

LAMPIRAN

Tabel L.1 Jadwal penelitian

No	Urutan Penelitian	Bulan Ke-					
		I	II	III	IV	V	VI
1	Studi Pustaka						
2	Seminar Proposal						
3	Pembuatan Alat Penelitian						
4	Pengambilan Data						
5	Pengolahan Data						
6	Seminar Hasil						
7	Ujian						

Tabel L.2 Sifat fisik fluida (udara)

TABLE A-15							
Properties of air at 1 atm pressure							
Temp. $T, ^\circ\text{C}$	Density $\rho, \text{kg/m}^3$	Specific Heat $c_p, \text{J/kg} \cdot \text{K}$	Thermal Conductivity $k, \text{W/m} \cdot \text{K}$	Thermal Diffusivity $\alpha, \text{m}^2/\text{s}^2$	Dynamic Viscosity $\mu, \text{kg/m} \cdot \text{s}$	Kinematic Viscosity $\nu, \text{m}^2/\text{s}$	Prandtl Number Pr
-150	2.866	983	0.01171	4.158×10^{-5}	8.636×10^{-6}	3.013×10^{-6}	0.7246
-100	2.038	966	0.01582	8.036×10^{-5}	1.189×10^{-5}	5.837×10^{-6}	0.7263
-50	1.582	999	0.01979	1.252×10^{-5}	1.474×10^{-5}	9.319×10^{-6}	0.7440
-40	1.514	1002	0.02057	1.356×10^{-5}	1.527×10^{-5}	1.008×10^{-5}	0.7436
-30	1.451	1004	0.02134	1.465×10^{-5}	1.579×10^{-5}	1.087×10^{-5}	0.7425
-20	1.394	1005	0.02211	1.578×10^{-5}	1.630×10^{-5}	1.169×10^{-5}	0.7408
-10	1.341	1006	0.02288	1.696×10^{-5}	1.680×10^{-5}	1.252×10^{-5}	0.7387
0	1.292	1006	0.02364	1.818×10^{-5}	1.729×10^{-5}	1.338×10^{-5}	0.7362
5	1.269	1006	0.02401	1.880×10^{-5}	1.754×10^{-5}	1.382×10^{-5}	0.7350
10	1.246	1006	0.02439	1.944×10^{-5}	1.778×10^{-5}	1.426×10^{-5}	0.7336
15	1.225	1007	0.02476	2.009×10^{-5}	1.802×10^{-5}	1.470×10^{-5}	0.7323
20	1.204	1007	0.02514	2.074×10^{-5}	1.825×10^{-5}	1.516×10^{-5}	0.7309
25	1.184	1007	0.02551	2.141×10^{-5}	1.849×10^{-5}	1.562×10^{-5}	0.7296
30	1.164	1007	0.02588	2.208×10^{-5}	1.872×10^{-5}	1.608×10^{-5}	0.7282
35	1.145	1007	0.02625	2.277×10^{-5}	1.895×10^{-5}	1.655×10^{-5}	0.7268
40	1.127	1007	0.02662	2.346×10^{-5}	1.918×10^{-5}	1.702×10^{-5}	0.7255
45	1.109	1007	0.02699	2.416×10^{-5}	1.941×10^{-5}	1.750×10^{-5}	0.7241
50	1.092	1007	0.02735	2.487×10^{-5}	1.963×10^{-5}	1.798×10^{-5}	0.7228
60	1.059	1007	0.02808	2.632×10^{-5}	2.008×10^{-5}	1.896×10^{-5}	0.7202
70	1.028	1007	0.02881	2.780×10^{-5}	2.052×10^{-5}	1.995×10^{-5}	0.7177
80	0.9994	1008	0.02953	2.931×10^{-5}	2.096×10^{-5}	2.097×10^{-5}	0.7154
90	0.9718	1008	0.03024	3.086×10^{-5}	2.139×10^{-5}	2.201×10^{-5}	0.7132
100	0.9458	1009	0.03095	3.243×10^{-5}	2.181×10^{-5}	2.306×10^{-5}	0.7111
120	0.8977	1011	0.03235	3.565×10^{-5}	2.264×10^{-5}	2.522×10^{-5}	0.7073
140	0.8542	1013	0.03374	3.898×10^{-5}	2.345×10^{-5}	2.745×10^{-5}	0.7041
160	0.8148	1016	0.03511	4.241×10^{-5}	2.420×10^{-5}	2.975×10^{-5}	0.7014
180	0.7788	1019	0.03646	4.593×10^{-5}	2.504×10^{-5}	3.212×10^{-5}	0.6992
200	0.7459	1023	0.03779	4.954×10^{-5}	2.577×10^{-5}	3.455×10^{-5}	0.6974
250	0.6746	1033	0.04104	5.890×10^{-5}	2.760×10^{-5}	4.091×10^{-5}	0.6946
300	0.6158	1044	0.04418	6.871×10^{-5}	2.934×10^{-5}	4.765×10^{-5}	0.6935
350	0.5664	1056	0.04721	7.892×10^{-5}	3.101×10^{-5}	5.475×10^{-5}	0.6937
400	0.5243	1069	0.05015	8.951×10^{-5}	3.261×10^{-5}	6.219×10^{-5}	0.6948
450	0.4880	1081	0.05298	1.004×10^{-4}	3.415×10^{-5}	6.997×10^{-5}	0.6965
500	0.4565	1093	0.05572	1.117×10^{-4}	3.563×10^{-5}	7.806×10^{-5}	0.6986
600	0.4042	1115	0.06093	1.352×10^{-4}	3.846×10^{-5}	9.515×10^{-5}	0.7037
700	0.3627	1135	0.06581	1.598×10^{-4}	4.111×10^{-5}	1.133×10^{-4}	0.7092
800	0.3289	1153	0.07037	1.855×10^{-4}	4.362×10^{-5}	1.326×10^{-4}	0.7149
900	0.3008	1169	0.07465	2.122×10^{-4}	4.600×10^{-5}	1.529×10^{-4}	0.7206
1000	0.2772	1184	0.07868	2.398×10^{-4}	4.826×10^{-5}	1.741×10^{-4}	0.7260
1500	0.1990	1234	0.09599	3.908×10^{-4}	5.817×10^{-5}	2.922×10^{-4}	0.7478
2000	0.1553	1264	0.11113	5.664×10^{-4}	6.630×10^{-5}	4.270×10^{-4}	0.7539

