

LAMPIRAN

Lampiran 1. Dokumentasi Penelitian



MTTF

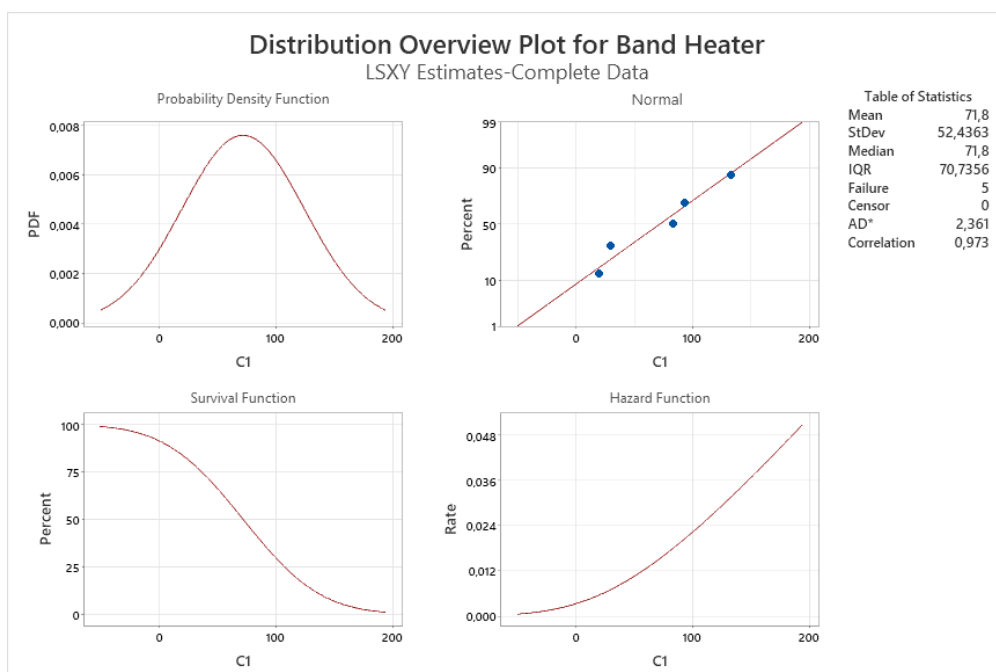


Table of MTTF

Distribution	Mean
Weibull	76,2303
Lognormal	85,1887
Exponential	73,2802
Normal	71,8000

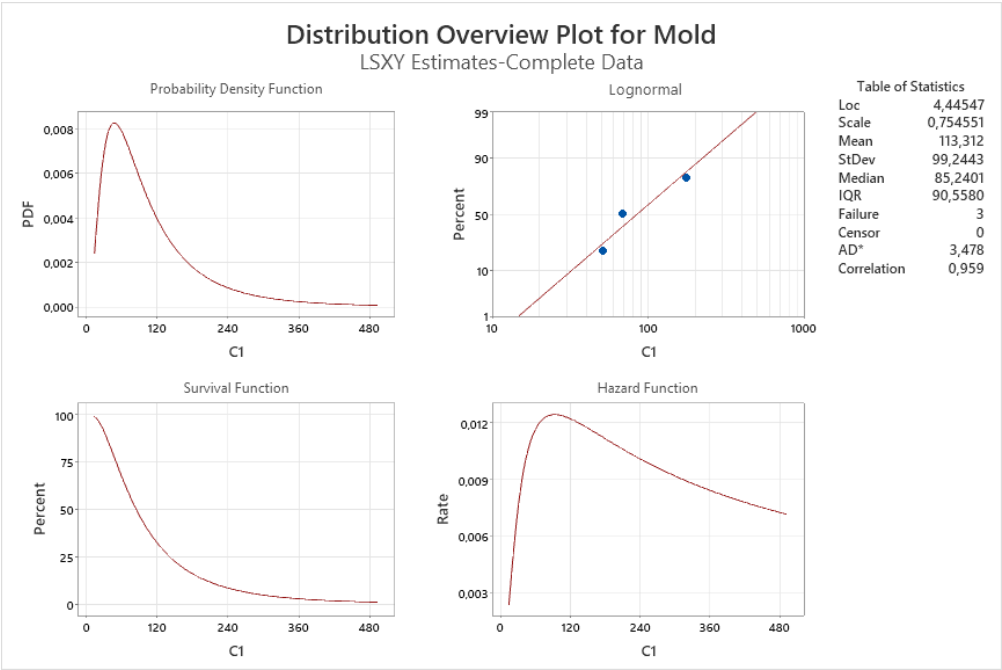


Table of MTTF

Distribution	Mean
Weibull	101,698
Lognormal	113,312
Exponential	111,414
Normal	98,667

