

OPERATING PERMIT - TECHNICAL SUMMARY
SITE OPERATING PERMIT - SOP
MINOR REVISION

Permit #:	O-02150	Company:	Huntsman Polymers Corporation
Project #:	10821	Site:	Odessa Facility - West Plant
Account #:	EB-0057-B	Application Area:	Odessa Facility - West Plant
Regulated Entity #:	RN101867554	Customer #:	CN600879712
Region:	7	County:	Ector
SIC Code:	2821	SIC Name:	Plastics Materials and Resins

Permit Reviewer: **Bonnie Barrera**

PERMIT INFORMATION

Was confidential information submitted?	No
Are any permits being reviewed for New Source Review action?	No
Is the application subject to acid rain permitting?	No

SITE INFORMATION

Physical Location: 2505 South Grandview Avenue
Nearest City: Odessa
Major Pollutants: VOC, PM, NOx, HAPS, CO
Additional FOPs: O-01230

PROJECT SUMMARY

Huntsman Polymers Odessa Facility - West Plant is a plastics materials and resins facility subject to 30 TAC Chapter 122 requiring the submission of a Federal Operating Permit application. Significant emissions at the site include flares, storage tanks, compressors, boilers, cooling towers, cracking furnaces, water separators, distillation units, heaters, reactors, wastewater treatment facilities, and loading facilities, all of which are subject to State and Federal Regulations. Some of the emission units at the facility are subject to Periodic Monitoring and are identified along with other applicable requirements. The permit includes Site-wide Terms and Conditions which were identified using information provided by the applicant in Form OP-REQ1, and Unit Specific applicable requirements which were identified using information provided by the applicant in various forms (Forms OP-SUM, OP-REQ2, and various Unit Attribute tables).

REVISION DESCRIPTION

A minor revision was received August 6, 2007 to add preconstruction authorization of NSR permit # 42112 to existing flare (unit ID EYPRCSFL). Additionally, an off permit notification was received August 1, 2007 to request addition of PBR 106.532 to the FOP.

PROCESS DESCRIPTION

The Olefins process uses ethane and propane to produce ethylene and propylene. Ethane and propane mix is separated by the ethane fractionator, from which the propane bottoms is sent to the propane fractionator, where propane is stripped overhead as a propane cracking furnace feed.

Propane/propylene (P/P) mix is sent to a heat exchanger and into the arsine removal beds to remove trace quantities of arsine, which is a polyolefins catalyst poison even in ppb levels. The P/P mix material is sent to the dryers to remove water by adsorption before moving to the predeethanizer column.

The ethane and propane from the Feed Fractionation system are sent to the cracking furnaces to be co-cracked with recycle ethane and recycle propane. Steam and dimethyl disulfide (DMDS) or dimethyl sulfide (DMS) are added to the cracking furnaces feed to minimize coke.

The cracked gas or cracking furnace effluent is sent to the quench tower to stop the reaction process. The quench tower's bottoms flow by gravity into an enclosed oil/water separator, where heavy oil is removed from the quench water, and either burned in C Boiler, or sent offsite. Filters and a coalescer remove most of the entrained hydrocarbons and coke fines in the quench water blowdown. Quench water blowdown and spent caustic combine to feed a water stripper, from which the bottoms are sent to the cold lime treater, to be used as cooling tower make-up. The cooling tower blowdown is sent to an offsite POTW.

After the quench towers, the cracked gas is sent with the recycle propylene from the polymers plant and recycle from the olefins process fractionation to the Cracked Gas Compressor train, consisting of a booster compressor followed by parallel four-stage cracked gas compressors. The cracked gas leaving the fourth-stage discharge compression drum is fed to the Gas Treating unit, where it is contacted counter-currently with a caustic solution. The spent caustic is sent to the water treatment stripper. The overheads from the acid gas removal column contain acetylene, a by-product of the cracking process, which is removed by catalytic hydrogenation in a vapor phase two-stage reactor system.

From the acetylene removal facility, the gas is dried in the vapor dryer system, comprised of three vessels containing molecular sieves. Two of the vessels are in operation at any one time while the other is being regenerated or in standby.

From the Gas Treating unit, the cracked gas is sent to the feed chilling system to be chilled against propylene refrigeration. The vapors are sent to the advanced recovery system (ARS), which produces impure ethylene for export, liquid feed for the demethanizer column, fuel gas, and hydrogen. Some hydrogen is sent offsite by pipeline for purification. The liquid from the feed chilling system is sent to the predemethanizer, where it is separated into an overhead of H₂/methane stream and a bottoms of ethylene plus material.

The demethanizer will receive material from both the ARS and the prefractionator column overheads to separate out the ethylene plus material. The demethanizer overhead product is sent back to the ARS for heat recovery and is used as fuel to the cracking furnaces. The ethylene plus material in the bottoms is sent to the deethanizer column.

