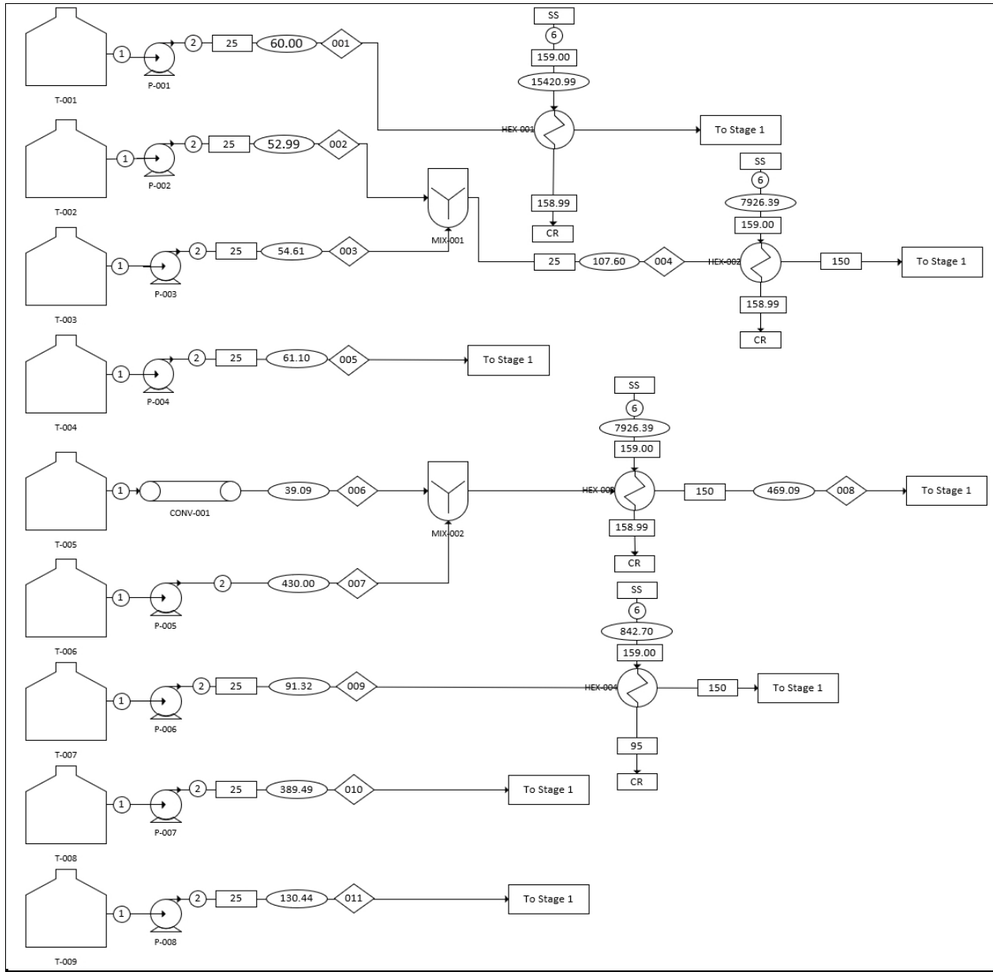

Stream Identification No.	001	002	003	004	005	006	007	008	009	010	011
Stream Description											
	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%
Component Formula											
2,4,5-trifluorobenzoylchloride C7H2F3Cl	100	0	0	0	0	0	0	0	0	0	0
Ethyl 3-(Dimethylamino)acrylate C7H13O2N	0	100	0	49.2	0	0	0	0	0	0	0
N,N-Diisopropylethylamine	0	0	100	50.8	0	0	0	0	0	0	0
Cyclopropylamine	0	0	0	0	100	0	0	0	0	0	0
Piperazine	0	0	0	0	0	100	0	8.3	0	0	0
Methyl sulfoxide	0	0	0	0	0	0	100	91.7	0	0	0
Tetrabutylammonium hydroxide	0	0	0	0	0	0	0	0	60	0	0
Water	0	0	0	0	0	0	0	0	40	0	0
1M HCl	0	0	0	0	0	0	0	0	0	100	0
