/2016 0:00 | 1 | 20 | 1 |
| Wrong Part | LBO | 5/19/2016 0:00 | 2 | 32 | 1 |
| Wrong part | LBO | 5/19/2016 0:00 | 10 | 20 | 1 |
| Wrong Part | LBO | 5/20/2016 0:00 | 5 | 20 | 1 |
| Broken blister/IC | LBO | 5/23/2016 0:00 | 1 | 20 | 2 |
| Asymmetrical eye | LBO | 5/23/2016 0:00 | 3 | 0 | 1 |
| Asymmetrical eye | LBO | 5/27/2016 0:00 | 2 | 32 | 1 |
| Black spot | LBO | 5/26/2016 0:00 | 1 | 0 | 1 |
| Black spot | LBO | 5/27/2016 0:00 | 2 | 32 | 1 |
| Black spot/dirty/contamination costume | LBO | 5/26/2016 0:00 | 7 | 0 | 1 |
| Broken part | LBO | 5/23/2016 0:00 | 6 | 20 | 1 |
| Broken stitches | LBO | 5/24/2016 0:00 | 4 | 20 | 1 |
| Broken stitches | LBO | 5/25/2016 0:00 | 3 | 20 | 1 |
| Bulging hair | LBO | 5/25/2016 0:00 | 8 | 32 | 1 |
| Bulging hair | LBO | 5/27/2016 0:00 | 1 | 0 | 1 |

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| Color mismatch | LBO | 5/26/2016 0:00 | 3 | 20 | 1 |
| Color mismatch | LBO | 5/26/2016 0:00 | 1 | 20 | 1 |
| Color mismatch | LBO | 5/27/2016 0:00 | 6 | 20 | 1 |
| Come off | LBO | 5/23/2016 0:00 | 3 | 32 | 1 |
| Come off | LBO | 5/26/2016 0:00 | 1 | 20 | 1 |
| Come off | LBO | 5/27/2016 0:00 | 1 | 20 | 1 |
| Come off | LBO | 5/28/2016 0:00 | 6 | 32 | 1 |
| Contamination paint/ink | LBO | 5/23/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 5/25/2016 0:00 | 13 | 20 | 1 |
| Damage/lifted/misalignment | LBO | 5/25/2016 0:00 | 2 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 5/26/2016 0:00 | 2 | 32 | 1 |
| Broken blister/IC | LBO | 5/27/2016 0:00 | 6 | 32 | 1 |
| Delamination I/C | LBO | 5/24/2016 0:00 | 1 | 32 | 1 |
| Dented | LBO | 5/23/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 5/23/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 5/24/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 5/25/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 5/27/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 5/27/2016 0:00 | 3 | 0 | 1 |
| Dirty | LBO | 5/27/2016 0:00 | 4 | 20 | 1 |
| Dirty | LBO | 5/27/2016 0:00 | 3 | 0 | 1 |
| Dirty | LBO | 5/27/2016 0:00 | 1 | 20 | 2 |
| Dirty | LBO | 5/27/2016 0:00 | 4 | 0 | 2 |
| Dirty | LBO | 5/28/2016 0:00 | 3 | 20 | 1 |
| Delamination I/C | LBO | 6/1/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 5/30/2016 0:00 | 6 | 32 | 1 |
| Dirty | LBO | 6/1/2016 0:00 | 3 | 0 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 3 | 0 | 2 |
| Dirty | LBO | 6/2/2016 0:00 | 3 | 0 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 5 | 20 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 6/2/2016 0:00 | 3 | 0 | 1 |
| Dirty | LBO | 6/3/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 6/3/2016 0:00 | 7 | 0 | 1 |
| Dirty | LBO | 6/3/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 6/4/2016 0:00 | 3 | 32 | 1 |

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|---|---|---|---|---|---|
| Dirty | LBO | 6/4/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 6/4/2016 0:00 | 3 | 0 | 1 |
| Extended periphery | LBO | 6/4/2016 0:00 | 1 | 20 | 1 |
| Flash/Parting Line | LBO | 6/3/2016 0:00 | 1 | 32 | 1 |
| Flash/Parting Line | LBO | 6/3/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 4 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 6 | 32 | 3 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 2 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 5 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/30/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/31/2016 0:00 | 1 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 5/31/2016 0:00 | 3 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 5/31/2016 0:00 | 9 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/31/2016 0:00 | 4 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 5/31/2016 0:00 | 6 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 2 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 11 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 6 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 3 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 6 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/1/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 1 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 6 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 2 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 2 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 8 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/2/2016 0:00 | 3 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 7 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 8 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/3/2016 0:00 | 4 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 4 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 6 | 32 | 1 |

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|---|---|---|---|---|---|
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 4 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/4/2016 0:00 | 1 | 32 | 1 |
| Foreign matter | LBO | 5/30/2016 0:00 | 3 | 0 | 1 |
| Foreign matter | LBO | 6/1/2016 0:00 | 9 | 32 | 1 |
| Foreign matter | LBO | 6/4/2016 0:00 | 9 | 32 | 1 |
| Gap part | LBO | 6/2/2016 0:00 | 2 | 32 | 1 |
| Gap part | LBO | 6/2/2016 0:00 | 3 | 32 | 2 |
| Gap insert | LBO | 6/3/2016 0:00 | 4 | 32 | 1 |
| Improper assembly | LBO | 5/31/2016 0:00 | 5 | 32 | 1 |
| Improper assembly | LBO | 5/31/2016 0:00 | 6 | 0 | 1 |
| Improper assembly | LBO | 6/2/2016 0:00 | 2 | 32 | 1 |
| Improper assembly | LBO | 6/4/2016 0:00 | 14 | 32 | 1 |
| Improper costume | LBO | 5/31/2016 0:00 | 5 | 0 | 1 |
| Improper dress | LBO | 5/30/2016 0:00 | 1 | 0 | 3 |
| Missing part | LBO | 6/1/2016 0:00 | 1 | 20 | 1 |
| Missing part | LBO | 6/2/2016 0:00 | 2 | 20 | 1 |
| Missing Printing | LBO | 5/30/2016 0:00 | 1 | 32 | 1 |
| Open flap | LBO | 5/30/2016 0:00 | 4 | 20 | 1 |
| Open flap | LBO | 5/31/2016 0:00 | 7 | 32 | 1 |
| Open flap | LBO | 6/2/2016 0:00 | 7 | 0 | 1 |
| Open flap | LBO | 6/3/2016 0:00 | 4 | 0 | 1 |
| Open flap | LBO | 6/3/2016 0:00 | 5 | 0 | 1 |
| Other | LBO | 6/4/2016 0:00 | 2 | 32 | 1 |
| Over print/over spray | LBO | 6/1/2016 0:00 | 1 | 20 | 1 |
| Over print/over spray | LBO | 6/1/2016 0:00 | 8 | 20 | 1 |
| Over print/over spray | LBO | 6/1/2016 0:00 | 9 | 20 | 1 |
| Peeled off | LBO | 6/3/2016 0:00 | 6 | 32 | 1 |
| Printing/hot stamp defect | LBO | 6/2/2016 0:00 | 7 | 32 | 1 |
| Printing/hot stamp defect | LBO | 6/4/2016 0:00 | 5 | 32 | 1 |
| Printing/hot stamp defect | LBO | 6/4/2016 0:00 | 9 | 0 | 1 |
| Printing/hot stamp defect | LBO | 6/4/2016 0:00 | 10 | 32 | 1 |
| Scratch | LBO | 5/30/2016 0:00 | 2 | 32 | 1 |
| Scratch | LBO | 6/1/2016 0:00 | 1 | 50 | 1 |
| Scratch | LBO | 6/1/2016 0:00 | 11 | 32 | 1 |
| Scratch | LBO | 6/2/2016 0:00 | 2 | 20 | 1 |
| scratch | LBO | 6/2/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 6/4/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 6/4/2016 0:00 | 2 | 32 | 1 |

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|---|---|---|---|---|---|
| Scratch | LBO | 6/4/2016 0:00 | 1 | 20 | 1 |
| Scratch/Peeled Off | LBO | 6/3/2016 0:00 | 1 | 50 | 1 |
| Shiny | LBO | 6/2/2016 0:00 | 5 | 32 | 1 |
| Smear part | LBO | 5/31/2016 0:00 | 1 | 50 | 1 |
| Solvent smear | LBO | 6/3/2016 0:00 | 7 | 32 | 1 |
| Under print / Under spray | LBO | 6/1/2016 0:00 | 11 | 32 | 1 |
| Unsealed | LBO | 5/30/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 6/1/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 6/3/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 6/4/2016 0:00 | 2 | 0 | 1 |
| Unsealed | LBO | 6/4/2016 0:00 | 3 | 32 | 1 |
| Wrong assortment | LBO | 5/30/2016 0:00 | 1 | 32 | 1 |
| Wrong assortment | LBO | 6/2/2016 0:00 | 3 | 32 | 1 |
| Wrong assortment | LBO | 6/3/2016 0:00 | 4 | 32 | 1 |
| Wrong assy | LBO | 6/3/2016 0:00 | 1 | 20 | 1 |
| Wrong Part | LBO | 5/30/2016 0:00 | 1 | 32 | 4 |
| Wrong Part | LBO | 5/30/2016 0:00 | 2 | 32 | 1 |
| Wrong Part | LBO | 5/30/2016 0:00 | 3 | 32 | 1 |
| Wrong part | LBO | 5/30/2016 0:00 | 1 | 20 | 1 |
| Wrong Part | LBO | 5/31/2016 0:00 | 2 | 32 | 2 |
| Wrong part | LBO | 6/2/2016 0:00 | 3 | 50 | 1 |
| Wrong part | LBO | 6/2/2016 0:00 | 3 | 20 | 1 |
| Wrong Part | LBO | 6/3/2016 0:00 | 5 | 20 | 1 |
| Wrong part | LBO | 6/4/2016 0:00 | 4 | 0 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/6/2016 0:00 | 1 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/9/2016 0:00 | 3 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/10/2016 0:00 | 2 | 32 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/11/2016 0:00 | 14 | 32 | 1 |
| Bending arm/leg/part | LBO | 6/7/2016 0:00 | 1 | 32 | 1 |
| Bending arm/leg/part | LBO | 6/9/2016 0:00 | 7 | 0 | 1 |
| Bending arm/leg/part | LBO | 6/9/2016 0:00 | 8 | 32 | 2 |
| Bending arm/leg/part | LBO | 6/10/2016 0:00 | 13 | 32 | 1 |
| Black spot | LBO | 6/7/2016 0:00 | 2 | 20 | 1 |
| Black spot | LBO | 6/9/2016 0:00 | 4 | 32 | 1 |
| Black spot | LBO | 6/10/2016 0:00 | 3 | 32 | 1 |
| Bubble/void | LBO | 6/8/2016 0:00 | 5 | 32 | 1 |
| Bubbles/water mark/void | LBO | 6/10/2016 0:00 | 1 | 32 | 1 |
| Bulging hair | LBO | 6/6/2016 0:00 | 1 | 0 | 1 |

