

**PRELIMINARY PLANT DESIGN OF CHLOROFORM  
FROM ACETONE AND BLEACHING POWDER  
CAPACITY 19,000 TONNES PER YEAR**



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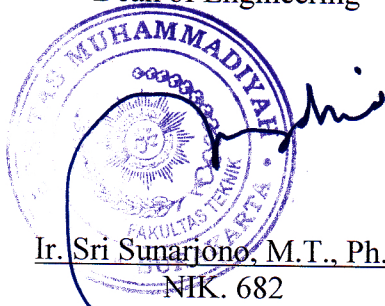
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# MOTTO

*“Things are more difficult if you don’t do them and only think of them, leading to complaints”*

*“Lucks are only for those who try and pray and believe in His way”*

*“Luck is the meeting of attempts and opportunity”*

*“Daring to start a story, daring to end it perfectly”*

*“God will give as we think, not as we imagine (the power of mindset)”*

*“the power of kepepet It is the rights of those who try hard, not those who stay quest and rely on being trapped”*

*“Identity will be formed when independence, honesty, and courage become inseparable unity”*

*“Mandates and responsibility always go hand in hand without exception”*

*“Everything will end if one gives up, everything will be beautiful if one perseveres and attack”*

*“No matter how many mottos touch one’s heart, it will be meaningless if they’re only touched then leave without any commitment to move”*

## DEDICATION

*I dedicate this work to:*

*Two angels from Allah who support my every breath, my beloved mother and father.  
Thank you for your prayers, support, love, sacrifice and education you've given. I can  
only give you my prayer and dedication for your love.*

*My beloved brother, Samsudin, S.pd., Anshory, Imam Kholiq and my beloved sister  
Isnaeni,Amd., Tri murni,Amd. who always gives support, advices, and support me to hang on.*

*Someone from another department (Mechanical Engineering), Angga Prihatmaja who always  
gives support.*

*All of my friends are ready for help me, as Yunianto, Hendra, Imala, Efany, Irfany, Rizky,  
Tika, Riya, Wury, Risma, Virman, Edo, Aziz, Sabda, Yulifan, Anik, Amiruddin, mbak Hartini.*

*CV. Image Design family who has given me an opportunity to look for knowledge and  
experience.*

*All of my students who brought color into my life.*

*Who gave various experiences Keluarga Mahasiswa Teknik Kimia and Solo Mengajar.*

*All of my classmates in the International class 2011 who gave me comfort when learning.*

*All of my friends from 2009, 2010, 2011, 2012, 2013 and all of people, who give me support  
until my final project are completed.*

*Thank's you for All...*

## **PREFACE**

All praises due to Allah SWT, because of his mercy and blessing this final project been completed. This report is one of requirements to pass the bachelor in chemical engineering.

The author realizes this report is not perfect due to our limited knowledge and experience, therefore advice and suggestion are welcome.

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5. Emi Erawati, S.T., M.Eng. as second supervisor of final project
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Authors wish this report to be beneficial to those may concern.

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Qomaroh

## THE TABLE OF CONTENT

|                                                   |      |
|---------------------------------------------------|------|
| COVER .....                                       | i    |
| VALIDATION .....                                  | ii   |
| STATEMENT OF AUTHENTICITY .....                   | iii  |
| MOTTO .....                                       | iv   |
| DEDICATION .....                                  | v    |
| PREFACE .....                                     | vi   |
| TABLE OF CONTENTS.....                            | vii  |
| LIST OF TABLE .....                               | viii |
| LIST OF FIGURES .....                             | ix   |
| ABSTRACT .....                                    | x    |
| CHAPTER I INTRODUCTION .....                      | 1    |
| 1.1. Background.....                              | 1    |
| 1.2. The Designed Production Capacity .....       | 1    |
| 1.3. Site Selection for the Manufacturer.....     | 4    |
| 1.4. Literature Reviews.....                      | 8    |
| 1.4.1 Types of the Processes .....                | 8    |
| 1.4.2 The Use of the Product .....                | 10   |
| 1.4.3 Physical and Chemical Properties .....      | 11   |
| 1.4.4 General Process Overview.....               | 17   |
| CHAPTER II PROCESS DESCRIPTION .....              | 19   |
| 2.1 Specification Raw Materials and Products..... | 19   |
| 2.1.1 Spesification of Raw Materials.....         | 19   |
| 2.1.2 Spesification Product .....                 | 19   |
| 2.2 Concept of Process .....                      | 20   |
| 2.2.1 Basic of Reaction.....                      | 20   |
| 2.2.2 Operation Condition .....                   | 20   |
| 2.2.3 Reaction Mechanism .....                    | 20   |
| 2.2.4 Thermodynamics Review .....                 | 21   |
| 2.2.5 Review Kinetics.....                        | 25   |