Note: For ideal gases, the properties c_p , k , μ , and Pr are independent of pressure. The properties ρ , ν , and α at a pressure P (in atm) other than 1 atm are determined by multiplying the values of ρ at the given temperature by P and by dividing ν and α by P .

Source: Data generated from the EES software developed by S. A. Klein and F. L. Alvarado. Original sources: Keenan, Chao, Keyes, Gas Tables, Wiley, 198; and Thermophysical Properties of Matter, Vol. 3: Thermal Conductivity, Y. S. Touloukian, P. E. Liley, S. C. Saxena, Vol. 11: Viscosity, Y. S. Touloukian, S. C. Saxena, and P. Hestermans, IFI/Plenum, NY, 1970, ISBN 0-306067020-8.

Tabel L.12 Data angin pada kecepatan 3,05 m/s

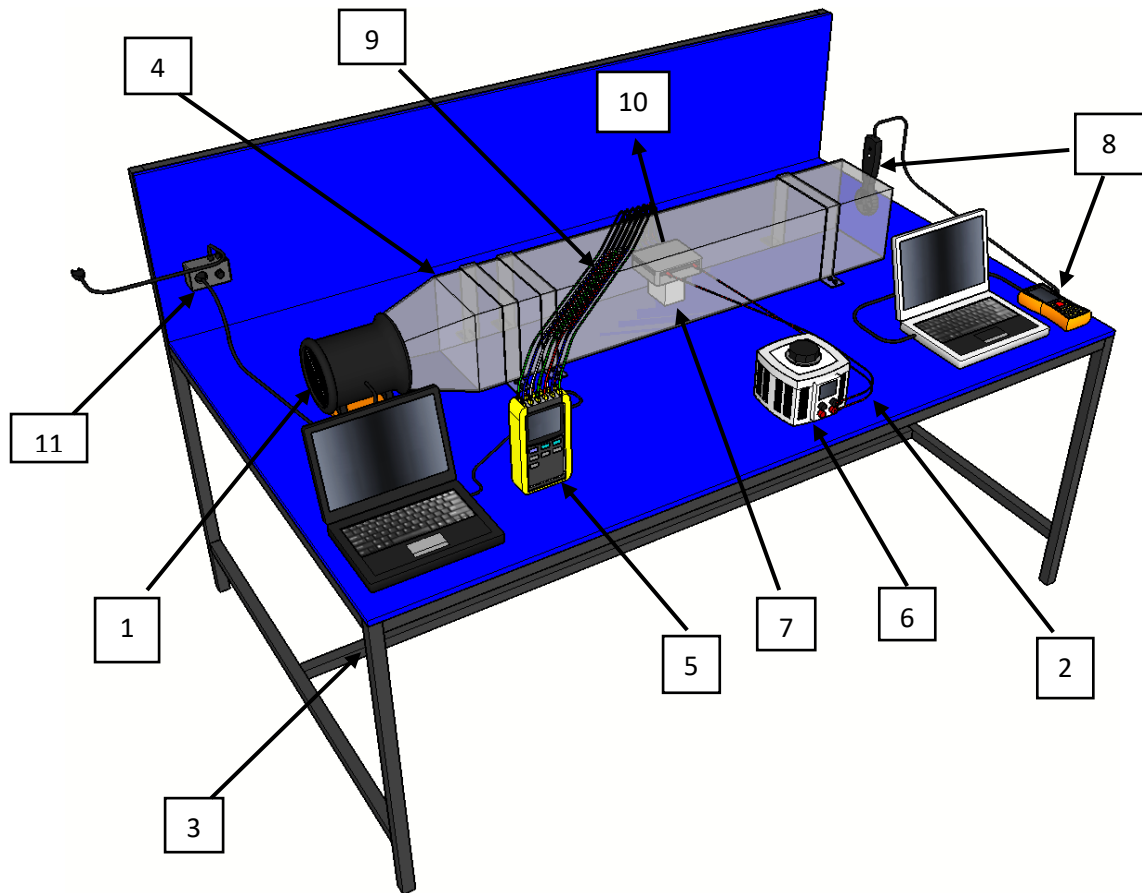
RecNo	MeaValue	Unit	Mode	Temperat	TempUnit	Time	Date
1	3.051	m/s	VEL	24.4	C	12:55:36	2024-07-13
2	3.057	m/s	VEL	24.4	C	12:55:37	2024-07-13
3	3.074	m/s	VEL	24.4	C	12:55:38	2024-07-13
4	3.08	m/s	VEL	24.4	C	12:55:39	2024-07-13
5	3.082	m/s	VEL	24.4	C	12:55:40	2024-07-13
6	3.101	m/s	VEL	24.4	C	12:55:41	2024-07-13
7	3.105	m/s	VEL	24.4	C	12:55:42	2024-07-13
8	3.075	m/s	VEL	24.4	C	12:55:43	2024-07-13
9	3.041	m/s	VEL	24.4	C	12:55:44	2024-07-13
10	3.025	m/s	VEL	24.4	C	12:55:45	2024-07-13
11	3.046	m/s	VEL	24.4	C	12:55:46	2024-07-13
12	3.062	m/s	VEL	24.4	C	12:55:47	2024-07-13
13	3.043	m/s	VEL	24.4	C	12:55:48	2024-07-13
14	3.023	m/s	VEL	24.4	C	12:55:49	2024-07-13
15	3.028	m/s	VEL	24.4	C	12:55:50	2024-07-13
16	3.035	m/s	VEL	24.4	C	12:55:51	2024-07-13