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| Bulging hair | LBO | 6/6/2016 0:00 | 1 | 0 | 1 |
| Bulging hair | LBO | 6/7/2016 0:00 | 6 | 32 | 1 |
| Bulging hair | LBO | 6/7/2016 0:00 | 8 | 32 | 1 |
| Bulging hair | LBO | 6/8/2016 0:00 | 3 | 32 | 1 |
| Bulging hair | LBO | 6/8/2016 0:00 | 5 | 32 | 1 |
| Bulging hair | LBO | 6/8/2016 0:00 | 2 | 0 | 1 |
| Bulging hair | LBO | 6/8/2016 0:00 | 12 | 32 | 1 |
| Bulging hair | LBO | 6/9/2016 0:00 | 8 | 32 | 1 |
| Bulging hair | LBO | 6/10/2016 0:00 | 6 | 32 | 1 |
| Come off | LBO | 6/8/2016 0:00 | 6 | 32 | 1 |
| Come off | LBO | 6/9/2016 0:00 | 1 | 0 | 1 |
| Come off | LBO | 6/10/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/6/2016 0:00 | 4 | 20 | 1 |
| Contamination paint/ink | LBO | 6/6/2016 0:00 | 3 | 32 | 1 |
| Contamination paint/ink | LBO | 6/6/2016 0:00 | 6 | 20 | 1 |
| Contamination paint/ink | LBO | 6/10/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/11/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/11/2016 0:00 | 2 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 6/10/2016 0:00 | 12 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 6/10/2016 0:00 | 3 | 32 | 1 |
| Deformed head | LBO | 6/11/2016 0:00 | 3 | 20 | 1 |
| Delamination I/C | LBO | 6/6/2016 0:00 | 4 | 32 | 1 |
| Delamination I/C | LBO | 6/6/2016 0:00 | 1 | 50 | 1 |
| Dirty | LBO | 6/7/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 6/7/2016 0:00 | 6 | 0 | 1 |
| Dirty | LBO | 6/7/2016 0:00 | 13 | 0 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 6 | 0 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 5 | 32 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/8/2016 0:00 | 12 | 0 | 1 |
| Dirty | LBO | 6/9/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/9/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/9/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/10/2016 0:00 | 4 | 20 | 1 |
| Dirty | LBO | 6/10/2016 0:00 | 6 | 20 | 1 |
| Dirty | LBO | 6/10/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/10/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/10/2016 0:00 | 8 | 20 | 1 |

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| Dirty | LBO | 6/10/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 6/11/2016 0:00 | 2 | 32 | 2 |
| Dirty | LBO | 6/11/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 6/11/2016 0:00 | 2 | 32 | 1 |
| Double date code (cri) | LBO | 6/10/2016 0:00 | 3 | 32 | 1c |
| Flash | LBO | 6/8/2016 0:00 | 2 | 20 | 1 |
| Flash/Parting Line | LBO | 6/7/2016 0:00 | 3 | 20 | 2 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 5 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 9 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/6/2016 0:00 | 4 | 32 | 2 |
| Fly away/loose/messy hair | LBO | 6/7/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/7/2016 0:00 | 6 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/7/2016 0:00 | 11 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/7/2016 0:00 | 13 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 2 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 3 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 4 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 2 | 0 | 2 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 3 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 5 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 5 | 0 | 2 |
| Fly away/loose/messy hair | LBO | 6/8/2016 0:00 | 12 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/9/2016 0:00 | 7 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/9/2016 0:00 | 6 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/9/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/10/2016 0:00 | 2 | 0 | 1 |
| Fly away/loose/messy hair | LBO | 6/11/2016 0:00 | 6 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/11/2016 0:00 | 1 | 20 | 1 |
| Foreign matter | LBO | 6/7/2016 0:00 | 4 | 0 | 1 |
| Foreign matter | LBO | 6/8/2016 0:00 | 5 | 0 | 1 |
| Gap insert | LBO | 6/6/2016 0:00 | 3 | 32 | 1 |
| Gap insert | LBO | 6/8/2016 0:00 | 1 | 32 | 1 |
| Gap insert | LBO | 6/8/2016 0:00 | 11 | 32 | 1 |
| Improper assembly | LBO | 6/6/2016 0:00 | 5 | 0 | 1 |
| Improper assembly | LBO | 6/7/2016 0:00 | 6 | 32 | 1 |
| Improper assembly | LBO | 6/9/2016 0:00 | 7 | 32 | 1 |
| Improper assembly | LBO | 6/9/2016 0:00 | 1 | 32 | 1 |

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|---|---|---|---|---|---|
| Improper assembly | LBO | 6/11/2016 0:00 | 1 | 32 | 1 |
| Improper assembly | LBO | 6/11/2016 0:00 | 6 | 0 | 1 |
| Improper assembly | LBO | 6/11/2016 0:00 | 4 | 32 | 1 |
| Improper assembly | LBO | 6/11/2016 0:00 | 4 | 20 | 1 |
| Improper costume | LBO | 6/8/2016 0:00 | 9 | 0 | 1 |
| Improper Dress | LBO | 6/7/2016 0:00 | 4 | 32 | 1 |
| Improper dress | LBO | 6/7/2016 0:00 | 4 | 0 | 1 |
| Improper dress | LBO | 6/8/2016 0:00 | 3 | 32 | 1 |
| Improper dress | LBO | 6/8/2016 0:00 | 3 | 32 | 1 |
| Improper dress | LBO | 6/9/2016 0:00 | 1 | 0 | 1 |
| Improper Dress | LBO | 6/9/2016 0:00 | 2 | 0 | 1 |
| Improper dress | LBO | 6/11/2016 0:00 | 4 | 32 | 1 |
| Improper glueing | LBO | 6/10/2016 0:00 | 12 | 0 | 1 |
| Improper grooming | LBO | 6/6/2016 0:00 | 1 | 32 | 1 |
| Improper grooming | LBO | 6/6/2016 0:00 | 4 | 32 | 2 |
| Improper grooming | LBO | 6/7/2016 0:00 | 11 | 32 | 1 |
| Improper grooming | LBO | 6/7/2016 0:00 | 1 | 20 | 1 |
| Improper grooming | LBO | 6/8/2016 0:00 | 2 | 32 | 1 |
| Improper Sewn | LBO | 6/9/2016 0:00 | 1 | 0 | 1 |
| Loose part | LBO | 6/6/2016 0:00 | 3 | 20 | 1 |
| Loose part | LBO | 6/8/2016 0:00 | 1 | 32 | 1 |
| Loose part | LBO | 6/8/2016 0:00 | 3 | 20 | 1 |
| Loose/Hanging thread | LBO | 6/8/2016 0:00 | 2 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/11/2016 0:00 | 2 | 0 | 1 |
| Mismatch Cap | LBO | 6/8/2016 0:00 | 2 | 0 | 1 |
| Mismatch Cap | LBO | 6/10/2016 0:00 | 3 | 20 | 1 |
| Mismatch insert | LBO | 6/7/2016 0:00 | 6 | 32 | 1 |
| Mismatch insert | LBO | 6/8/2016 0:00 | 5 | 0 | 1 |
| Mismatch insert | LBO | 6/8/2016 0:00 | 11 | 32 | 1 |
| Mismatch insert | LBO | 6/9/2016 0:00 | 1 | 20 | 1 |
| Mismatch insert | LBO | 6/9/2016 0:00 | 1 | 32 | 1 |
| Mismatch insert | LBO | 6/9/2016 0:00 | 2 | 32 | 2 |
| Mismatch insert | LBO | 6/10/2016 0:00 | 4 | 32 | 1 |
| Mismatch insert | LBO | 6/10/2016 0:00 | 7 | 32 | 1 |
| Misposition paint | LBO | 6/6/2016 0:00 | 3 | 32 | 1 |
| Missing attachment/accesories | LBO | 6/9/2016 0:00 | 1 | 32 | 1 |
| Missing date code (cri) | LBO | 6/9/2016 0:00 | 7 | 32 | 1c |
| Missing paint | LBO | 6/9/2016 0:00 | 1 | 0 | 1 |
| Missing part | LBO | 6/7/2016 0:00 | 11 | 20 | 1 |
| Missing part | LBO | 6/8/2016 0:00 | 9 | 32 | 1 |