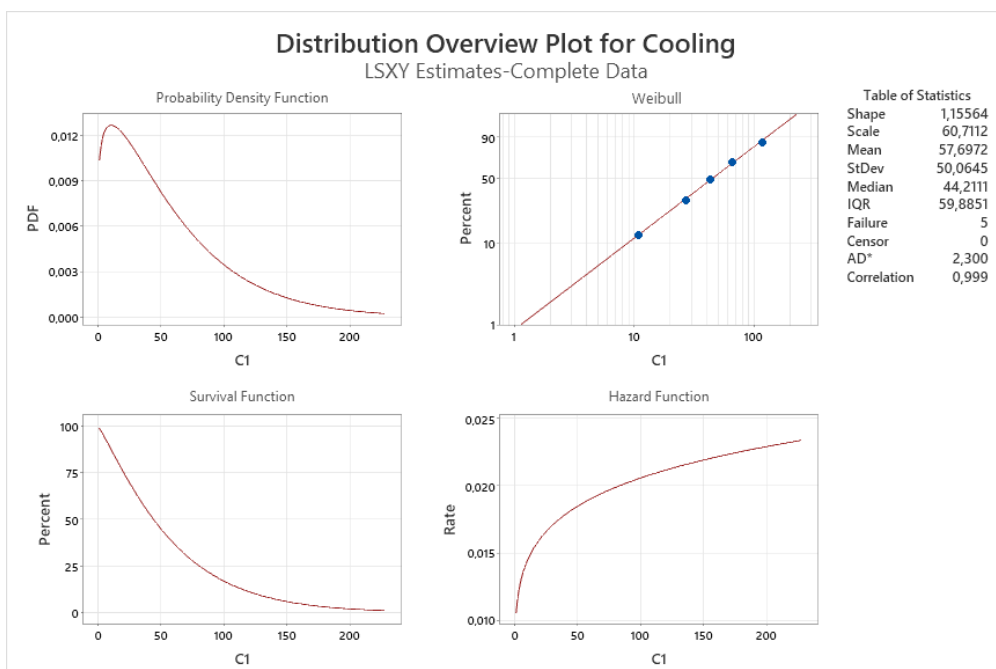


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	57,6972
Lognormal	67,4187
Exponential	58,0014
Normal	52,8000