2-methyltetrahydrofuran	0	0	0	0	0	0	0	0	0	0	100
Total Mass Flow Rate (kg/hr)	60.00	52.99	54.61	107.60	61.10	39.09	430.00	469.09	91.32	389.49	130.44
Total Molar Flow Rate (kmol/hr)	0.31	0.37	0.42	0.79	1.07	0.45	5.50	5.96	2.24	10.68274	1.160982
Max Pressure (atm)	2	2	2	2	2	1	2	2	2	2	2
Max Temperature (C)	150	25	25	150	25	25	25	150	150	25	25

NOTES:

CWS - Cool water supply
CWR - Cool water return
SS - Steam supply
CR - Condensate Return

LEGEND

- Stream Number
- Mass Flow (kg/hr)
- Temperature (C)
- Pressure (atm)

REVISIONS

REV	DATE	DESCRIPTION
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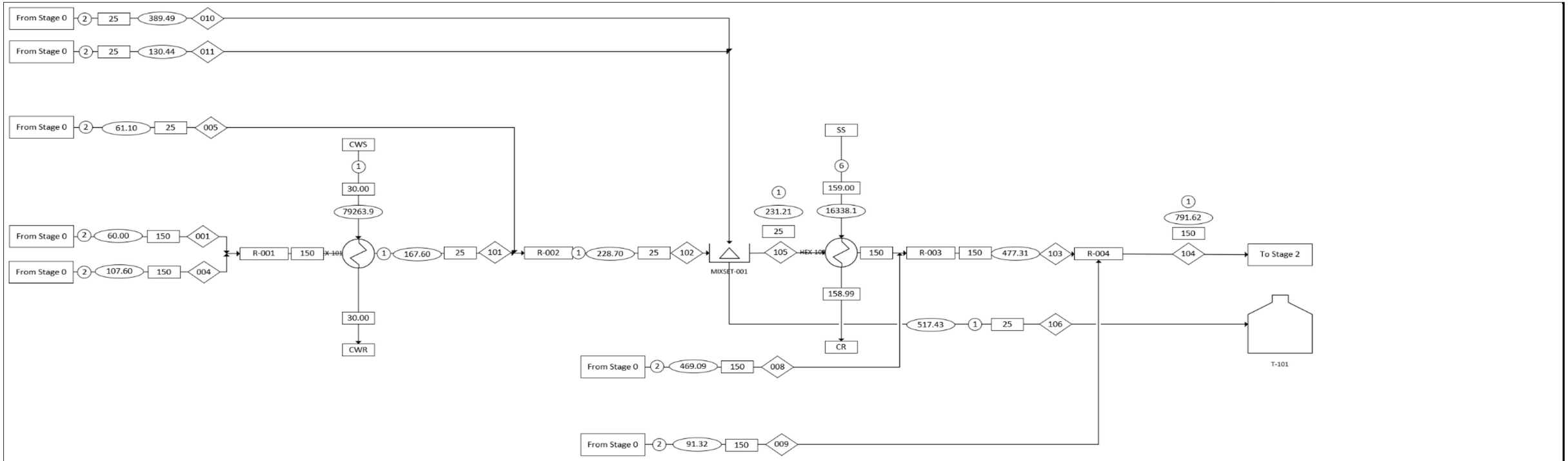
DEPARTMENT OF
CHEMICAL ENGINEERING