|                                           |                                            |    |
|-------------------------------------------|--------------------------------------------|----|
| 2.3                                       | Process Flow diagram .....                 | 28 |
| 2.3.1                                     | Process Flow Diagram.....                  | 28 |
| 2.3.2                                     | Production Process .....                   | 28 |
| 2.4                                       | Mass Balance and Heat Balance .....        | 33 |
| 2.4.1                                     | Mass Balance .....                         | 33 |
| 2.4.2                                     | Heat Balance.....                          | 38 |
| 2.5                                       | Factory and Process Equipment Lay Out..... | 43 |
| 2.5.1                                     | Factory Layout.....                        | 43 |
| 2.5.2                                     | Equipment Lay Out .....                    | 48 |
| CHAPTER III EQUIPMENT SPECIFICATION ..... |                                            | 52 |
| 3.1                                       | Acetone Storage Tank .....                 | 52 |
| 3.2                                       | Chloroform Storage Tank .....              | 52 |
| 3.3                                       | Reaktor .....                              | 53 |
| 3.4                                       | Mixer 01 .....                             | 53 |
| 3.5                                       | Distillation Column .....                  | 54 |
| 3.6                                       | Filter .....                               | 55 |
| 3.7                                       | Decanter .....                             | 56 |
| 3.8                                       | Heat Exchanger 01 .....                    | 56 |
| 3.9                                       | Heat Exchanger 02 .....                    | 57 |
| 3.10                                      | Heat Exchanger 03 .....                    | 58 |
| 3.11                                      | Heat Exchanger 04 .....                    | 59 |
| 3.12                                      | Heat Exchanger 05 .....                    | 60 |
| 3.13                                      | Heat Exchanger 06 .....                    | 61 |
| 3.14                                      | Condenser 01 .....                         | 63 |
| 3.15                                      | Reboiler 01 .....                          | 64 |
| 3.16                                      | Pump 01.....                               | 65 |
| 3.17                                      | Pump 02 .....                              | 65 |
| 3.18                                      | Pump 03 .....                              | 66 |
| 3.19                                      | Pump 04 .....                              | 66 |
| 3.20                                      | Pump 05 .....                              | 67 |
| 3.21                                      | Pump 06 .....                              | 67 |

