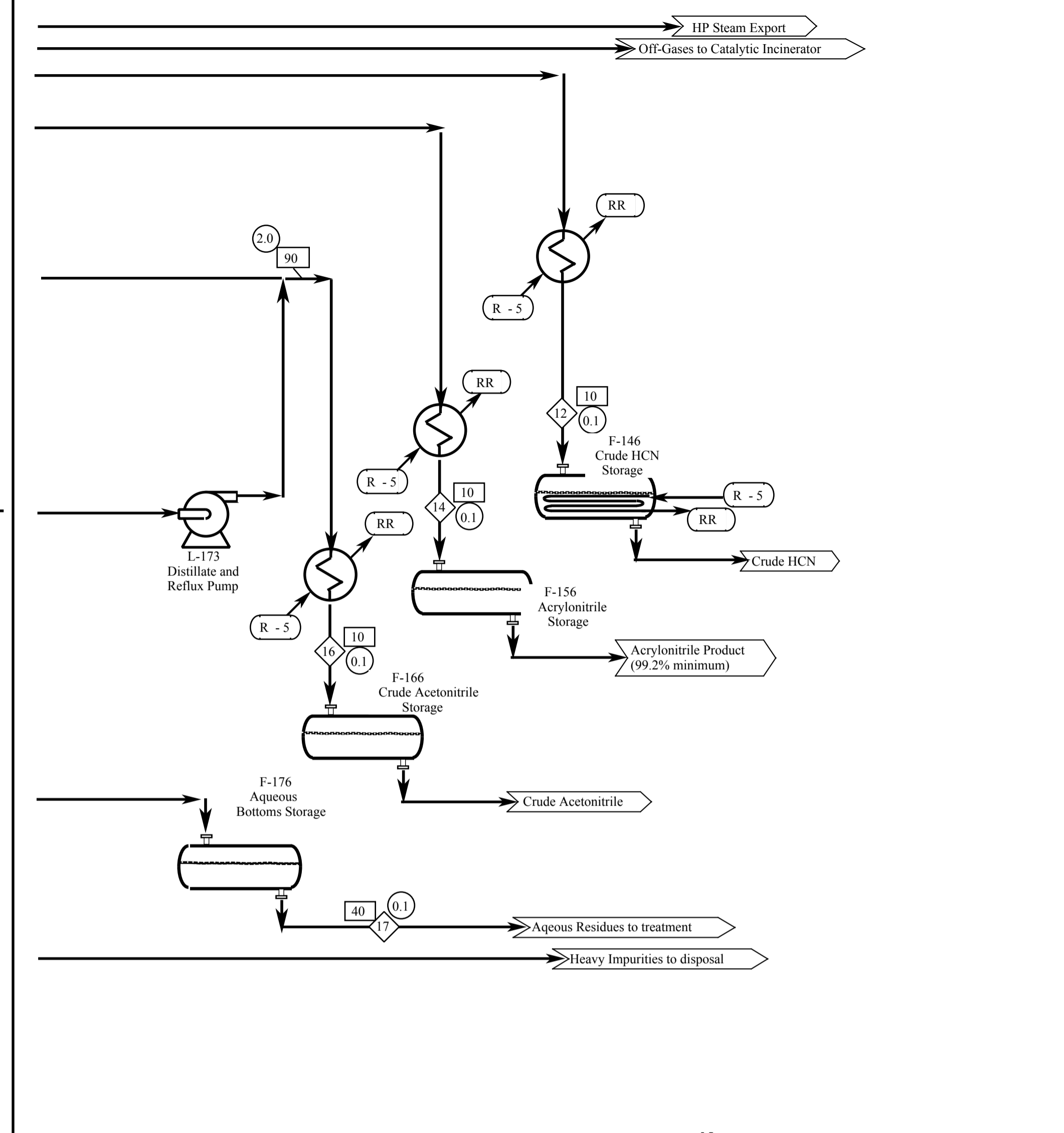