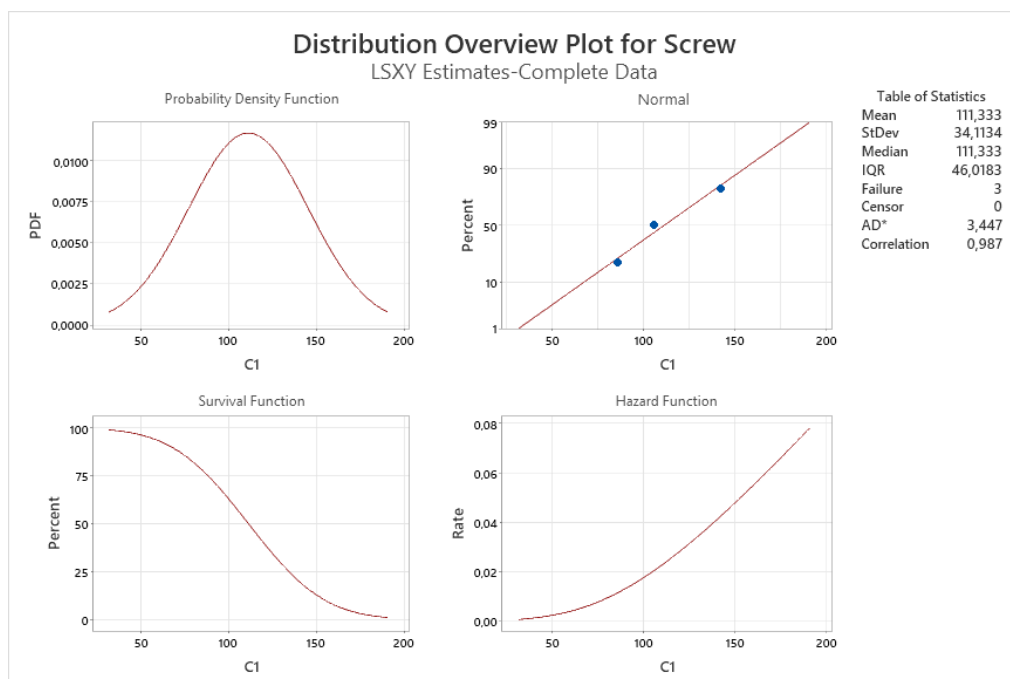


Table of MTTF

Distribution	Mean
Weibull	110,961
Lognormal	114,190
Exponential	104,810
Normal	111,333

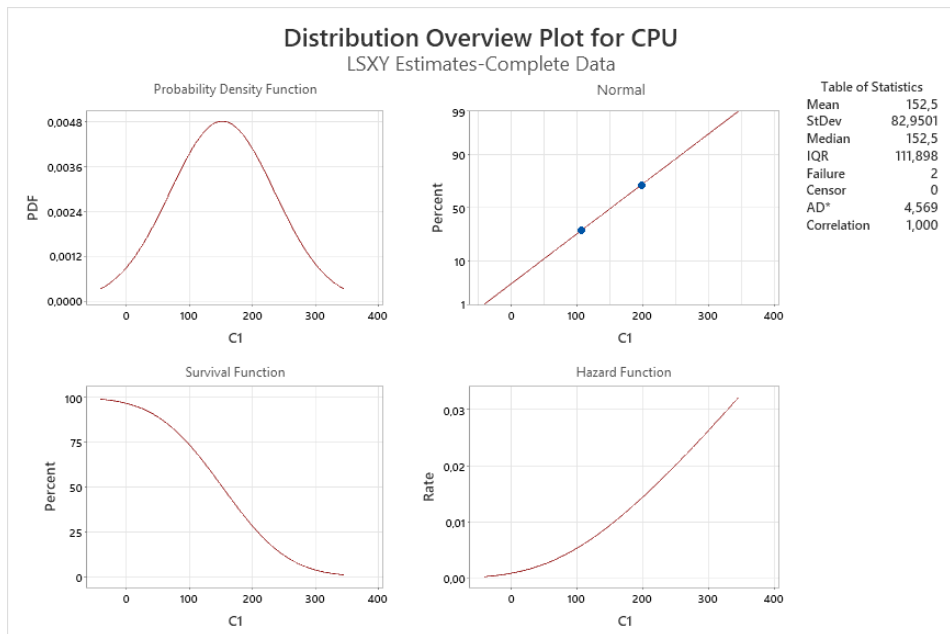


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	158,557
Lognormal	170,359
Exponential	171,562
Normal	152,500

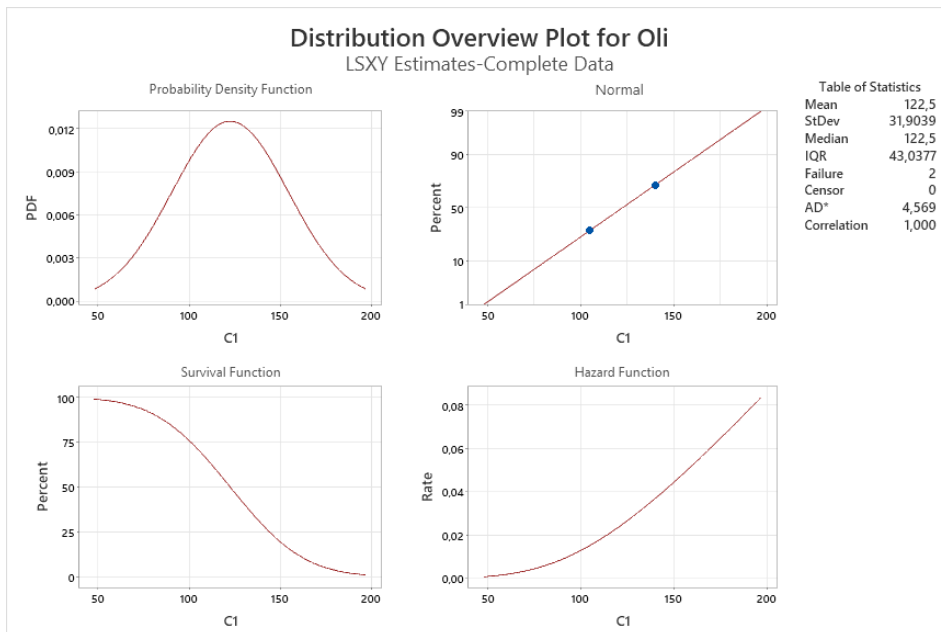


Table of MTTF

Distribution	Mean
Weibull	121,759
Lognormal	125,485
Exponential	127,487
Normal	122,500