17	3.014	m/s	VEL	24.4	C	12:55:52	2024-07-13
18	3.01	m/s	VEL	24.4	C	12:55:53	2024-07-13
19	3.019	m/s	VEL	24.4	C	12:55:54	2024-07-13
20	3.025	m/s	VEL	24.4	C	12:55:55	2024-07-13
21	3.023	m/s	VEL	24.4	C	12:55:56	2024-07-13
22	3.025	m/s	VEL	24.4	C	12:55:57	2024-07-13
23	3.031	m/s	VEL	24.4	C	12:55:58	2024-07-13
24	3.045	m/s	VEL	24.4	C	12:55:59	2024-07-13
25	3.044	m/s	VEL	24.4	C	12:56:00	2024-07-13
26	3.038	m/s	VEL	24.4	C	12:56:01	2024-07-13
27	3.07	m/s	VEL	24.4	C	12:56:02	2024-07-13
28	3.08	m/s	VEL	24.4	C	12:56:03	2024-07-13
29	3.082	m/s	VEL	24.4	C	12:56:04	2024-07-13
30	3.08	m/s	VEL	24.4	C	12:56:05	2024-07-13
31	3.055	m/s	VEL	24.4	C	12:56:06	2024-07-13
32	3.006	m/s	VEL	24.4	C	12:56:07	2024-07-13
33	2.991	m/s	VEL	24.4	C	12:56:08	2024-07-13
34	2.969	m/s	VEL	24.4	C	12:56:09	2024-07-13
35	2.999	m/s	VEL	24.4	C	12:56:10	2024-07-13
36	3.008	m/s	VEL	24.4	C	12:56:11	2024-07-13
37	3.008	m/s	VEL	24.4	C	12:56:12	2024-07-13
38	3.025	m/s	VEL	24.4	C	12:56:13	2024-07-13
39	3.045	m/s	VEL	24.4	C	12:56:14	2024-07-13
40	3.052	m/s	VEL	24.4	C	12:56:15	2024-07-13
41	3.051	m/s	VEL	24.4	C	12:56:16	2024-07-13
42	3.047	m/s	VEL	24.4	C	12:56:17	2024-07-13
43	3.037	m/s	VEL	24.4	C	12:56:18	2024-07-13
44	3.033	m/s	VEL	24.4	C	12:56:19	2024-07-13
45	3.05	m/s	VEL	24.4	C	12:56:20	2024-07-13
46	3.059	m/s	VEL	24.4	C	12:56:21	2024-07-13
47	3.047	m/s	VEL	24.4	C	12:56:22	2024-07-13
48	3.039	m/s	VEL	24.4	C	12:56:23	2024-07-13
49	3.001	m/s	VEL	24.4	C	12:56:24	2024-07-13
50	2.96	m/s	VEL	24.4	C	12:56:25	2024-07-13
	3.054						