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| Missing part | LBO | 6/8/2016 0:00 | 2 | 50 | 1 |
| Missing part | LBO | 6/8/2016 0:00 | 5 | 32 | 1 |
| Missing part | LBO | 6/8/2016 0:00 | 1 | 20 | 2 |
| Missing part | LBO | 6/10/2016 0:00 | 1 | 32 | 1 |
| Missing part | LBO | 6/11/2016 0:00 | 9 | 20 | 1 |
| Open flap | LBO | 6/6/2016 0:00 | 4 | 32 | 2 |
| Open flap | LBO | 6/7/2016 0:00 | 5 | 20 | 1 |
| Open flap | LBO | 6/8/2016 0:00 | 7 | 20 | 1 |
| Open flap | LBO | 6/9/2016 0:00 | 10 | 32 | 1 |
| Open flap | LBO | 6/9/2016 0:00 | 8 | 0 | 1 |
| Open flap | LBO | 6/9/2016 0:00 | 5 | 32 | 1 |
| Open flap | LBO | 6/10/2016 0:00 | 3 | 0 | 1 |
| Open Sealed | LBO | 6/8/2016 0:00 | 7 | 0 | 1 |
| Others | LBO | 6/6/2016 0:00 | 8 | 32 | 1 |
| Over Cutting | LBO | 6/8/2016 0:00 | 6 | 20 | 1 |
| Printing/hot stamp defect | LBO | 6/7/2016 0:00 | 9 | 32 | 1 |
| Printing/hot stamp defect | LBO | 6/11/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 6/7/2016 0:00 | 2 | 20 | 1 |
| Scratch | LBO | 6/7/2016 0:00 | 2 | 20 | 2 |
| Scratch | LBO | 6/7/2016 0:00 | 11 | 0 | 1 |
| Scratch | LBO | 6/8/2016 0:00 | 2 | 32 | 1 |
| Scratch | LBO | 6/8/2016 0:00 | 2 | 20 | 1 |
| Scratch | LBO | 6/8/2016 0:00 | 6 | 32 | 1 |
| Scratch | LBO | 6/9/2016 0:00 | 6 | 20 | 1 |
| Scratch | LBO | 6/10/2016 0:00 | 12 | 32 | 1 |
| Scratch | LBO | 6/10/2016 0:00 | 5 | 32 | 1 |
| Scratch | LBO | 6/10/2016 0:00 | 4 | 20 | 1 |
| Scratch | LBO | 6/11/2016 0:00 | 4 | 32 | 1 |
| Scratch | LBO | 6/11/2016 0:00 | 1 | 20 | 1 |
| Sharp point/edge blister | LBO | 6/7/2016 0:00 | 2 | 32 | 1 |
| Short shot | LBO | 6/7/2016 0:00 | 3 | 20 | 1 |
| Short shot | LBO | 6/7/2016 0:00 | 3 | 20 | 1 |
| Short shot | LBO | 6/8/2016 0:00 | 4 | 20 | 1 |
| Smear painted head | LBO | 6/6/2016 0:00 | 1 | 20 | 1 |
| Smear part | LBO | 6/11/2016 0:00 | 1 | 32 | 1 |
| Solvent smear | LBO | 6/6/2016 0:00 | 5 | 0 | 1 |
| Solvent Smear | LBO | 6/8/2016 0:00 | 2 | 32 | 1 |
| Solvent smear | LBO | 6/9/2016 0:00 | 2 | 32 | 1 |
| Unclear date code (cri) | LBO | 6/9/2016 0:00 | 1 | 32 | 1c |
| Unsealed | LBO | 6/6/2016 0:00 | 3 | 32 | 1 |

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| Unsealed | LBO | 6/6/2016 0:00 | 2 | 20 | 1 |
| Unsealed | LBO | 6/8/2016 0:00 | 7 | 20 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/11/2016 0:00 | 8 | 32 | 1 |
| White Mark | LBO | 6/8/2016 0:00 | 6 | 20 | 1 |
| Wrong assortment | LBO | 6/8/2016 0:00 | 2 | 32 | 1 |
| Wrong assortment | LBO | 6/9/2016 0:00 | 1 | 3 | 1 |
| Wrong dash code | LBO | 6/11/2016 0:00 | 6 | 32 | 1 |
| Wrong date code (cri) | LBO | 6/8/2016 0:00 | 1 | 20 | 2c |
| Wrong Part | LBO | 6/7/2016 0:00 | 8 | 32 | 1 |
| Wrong Part | LBO | 6/7/2016 0:00 | 3 | 32 | 1 |
| Wrong Part | LBO | 6/9/2016 0:00 | 1 | 32 | 2 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/15/2016 0:00 | 4 | 0 | 1 |
| Asymmetrical eye | LBO | 6/14/2016 0:00 | 6 | 32 | 1 |
| Asymmetrical eye | LBO | 6/16/2016 0:00 | 7 | 0 | 1 |
| Asymmetrical eye | LBO | 6/18/2016 0:00 | 1 | 20 | 2 |
| Bald spot | LBO | 6/14/2016 0:00 | 6 | 32 | 1 |
| Bending arm/leg/part | LBO | 6/13/2016 0:00 | 12 | 32 | 1 |
| Bending arm/leg/part | LBO | 6/16/2016 0:00 | 3 | 32 | 1 |
| Bending arm/leg/part (MIN) | LBO | 6/17/2016 0:00 | 4 | 32 | 1M |
| Bending arm/leg/part | LBO | 6/18/2016 0:00 | 3 | 32 | 1 |
| Black spot | LBO | 6/13/2016 0:00 | 2 | 32 | 1 |
| Black spot | LBO | 6/14/2016 0:00 | 7 | 0 | 1 |
| Black spot | LBO | 6/15/2016 0:00 | 5 | 32 | 1 |
| Black spot | LBO | 6/17/2016 0:00 | 11 | 32 | 1 |
| Black spot/dirty/contamination costume | LBO | 6/16/2016 0:00 | 1 | 32 | 1 |
| Broken blister/IC | LBO | 6/15/2016 0:00 | 1 | 20 | 1 |
| Broken blister/IC | LBO | 6/18/2016 0:00 | 7 | 20 | 1 |
| Broken stitches | LBO | 6/13/2016 0:00 | 11 | 20 | 1 |
| Bubbles/water mark/void | LBO | 6/16/2016 0:00 | 12 | 32 | 1 |
| Come off | LBO | 6/13/2016 0:00 | 11 | 32 | 1 |
| Contamination paint/ink | LBO | 6/13/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/13/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 6/15/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 6/15/2016 0:00 | 5 | 20 | 1 |
| Contamination paint/ink | LBO | 6/16/2016 0:00 | 11 | 32 | 1 |
| Contamination paint/ink | LBO | 6/16/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 6/16/2016 0:00 | 8 | 0 | 1 |
| Contamination paint/ink | LBO | 6/17/2016 0:00 | 5 | 20 | 1 |
| Damage/lifted/misalignment | LBO | 6/16/2016 0:00 | 2 | 32 | 1 |

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|---|---|---|---|---|---|
| Damage/lifted/misalignment | LBO | 6/18/2016 0:00 | 1 | 32 | 1 |
| Deformed | LBO | 6/15/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 10 | 0 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 6 | 20 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 10 | 32 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 10 | 0 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 6/13/2016 0:00 | 10 | 32 | 1 |
| Dirty | LBO | 6/14/2016 0:00 | 3 | 20 | 1 |
| Dirty | LBO | 6/14/2016 0:00 | 9 | 0 | 1 |
| Dirty | LBO | 6/15/2016 0:00 | 9 | 32 | 1 |
| Dirty | LBO | 6/15/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 6/15/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/15/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/16/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/16/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/16/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 6/16/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 6/17/2016 0:00 | 8 | 32 | 1 |
| Dirty | LBO | 6/18/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/18/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/18/2016 0:00 | 2 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/13/2016 0:00 | 6 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/17/2016 0:00 | 1 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/17/2016 0:00 | 4 | 32 | 1 |
| Gap insert | LBO | 6/18/2016 0:00 | 9 | 32 | 1 |
| Gate remnant | LBO | 6/13/2016 0:00 | 9 | 20 | 1 |
| Gate remnant | LBO | 6/13/2016 0:00 | 4 | 20 | 1 |
| Gate remnant | LBO | 6/15/2016 0:00 | 5 | 20 | 1 |
| Improper assembly | LBO | 6/13/2016 0:00 | 12 | 0 | 1 |
| Improper assembly | LBO | 6/14/2016 0:00 | 2 | 0 | 1 |
| Improper Dress | LBO | 6/15/2016 0:00 | 2 | 32 | 1 |
| Improper Dress | LBO | 6/15/2016 0:00 | 3 | 0 | 1 |
| Improper Dress | LBO | 6/16/2016 0:00 | 2 | 0 | 1 |
| Improper Dress | LBO | 6/16/2016 0:00 | 6 | 32 | 3 |
| Improper Dress | LBO | 6/16/2016 0:00 | 7 | 0 | 1 |
| Improper Dress | LBO | 6/16/2016 0:00 | 11 | 0 | 1 |
| Improper Dress | LBO | 6/17/2016 0:00 | 1 | 32 | 1 |
| Improper Dress | LBO | 6/17/2016 0:00 | 13 | 32 | 2 |
| Improper Dress | LBO | 6/17/2016 0:00 | 12 | 32 | 1 |