MTTR

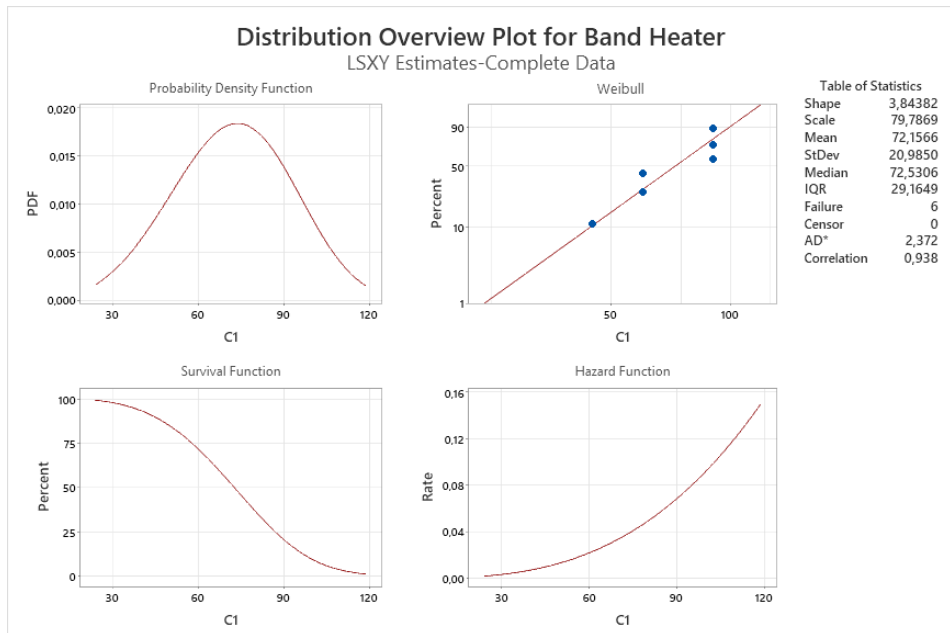


Table of MTTF

Distribution	Mean
Weibull	72,1566
Lognormal	73,3838
Exponential	57,9838
Normal	72,5000

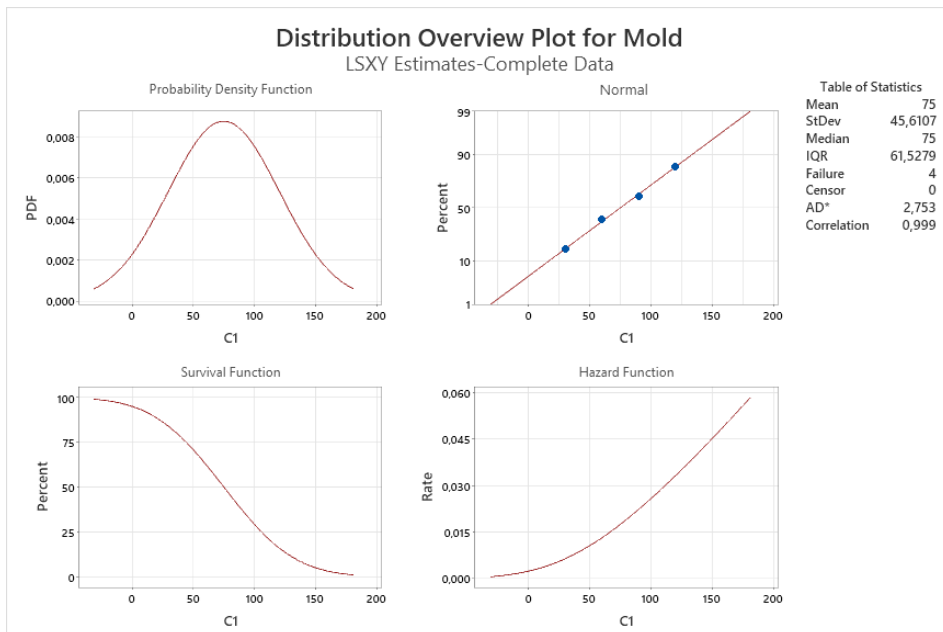


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	78,7528
Lognormal	84,5387
Exponential	74,8397
Normal	75,0000