Tabel L.13 Data angin pada kecepatan 2,88 m/s

RecNo	MeaValue	Unit	Mode	Temperat	TempUnit	Time	Date
1	2.883	m/s	VEL	24.3	C	12:49:56	2024-07-13
2	2.883	m/s	VEL	24.3	C	12:49:57	2024-07-13
3	2.883	m/s	VEL	24.3	C	12:49:58	2024-07-13
4	2.883	m/s	VEL	24.3	C	12:49:59	2024-07-13
5	2.883	m/s	VEL	24.3	C	12:50:00	2024-07-13
6	2.883	m/s	VEL	24.3	C	12:50:01	2024-07-13
7	2.883	m/s	VEL	24.3	C	12:50:02	2024-07-13
8	2.883	m/s	VEL	24.3	C	12:50:03	2024-07-13
9	2.883	m/s	VEL	24.3	C	12:50:04	2024-07-13
10	2.883	m/s	VEL	24.3	C	12:50:05	2024-07-13
11	2.883	m/s	VEL	24.3	C	12:50:06	2024-07-13
12	2.883	m/s	VEL	24.3	C	12:50:07	2024-07-13
13	2.883	m/s	VEL	24.3	C	12:50:08	2024-07-13
14	2.883	m/s	VEL	24.3	C	12:50:09	2024-07-13
15	2.883	m/s	VEL	24.3	C	12:50:10	2024-07-13
16	2.883	m/s	VEL	24.3	C	12:50:11	2024-07-13
17	2.883	m/s	VEL	24.3	C	12:50:12	2024-07-13
18	2.883	m/s	VEL	24.3	C	12:50:13	2024-07-13
19	2.883	m/s	VEL	24.3	C	12:50:14	2024-07-13
20	2.883	m/s	VEL	24.3	C	12:50:15	2024-07-13
21	2.883	m/s	VEL	24.3	C	12:50:16	2024-07-13
22	2.883	m/s	VEL	24.3	C	12:50:17	2024-07-13
23	2.883	m/s	VEL	24.3	C	12:50:18	2024-07-13
24	2.883	m/s	VEL	24.3	C	12:50:19	2024-07-13
25	2.883	m/s	VEL	24.3	C	12:50:20	2024-07-13
26	2.883	m/s	VEL	24.3	C	12:50:21	2024-07-13
27	2.883	m/s	VEL	24.3	C	12:50:22	2024-07-13
28	2.883	m/s	VEL	24.3	C	12:50:23	2024-07-13
29	2.883	m/s	VEL	24.3	C	12:50:24	2024-07-13
30	2.883	m/s	VEL	24.3	C	12:50:25	2024-07-13
31	2.883	m/s	VEL	24.3	C	12:50:26	2024-07-13
32	2.883	m/s	VEL	24.3	C	12:50:27	2024-07-13
33	2.883	m/s	VEL	24.3	C	12:50:28	2024-07-13
34	2.883	m/s	VEL	24.3	C	12:50:29	2024-07-13
35	2.883	m/s	VEL	24.3	C	12:50:30	2024-07-13
36	2.883	m/s	VEL	24.3	C	12:50:31	2024-07-13
37	2.883	m/s	VEL	24.3	C	12:50:32	2024-07-13
38	2.883	m/s	VEL	24.3	C	12:50:33	2024-07-13
39	2.883	m/s	VEL	24.3	C	12:50:34	2024-07-13
40	2.883	m/s	VEL	24.3	C	12:50:35	2024-07-13
41	2.883	m/s	VEL	24.3	C	12:50:36	2024-07-13
42	2.883	m/s	VEL	24.3	C	12:50:37	2024-07-13
43	2.883	m/s	VEL	24.3	C	12:50:38	2024-07-13
44	2.883	m/s	VEL	24.3	C	12:50:39	2024-07-13
45	2.883	m/s	VEL	24.3	C	12:50:40	2024-07-13
46	2.883	m/s	VEL	24.3	C	12:50:41	2024-07-13
47	2.883	m/s	VEL	24.3	C	12:50:42	2024-07-13
48	2.883	m/s	VEL	24.3	C	12:50:43	2024-07-13
49	2.883	m/s	VEL	24.3	C	12:50:44	2024-07-13
50	2.883	m/s	VEL	24.3	C	12:50:45	2024-07-13
	2.88			24.3			