COURSE NO.	DRAWN BY	DATE
CHE 487	ELIOT S.	3/25/2022

Group: 05 | PROCESS FLOW DIAGRAM

DRAWING TITLE: Feed Storage and Preparation - Stage 0 | REV. C



Stream Identification No.	001	004	005	008	009	010	011	101	102	103	104	105	106
Stream Description													
	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%
Component Formula													
2,4,5-trifluorobenzoylchloride	100	0	0	0	0	0	0	1.4	1.0	1.7	1.5	1.0	0
Ethyl 3-(Dimethylamino)acrylate	0	49.2	0	0	0	0	0	6.3	4.6	0	0	0	2.0
N,N-Diisopropylethylamine	0	50.8	0	0	0	0	0	9.8	7.1	2.3	2.1	7.1	0
N,N-Diisopropylethylamine HCl	0	0	0	0	0	0	0	29.3	21.5	0	0	0	9.5
Cyclopropylamine	0	0	100	0	0	0	0	0	19.7	0	0	0	8.7
Piperazine	0	0	0	8.3	0	0	0	0	0.0	2.7	2.4	0	0
Methyl sulfoxide	0	0	0	91.7	0	0	0	0	0	61.4	54.3	0	0
Tetrabutylammonium hydroxide	0	0	0	0	60	0	0	0	0	0	11.5	0	0
ethyl 3-(dimethylamino)-2-(2,4,5-trifluorobenzoyl)prop-2-enoate	0	0	0	0	0	0	0	53.2	2.0	0.7	0.6	2.0	0.9
3-Cyclopropylamino-2-(2,4,5-trifluorbenzoyl)acrylsaeure-ethylester	0	0	0	0	0	0	0	0	38.4	0.6	0.5	33.5	2.0
1-cyclopropyl-6-fluoro-4-oxo-7-(piperazin-1-yl)-1,4-dihydroquinoline-3-carboxylate ethyl ester	0	0	0	0	0	0	0	0	0.0	12.0	0.6	0	0
Ciprofloxacin	0	0	0	0	0	0	0	0	0	0	9.3	0	0
Water	0	0	0	0	40	0	0	0	0	0	4.6	0	0
1M Hydrochloric acid	0	0	0	0	0	100	0	0	0	0	0	0	75.3
2-methyltetrahydrofuran	0	0	0	0	0	0	100	0	0	18.6	16.5	56.4	0
Dimethylamine	0	0	0	0	0	0	0	0	5.5	0	0	0	1.5E-05
Ethanol	0	0	0	0	0	0	0	0	0.0	0	1.29	0	0
Total Mass Flow Rate (kg/hr)	60.00	107.60	61.10	469.09	91.32	389.49	130.44	167.60	228.70	700.30	791.62	231.21	517.43
Total Molar Flow Rate (kmol/hr)	0.308419862	0.79	1.07	5.96	2.24	10.68273563	1.160981726	0.508897354	0.98999518	4.38	0.574552403	0.060296375	11.50593
Max Pressure (atm)	2	2	2	2	2	2	2	1	1	1	1	1	1
Max Temperature (C)	150	150	25	150	150	25	25	150	150	150	150	25	25

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NOTES:

CWS - Cool water supply
CWR - Cool water return
SS - Steam supply
CR - Condensate Return

LEGEND

- Stream Number
- Mass Flow (kg/hr)
- Temperature (C)
- Pressure (atm)