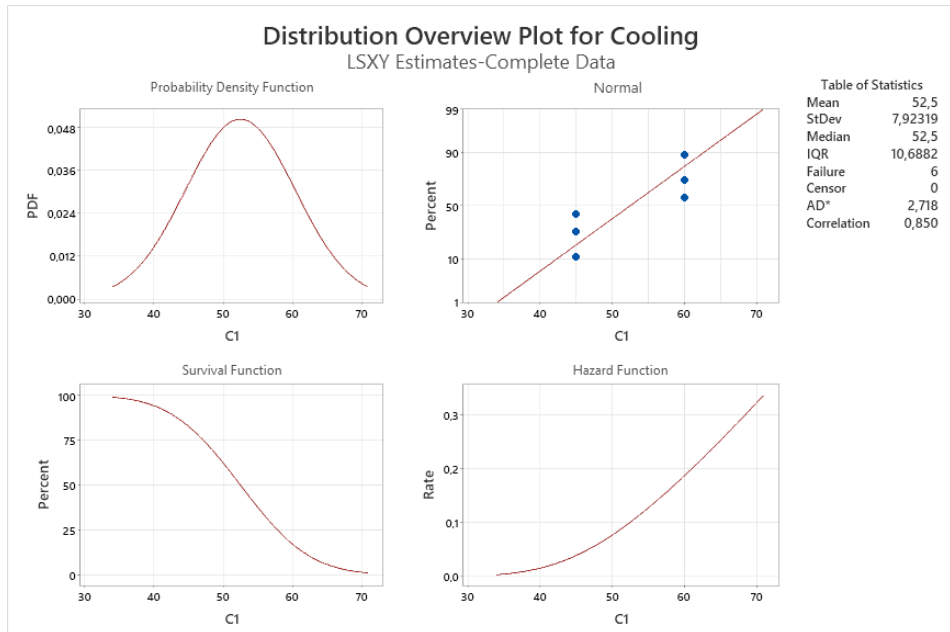


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	52,0910
Lognormal	52,5649
Exponential	39,4270
Normal	52,5000

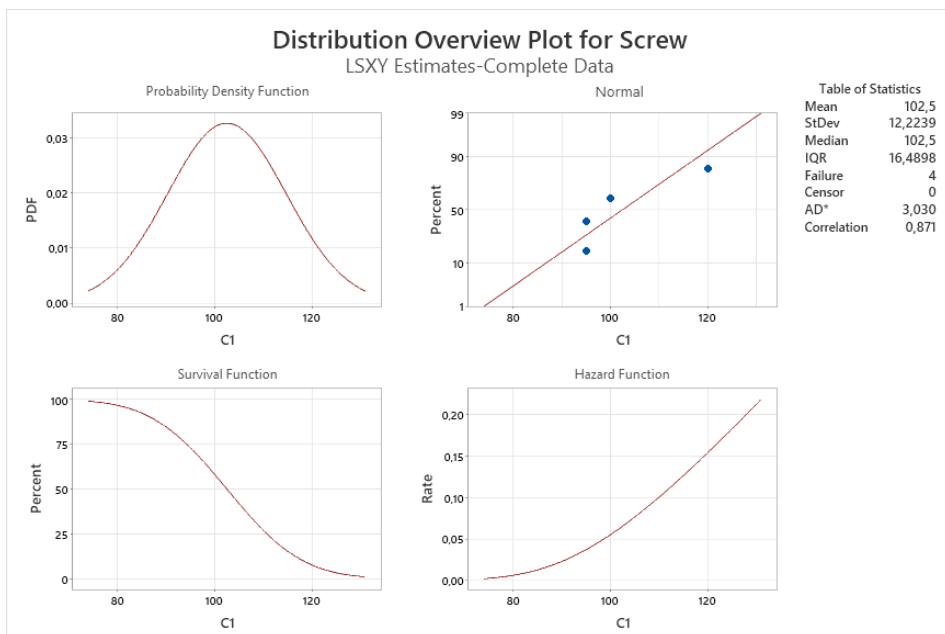


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	101,754
Lognormal	102,688
Exponential	83,158
Normal	102,500