Tabel L.14 Data angin pada kecepatan 2,67 m/s

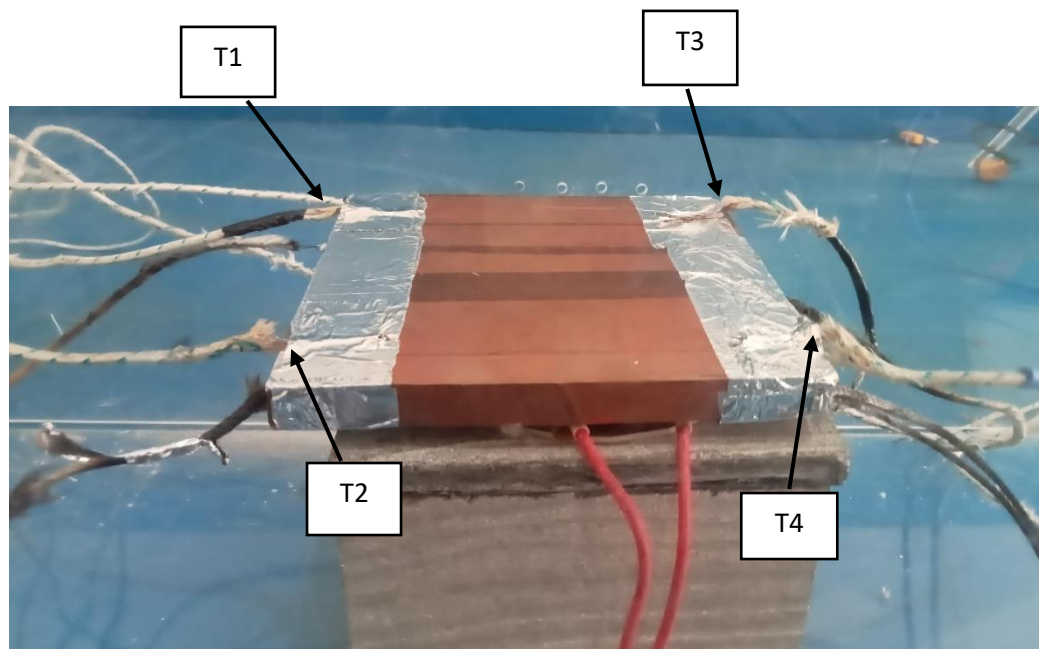
RecNo	MeaValue	Unit	Mode	Temperat	TempUnit	Time	Date
1	2.667	m/s	VEL	24.3	C	12:48:26	2024-07-13
2	2.667	m/s	VEL	24.3	C	12:48:27	2024-07-13
3	2.667	m/s	VEL	24.3	C	12:48:28	2024-07-13
4	2.667	m/s	VEL	24.3	C	12:48:29	2024-07-13
5	2.667	m/s	VEL	24.3	C	12:48:30	2024-07-13
6	2.667	m/s	VEL	24.3	C	12:48:31	2024-07-13
7	2.667	m/s	VEL	24.3	C	12:48:32	2024-07-13
8	2.667	m/s	VEL	24.3	C	12:48:33	2024-07-13
9	2.667	m/s	VEL	24.3	C	12:48:34	2024-07-13
10	2.667	m/s	VEL	24.3	C	12:48:35	2024-07-13
11	2.667	m/s	VEL	24.3	C	12:48:36	2024-07-13
12	2.667	m/s	VEL	24.3	C	12:48:37	2024-07-13
13	2.667	m/s	VEL	24.3	C	12:48:38	2024-07-13
14	2.667	m/s	VEL	24.3	C	12:48:39	2024-07-13
15	2.667	m/s	VEL	24.3	C	12:48:40	2024-07-13
16	2.667	m/s	VEL	24.3	C	12:48:41	2024-07-13
17	2.667	m/s	VEL	24.3	C	12:48:42	2024-07-13
18	2.667	m/s	VEL	24.3	C	12:48:43	2024-07-13
19	2.667	m/s	VEL	24.3	C	12:48:44	2024-07-13
20	2.667	m/s	VEL	24.3	C	12:48:45	2024-07-13
21	2.667	m/s	VEL	24.3	C	12:48:46	2024-07-13
22	2.667	m/s	VEL	24.3	C	12:48:47	2024-07-13
23	2.667	m/s	VEL	24.3	C	12:48:48	2024-07-13
24	2.667	m/s	VEL	24.3	C	12:48:49	2024-07-13
25	2.667	m/s	VEL	24.3	C	12:48:50	2024-07-13
26	2.667	m/s	VEL	24.3	C	12:48:51	2024-07-13
27	2.667	m/s	VEL	24.3	C	12:48:52	2024-07-13
28	2.667	m/s	VEL	24.3	C	12:48:53	2024-07-13
29	2.667	m/s	VEL	24.3	C	12:48:54	2024-07-13
30	2.667	m/s	VEL	24.3	C	12:48:55	2024-07-13
31	2.667	m/s	VEL	24.3	C	12:48:56	2024-07-13
32	2.667	m/s	VEL	24.3	C	12:48:57	2024-07-13
33	2.667	m/s	VEL	24.3	C	12:48:58	2024-07-13
34	2.667	m/s	VEL	24.3	C	12:48:59	2024-07-13
35	2.667	m/s	VEL	24.3	C	12:49:00	2024-07-13
36	2.667	m/s	VEL	24.3	C	12:49:01	2024-07-13
37	2.667	m/s	VEL	24.3	C	12:49:02	2024-07-13
38	2.667	m/s	VEL	24.3	C	12:49:03	2024-07-13
39	2.667	m/s	VEL	24.3	C	12:49:04	2024-07-13
40	2.667	m/s	VEL	24.3	C	12:49:05	2024-07-13
41	2.667	m/s	VEL	24.3	C	12:49:06	2024-07-13
42	2.667	m/s	VEL	24.3	C	12:49:07	2024-07-13
43	2.667	m/s	VEL	24.3	C	12:49:08	2024-07-13
44	2.667	m/s	VEL	24.3	C	12:49:09	2024-07-13
45	2.667	m/s	VEL	24.3	C	12:49:10	2024-07-13
46	2.667	m/s	VEL	24.3	C	12:49:11	2024-07-13
47	2.667	m/s	VEL	24.3	C	12:49:12	2024-07-13
48	2.667	m/s	VEL	24.3	C	12:49:13	2024-07-13
49	2.667	m/s	VEL	24.3	C	12:49:14	2024-07-13
50	2.667	m/s	VEL	24.3	C	12:49:15	2024-07-13
	2.67			24.3			