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|---|---|---|---|---|---|
| Improper Dress | LBO | 6/17/2016 0:00 | 3 | 32 | 1 |
| Improper glueing | LBO | 6/14/2016 0:00 | 9 | 32 | 1 |
| Improper grooming | LBO | 6/13/2016 0:00 | 2 | 20 | 1 |
| Improper grooming | LBO | 6/16/2016 0:00 | 1 | 20 | 1 |
| Improper/double stitches | LBO | 6/16/2016 0:00 | 1 | 32 | 1 |
| Improper/double stitches | LBO | 6/17/2016 0:00 | 4 | 0 | 1 |
| Improper/double stitches | LBO | 6/18/2016 0:00 | 1 | 32 | 2 |
| Improper/double stitches | LBO | 6/18/2016 0:00 | 1 | 0 | 1 |
| Loose part | LBO | 6/14/2016 0:00 | 1 | 20 | 1 |
| Loose part | LBO | 6/15/2016 0:00 | 5 | 20 | 1 |
| Loose/Hanging thread | LBO | 6/17/2016 0:00 | 3 | 0 | 1 |
| Loose/Hanging thread | LBO | 6/17/2016 0:00 | 7 | 32 | 1 |
| Mismatch insert | LBO | 6/13/2016 0:00 | 12 | 32 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 6 | 32 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 14 | 32 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 12 | 32 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 10 | 32 | 2 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 4 | 0 | 2 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 9 | 0 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 5 | 32 | 1 |
| Mismatch insert | LBO | 6/14/2016 0:00 | 11 | 32 | 2 |
| Mismatch insert | LBO | 6/15/2016 0:00 | 9 | 0 | 1 |
| Mismatch insert | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Mismatch insert | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Mismatch insert | LBO | 6/18/2016 0:00 | 4 | 32 | 1 |
| Mismatch insert | LBO | 6/18/2016 0:00 | 5 | 32 | 1 |
| Misposition accesories | LBO | 6/13/2016 0:00 | 10 | 0 | 1 |
| Misposition accesories | LBO | 6/13/2016 0:00 | 10 | 20 | 1 |
| Misposition accesories | LBO | 6/16/2016 0:00 | 3 | 20 | 1 |
| Misposition accesories | LBO | 6/16/2016 0:00 | 2 | 20 | 1 |
| Misposition accesories | LBO | 6/17/2016 0:00 | 3 | 20 | 1 |
| Misposition eye | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Misposition paint | LBO | 6/17/2016 0:00 | 3 | 32 | 1 |
| Misposition paint | LBO | 6/17/2016 0:00 | 14 | 32 | 1 |
| Missing date code (cri) | LBO | 6/17/2016 0:00 | 4 | 20 | 1c |
| Missing date code (cri) | LBO | 6/17/2016 0:00 | 1 | 20 | 1c |
| Missing paint | LBO | 6/13/2016 0:00 | 3 | 32 | 1 |
| Missing paint | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Missing paint | LBO | 6/18/2016 0:00 | 8 | 20 | 1 |
| Missing part | LBO | 6/14/2016 0:00 | 2 | 20 | 1 |

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|---|---|---|---|---|---|
| Missing part | LBO | 6/18/2016 0:00 | 3 | 32 | 1 |
| Mold Mark | LBO | 6/16/2016 0:00 | 4 | 20 | 1 |
| Open flap | LBO | 6/13/2016 0:00 | 5 | 32 | 1 |
| Open flap | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Open flap | LBO | 6/17/2016 0:00 | 6 | 32 | 1 |
| Open Sealed | LBO | 6/14/2016 0:00 | 8 | 20 | 1 |
| Over print/over spray | LBO | 6/14/2016 0:00 | 1 | 32 | 1 |
| Over print/over spray | LBO | 6/15/2016 0:00 | 1 | 32 | 1 |
| Over print/over spray | LBO | 6/15/2016 0:00 | 1 | 20 | 1 |
| Over Trim | LBO | 6/13/2016 0:00 | 1 | 32 | 1 |
| Over Trim | LBO | 6/13/2016 0:00 | 2 | 20 | 1 |
| Over/under # SPI of pheriphery | LBO | 6/17/2016 0:00 | 13 | 0 | 1 |
| Rough surface/mold mark/water mark/flow mark | LBO | 6/18/2016 0:00 | 5 | 32 | 1 |
| Scratch | LBO | 6/13/2016 0:00 | 10 | 32 | 1 |
| Scratch | LBO | 6/13/2016 0:00 | 8 | 32 | 1 |
| Scratch | LBO | 6/13/2016 0:00 | 13 | 32 | 1 |
| Scratch | LBO | 6/14/2016 0:00 | 5 | 32 | 1 |
| Scratch | LBO | 6/15/2016 0:00 | 4 | 20 | 1 |
| Scratch | LBO | 6/16/2016 0:00 | 11 | 32 | 1 |
| Scratch | LBO | 6/16/2016 0:00 | 8 | 20 | 1 |
| Scratch (MIN) | LBO | 6/17/2016 0:00 | 3 | 20 | 1M |
| Scratch | LBO | 6/17/2016 0:00 | 8 | 20 | 1 |
| Scratch (MIN) | LBO | 6/18/2016 0:00 | 2 | 50 | 1M |
| Short shot | LBO | 6/14/2016 0:00 | 2 | 32 | 1 |
| Short shot | LBO | 6/15/2016 0:00 | 15 | 32 | 1 |
| Short shot | LBO | 6/16/2016 0:00 | 2 | 32 | 1 |
| Smear part | LBO | 6/15/2016 0:00 | 4 | 32 | 1 |
| Solvent smear | LBO | 6/14/2016 0:00 | 7 | 32 | 1 |
| Solvent smear | LBO | 6/16/2016 0:00 | 9 | 32 | 1 |
| Unclear date code (cri) | LBO | 6/13/2016 0:00 | 5 | 20 | 1c |
| Under print / Under spray | LBO | 6/15/2016 0:00 | 11 | 32 | 1 |
| Under print / Under spray | LBO | 6/17/2016 0:00 | 6 | 32 | 2 |
| Under print / Under spray | LBO | 6/18/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 6/16/2016 0:00 | 3 | 20 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/14/2016 0:00 | 2 | 32 | 1 |
| Wrong Assy | LBO | 6/14/2016 0:00 | 1 | 0 | 1 |
| Wrong Part | LBO | 6/13/2016 0:00 | 2 | 32 | 1 |
| Wrong part | LBO | 6/14/2016 0:00 | 1 | 20 | 1 |
| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/20/2016 0:00 | 2 | 20 | 1 |

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| Aesthetic I/C (Damage/Milky/Blurred/Stress mark) | LBO | 6/23/2016 0:00 | 10 | 20 | 1 |
| AESTHETIC I/C (Damage/Milky/Blurred/Stress) | LBO | 6/24/2016 0:00 | 4 | 32 | 1 |
| Black spot | LBO | 6/21/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 6/21/2016 0:00 | 4 | 20 | 1 |
| Black spot | LBO | 6/21/2016 0:00 | 2 | 20 | 1 |
| Black spot | LBO | 6/22/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 6/24/2016 0:00 | 7 | 0 | 1 |
| Broken blister/IC | LBO | 6/20/2016 0:00 | 2 | 20 | 1 |
| Broken blister/IC | LBO | 6/20/2016 0:00 | 6 | 20 | 1 |
| Broken PVC | LBO | 6/21/2016 0:00 | 8 | 32 | 1 |
| Broken PVC | LBO | 6/24/2016 0:00 | 1 | 32 | 1 |
| Bubbles/water mark/void | LBO | 6/21/2016 0:00 | 3 | 20 | 1 |
| Bulging hair | LBO | 6/23/2016 0:00 | 8 | 0 | 1 |
| Come off | LBO | 6/20/2016 0:00 | 2 | 20 | 1 |
| Come off | LBO | 6/23/2016 0:00 | 1 | 32 | 1 |
| Come Off | LBO | 6/23/2016 0:00 | 6 | 20 | 1 |
| Come off | LBO | 6/24/2016 0:00 | 1 | 32 | 1 |
| Contamination paint/ink | LBO | 6/20/2016 0:00 | 1 | 20 | 1 |
| Contamination paint/ink | LBO | 6/20/2016 0:00 | 4 | 0 | 1 |
| Contamination paint/ink | LBO | 6/20/2016 0:00 | 3 | 32 | 1 |
| Contamination paint/ink | LBO | 6/21/2016 0:00 | 5 | 20 | 1 |
| Contamination paint/ink | LBO | 6/22/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/24/2016 0:00 | 4 | 32 | 1 |
| Damage/lifted/misalignment | LBO | 6/23/2016 0:00 | 4 | 32 | 1 |
| Deformed | LBO | 6/20/2016 0:00 | 4 | 0 | 1 |
| Deformed | LBO | 6/24/2016 0:00 | 7 | 32 | 1 |
| Dented | LBO | 6/25/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 7 | 20 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 6 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 8 | 0 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 9 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 1 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 6 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 12 | 32 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 2 | 0 | 1 |
| Dirty | LBO | 6/20/2016 0:00 | 7 | 20 | 1 |
| Dirty | LBO | 6/21/2016 0:00 | 4 | 32 | 1 |