REVISIONS

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CHEMICAL ENGINEERING

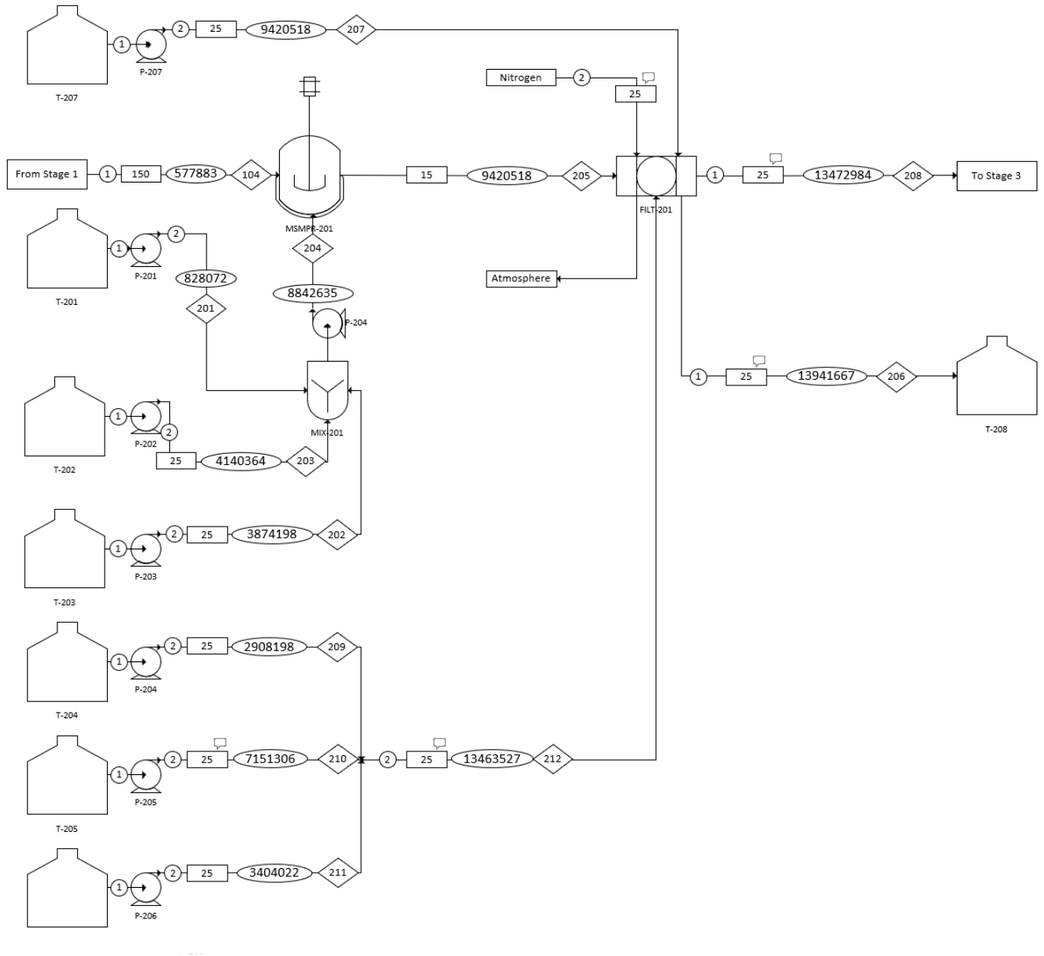
COURSE NO.	DRAWN BY	DATE
CHE 487	ELIOT S.	4/1/2022

Group: 05 — PROCESS FLOW DIAGRAM

DRAWING TITLE: Reactors - Stage 1 — REV. D

NOTES:

ORDER OF STEPS FOR NUTSCHE FILTER:
1. PRECIPITATION SUSPENSION (STREAM 205) ENTERS
2. NITROGEN ENTERS, AND THE TANK IS PRESSURIZED TO 200kPa DURING FILTERING
3. FILTRATE LEAVES TO TANK T-208
4. WASH SOLVENT (STREAM 207) ENTERS
5. WASH SOLVENT LEAVES TO TANK T-208
5. DISSOLUTION SOLVENT (STREAM 212) ENTERS
6. THE DISSOLVED SOLUTION (STREAM 208) EXITS TO STAGE 3