Gambar L.1 Layout penelitian laju perpindahan panas pada pelat tembaga

Keterangan gambar

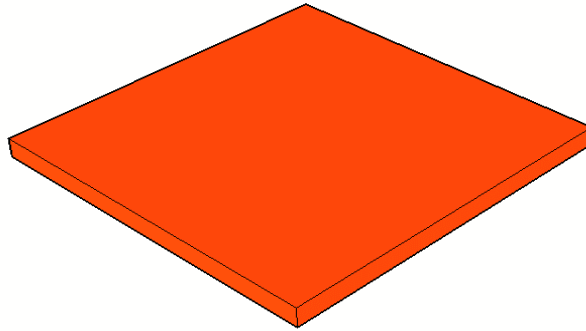
- | | |
|-----------------------------|--|
| 1. Blower | 7. Isolator |
| 2. Control Module | 8. Anemometer data logger |
| 3. Meja | 9. Kabel input <i>thermocouple data logger</i> |
| 4. Saluran Segi Empat | 10. Heater |
| 5. Thermocouple Data Logger | 11. Dimer |
| 6. Regulator AC | |



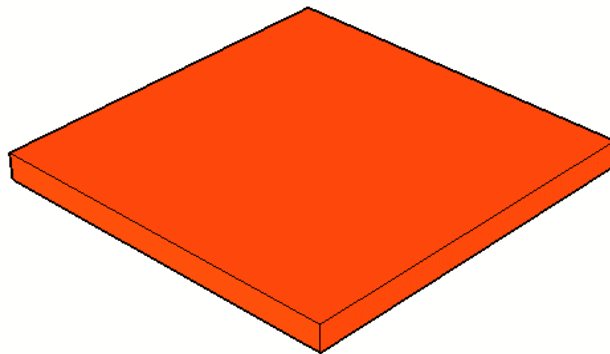
Gambar L.2 Posisi specimen uji diatas *heater*

Keterangan gambar:

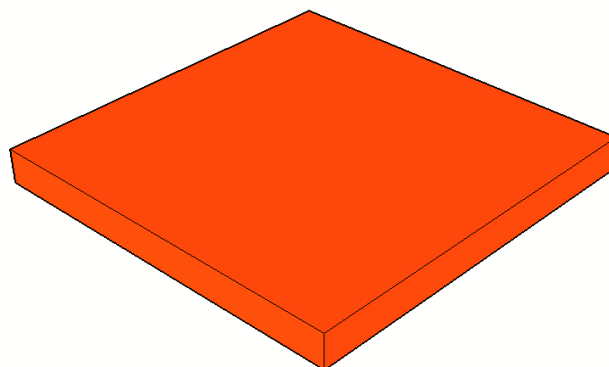
- .1.1. T1: Temperatur 1 permukaan atas material
- .1.2. T2: Temperatur 2 permukaan atas material
- .1.3. T3: Temperatur 3 permukaan atas material
- .1.4. T4: Temperatur 4 permukaan atas material



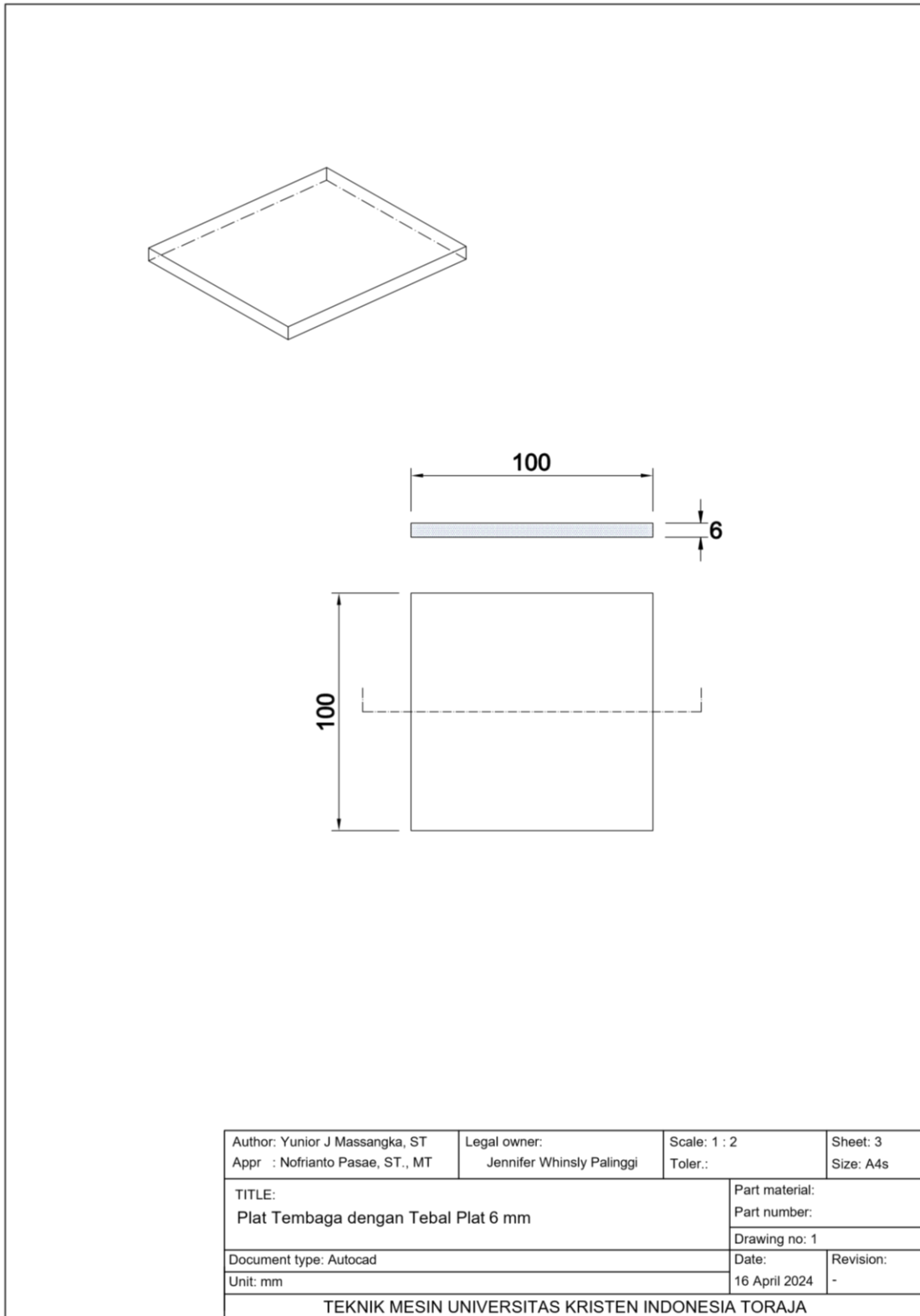
Gambar L.3 Tebal pelat specimen uji 6 mm



