

# TABLE OF CONTENTS

## BASIC ANALYSIS

About This Report.....	1
Executive Summary.....	3
About Hydrogen Chloride.....	6
Introduction.....	6
Commercial Forms & Applications.....	7
Hydrogen Chloride Production Pathways.....	8
Process Overview.....	9
Product(s) Generated.....	9
Process Inputs.....	9
Technology Maturity Assessment.....	10
Highlights & Remarks.....	12
Industrial Site.....	13
Introduction.....	13
Process Unit Description.....	15
Site Infrastructure Description.....	19
Key Process Input and Output Figures.....	23
Labor Requirements.....	23
Capital Investment.....	24
Fixed Capital.....	25
Working Capital.....	27
Additional Capital Requirements.....	28
Total Capital Investment.....	29
Operating Costs.....	30
Operating Variable Costs.....	32

Operating Fixed Costs.....	33
Depreciation.....	33
Total Operating Cost.....	33
Product Value Analysis.....	35
Corporate Overhead.....	36
Return on Capital Employed (ROCE).....	36
Process Economics Summary.....	37
Product Value Composition.....	37
Economic Datasheet.....	37
Economic Remarks.....	39
References.....	40
Analysis Methodology.....	41
APPENDIX A - ABOUT INTRATEC.....	A-1
APPENDIX B - TERMS & CONDITIONS.....	B-1
APPENDIX C - REPORT SHARING TERMS.....	C-1
APPENDIX D - EXTENDED ANALYSIS.....	D-1
Utilities Consumption Breakdown.....	D-2
Utilities Consumption Figures.....	D-2
Impact of Utilities on Operating Cost.....	D-3
Economic Analysis for Different Capacities.....	D-4
Introduction.....	D-4
Capital Investment Comparison.....	D-4
Operating Cost & Product Value Comparison.....	D-5
Project Implementation & Construction Schedule.....	D-7
Materials & Utilities Pricing Data.....	D-9
Analysis Pricing Basis.....	D-9
Historical Prices.....	D-9

## LIST OF TABLES

Economic Analysis Summary.....	5
Process Technology Maturity Scale.....	11
Raw Materials Consumption.....	23
Labor Requirements.....	23
Plant Cost Estimate Accuracy Range (USD Million).....	26
Owner's Cost Summary.....	26
Fixed Capital Summary.....	27
Working Capital Breakdown.....	27
Additional Capital Requirements Breakdown.....	28
Operating Variable Costs Breakdown.....	32
Operating Fixed Costs Breakdown.....	33
Operating Cost Summary.....	33
Corporate Overhead Costs Breakdown.....	36
Hydrogen Chloride Production from Hydrogen and Chlorine - Economic Datasheet.....	38
Process Contingency Factor Estimation Methodology.....	46
Project Contingency Factor Estimation Methodology.....	47
Fixed Capital Estimate Accuracy Range.....	51
Maintenance Cost Estimation Methodology.....	54
Marketing & Advertising Cost Estimation Methodology.....	56
Research & Development Cost Estimation Methodology.....	56
Expected ROCE Factor Estimation Methodology.....	57
Net Utility Consumption Rates (per mt of Hydrogen Chloride).....	D-2
Utilities Share in Total Operating Cost.....	D-3
Capital Investment Analysis for Different Capacities (MM USD).....	D-5
Operating Cost & Product Value Analysis for Different Capacities (USD/mt).....	D-6

\* Available in 'Extended' version only

Project Phases Schedule.....	D-7
Materials & Utilities Prices (United States, Q4'19).....	D-9

\* Available in 'Extended' version only

## LIST OF FIGURES

Hydrogen Chloride Production Pathways Diagram.....	8
Industrial Site Configuration.....	14
Block Flow Diagram - Manufacturing Process.....	16
Plant Cost Summary (USD Million).....	25
Capital Investment Summary (USD Million).....	29
Operating Cost Breakdown (USD/mt).....	34
Product Value Composition (USD/mt).....	37
Production Cost Report Development Methodology.....	42
Cost Contribution of Each Utility.....	D-3
Capital Investment (USD Million) Versus Plant Capacity.....	D-4
Operating Cost (USD/mt) Versus Plant Capacity.....	D-5
Implementation & Construction Schedule.....	D-8

\* Available in 'Extended' version only