|                            |                                            |     |
|----------------------------|--------------------------------------------|-----|
| 3.22                       | Pump 07 .....                              | 68  |
| 3.23                       | Pump 08 .....                              | 68  |
| 3.24                       | Pump 09.....                               | 69  |
| 3.25                       | Bin Bleaching powder .....                 | 69  |
| 3.26                       | Belt Conveyor 01.....                      | 70  |
| 3.27                       | Screw Conveyor Feeder 01 .....             | 70  |
| CHAPTER IV UTILITIES ..... |                                            | 71  |
| 4.1                        | The Process Supporting .....               | 71  |
| 4.1.1                      | Water Procurement Unit.....                | 72  |
| 4.1.2                      | Procurement Unit Steam.....                | 86  |
| 4.1.3                      | Power Supply Unit.....                     | 89  |
| 4.1.4                      | Procurement Fuel Unit.....                 | 93  |
| 4.1.5                      | Compressed Air Supply Unit.....            | 94  |
| 4.1.6                      | Waste Processing Unit.....                 | 94  |
| 4.2                        | Laboratory .....                           | 95  |
| 4.2.1                      | Laboratory Work Program.....               | 96  |
| 4.2.2                      | Analysis Method.....                       | 96  |
| 4.2.3                      | The Main Equipment of the Laboratory ..... | 97  |
| 4.3                        | Health and Safety at Work .....            | 97  |
| CHAPTER V MANAGEMENT ..... |                                            | 100 |
| 5.1                        | Format of The Company .....                | 100 |
| 5.2                        | Organizational Structure.....              | 102 |
| 5.3                        | Tasks and Authorities .....                | 104 |
| 5.4                        | Working Hours Allocation .....             | 107 |
| 5.5                        | Employee's Status and Wages System.....    | 109 |
| 5.6                        | Classification of Position.....            | 110 |
| 5.7                        | Employee's Social Welfare .....            | 114 |
| 5.8                        | Production Management.....                 | 114 |
| 5.9                        | Production Planning .....                  | 115 |
| 5.10                       | Production Control .....                   | 116 |

|                                                        |     |
|--------------------------------------------------------|-----|
| CHAPTER VI ECONOMIC ANALYSIS.....                      | 118 |
| 6.1 Equipment Prices Approximation .....               | 121 |
| 6.2 Basic Calculation .....                            | 123 |
| 6.3 Total Capital Investment (TCI) Determination ..... | 124 |
| 6.4 Result Calculation .....                           | 125 |
| 6.5 Feasibility Analysis .....                         | 131 |
| CHAPTER VII DISCUSSION AND CONCLUSION .....            | 133 |
| 7.1 Discussion .....                                   | 133 |
| 7.2 Conclusion .....                                   | 133 |
| REFERENCES .....                                       | xi  |
| Attachments                                            |     |

## LIST OF TABLE

|                                                                       |     |
|-----------------------------------------------------------------------|-----|
| Table 1.1 Import of Chloroform in Indonesia from 2006 until 2010..... | 2   |
| Table 1.2 The demand of Chloroform overseas at 2006 until 2010.....   | 3   |
| Table 1.3 Data of the capacity of the plants established abroad ..... | 4   |
| Table 2.1 Data of $\Delta H_f^0$ every component at 298 K .....       | 22  |
| Table 2.2 Data of Gibb's free energy every component at 298K .....    | 24  |
| Table 2.3 Mass balance Mixer01 (M-110).....                           | 33  |
| Table 2.4 Mass balance Reactor (R-110).....                           | 34  |
| Table 2.5 Mass balance Filter (H-110) .....                           | 34  |
| Table 2.6 Mass balance Decanter (H-210).....                          | 35  |
| Table 2.7 Mass balance Distillaation Column (D-110) .....             | 35  |
| Table 2.7 Total mass balance .....                                    | 36  |
| Table 2.8 Heat balance Reactor (R-110).....                           | 38  |
| Table 2.9 Heat balance Filter (H-110) .....                           | 38  |
| Table 2.10 Heat balance Decanter (H-001).....                         | 39  |
| Table 2.11 Heat balance Distillaation Column (D-110) .....            | 39  |
| Table 2.12 Heat balance Heat Exchanger 01 (E-110).....                | 39  |
| Table 2.13 Heat balance Heat Exchanger 02 (E-111).....                | 40  |
| Table 2.14 Heat balance Heat Exchanger 03 (E-210).....                | 40  |
| Table 2.15 Heat balance Heat Exchanger 04 (E-112).....                | 41  |
| Table 2.16 Heat balance Heat Exchanger 05 (E-211).....                | 41  |
| Table 2.17 Heat balance Heat Exchanger 06 (E-212).....                | 41  |
| Table 2.18 Total heat balance .....                                   | 46  |
| Table 2.19 Land area as manufacture plant .....                       | 45  |
| Table 4.1 Totals of water need.....                                   | 86  |
| Table 4.2 Procurement needs steam.....                                | 86  |
| Table 4.3 Power consumption for process and utillity.....             | 90  |
| Table 4.4 Power consumption for lighting.....                         | 91  |
| Table 4.5 Waste sources.....                                          | 95  |
| Table 5.1 The work schedules of each team .....                       | 109 |