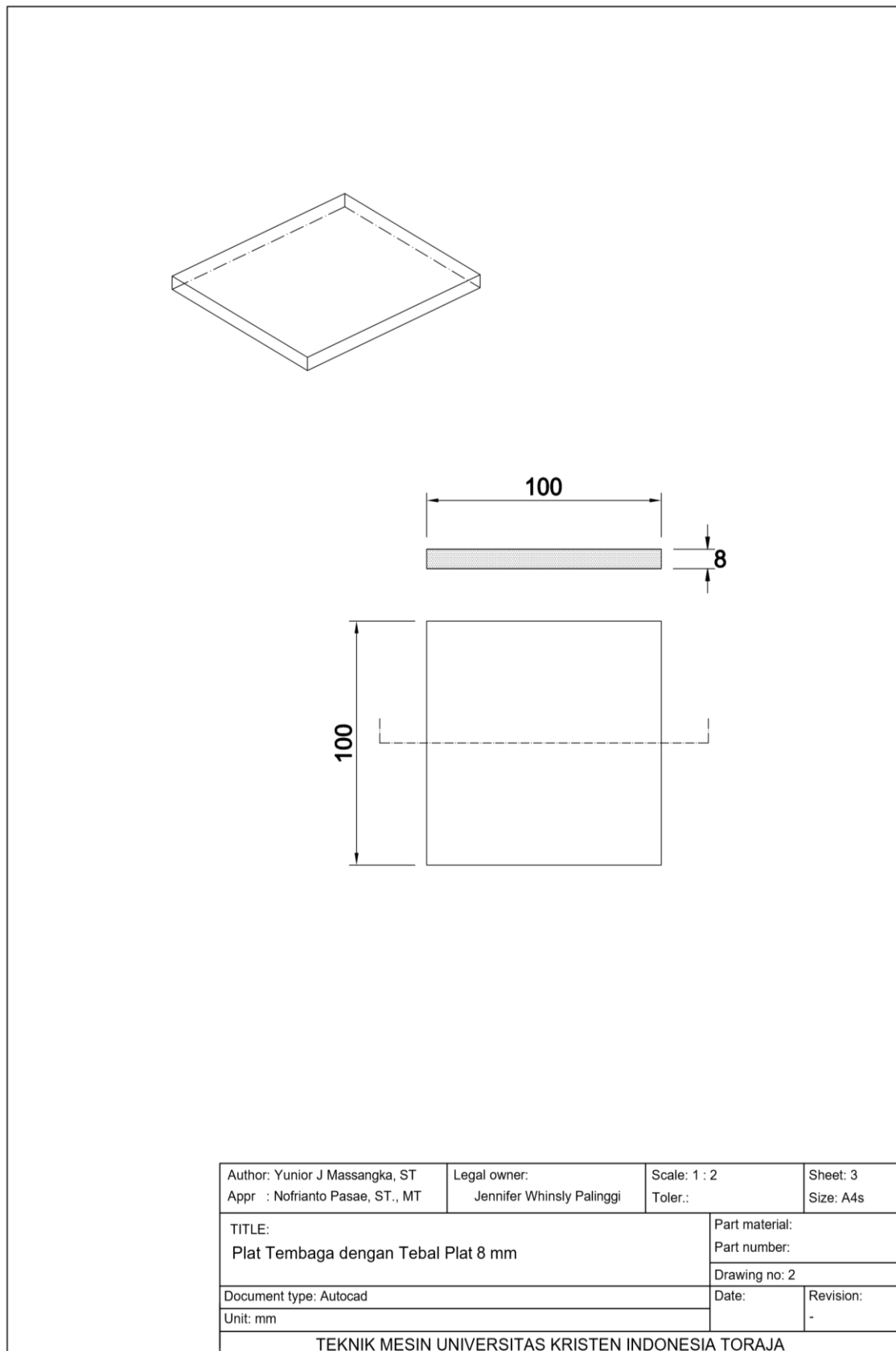
Gambar L.4 Tebal pelat specimen uji 8 mm