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|---|---|---|---|---|---|
| Dirty | LBO | 6/21/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 6/21/2016 0:00 | 10 | 32 | 1 |
| Dirty | LBO | 6/21/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 6/22/2016 0:00 | 1 | 32 | 2 |
| Dirty | LBO | 6/22/2016 0:00 | 6 | 0 | 1 |
| Dirty | LBO | 6/22/2016 0:00 | 2 | 32 | 1 |
| Dirty | LBO | 6/23/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/23/2016 0:00 | 8 | 0 | 1 |
| Dirty | LBO | 6/23/2016 0:00 | 8 | 32 | 1 |
| Dirty | LBO | 6/23/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/24/2016 0:00 | 1 | 0 | 1 |
| Dirty | LBO | 6/24/2016 0:00 | 7 | 32 | 1 |
| Dirty | LBO | 6/25/2016 0:00 | 8 | 0 | 1 |
| Dirty | LBO | 6/25/2016 0:00 | 1 | 20 | 1 |
| Flash | LBO | 6/25/2016 0:00 | 1 | 20 | 1 |
| Flash/Parting Line | LBO | 6/21/2016 0:00 | 3 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 6/20/2016 0:00 | 4 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/24/2016 0:00 | 1 | 32 | 1 |
| Foreign matter | LBO | 6/21/2016 0:00 | 7 | 32 | 1 |
| Gap insert | LBO | 6/20/2016 0:00 | 10 | 32 | 1 |
| Gap part | LBO | 6/22/2016 0:00 | 2 | 32 | 1 |
| Gap upper/ lower torso | LBO | 6/20/2016 0:00 | 1 | 20 | 1 |
| Gate remnant | LBO | 6/20/2016 0:00 | 6 | 20 | 1 |
| Gate remnant | LBO | 6/21/2016 0:00 | 1 | 20 | 1 |
| Gate remnant | LBO | 6/22/2016 0:00 | 1 | 20 | 1 |
| Gate remnant | LBO | 6/23/2016 0:00 | 1 | 20 | 1 |
| Gate remnant | LBO | 6/24/2016 0:00 | 1 | 20 | 1 |
| Gate remnant | LBO | 6/25/2016 0:00 | 4 | 20 | 1 |
| Gate remnant | LBO | 6/25/2016 0:00 | 5 | 20 | 1 |
| Gate remnant | LBO | 6/25/2016 0:00 | 3 | 20 | 1 |
| Improper assembly | LBO | 6/22/2016 0:00 | 2 | 20 | 1 |
| Improper assembly | LBO | 6/24/2016 0:00 | 9 | 32 | 1 |
| Improper costume | LBO | 6/20/2016 0:00 | 6 | 32 | 3 |
| Improper costume | LBO | 6/21/2016 0:00 | 7 | 0 | 1 |
| Improper costume | LBO | 6/21/2016 0:00 | 3 | 32 | 1 |
| Improper costume | LBO | 6/22/2016 0:00 | 1 | 32 | 2 |
| Improper costume | LBO | 6/22/2016 0:00 | 2 | 32 | 2 |
| Improper costume | LBO | 6/23/2016 0:00 | 13 | 32 | 1 |
| Improper costume | LBO | 6/23/2016 0:00 | 14 | 32 | 1 |
| Improper costume | LBO | 6/23/2016 0:00 | 6 | 0 | 1 |

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| Improper costume | LBO | 6/24/2016 0:00 | 3 | 32 | 2 |
| Improper costume | LBO | 6/24/2016 0:00 | 2 | 32 | 1 |
| Improper costume | LBO | 6/25/2016 0:00 | 2 | 32 | 1 |
| Improper costume | LBO | 6/25/2016 0:00 | 4 | 32 | 1 |
| Improper costume | LBO | 6/25/2016 0:00 | 1 | 0 | 1 |
| Improper costume | LBO | 6/25/2016 0:00 | 1 | 0 | 1 |
| Improper Dress | LBO | 6/20/2016 0:00 | 13 | 32 | 1 |
| Improper Dress | LBO | 6/20/2016 0:00 | 3 | 0 | 2 |
| Improper Dress | LBO | 6/20/2016 0:00 | 1 | 0 | 2 |
| Improper Dress | LBO | 6/20/2016 0:00 | 5 | 0 | 2 |
| Improper Dress | LBO | 6/20/2016 0:00 | 1 | 0 | 1 |
| Improper dress | LBO | 6/21/2016 0:00 | 3 | 0 | 1 |
| Improper Dress | LBO | 6/22/2016 0:00 | 8 | 32 | 1 |
| Improper dress | LBO | 6/22/2016 0:00 | 2 | 0 | 1 |
| Improper Dress | LBO | 6/23/2016 0:00 | 3 | 32 | 1 |
| Improper Dress | LBO | 6/24/2016 0:00 | 8 | 32 | 1 |
| Improper Dress | LBO | 6/24/2016 0:00 | 1 | 0 | 1 |
| Improper dress | LBO | 6/25/2016 0:00 | 3 | 32 | 1 |
| Improper grooming | LBO | 6/20/2016 0:00 | 5 | 32 | 1 |
| Improper grooming | LBO | 6/23/2016 0:00 | 2 | 20 | 1 |
| Improper grooming | LBO | 6/24/2016 0:00 | 1 | 32 | 1 |
| Improper Sewn | LBO | 6/25/2016 0:00 | 2 | 32 | 1 |
| Loose part | LBO | 6/24/2016 0:00 | 3 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/20/2016 0:00 | 2 | 0 | 1 |
| Loose/Hanging thread | LBO | 6/20/2016 0:00 | 4 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/21/2016 0:00 | 5 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/23/2016 0:00 | 10 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/24/2016 0:00 | 3 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/25/2016 0:00 | 4 | 0 | 1 |
| Material contamination | LBO | 6/21/2016 0:00 | 2 | 32 | 1 |
| Material contamination | LBO | 6/22/2016 0:00 | 4 | 32 | 1 |
| Material contamination | LBO | 6/23/2016 0:00 | 1 | 32 | 1 |
| Material contamination | LBO | 6/23/2016 0:00 | 8 | 32 | 1 |
| Material contamination | LBO | 6/25/2016 0:00 | 4 | 32 | 1 |
| Material contamination | LBO | 6/25/2016 0:00 | 1 | 20 | 1 |
| Mismatch insert | LBO | 6/20/2016 0:00 | 8 | 32 | 1 |
| Mismatch insert | LBO | 6/21/2016 0:00 | 8 | 0 | 1 |
| Mismatch Insert | LBO | 6/21/2016 0:00 | 5 | 32 | 1 |
| Mismatch insert | LBO | 6/21/2016 0:00 | 4 | 32 | 1 |
| Mismatch Insert | LBO | 6/25/2016 0:00 | 12 | 32 | 1 |