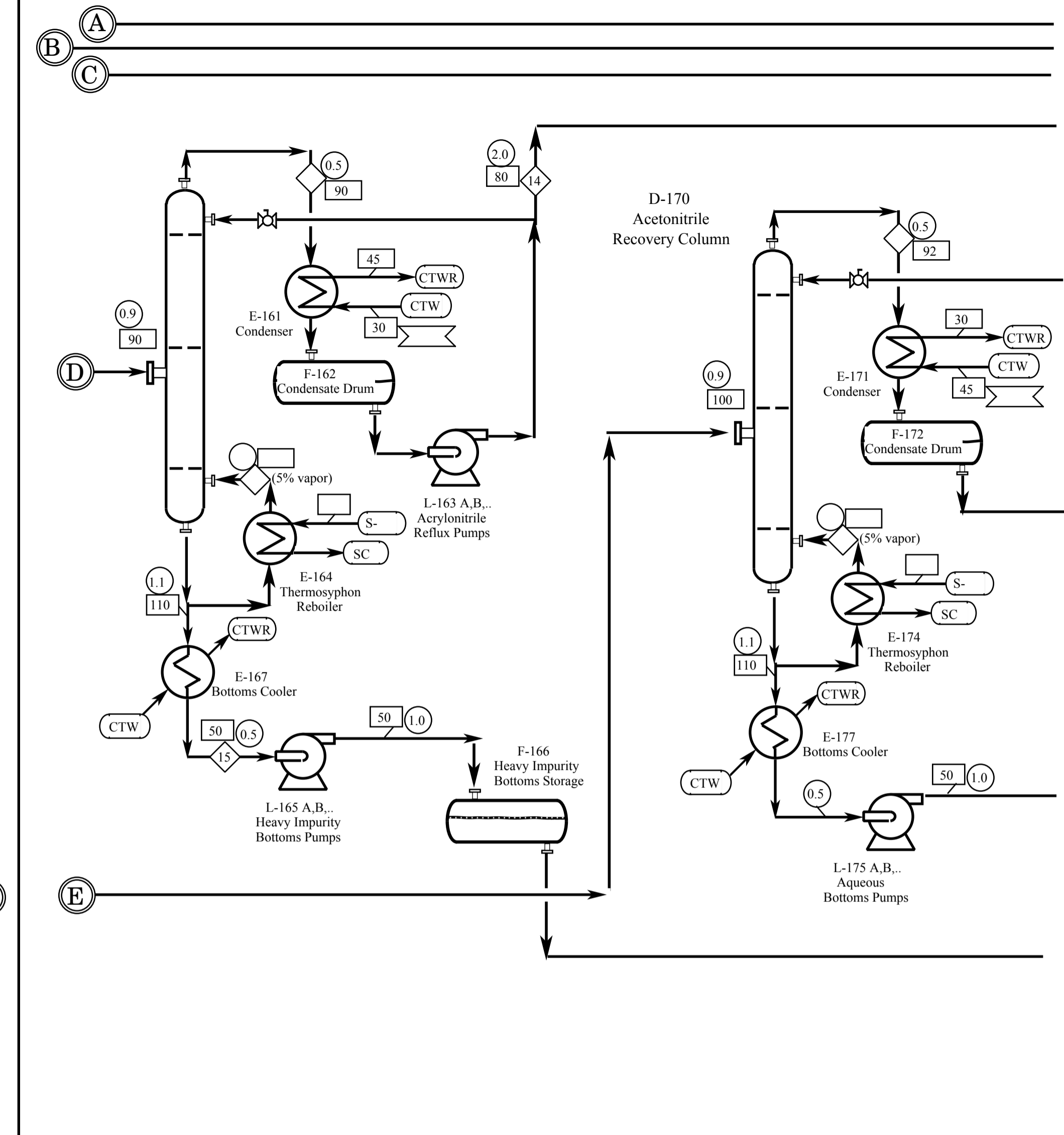
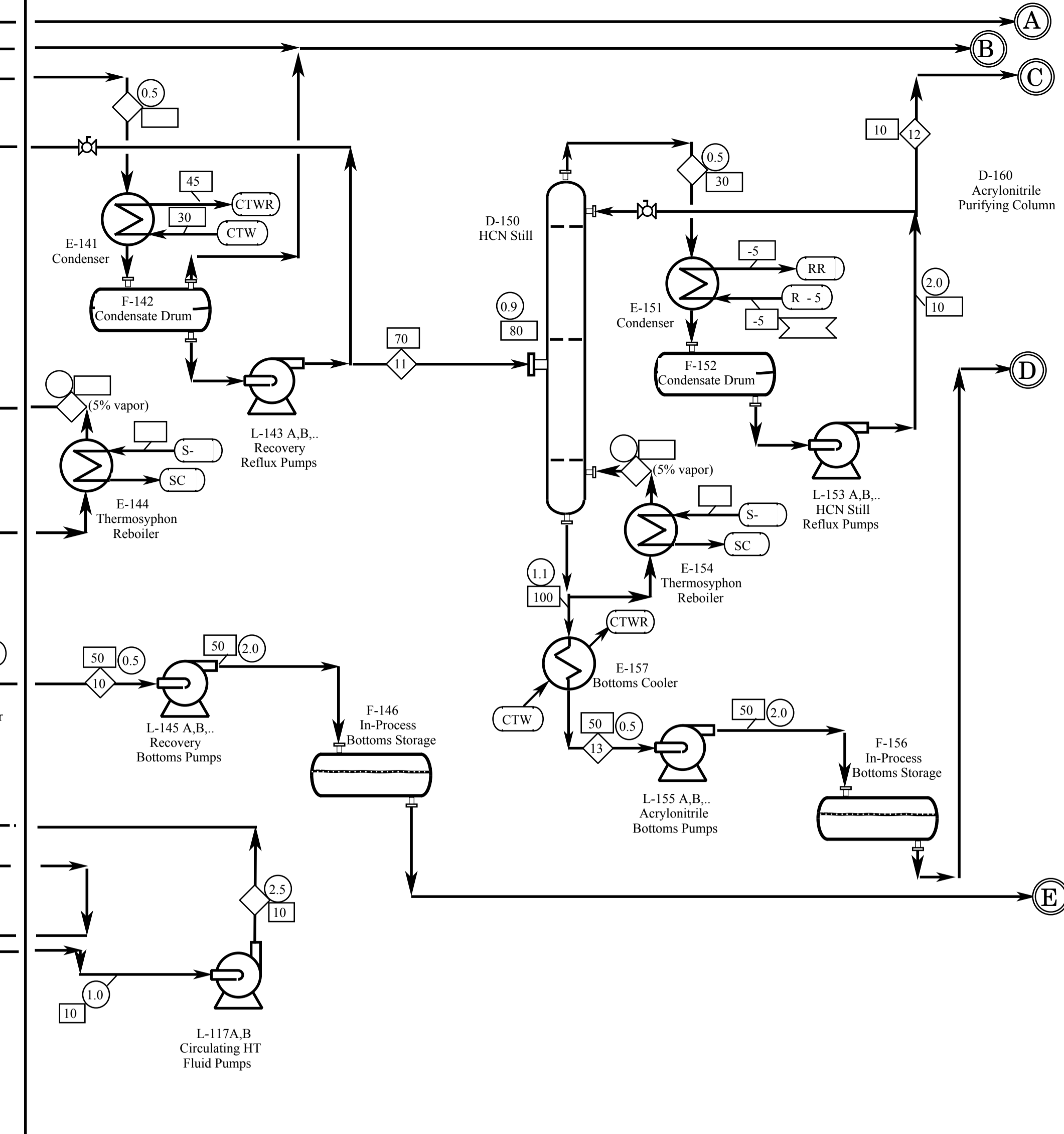