The bottoms material from the prefractionator (or predemethanizer) is sent to the deethanizer along with bottoms from the demethanizer. The deethanizer will separate into an overhead of ethylene and a bottoms of propylene plus material. The deethanizer bottoms product is pressured to the primary depropanizer. The overhead product feeds both the ethylene towers and the recycle ethylene tower.

The ethylene tower produces a polymer grade ethylene overhead product and an ethane bottoms product. The bottoms of the ethylene tower is recycled to the cracking furnaces, and the ethylene product from this tower is pressurized and either sent by pipeline to the onsite Polyethylene Plants or pressure loaded for off-site sales.

The recycle ethylene tower receives feed from the deethanizer overhead and recycle from the polymers facility onsite. The recycle ethylene stream may contain vinyl acetate, which is separated in this tower as the bottoms and then stripped further by the VA stripper. The resulting vinyl acetate/

heptane is stored in pressure vessels and either sent offsite or burned at C Boiler. Overhead vents from the recycle ethylene tower and the VA stripper are recycled to the Cracked Gas Compressor unit.

The P/P mix material is sent to the predeethanizer to separate out the ethane. Overheads ethane is recycled to the Cracked Gas Compressor unit, and the bottoms material is sent to the primary depropanizer along with the bottoms product from the deethanizer.

The primary depropanizer separates the propane and lighter components (in the overheads) and the butane and heavier components (bottoms). The primary depropanizer overhead is condensed against cooling water and the liquid is pumped to the C3 hydrogenation system. The bottoms of the primary depropanizer are fed to the debutanizer. C3 hydrogenation is a vapor phase single-stage reactor system using purified hydrogen and regenerated by the Yuba heater.

The propylene stripper processes propylene recycle from the polymer units. The feeds are separated into an overhead ethane stream and bottoms propylene plus stream. The overheads are recycled back to the Cracked Gas Compressor unit. The bottoms product, containing propane and propylene, is pumped to the propylene tower along with a stream from C3 hydrogenation.

The propylene tower is fed with hydrogenated propylene material, and the polymer grade propylene is taken as an overhead liquid product, then sent to the polypropylene facilities on site or to storage. The bottoms propylene is recycled to the crackers.

The primary depropanizer bottoms is sent to the debutanizer, which separates out the C3's from the higher boiling point material. The C3 components (the overheads) are then sent to the secondary depropanizer. The C4 plus bottoms, or debutanized aromatic concentrate, is sent to bullet storage to be sent offsite.

The secondary depropanizer receives the debutanizer overheads to strip out the C4 and lighter material, which is recycled back to the cracked gas compressors. The C4 plus bottoms, or butadiene butylene concentrate, is pressurized to storage, and the BBC is pump loaded into railcars.

TECHNICAL REVIEW

The draft permit was submitted to the applicant on: August 16, 2007

Did the applicant comment on the draft permit?

If yes briefly describe the comments and the changes made to the draft permit (if applicable).

MANUAL CHANGES TO PERMIT None

EMISSIONS BANKING AND TRADING PROVISIONS (Pursuant to 30 TAC Chapter 101, Subchapter H)

Is the site/permit area located in the Houston/Galveston ozone non-attainment area (as defined in 30 TAC Chapter 101, §101.1): No

COMPLIANCE ASSURANCE MONITORING (CAM)/ PERIODIC MONITORING (PM)

A review of the permit added additional CAM/PM for the following emission sources subject to the identified regulations: None

STATEMENT OF BASIS

A Statement of Basis sets forth the legal and factual basis for the permit conditions.

The Statement of Basis was prepared on: August 16, 2007

The Statement of Basis GroupWise Document #(OPDP Database):

PUBLIC ANNOUNCEMENT/EPA REVIEW

Posting Date:

Did the public comment on the working draft permit?

Beginning of the EPA Review Period:

Did the EPA comment on the proposed permit?

Discuss any changes to the Applicable Requirements that are not in agreement with the results generated by the RRT, or changes to the Terms and Conditions generated by the IMS in the 'Manual Changes to Permit Section' of the Technical Summary. **DELETE this sentence when EPA Review is completed.**

PUBLIC PETITION PERIOD/FINAL STATE ACTION

Effective permit issuance date:

Bonnie Barrera
Permit Reviewer
Operating Permits Section
Air Permits Division

Tanveer Anjum, P.E.
Team Leader
Operating Permits Section
Air Permits Division

ATTACHMENTS

IMS Tracking Elements
Communication Log
Administrative Data

IMS TRACKING ELEMENTS

COMMUNICATION LOG

Company Name	Application Area	Air Account Number	Regulated Entity Number	IMS Project Number
Huntsman Polymers Corporation	Odessa Facility - West Plant	EB-0057-B	RN101867554	10821

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ADMINISTRATIVE DATA

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