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|---|---|---|---|---|---|
| Missing paint | LBO | 6/20/2016 0:00 | 6 | 20 | 1 |
| Missing part | LBO | 6/22/2016 0:00 | 1 | 32 | 2 |
| Missing part | LBO | 6/22/2016 0:00 | 3 | 32 | 1 |
| Missing Printing | LBO | 6/20/2016 0:00 | 10 | 32 | 1 |
| Missing Printing | LBO | 6/20/2016 0:00 | 10 | 32 | 1 |
| Open flap | LBO | 6/21/2016 0:00 | 5 | 0 | 1 |
| Open flap | LBO | 6/25/2016 0:00 | 5 | 32 | 1 |
| Open sealed | LBO | 6/21/2016 0:00 | 2 | 20 | 1 |
| Open sealed | LBO | 6/22/2016 0:00 | 4 | 32 | 1 |
| Open Sealed | LBO | 6/22/2016 0:00 | 1 | 20 | 1 |
| Open Sealed | LBO | 6/23/2016 0:00 | 1 | 32 | 1 |
| Over print/over spray | LBO | 6/21/2016 0:00 | 2 | 32 | 1 |
| Over print/over spray | LBO | 6/22/2016 0:00 | 6 | 0 | 1 |
| Over print/over spray | LBO | 6/23/2016 0:00 | 1 | 32 | 1 |
| Over print/over spray | LBO | 6/23/2016 0:00 | 11 | 32 | 1 |
| Over print/over spray | LBO | 6/25/2016 0:00 | 12 | 0 | 1 |
| Peeled off | LBO | 6/20/2016 0:00 | 3 | 20 | 1 |
| Peeled off | LBO | 6/20/2016 0:00 | 2 | 20 | 3 |
| Peeled off | LBO | 6/21/2016 0:00 | 2 | 32 | 1 |
| Printing/hot stamp defect | LBO | 6/25/2016 0:00 | 4 | 32 | 1 |
| Scratch | LBO | 6/22/2016 0:00 | 3 | 20 | 1 |
| Scratch | LBO | 6/22/2016 0:00 | 4 | 20 | 1 |
| Scratch | LBO | 6/22/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 6/22/2016 0:00 | 5 | 20 | 1 |
| Scratch | LBO | 6/23/2016 0:00 | 13 | 20 | 1 |
| Scratch | LBO | 6/24/2016 0:00 | 4 | 20 | 1 |
| Scratch | LBO | 6/25/2016 0:00 | 2 | 32 | 1 |
| Short shot | LBO | 6/23/2016 0:00 | 2 | 20 | 1 |
| Short shot | LBO | 6/24/2016 0:00 | 1 | 32 | 1 |
| Short shot | LBO | 6/25/2016 0:00 | 1 | 32 | 1 |
| Sink mark | LBO | 6/22/2016 0:00 | 7 | 32 | 1 |
| Sink mark | LBO | 6/23/2016 0:00 | 2 | 32 | 1 |
| Solvent smear | LBO | 6/20/2016 0:00 | 12 | 32 | 1 |
| Solvent smear | LBO | 6/21/2016 0:00 | 9 | 32 | 1 |
| Solvent smear | LBO | 6/22/2016 0:00 | 1 | 32 | 1 |
| Solvent smear | LBO | 6/24/2016 0:00 | 2 | 20 | 1 |
| Torn/overtrim | LBO | 6/22/2016 0:00 | 6 | 0 | 1 |
| Under print / Under spray | LBO | 6/21/2016 0:00 | 8 | 32 | 1 |
| Under print / Under spray | LBO | 6/25/2016 0:00 | 2 | 20 | 1 |
| Unsealed | LBO | 6/20/2016 0:00 | 4 | 0 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Unsealed | LBO | 6/20/2016 0:00 | 5 | 20 | 1 |
| Unsealed | LBO | 6/21/2016 0:00 | 2 | 20 | 2 |
| Unsealed | LBO | 6/21/2016 0:00 | 5 | 0 | 1 |
| Unsealed | LBO | 6/21/2016 0:00 | 2 | 0 | 1 |
| Unsealed | LBO | 6/22/2016 0:00 | 3 | 20 | 2 |
| Unsealed | LBO | 6/23/2016 0:00 | 1 | 20 | 2 |
| Unsealed | LBO | 6/24/2016 0:00 | 1 | 20 | 1 |
| Unsealed | LBO | 6/25/2016 0:00 | 2 | 32 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/20/2016 0:00 | 1 | 0 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/21/2016 0:00 | 6 | 32 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/22/2016 0:00 | 3 | 32 | 1 |
| Wrinkle | LBO | 6/23/2016 0:00 | 3 | 32 | 1 |
| Wrong assortment | LBO | 6/22/2016 0:00 | 1 | 32 | 1 |
| Wrong assortment | LBO | 6/22/2016 0:00 | 2 | 20 | 1 |
| WRONG HEAD | LBO | 6/22/2016 0:00 | 1 | 20 | 3 |
| Wrong part | LBO | 6/21/2016 0:00 | 1 | 20 | 1 |
| Wrong part | LBO | 6/24/2016 0:00 | 5 | 20 | 1 |
| Wrong part | LBO | 6/24/2016 0:00 | 6 | 20 | 1 |
| Asymmetrical eye | LBO | 7/1/2016 0:00 | 4 | 20 | 1 |
| Black spot | LBO | 6/28/2016 0:00 | 1 | 32 | 1 |
| Black spot | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Broken PVC | LBO | 6/28/2016 0:00 | 2 | 20 | 1 |
| Broken PVC | LBO | 7/1/2016 0:00 | 1 | 32 | 1 |
| Broken stitches | LBO | 6/28/2016 0:00 | 3 | 32 | 1 |
| Broken stitches | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Bubbles/water mark/void | LBO | 6/27/2016 0:00 | 15 | 32 | 1 |
| Bubbles/water mark/void | LBO | 7/1/2016 0:00 | 8 | 32 | 1 |
| Come off | LBO | 6/27/2016 0:00 | 1 | 32 | 1 |
| Come off | LBO | 6/28/2016 0:00 | 3 | 20 | 1 |
| Come off | LBO | 6/29/2016 0:00 | 2 | 32 | 1 |
| Contamination on packaging | LBO | 7/1/2016 0:00 | 4 | 32 | 1 |
| Contamination paint/ink | LBO | 6/27/2016 0:00 | 3 | 20 | 1 |
| Contamination paint/ink | LBO | 6/28/2016 0:00 | 15 | 20 | 1 |
| Contamination paint/ink | LBO | 6/28/2016 0:00 | 5 | 32 | 1 |
| Contamination paint/ink | LBO | 6/28/2016 0:00 | 6 | 32 | 1 |
| Contamination paint/ink | LBO | 6/29/2016 0:00 | 2 | 20 | 1 |
| Contamination paint/ink | LBO | 6/30/2016 0:00 | 6 | 0 | 1 |
| Damage | LBO | 6/29/2016 0:00 | 1 | 0 | 1 |
| Deformed | LBO | 6/28/2016 0:00 | 1 | 32 | 1 |
| Dented | LBO | 6/29/2016 0:00 | 5 | 32 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Dirty | LBO | 6/27/2016 0:00 | 16 | 32 | 1 |
| Dirty | LBO | 6/27/2016 0:00 | 1 | 20 | 1 |
| Dirty | LBO | 6/27/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 6/27/2016 0:00 | 10 | 0 | 1 |
| Dirty | LBO | 6/27/2016 0:00 | 3 | 32 | 1 |
| Dirty | LBO | 6/28/2016 0:00 | 4 | 32 | 1 |
| Dirty | LBO | 6/28/2016 0:00 | 4 | 20 | 1 |
| Dirty | LBO | 6/28/2016 0:00 | 2 | 20 | 1 |
| Dirty | LBO | 6/29/2016 0:00 | 1 | 32 | 2 |
| Dirty | LBO | 6/30/2016 0:00 | 3 | 32 | 2 |
| Dirty | LBO | 6/30/2016 0:00 | 6 | 32 | 1 |
| Dirty | LBO | 6/30/2016 0:00 | 6 | 0 | 1 |
| Dirty | LBO | 6/30/2016 0:00 | 6 | 0 | 1 |
| Dirty | LBO | 6/30/2016 0:00 | 8 | 32 | 1 |
| Dirty | LBO | 7/1/2016 0:00 | 7 | 0 | 1 |
| Extended periphery | LBO | 6/27/2016 0:00 | 1 | 32 | 1 |
| Flash | LBO | 6/30/2016 0:00 | 5 | 0 | 1 |
| Flash/Parting Line | LBO | 6/29/2016 0:00 | 11 | 20 | 1 |
| Flash/Parting Line | LBO | 6/29/2016 0:00 | 1 | 32 | 1 |
| Flash/Parting Line | LBO | 6/30/2016 0:00 | 1 | 20 | 1 |
| Flash/Parting Line | LBO | 6/30/2016 0:00 | 5 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 6/28/2016 0:00 | 9 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 6/30/2016 0:00 | 3 | 20 | 1 |
| Fly away/loose/messy hair | LBO | 6/30/2016 0:00 | 5 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 7/1/2016 0:00 | 7 | 32 | 1 |
| Fly away/loose/messy hair | LBO | 7/1/2016 0:00 | 1 | 20 | 1 |
| Improper assembly | LBO | 6/28/2016 0:00 | 1 | 20 | 1 |
| Improper assembly | LBO | 6/28/2016 0:00 | 1 | 20 | 1 |
| Improper costume | LBO | 6/27/2016 0:00 | 1 | 0 | 1 |
| Improper costume | LBO | 6/27/2016 0:00 | 2 | 0 | 1 |
| Improper costume | LBO | 6/27/2016 0:00 | 5 | 32 | 1 |
| Improper costume | LBO | 6/27/2016 0:00 | 5 | 32 | 1 |
| Improper costume | LBO | 6/27/2016 0:00 | 4 | 0 | 1 |
| Improper costume | LBO | 6/28/2016 0:00 | 3 | 32 | 1 |
| Improper costume | LBO | 6/28/2016 0:00 | 9 | 0 | 1 |
| Improper Dress | LBO | 6/27/2016 0:00 | 1 | 0 | 1 |
| Improper dress | LBO | 6/28/2016 0:00 | 1 | 32 | 1 |
| Improper function | LBO | 6/28/2016 0:00 | 14 | 20 | 1 |
| Improper grooming | LBO | 6/27/2016 0:00 | 1 | 0 | 1 |
| Improper grooming | LBO | 6/27/2016 0:00 | 8 | 20 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| Improper Sewn | LBO | 6/28/2016 0:00 | 11 | 32 | 1 |
| Loose/Hanging thread | LBO | 6/30/2016 0:00 | 7 | 32 | 1 |
| MASK MARK | LBO | 6/28/2016 0:00 | 4 | 32 | 1 |
| Missing date code (cri) | LBO | 6/30/2016 0:00 | 1 | 32 | 1c |
| Missing date code (cri) | LBO | 7/1/2016 0:00 | 1 | 32 | 1c |
| Missing paint | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Missing part | LBO | 6/27/2016 0:00 | 2 | 32 | 1 |
| Missing Printing | LBO | 6/27/2016 0:00 | 10 | 32 | 1 |
| Missing Printing | LBO | 6/28/2016 0:00 | 9 | 32 | 1 |
| Missing Printing | LBO | 6/28/2016 0:00 | 8 | 32 | 2 |
| Missing Printing | LBO | 6/28/2016 0:00 | 9 | 32 | 1 |
| Open flap | LBO | 6/29/2016 0:00 | 2 | 20 | 1 |
| Open flap | LBO | 6/29/2016 0:00 | 1 | 32 | 1 |
| Open sealed | LBO | 6/27/2016 0:00 | 1 | 20 | 1 |
| Overtrimmed/untrimmed part | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 6/27/2016 0:00 | 1 | 0 | 1 |
| Scratch | LBO | 6/27/2016 0:00 | 4 | 32 | 1 |
| Scratch | LBO | 6/28/2016 0:00 | 1 | 32 | 1 |
| Scratch | LBO | 6/29/2016 0:00 | 9 | 32 | 1 |
| Scratch | LBO | 6/30/2016 0:00 | 3 | 32 | 1 |
| Smear part | LBO | 6/29/2016 0:00 | 6 | 20 | 1 |
| Smear part | LBO | 6/29/2016 0:00 | 1 | 20 | 1 |
| Smear part | LBO | 6/30/2016 0:00 | 6 | 20 | 1 |
| Solvent smear | LBO | 6/28/2016 0:00 | 10 | 32 | 1 |
| Solvent smear | LBO | 6/29/2016 0:00 | 4 | 32 | 1 |
| Under print / Under spray | LBO | 6/27/2016 0:00 | 1 | 50 | 1 |
| Under print / Under spray | LBO | 7/1/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 6/27/2016 0:00 | 1 | 20 | 1 |
| Unsealed | LBO | 6/27/2016 0:00 | 2 | 20 | 1 |
| Unsealed | LBO | 6/28/2016 0:00 | 2 | 32 | 2 |
| Unsealed | LBO | 6/29/2016 0:00 | 3 | 20 | 1 |
| Unsealed | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Unsealed | LBO | 7/1/2016 0:00 | 2 | 20 | 1 |
| Weldline/Flow mark/Silver | LBO | 6/29/2016 0:00 | 6 | 32 | 1 |
| Wrinkle | LBO | 6/27/2016 0:00 | 8 | 32 | 1 |
| Wrong assortment | LBO | 6/30/2016 0:00 | 1 | 32 | 1 |
| Wrong assy | LBO | 6/29/2016 0:00 | 1 | 20 | 1 |
| Wrong Part | LBO | 6/27/2016 0:00 | 2 | 20 | 4 |

