STYRENE PARK OFFSITE

Document Title:

Process Description

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R0	21-Feb-2024	Issue For Information	M. Hosseini	E. Malek	H. Keshmiri

REVISION RECORD SHEET

Page	Revisions								Page	Revisions						
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1. Introduction

Creation and development of chain units of Styrene Monomer is the mission of Gohar Ofogh Industrial Park. This Company joint investment of four companies including JPC, Asaluyeh Sadaf Chemical, Kimia Sanaye Dalahoo and Entekhab Group and is located in Assaluyeh.
Feed and utility lines and network construction, a Styrene Monomer tank construction, Peroxide and its sidelong equipment warehouse are among this company's missions.
Some of the ongoing Projects of this company are:

- ABS-Rubber project
- ESBR project
- EPS project
- Poly Styrene

Utility services of Park Styrene, including DM water, HP steam, service water, potable water, cooling water make up, nitrogen, instrument air, plant air and fuel gas are provided by Damavand Petrochemical and delivered at the south battery limit of park styrene. COC, POC, SN, Condensate return and cooling blow down are returned from park styrene and return to Damavand Petrochemical.

2. Definitions

Project: Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE
Owner: Gohar Ofogh Industrial Park
Contractor: Bina EPC Contractor Co.
Location: Assaluyeh zone, Boushehr province, IRAN

3. Site Environmental Conditions & Utilities

This package was installed outdoors. Outdoor conditions are according to the below table:

Outdoor Conditions	
Max. Ambient Design Temperature	85ºC
Expected Extreme Temperature	52ºC
Min. Ambient Temperature	5ºC
Max. Relative Humidity	80%
Min. Relative Humidity	65%

4. Design Data

Each row of filters flowrate is according to the below:

- Operating flowrate: 1080 Nm3/h
- Design flowrate: 1188 Nm3/h

For more process and mechanical information about equipment's refer to reference documents.

5. Process Description

In air pollution control, activated carbon is the most widely used adsorbent. Activated carbon is the most suitable adsorbent for the removal of organic vapor.

Polluted air vented from the styrene storage tanks TK-0001A/B, is diluted with air and sucked by the blower B-0001A~D. The effluent will be routed to activated carbon filters (PK-0001-F1 & PK-0002-F1) (one filter for each storage tank) for minimization of styrene emission. The Active Carbon Filter Package is designed to eliminate VOC impurities (mostly styrene).

Activated carbon is a microporous inert carbon matrix with a very large internal surface (700 to 1500 m^2/g). The internal surface is ideal for adsorption.

The gas stream is passed through the activated carbon, where the to be-removed components bond with the activated carbon via adsorption, until it is saturated. Once the activated carbon's saturation level has been reached, it is replaced.

A cartridge filter is a type of filter used to remove impurities and particles from liquids or gases. It consists of a cylindrical or pleated filter element housed in a casing of various materials, such as paper, polyester, or cotton.

The principle of working a cartridge filter is based on the physical process of filtration. It involves the separation of solids from liquids or gases by passing them through a porous medium.

When contaminated gas flow into the cartridge filter (PK-0001-F2 & PK-0002-F2), it enters the filter housing through an inlet port and then passes through the filter element.

The gas flow through the pores of the filter element. The filter traps the solid particles larger than the component's pore size on the surface.

A specific micron rating is vital while designing the cartridge. It determines the size of particles that the filter can capture.

A cartridge type filter will be considered in downstream of active carbon filters to eliminate solid particles larger than 5 microns from the gas stream before venting to atmosphere. The cartridge filter is capable of retaining 95% of particles larger than 5 microns.

6. Reference Document

- Piping & Instrumentation Diagram (P&ID) [EI0127-HRC-VD-PR-PID-003]
- Process Flow Diagram (PFD) [EI0127-HRC-VD-PR-PID-002]
- Equipment Data Sheet-Active Carbon Filter [EI0127-HRC-VD-ME-DSH-001]
- Equipment Data Sheet-Cartridge Filter [EI0127-HRC-VD-ME-DSH-002]