Stream Identification No.	206	207	208	209	210	211	212
Stream Description							
	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%	Wt%
Component Formula							
Acetic Acid	6.0	0	0	0	0	0	0
Water	29.7	0	53.1	0	100	0	53.1
Acetonitrile	27.8	0	0	0	0	0	0
Acetone	32.5	100	0	0	0	0	0
Formic Acid	0.0	0	21.6	100	0	0	21.6
Isopropanol	0.0	0	0	0	0	0	0
ciprofloxacin	0.008	0	0.2	0	0	0	0
Tetrabutylammonium hydroxide	0.5	0	0	0	0	0	0
0.35 M Hydrochloric acid	0	0	25.3	0	0	100	25.3
2,4,5-trifluorobenzoylchloride	0.06	0	0.0	0	0	0	0.0
N,N-Diisopropylethylamine	0.09	0	0.0	0	0	0	0.0
Piperazine	0.10	0	0.0	0	0	0	0.0
Methyl sulfoxide	2.3	0	0.0	0	0	0	0.0
trifluorobenzoyl)prop-2-enoate	0	0	0.025	0	0	0	0.0
trifluorbenzoyl)acrylsaeure-ethylester	0	0	0.02	0	0	0	0
1-cyclopropyl-6-fluoro-4-oxo-7-(piperazin-1-	0	0	0.02	0	0	0	0
2-methyltetrahydrofuran	0.7	0	0	0	0	0	0
Ethanol	0.05	0	0	0	0	0	0
Total Mass Flow Rate (kg/batch)	13941667.32	4530605.72	13472984.38	2908198.12	7151306.86	3404022.07	13463527.05
Total Molar Flow Rate (kmol/hr)	314.8163939	106.8579409	50.17983412	86.54862147	543.7561484	127.8947868	758.1995567
Max Pressure (atm)							
Max Temperature ©	25	25	25	25	25	25	25

NOTES:

CWS - Cool water supply
CWR - Cool water return
SS - Steam supply
CR - Condensate Return

LEGEND

Stream Number
Mass Flow (kg/hr)
Temperature (C)
Pressure (atm)

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CHEMICAL ENGINEERING

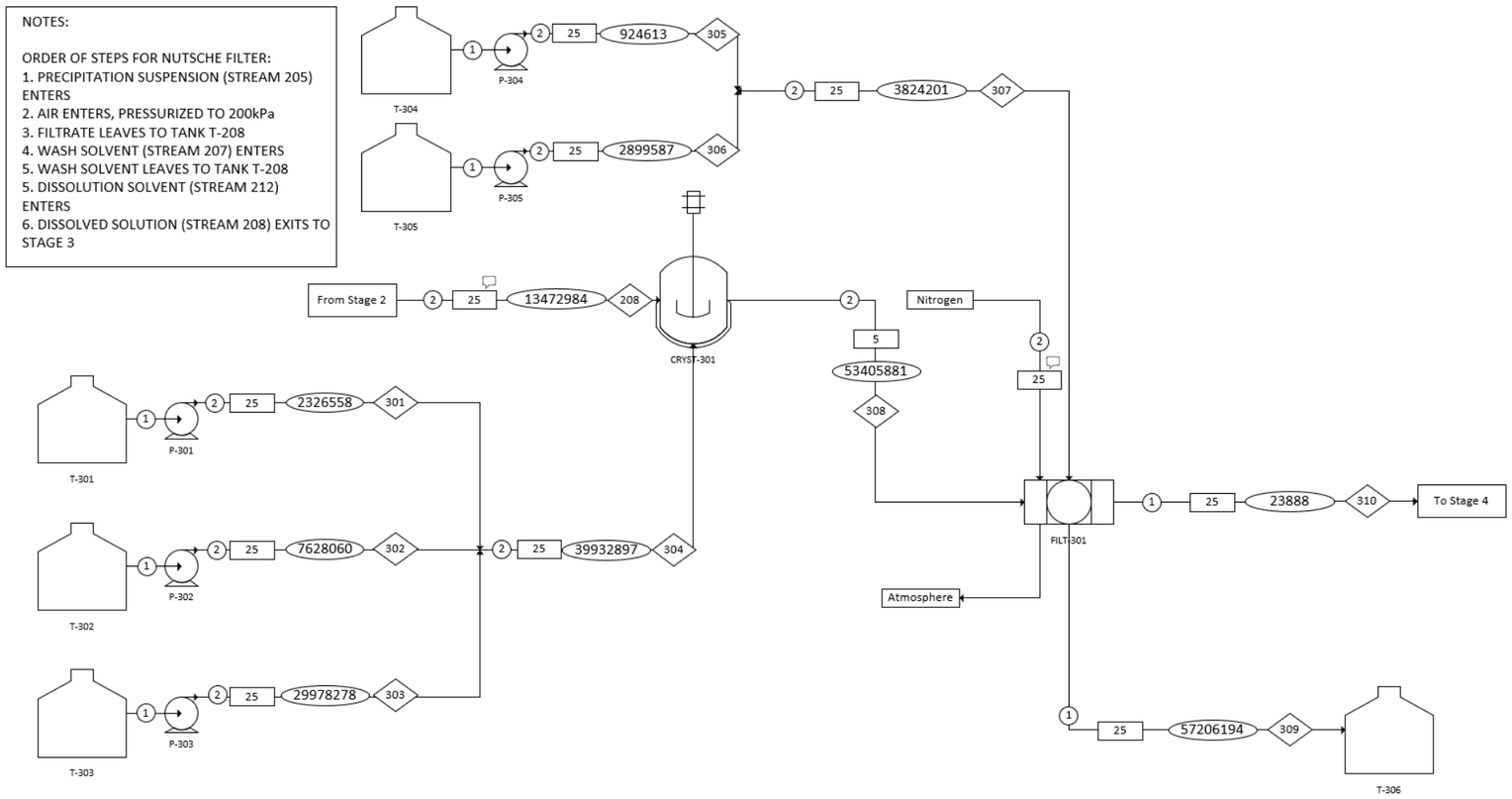
COURSE NO.	DRAWN BY	DATE
CHE 487	ELIOT S.	4/1/2022