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Table 5.2 Position classification, number of employees and salaries .....  | 111 |
| Table 6.1 Price of equipment is done by using a price index data 1991-2002 | 122 |
| Table 6.2 Indeks equipment price 2005-2012 .....                           | 122 |
| Table 6.3 Fixed Capital Invesment .....                                    | 125 |
| Table 6.4 Working Capital Investment .....                                 | 125 |
| Table 6.5 Direct Manufacturing Cost .....                                  | 126 |
| Table 6.6 Indirect Manufacturing Cost .....                                | 126 |
| Table 6.7 Fixed Manufacturing Cost .....                                   | 127 |
| Table 6.8 General Expense .....                                            | 127 |
| Table 6.9 Feasibility Analysis.....                                        | 131 |

## LIST OF FIGURES

|                                                                    |     |
|--------------------------------------------------------------------|-----|
| Figure 1.1 Graph need of chloroform in Indonesia.....              | 2   |
| Figure 1.2 Location to manufacture the plant .....                 | 7   |
| Figure 2.1 Schematic mechanism reaction modele of chloroform ..... | 21  |
| Figure 2.2 Flow diagram qualitative flow.....                      | 30  |
| Figure 2.3 Flow diagram quantitave .....                           | 31  |
| Figure 2.4 Flow mass balance .....                                 | 33  |
| Figure 2.5 Flow heat balance .....                                 | 37  |
| Figure 2.6 Plant lay out .....                                     | 47  |
| Figure 2.7 Lay out of equipment.....                               | 50  |
| Figure 4.1 Water treatment plant .....                             | 76  |
| Figure 5.1 Structure Organization in the Chloroform Plant.....     | 104 |
| Figure 6.1 Chemical Engineering Cost Index .....                   | 123 |
| Figure 6.2 Graph of Feasibility Analysis .....                     | 132 |

## ABSTRACT

Indonesia still has not built any chloroform plants. To meet the need of society for chloroform, Indonesia is still importing from other countries. The plant capacity is then determined to reach 19,000 tonnes/year in Cilegon, Banten.

Chloroform is produced by reactions acetone 1307.300 kg/year and bleaching powder 13073.002 kg/year. Using reactor which is equipped with agitator at temperature 50°C and pressure 1 atm also 2 hours for reaction. Besides being the main product, chloroform within reactor also produces calcium acetate  $\text{Ca}(\text{CH}_3\text{COO})_2$ , calcium hydroxide  $\text{Ca}(\text{OH})_2$ , calcium chloride  $\text{CaCl}_2$ . With area of plant 38,857 m<sup>2</sup>, total of water needs is 147 m<sup>3</sup>/hours, steam required is 2,506.886 kg/h, for electricity is 529 KW, fuel requirement is 82.79 L/h, this plant will start to produce in 2015.

The economic analysis concludes that fixed manufacturing cost (Fa) is 462,493,237,829. Variable cost (Va) is 7,852,508,693,058. Regulated cost (Ra) is 7,941,777,516,246. Selling product (Sa) is 19,629,796,640,852. ROI (Return on Investment) before and after tax is 94.811% and 66.36%. POT (Pay Out Time) before and after tax is 0.95 years and 1.31 years. BEP (Break-even Point) 45.75%, and SDP (Shutdown Point) 38.32%. While DCF (Discounted Cash Flow) as 35.61%. From the economic analysis, this plant is recommended to build.

Keywords : chloroform, acetone, bleaching powder.