

Inventory List of Chemicals

Confidential

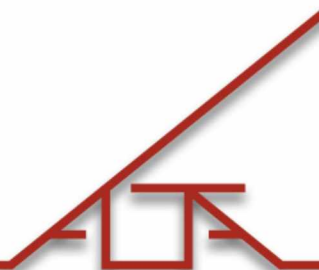
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1 Introduction

This document is prepared for the investigation of the requirements related to permits and legislation. Prior to construction the information in this document shall be reviewed and updated.

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2 Abbreviations and Nomenclature

As stated in Chapter 1 Introduction the chemical components are **strictly confidential**.

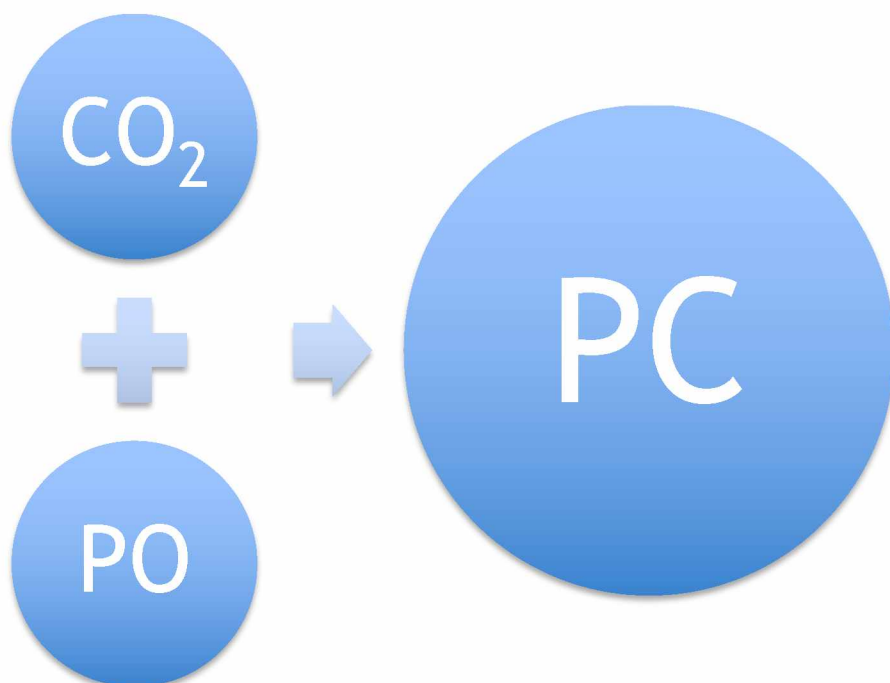
In the table below the synonyms, chemical components and abbreviation are summarized and can be used for clarification of other documents that are anonymised.

Synonym	Chemical Name	Abbreviation
Feedstock A	Propylene Oxide	PO
Feedstock B	Carbon Dioxide	CO ₂
Product	Propylene Carbonate	PC
Regenerant	Bromooctane	OctBr
Scrubbing agent	15% Sulfuric Acid	H ₂ SO ₄

In this document the abbreviations for the chemical component are used.

3 Overview process

The block diagram below shows the required feedstock and the product produced. The first plant will produce 2,320 ton/yr of PC. PC can be used as green chemical feedstock and solvent in many applications in the chemical industry.



Both CO₂ and PO are fed to a reactor. The reactor operates near atmospheric pressure with a temperature of 170°C. Under these conditions a catalyst is required in order to produce PC. In time, the catalyst deactivates and can be regenerated with OctBr.

The Material Safety Data Sheets of PO, CO₂, PC and OctBr are given in Chapter 6.

4 Feedstock, Product and Regenerant

4.1 Feedstock

The process will use 1,000 ton/yr of CO₂ and 1,230 ton/yr of PO. The feedstock is transported to the location of the plant with trucks and the frequency is approximately 1 truck per week for CO₂ and approximately 1 truck per week for PO. The feedstock is fed to the storage vessels of the installation.

4.1.1 CO₂ Storage

The CO₂ storage vessel (Storage Vessel Feedstock B with tag number V-102) has a total volume of 30.1 m³, with a maximum storage capacity of 28.6 m³ (29.5 ton) CO₂. CO₂ is stored at elevated pressure (18 barg) and at a temperature of -20°C.

4.1.2 PO Storage

The PO storage vessel (Storage Vessel Feedstock A with tag number V-101) has a total volume of 71.6 m³, with a maximum storage capacity of 67.4 m³ (56.3 ton) PO. PO is stored at a slight overpressure (1 barg) and at a temperature of 16°C (cooled with chilled water). The storage vessel is blanketed with inert gas (N₂).

PO storage is not applicable if PO is used that is already present at the location (pipe or storage vessel by others) and is transported to the location of Alta by piping.

4.2 Product

The process will produce 2,230 ton/yr of PC. PC is transported from the plant with trucks and the frequency is approximately 2 trucks per week to transport PC away from the installation.

The PC storage vessel (Storage Vessel Product with tag number V-103) has a total volume of 64.2 m³, with a maximum storage capacity of 60.8 m³ (72.1 ton) PC. PC is stored at a slight overpressure (0.2 barg) and at a temperature of 35°C. The storage vessel is blanketed with inert gas (N₂).

4.3 Regenerant

Make-up OctBr is packaged in drums and transported to the location of the plant by truck. Make-up OctBr is only present on the location during filling of the OctBr storage vessel (Regenerant Storage Vessel with tag number V-305). During normal operation make-up OctBr is not required, since it is reused in the process.

Reused OctBr is collected and stored in the OctBr storage vessel and has a total volume of 1.0 m³, with a maximum storage capacity of 0.7 m³ (0.9 ton) OctBr. OctBr is stored at atmospheric pressure and at a temperature of 100°C. The storage vessel is blanketed with inert gas (CO₂).

4.4 Scrubbing agent

A small waste gas stream containing mainly CO₂, will be lead through a caustic scrubber followed by an activated carbon bed removing any residual hydrocarbons. The expected waste gas stream of the plant is 2,3 grams per hour of PO.

5 Chemical content total installation

In the table below the maximum and normal chemical content of the total installation is given, divided in a storage section and production section. OctBr is stored in the production section, and therefore not present in the storage section.

		Storage Section		Production Section		Total Installation	
		Maximum	Normal	Maximum	Normal	Maximum	Normal
PO	[ton]	46.67	16.87	0.33	0.26	47	17.13
CO ₂	[ton]	29.5	19.2	0.02	0.02	29.5	19.3
PC	[ton]	68.4	6.5	23.6	18.5	92	25
OctBr	[ton]	-	-	2.7	1.9	2.7	1.9
H ₂ SO ₄	[ton]	-	-	0.9	0.9	0.9	0.9

6 MSDS

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