

400 Area

PURIFICATION AREA 400

Crude EDC containing water, lights, and heavies from the direct and oxyhydrochlorination units, and recycled EDC containing lights and heavies from the cracking unit are fed to the EDC purification section. This unit removes the lights, heavies, and water contained in these feeds to yield EDC at minimum specified purity of 99.1% for sale (usually to VCM #2) or for conversion to vinyl chloride in the cracking unit.

In the following sections the terms "lights" and "heavies" will be used to denote a group of components. Lights will be components with boiling points lower than EDC and higher than VCl, while heavies will denote components with boiling points higher than EDC.

The EDC purification unit consists of four distillation columns with their related equipment. The columns are:

Heads column	AS-401
Lights column	AS-402
High Boil column	AS-403
Vacuum column	AS-404

Crude wet EDC from the direct and oxyhydrochlorination units is stored in the wet EDC storage tank (MF-701). This crude EDC which is fed to the heads column is saturated with water and contaminated with lights and heavies. The purpose of the Heads Column is to remove lights and water from the EDC and heavies. A water-EDC azeotrope and lights are distilled overhead in the column. The water-EDC azeotrope is condensed in the condenser and collected in the reflux drum, where it separates into two phases due to differences in specific gravities. The water (top layer) is drained from the reflux drum to a decant tank, then pumped to the waste water separator. The bottom layer is pumped to the top tray of the column as reflux. Some lights are vented from the condenser and reflux drum to the Heads Vent Blower, then pumped to the incinerators. Dry

EDC and heavies from the bottom of the heads column are then directed as feed to the Hi-boil column.

Make a process flow diagram of the 400 area using a P&ID for reference. Show control valve locations and learn the function of the area and each major piece of equipment.

The purpose of the Hi-boil column is to separate the Heavies from the EDC. In this column EDC is distilled up and recovered in an overhead pasteurization cut (27 Tray draw). The pasteurization section as referred to in the high boil column is that section of the column above the product tray in which the lower boiling impurities are allowed to concentrate. The EDC product is drawn off of the 27th tray and sent to the furnace feed drum. In the bottom of the column the heavies, diluted with EDC, are drawn off as feed to the vacuum column.

The vacuum column receives a diluted heavies stream from the bottom of the Hi-boil column (6 to 10% heavies) and concentrates the heavies in the bottom for disposal. EDC overhead product from the vacuum column is recycled back to the final wash tank, then to the crude tank.

Dry EDC recycle, with lights and heavies, from the VCI column bottom in the cracking unit is fed to the lights column where the by-product lights are removed as overhead vapors from the reflux drum. Dry EDC, containing heavies, from the bottom of the lights column is combined with the bottoms from the heads column and fed to the Hi-boil column. Product EDC is recovered as noted above.

The following is a list of 400 area equipment names and corresponding numbers:

	NAME:	NUMBER:
1.	Heads Column Reboiler	TT-401A/B
2.	Heads Reflux Condenser	TT-402
3.	Heads Column Reflux Drum	MS-401
4.	Heads Reflux EDC Head Tank	MS-408
5.	Heads Decant Water Tank	MS-407
6.	Lights Column Reboiler	TT-404A/B
7.	Lights Reflux Condenser	TT-405
8.	Lights Column Reflux Drum	MS-402
9.	HiBoil Column Reboiler	TT-407A/B
10.	Furnace Feed Drum	MS-403
11.	Side Stream Cooler	TT-412
12.	HiBoil Reflux Condenser	TT-408
13.	HiBoil Reflux drum	MS-406
14.	EDC Product Cooler	TT-41
15.	Vacuum Column Reboiler	TT-409
16.	Vacuum Reflux Condenser	TT-410
17.	Vacuum Column Reflux Drum	MS-404
18.	Heavy Ends Tank	MF-613
19.		

20.	PUMPS:	
*	Heads Column Bottom Pump	PP-401
*	Heads Column Reflux Pump	PP-402A/B
*	Heads Decanter Pump	PP-411A/B
*	Heads Vent Vacuum Pump	PP-412A/B
*	Lights Column Bottom Pump	PP-403A/B
*	Lights Column Reflux Pump	PP-404A/B
*	Hi-Boil Column Bottoms Pump	PP-405
*	Hi-Boil Column Reflux Pump	PP-406A/B
*	Furnace Feed Pump	PP-407A/B
*	EDC Produce Pump	PP-703A/B
*	Vacuum Column Bottom Pump	PP-408
*	Vacuum Column Reflux Pump	PP-409
*	Vacuum Column Bottom Pump	PP-410
*	Vacuum Column Recirc. Pump	PP-415
*	Vacuum Pump (W)	PP-422
*	Vacuum Pump (E)	PP-423
*	Vacuum bottom Loading Pump	PP-413