## Appendix 2 – MSA Results Before Improvement

| Name : Rohimah<br>Area : Molding | | | | | |
|---|---|---|---|---|---|
| No sample | Answer | No Sample | Answer | No Sample | Answer |
| 1 | 0 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 1 | 7 | 1 | 6 | 0 |
| 4 | 1 | 2 | 0 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 0 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 0 | 5 | 0 |
| 9 | 0 | 1 | 0 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name : Fitri<br>Area : Molding | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 0 | 4 | 1 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 1 | 2 | 0 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 1 |
| 8 | 0 | 6 | 0 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name : Rita<br>Area : Molding | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 1 | 7 | 1 | 6 | 0 |
| 4 | 1 | 2 | 0 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 0 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name : Nurul<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 0 | 7 | 1 | 6 | 1 |
| 4 | 1 | 2 | 0 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 1 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 1 | 9 | 0 |

| Name : Sutarini<br>Area : painting | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 0 | 7 | 0 | 6 | 1 |
| 4 | 1 | 2 | 0 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 1 | 10 | 1 | 1 | 1 |
| 7 | 0 | 3 | 0 | 3 | 0 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 0 |
| 10 | 1 | 8 | 1 | 9 | 0 |

| Name : Poni<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 0 | 7 | 1 | 6 | 1 |
| 4 | 1 | 2 | 0 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 1 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 1 | 9 | 0 |

| Name : Budi<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 0 | 7 | 1 | 6 | 1 |
| 4 | 1 | 2 | 0 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 1 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 1 | 9 | 0 |

| Name : Etik<br>Area : painting | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 1 | 9 | 1 | 2 | 0 |
| 2 | 0 | 4 | 1 | 4 | 1 |
| 3 | 0 | 7 | 1 | 6 | 1 |
| 4 | 1 | 2 | 0 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 1 |
| 6 | 1 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 1 | 9 | 0 |

| Name : Puput<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : Nani<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 1 | 5 | 1 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 1 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : Yuliani<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : Durotul<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : | Indah | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 1 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : | Ratna | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 1 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : | Sriyani | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

| Name : Sahiroh<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Anwer | No. Sample | Anwer | No. Sample | Anwer |
| 1 | 1 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 1 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 1 | 7 | 0 |
| 10 | 0 | 8 | 0 | 9 | 1 |

| Name : Suci<br>Area : TA | | | | | |
|---|---|---|---|---|---|
| No. Sample | Answer | No. Sample | Answer | No. Sample | Answer |
| 1 | 0 | 9 | 1 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 1 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 0 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 1 | 6 | 1 | 5 | 0 |
| 9 | 1 | 1 | 0 | 7 | 0 |
| 10 | 0 | 8 | 1 | 9 | 1 |

## Appendix 3 – Attribute Agreement Analysis before improvement

```
Welcome to Minitab, press F1 for help.
```

### Attribute Agreement Analysis for Puput1, Puput2, Puput3, Nani1, Nani2, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Puput              10         10   100.00  (74.11, 100.00)
Nani               10          8    80.00  (44.39,  97.48)
Yuliani            10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Puput              10         10   100.00  (74.11, 100.00)
Nani               10          8    80.00  (44.39,  97.48)
Yuliani            10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Puput            0     0.00        0     0.00        0     0.00
Nani             0     0.00        0     0.00        2    20.00
Yuliani          0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          8    80.00  (44.39, 97.48)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics
```

```
Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.877232  0.0527046  16.6443     0.0000
1         0.877232  0.0527046  16.6443     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          8    80.00  (44.39, 97.48)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.931257  0.105409  8.83468     0.0000
1         0.931257  0.105409  8.83468     0.0000
```

### Attribute Agreement Analysis

```
Welcome to Minitab, press F1 for help.
```

### Attribute Agreement Analysis for Durotul1, Durotul2, Durotul3, Indah1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Durotul             10         10   100.00  (74.11, 100.00)
Indah               10          9    90.00  (55.50,  99.75)
Ratna               10          9    90.00  (55.50,  99.75)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Durotul             10         10   100.00  (74.11, 100.00)
Indah               10          9    90.00  (55.50,  99.75)
Ratna               10          9    90.00  (55.50,  99.75)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Durotul          0     0.00        0     0.00        0     0.00
Indah            0     0.00        0     0.00        1    10.00
```

```
Ratna            0     0.00        0     0.00        1    10.00
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          8    80.00  (44.39, 97.48)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.910935  0.0527046  17.2838     0.0000
1         0.910935  0.0527046  17.2838     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          8    80.00  (44.39, 97.48)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.955107  0.105409  9.06094     0.0000
1         0.955107  0.105409  9.06094     0.0000
```

### Attribute Agreement Analysis

```
Welcome to Minitab, press F1 for help.
```

### Attribute Agreement Analysis for Sriyani1, Sriyani2, Sriyani3, Sahiroh1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Sriyani             10         10   100.00  (74.11, 100.00)
Sahiroh             10          8    80.00  (44.39,  97.48)
Suci                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

## Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Sriyani             10         10   100.00  (74.11, 100.00)
Sahiroh             10          7    70.00  (34.75,  93.33)
Suci                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Sriyani          0     0.00        0     0.00        0     0.00
Sahiroh          1    20.00        0     0.00        2    20.00
Suci             0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

## Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          7    70.00  (34.75, 93.33)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.777338  0.0527046  14.7490     0.0000
1         0.777338  0.0527046  14.7490     0.0000
```

## All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          7    70.00  (34.75, 93.33)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.864815  0.105409  8.20435     0.0000
1         0.864815  0.105409  8.20435     0.0000
```

## Attribute Agreement Analysis

```
Welcome to Minitab, press F1 for help.
```

## Attribute Agreement Analysis for Nurul1, Nurul2, Nurul3, Sutarini1, ...

## Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Nurul              10         10   100.00  (74.11, 100.00)
Sutarini           10         10   100.00  (74.11, 100.00)
Poni               10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

## Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Nurul              10          9    90.00  (55.50,  99.75)
Sutarini           10         10   100.00  (74.11, 100.00)
Poni               10          9    90.00  (55.50,  99.75)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Nurul            1    20.00        0     0.00        0     0.00
Sutarini         0     0.00        0     0.00        0     0.00
Poni             1    20.00        0     0.00        0     0.00
```

## Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.898190  0.0527046  17.0420     0.0000
1         0.898190  0.0527046  17.0420     0.0000
```

## All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
```

```
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.865320  0.105409  8.20915     0.0000
1         0.865320  0.105409  8.20915     0.0000
```

### Attribute Agreement Analysis

```
Welcome to Minitab, press F1 for help.
```

### Attribute Agreement Analysis for Budi1, Budi2, Budi3, Etik1, Etik2, Etik3

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Budi               10         10   100.00  (74.11, 100.00)
Etik               10          8    80.00  (44.39,  97.48)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent      95% CI
Budi               10          9    90.00  (55.50, 99.75)
Etik               10          7    70.00  (34.75, 93.33)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Budi             1    20.00        0     0.00        0     0.00
Etik             1    20.00        0     0.00        2    20.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
```

```
         10          8    80.00  (44.39, 97.48)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.856459  0.0816497  10.4894     0.0000
1         0.856459  0.0816497  10.4894     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          7    70.00  (34.75, 93.33)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.726431  0.129099  5.62691     0.0000
1         0.726431  0.129099  5.62691     0.0000
```