Group: 05 — PROCESS FLOW DIAGRAM

DRAWING TITLE: Primary Recovery - Stage 2 — REV. C

NOTES:

ORDER OF STEPS FOR NUTSCHE FILTER:
1. PRECIPITATION SUSPENSION (STREAM 205) ENTERS
2. AIR ENTERS, PRESSURIZED TO 200kPa
3. FILTRATE LEAVES TO TANK T-208
4. WASH SOLVENT (STREAM 207) ENTERS
5. WASH SOLVENT LEAVES TO TANK T-208
5. DISSOLUTION SOLVENT (STREAM 212) ENTERS
6. DISSOLVED SOLUTION (STREAM 208) EXITS TO STAGE 3



Stream Identification No.	309	310							
Stream Description									
	Wt%	Wt%							
Component Formula									
Acetic Acid	0	0							
Water	27.4	29.9							
Acetonitrile	0	0							
Acetone	5.1	0							
Formic Acid	9.2	0							
Isopropanol	52.4	0							
Ciprofloxacin HCl	0.0173	70.1							
Tetrabutylammonium hydroxide	0	0							
Hydrochloric Acid	5.950	0							
trifluorobenzoyl)prop-2-enoate	0.006	0							
trifluorbenzoyl)acrylsaeure-ethylester	0.005	0							
1-cyclopropyl-6-fluoro-4-oxo-7-(piperazin-1-	0.006	0							
Total Mass Flow Rate (kg/batch)	57206194.3	23888.65							
Total Molar Flow Rate	1520.809476	0.605472							
Max Pressure (atm)									
Max Temperature									

NOTES:

CWS - Cool water supply
CWR - Cool water return
SS - Steam supply
CR - Condensate Return

LEGEND

- Stream Number
- Mass Flow (kg/hr)
- Temperature (C)
- Pressure (atm)