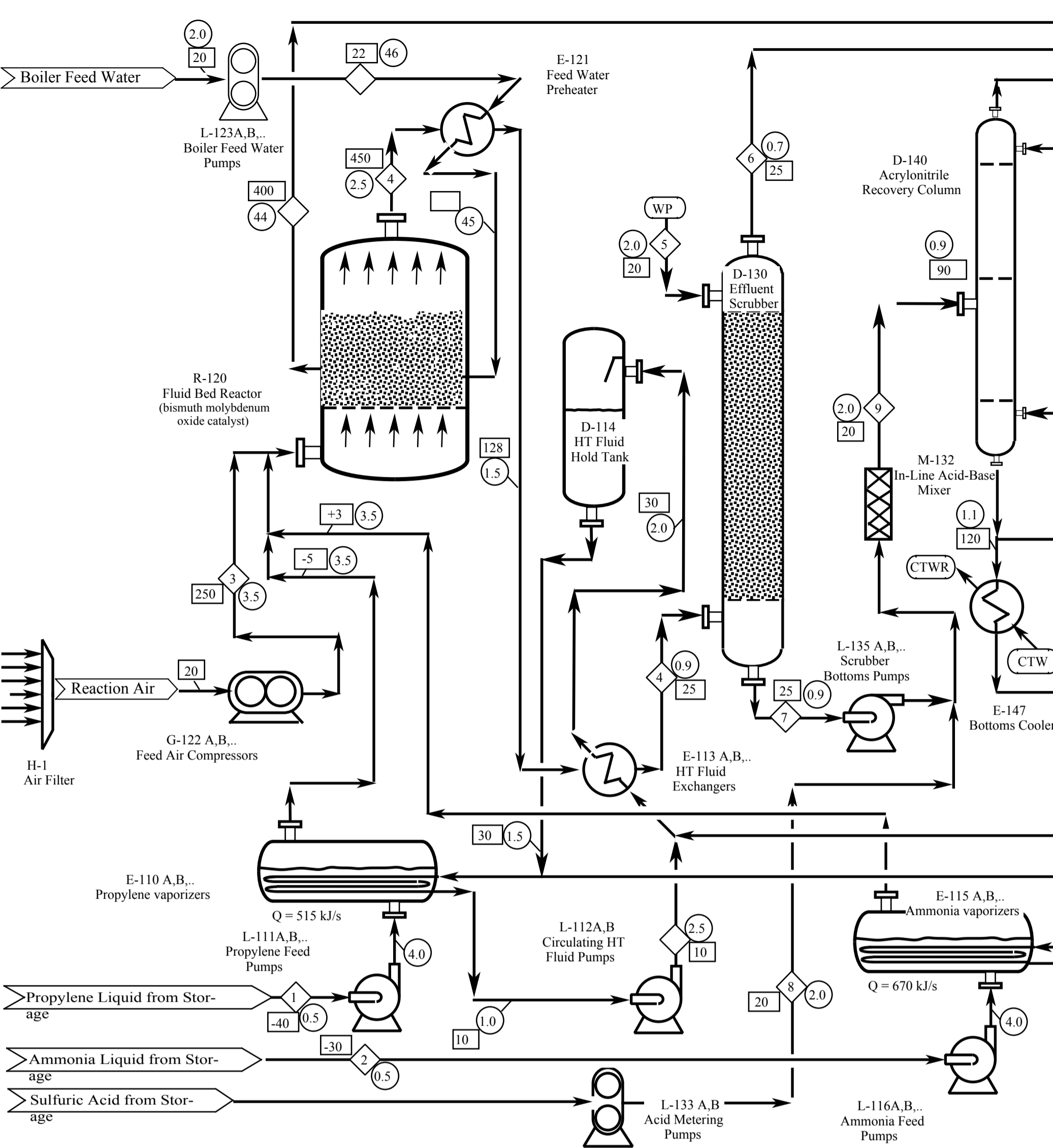