### Attribute Agreement Analysis

### Attribute Agreement Analysis for Rohimah1, Rohimah2, Rohimah3, Fitri1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Rohimah             10         10   100.00  (74.11, 100.00)
Fitri               10          7    70.00  (34.75,  93.33)
Rita                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Rohimah             10          9    90.00  (55.50,  99.75)
Fitri               10          7    70.00  (34.75,  93.33)
Rita                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.
```

Assessment Disagreement

| Appraiser | # 1 / 0 | Percent | # 0 / 1 | Percent | # Mixed | Percent |
|---|---|---|---|---|---|---|
| Rohimah | 0 | 0.00 | 1 | 20.00 | 0 | 0.00 |
| Fitri | 0 | 0.00 | 0 | 0.00 | 3 | 30.00 |
| Rita | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |

# 1 / 0: Assessments across trials = 1 / standard = 0.
# 0 / 1: Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.

## Between Appraisers

Assessment Agreement

| # Inspected | # Matched | Percent | 95% CI |
|---|---|---|---|
| 10 | 7 | 70.00 | (34.75, 93.33) |

# Matched: All appraisers' assessments agree with each other.

Fleiss' Kappa Statistics

| Response | Kappa | SE Kappa | Z | P(vs > 0) |
|---|---|---|---|---|
| 0 | 0.760881 | 0.0527046 | 14.4367 | 0.0000 |
| 1 | 0.760881 | 0.0527046 | 14.4367 | 0.0000 |

## All Appraisers vs Standard

Assessment Agreement

| # Inspected | # Matched | Percent | 95% CI |
|---|---|---|---|
| 10 | 7 | 70.00 | (34.75, 93.33) |

# Matched: All appraisers' assessments agree with the known standard.

Fleiss' Kappa Statistics

| Response | Kappa | SE Kappa | Z | P(vs > 0) |
|---|---|---|---|---|
| 0 | 0.840067 | 0.105409 | 7.96958 | 0.0000 |
| 1 | 0.840067 | 0.105409 | 7.96958 | 0.0000 |

## Attribute Agreement Analysis

## Appendix 4 – MSA Result After Improvement

| Nama : | Rohimah | | | | |
|---|---|---|---|---|---|
| Area : | Molding | | | | |
| No.Sample | Answer | No.Sample | Answer | No.Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Nama : | Fitri | | | | |
|---|---|---|---|---|---|
| Area : | Molding | | | | |
| No.Sample | Answer | No.Sample | Answer | No.Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Nama : | Rita | | | | |
|---|---|---|---|---|---|
| Area : | Molding | | | | |
| No.Sample | Answer | No.Sample | Answer | No.Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Nama : Nurul<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 1 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 0 | 8 | 0 | 9 | 0 |

| Nama : Sutarini<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 1 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 0 | 8 | 0 | 9 | 0 |

| Nama : Poni<br>Area : Painting | | | | | |
|---|---|---|---|---|---|
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 1 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 0 | 8 | 0 | 9 | 0 |

| Nama : Budi<br>Area : Painting |
|---|

| Sample | Answer | Sample | Answer | Sample | Answer |
|---|---|---|---|---|---|
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 0 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 0 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 0 |
| 10 | 0 | 8 | 0 | 9 | 0 |

Nama : Etik
Area : Painting

| Sample | Answer | Sample | Answer | Sample | Answer |
|---|---|---|---|---|---|
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 1 | 7 | 1 | 6 | 1 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 0 | 5 | 0 | 10 | 0 |
| 6 | 1 | 10 | 0 | 1 | 1 |
| 7 | 1 | 3 | 1 | 3 | 1 |
| 8 | 0 | 6 | 1 | 5 | 0 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 0 | 8 | 0 | 9 | 0 |

Name: Puput
Area : TA

| Sample | Answer | Sample | Answer | Sample | Answer |
|---|---|---|---|---|---|
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

Nama : Durotul
Area : TA

| Sample | Answer | Sample | Answer | Sample | Answer |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Nama : | Indah | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 0 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 0 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name: | Ratna | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name: | Sriyani | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 0 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 0 |

| Name: | Sahiroh | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 1 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 1 |

| Name: | Sahiroh | | | | |
|---|---|---|---|---|---|
| Area : | TA | | | | |
| Sample | Answer | Sample | Answer | Sample | Answer |
| 1 | 1 | 9 | 0 | 2 | 1 |
| 2 | 1 | 4 | 0 | 4 | 0 |
| 3 | 0 | 7 | 1 | 6 | 0 |
| 4 | 0 | 2 | 1 | 8 | 0 |
| 5 | 1 | 5 | 1 | 10 | 1 |
| 6 | 0 | 10 | 1 | 1 | 1 |
| 7 | 1 | 3 | 0 | 3 | 0 |
| 8 | 0 | 6 | 0 | 5 | 1 |
| 9 | 1 | 1 | 1 | 7 | 1 |
| 10 | 1 | 8 | 0 | 9 | 1 |

## Appendix 5 – Attribute Agreement Analysis After improvement

### Attribute Agreement Analysis for Rohimah 1, Rohimah 2, Rohimah 3, Fitri1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Rohimah             10         10   100.00  (74.11, 100.00)
Fitri               10         10   100.00  (74.11, 100.00)
Rita                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Rohimah             10         10   100.00  (74.11, 100.00)
Fitri               10         10   100.00  (74.11, 100.00)
Rita                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Rohimah          0     0.00        0     0.00        0     0.00
Fitri            0     0.00        0     0.00        0     0.00
Rita             0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)
```

```
# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response  Kappa   SE Kappa        Z  P(vs > 0)
0             1  0.0527046  18.9737     0.0000
1             1  0.0527046  18.9737     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response  Kappa  SE Kappa        Z  P(vs > 0)
0             1  0.105409  9.48683     0.0000
1             1  0.105409  9.48683     0.0000
```

### Attribute Agreement Analysis

### Results for: Worksheet 2

### Attribute Agreement Analysis for Nurul1, Nurul2, Nurul3, Sutarini1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Nurul               10         10   100.00  (74.11, 100.00)
Sutarini            10         10   100.00  (74.11, 100.00)
Poni                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Nurul               10         10   100.00  (74.11, 100.00)
Sutarini            10         10   100.00  (74.11, 100.00)
Poni                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.
```

```
Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Nurul            0     0.00        0     0.00        0     0.00
Sutarini         0     0.00        0     0.00        0     0.00
Poni             0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response  Kappa   SE Kappa        Z  P(vs > 0)
0             1  0.0527046  18.9737     0.0000
1             1  0.0527046  18.9737     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response  Kappa  SE Kappa        Z  P(vs > 0)
0             1  0.105409  9.48683     0.0000
1             1  0.105409  9.48683     0.0000
```

### Attribute Agreement Analysis

### Results for: Worksheet 3

### Attribute Agreement Analysis for Budi1, Budi2, Budi3, Etik1, Etik2, Etik3

### Within Appraisers

```
Assessment Agreement
```

```
Appraiser  # Inspected  # Matched  Percent       95% CI
Budi               10         10   100.00  (74.11, 100.00)
Etik               10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Budi               10          9    90.00  (55.50,  99.75)
Etik               10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Budi             0     0.00        1    20.00        0     0.00
Etik             0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.878788  0.0816497  10.7629     0.0000
1         0.878788  0.0816497  10.7629     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics
```

```
Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.898990  0.129099  6.96355     0.0000
1         0.898990  0.129099  6.96355     0.0000
```

### Attribute Agreement Analysis for Puput1, Puput2, Puput3, Nani1, Nani2, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Puput              10         10   100.00  (74.11, 100.00)
Nani               10         10   100.00  (74.11, 100.00)
Yuiani             10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Puput              10         10   100.00  (74.11, 100.00)
Nani               10         10   100.00  (74.11, 100.00)
Yuiani             10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Puput            0     0.00        0     0.00        0     0.00
Nani             0     0.00        0     0.00        0     0.00
Yuiani           0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)

# Matched: All appraisers' assessments agree with each other.
```

```
Fleiss' Kappa Statistics

Response  Kappa   SE Kappa        Z  P(vs > 0)
0             1  0.0527046  18.9737     0.0000
1             1  0.0527046  18.9737     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent       95% CI
         10         10   100.00  (74.11, 100.00)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response  Kappa  SE Kappa        Z  P(vs > 0)
0             1  0.105409  9.48683     0.0000
1             1  0.105409  9.48683     0.0000
```

### Attribute Agreement Analysis

### Attribute Agreement Analysis for Durotul1, Durotul2, Durotul3, Indah 1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Durotul             10         10   100.00  (74.11, 100.00)
Indah               10          9    90.00  (55.50,  99.75)
Ratna               10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Durotul             10         10   100.00  (74.11, 100.00)
Indah               10          9    90.00  (55.50,  99.75)
Ratna               10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
```

```
Durotul          0     0.00        0     0.00        0     0.00
Indah            0     0.00        0     0.00        1    10.00
Ratna            0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.922068  0.0527046  17.4950     0.0000
1         0.922068  0.0527046  17.4950     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.955107  0.105409  9.06094     0.0000
1         0.955107  0.105409  9.06094     0.0000
```

### Attribute Agreement Analysis

### Attribute Agreement Analysis for Sriyani1, Sriyani2, Sriyani3, Sahiroh1, ...

### Within Appraisers

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Sriyani             10         10   100.00  (74.11, 100.00)
Sahiroh             10          9    90.00  (55.50,  99.75)
Suci                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser agrees with him/herself across trials.
```

### Each Appraiser vs Standard

```
Assessment Agreement

Appraiser  # Inspected  # Matched  Percent       95% CI
Sriyani             10         10   100.00  (74.11, 100.00)
Sahiroh             10          9    90.00  (55.50,  99.75)
Suci                10         10   100.00  (74.11, 100.00)

# Matched: Appraiser's assessment across trials agrees with the known
standard.


Assessment Disagreement

Appraiser  # 1 / 0  Percent  # 0 / 1  Percent  # Mixed  Percent
Sriyani          0     0.00        0     0.00        0     0.00
Sahiroh          0     0.00        0     0.00        1    10.00
Suci             0     0.00        0     0.00        0     0.00


# 1 / 0:  Assessments across trials = 1 / standard = 0.
# 0 / 1:  Assessments across trials = 0 / standard = 1.
# Mixed: Assessments across trials are not identical.
```

### Between Appraisers

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with each other.


Fleiss' Kappa Statistics

Response     Kappa   SE Kappa        Z  P(vs > 0)
0         0.922068  0.0527046  17.4950     0.0000
1         0.922068  0.0527046  17.4950     0.0000
```

### All Appraisers vs Standard

```
Assessment Agreement

# Inspected  # Matched  Percent      95% CI
         10          9    90.00  (55.50, 99.75)

# Matched: All appraisers' assessments agree with the known standard.


Fleiss' Kappa Statistics

Response     Kappa  SE Kappa        Z  P(vs > 0)
0         0.955107  0.105409  9.06094     0.0000
1         0.955107  0.105409  9.06094     0.0000
```