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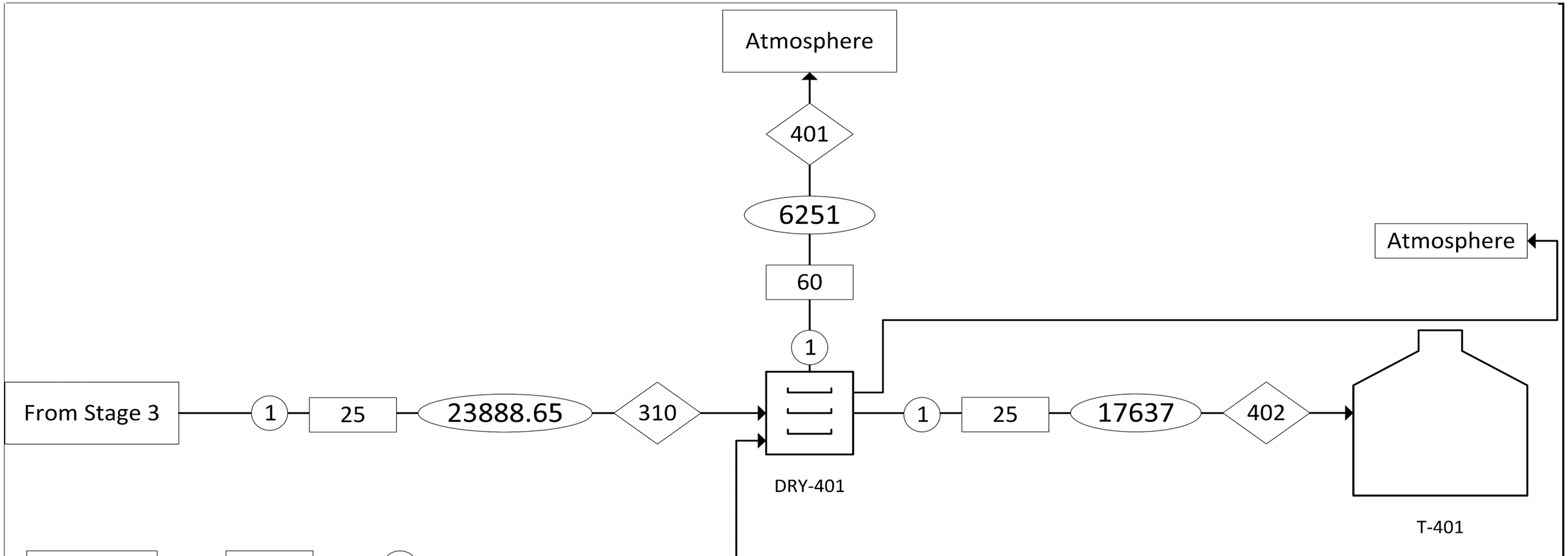
COURSE NO.	DRAWN BY	DATE
CHE 487	ELIOT	3/25/2022

Group: 05 — PROCESS FLOW DIAGRAM

DRAWING TITLE: Crystallization - Stage 3 — REV. C



Stream Identification No.	310	401	402															
Stream Description																		
Component Formula																		
Ciprofloxacin HCl	70.1	0	95.5															
Water	29.9	100	0.5															
Total Mass Flow Rate (kg/batch)	23888.65	6251.00	17637.65															
Total Molar Flow Rate (kmol/hr)	0.605472	0.515653	0.089819															
Max Pressure (atm)																		
Max Temperature																		

NOTES:

CWS - Cool water supply
CWR - Cool water return
SS - Steam supply
CR - Condensate Return

LEGEND

Stream Number
Mass Flow (kg/hr)
Temperature (C)
Pressure (atm)

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COURSE NO.	DRAWN BY	DATE
CHE 487	ELIOT S.	3/25/2022

Group: PROCESS FLOW DIAGRAM

DRAWING TITLE: Drying - Stage 4

REV. C