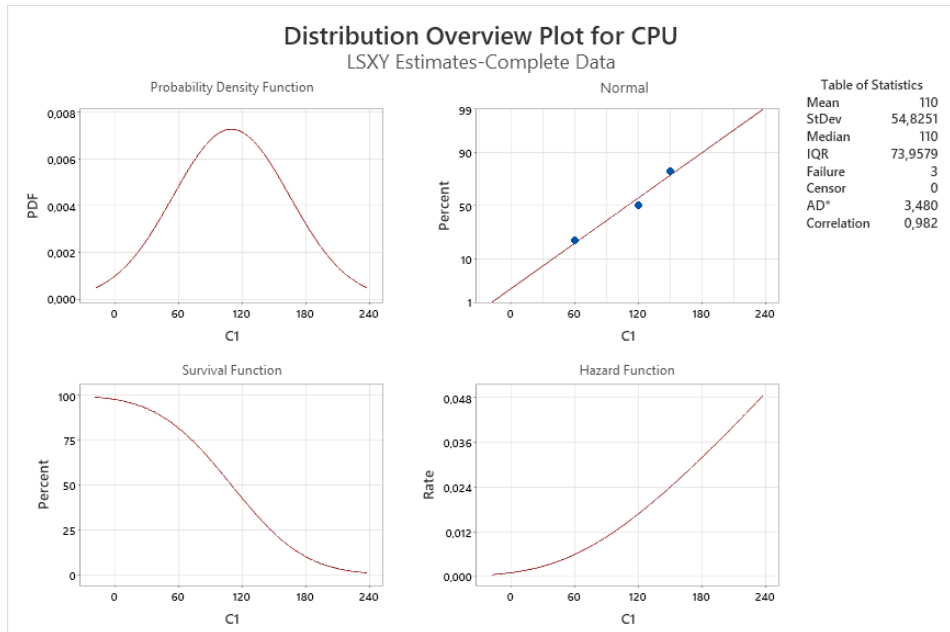


Table of MTTF

<u>Distribution</u>	<u>Mean</u>
Weibull	113,496
Lognormal	119,893
Exponential	110,205
Normal	110,000

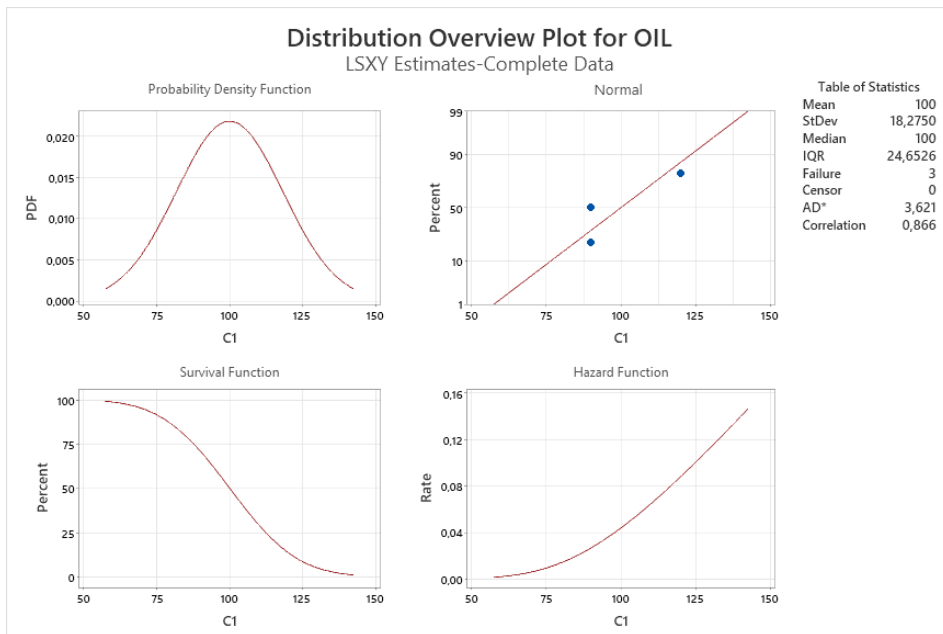


Table of MTF

<u>Distribution</u>	<u>Mean</u>
Weibull	98,924
Lognormal	100,591
Exponential	89,986
Normal	100,000