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Stream Chart/Mass Balance (kg/s)

Component	Stream 1 (m.w.)	Stream 2 Propylene Feed	Stream 3 Ammonia Feed	Stream 4 Air Feed	Stream 5 Reactor Effluent	Stream 6 Scrub Water	Stream 7 Vent Gases	Stream 8 Scrub Bottoms	Stream 9 Sulfuric Acid	Stream 10 Neutralized Crude	Stream 11 Recovery Bottoms
C ₃ H ₆ (propylene)	42	1.100			0.164	0.160	0.004			0.004	0.000
NH ₃ (ammonia)	17		0.445		0.049		0.001	0.048			
O ₂ (oxygen)	32			1.260							
N ₂ (nitrogen)	28			4.140	4.140	4.140				1.000	0.020
C ₃ H ₃ N (acrylonitrile)	53				1.002	0.002	1.000			1.000	0.020
HCN (hydrogen cyanide)	27				0.100	0.0002	0.0998			0.0998	0.0050
C ₂ H ₃ N (acetonitrile)	41				0.029	0.0001	0.0289			0.0289	0.0285
H ₂ O (water)	18			0.060	1.336	24.000	0.206	25.130	0.360	25.490	25.485
CO (carbon monoxide)	28				0.073		0.072	0.001		0.001	0.0010
CO ₂ (carbon dioxide)	44				0.114		0.110	0.004		0.004	0.004
H ₂ SO ₄ (sulfuric acid)	98							0.140			
(NH ₄) ₂ SO ₄	132									0.190	0.190
Total		1.100	0.445	5.460	7.007	24.000	4.691	26.316	0.500	26.818	25.734
Vapor Mole Fraction	0.0	0.0		1.0	0.0	1.0	0.0				
Liquid Density@25°C(kg/m ³)	600	650			1000		1000				
Heat Capacity (kJ/kg °C)				1.0	1.1		1.1				
Heat of Vaporization (kJ/kg)		470	1270								