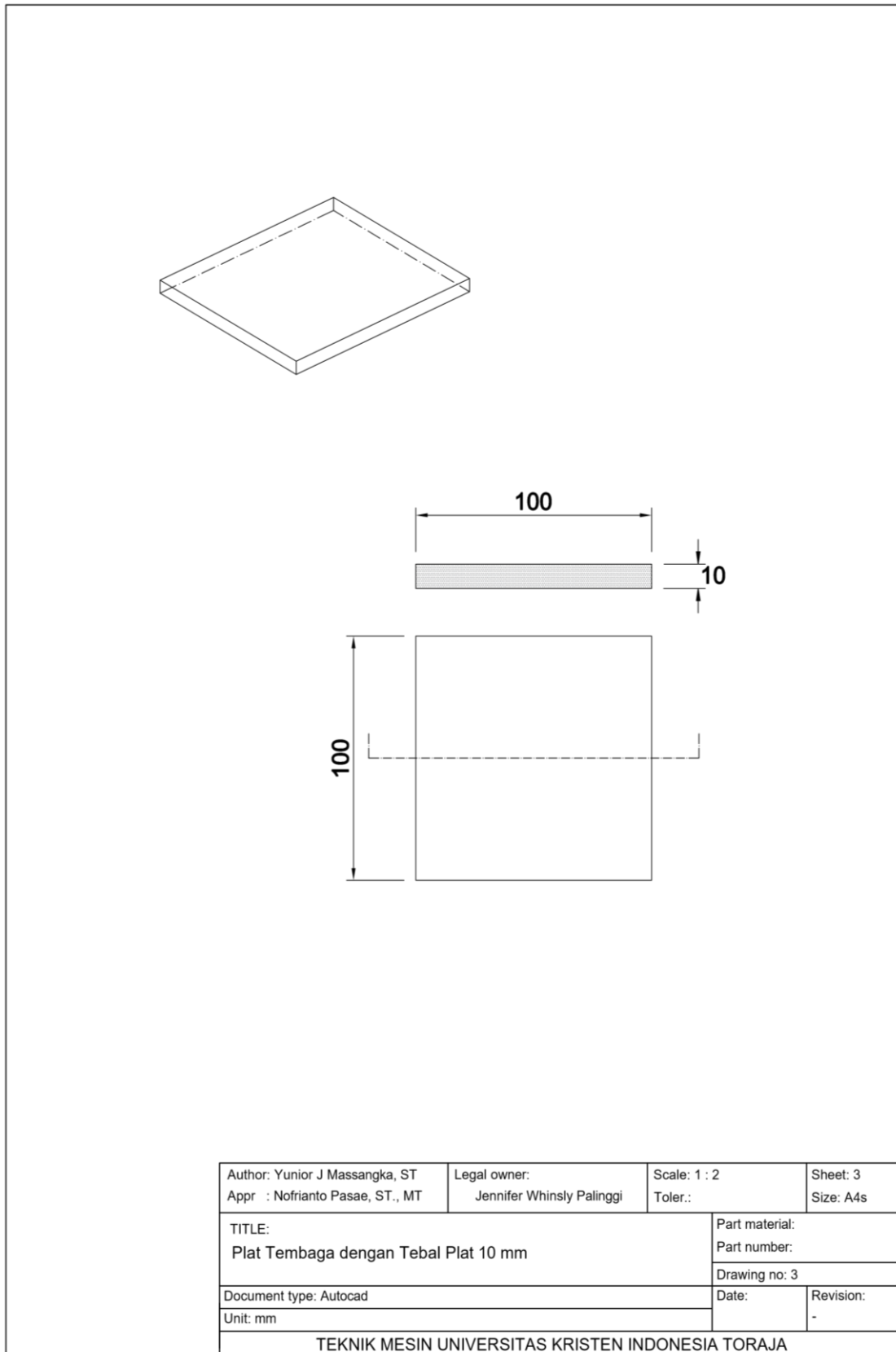
Gambar L.5 Tebal pelat specimen uji 10 mm



Gambar L.6 Dimensi pelat uji 6 mm



Gambar L.7 Dimensi pelat uji 8 mm



Gambar L.8 Dimensi pelat uji 10 mm

Lampiran kegiatan pengambilan data



Gambar L.9 Dokumentasi pengambilan data



Gambar L.10 Dokumentasi pengambilan data



Gambar L.11 Dokumentasi pengambilan data