Key

- Material Balance (kg/s)
- Point Temperature; C
- Liquid Flow Rate; liter/s
- Gas Flow Rate; std cubic meter/s
- Molar flow (kgmole/s) also Utilities Designation Symbol
- Pressure; bar (gage)
- Pressure; kPa (gage)

Process Flow Diagram

Acrylonitrile Production Process
(kg/year)

Drawn: Feb 2002 By: G.Ulrich
Rev: 2 Dec 2003 G.Ulrich
Rev: Sheet 1 of 2

Stream Hazard Chart

Compound	mw	CAS No.	Melting Point, °C	Flash Point, °C	Boiling Point, °C	Liquid Density, kg/m ³
C ₃ H ₆ (propylene)	42					
NH ₃ (ammonia)	17					
O ₂ (oxygen)	32					
N ₂ (nitrogen)	28					
C ₃ H ₃ N (acrylonitrile, vinylcyanide)	53	107-13-1	-83	0	77	806
HCN (hydrogen cyanide, hydrocyanic acid)	27	75-05-8	-14		26	700
C ₂ H ₃ N (acetonitrile)	41		-88	5	82	786
CO (carbon monoxide)	28					
CO ₂ (carbon dioxide)	44					
H ₂ SO ₄ (sulfuric acid)	98					
(NH ₄) ₂ SO ₄	132					

Key

- Material Balance (kg/s)
- Point Temperature; C
- Liquid Flow Rate; liter/s
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- Molar flow (kgmole/s) also Utilities Designation Symbol
- Pressure; bar (gage)
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Process Flow Diagram

Acrylonitrile Production Process
(kg/year)

Drawn: Feb 2002 By: G.Ulrich
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Flammability	Toxicity					
	Highly Poisonous?	Toxin?	Carcinogenic?	Mutagenic?	Irritating?	Corrosive?
high	yes	suffocation hazard			no	no
moderate		yes			strongly	moderately
powerful oxidant					no	sometimes
non		suffocation hazard			no	no
high	yes		yes	yes	yes	
high	yes	yes				
high	yes				no	no
non		suffocation hazard			no	no
powerful oxidant		yes			strongly	strongly