1. Tabel Fungsi Gamma

x	$\Gamma(x)$	x	$\Gamma(x)$	x	$\Gamma(x)$	x	$\Gamma(x)$
1.01	0.99433	1.51	0.88659	2.01	1.00427	2.51	1.33875
1.02	0.98884	1.52	0.88704	2.02	1.00862	2.52	1.34830
1.03	0.98355	1.53	0.88757	2.03	1.01306	2.53	1.35798
1.04	0.97844	1.54	0.88818	2.04	1.01758	2.54	1.36779
1.05	0.97350	1.55	0.88887	2.05	1.02218	2.55	1.37775
1.06	0.96874	1.56	0.88964	2.06	1.02687	2.56	1.38784
1.07	0.96415	1.57	0.89049	2.07	1.03164	2.57	1.39807
1.08	0.95973	1.58	0.89142	2.08	1.03650	2.58	1.40844
1.09	0.95546	1.59	0.89243	2.09	1.04145	2.59	1.41896
1.10	0.95133	1.60	0.89352	2.10	1.04649	2.60	1.42962
1.11	0.94740	1.61	0.89468	2.11	1.05161	2.61	1.44044
1.12	0.94359	1.62	0.89592	2.12	1.05682	2.62	1.45140
1.13	0.93993	1.63	0.89724	2.13	1.06212	2.63	1.46251
1.14	0.93642	1.64	0.89864	2.14	1.06751	2.64	1.47377
1.15	0.93304	1.65	0.90012	2.15	1.07300	2.65	1.48519
1.16	0.92980	1.66	0.90167	2.16	1.07857	2.66	1.49677
1.17	0.92670	1.67	0.90330	2.17	1.08424	2.67	1.50851
1.18	0.92373	1.68	0.90500	2.18	1.09000	2.68	1.52040
1.19	0.92089	1.69	0.90678	2.19	1.09585	2.69	1.53246
1.20	0.91817	1.70	0.90864	2.20	1.10180	2.70	1.54469
1.21	0.91558	1.71	0.91057	2.21	1.10785	2.71	1.55708
1.22	0.91311	1.72	0.91258	2.22	1.11399	2.72	1.56964
1.23	0.91075	1.73	0.91467	2.23	1.12023	2.73	1.58237
1.24	0.90852	1.74	0.91683	2.24	1.12657	2.74	1.59528
1.25	0.90640	1.75	0.91906	2.25	1.13300	2.75	1.60836
1.26	0.90440	1.76	0.92137	2.26	1.13954	2.76	1.62162
1.27	0.90250	1.77	0.92376	2.27	1.14618	2.77	1.63506
1.28	0.90072	1.78	0.92623	2.28	1.15292	2.78	1.64868
1.29	0.89904	1.79	0.92877	2.29	1.15976	2.79	1.66249
1.30	0.89747	1.80	0.93138	2.30	1.16671	2.80	1.67649
1.31	0.89600	1.81	0.93408	2.31	1.17377	2.81	1.69068
1.32	0.89464	1.82	0.93685	2.32	1.18093	2.82	1.70506
1.33	0.89338	1.83	0.93969	2.33	1.18819	2.83	1.71963
1.34	0.89222	1.84	0.94261	2.34	1.19557	2.84	1.73441
1.35	0.89115	1.85	0.94561	2.35	1.20305	2.85	1.74938
1.36	0.89018	1.86	0.94869	2.36	1.21065	2.86	1.76456
1.37	0.88931	1.87	0.95184	2.37	1.21836	2.87	1.77994
1.38	0.88854	1.88	0.95507	2.38	1.22618	2.88	1.79553
1.39	0.88785	1.89	0.95838	2.39	1.23412	2.89	1.81134
1.40	0.88726	1.90	0.96177	2.40	1.24217	2.90	1.82736
1.41	0.88676	1.91	0.96523	2.41	1.25034	2.91	1.84359
1.42	0.88636	1.92	0.96877	2.42	1.25863	2.92	1.86005
1.43	0.88604	1.93	0.97240	2.43	1.26703	2.93	1.87673
1.44	0.88581	1.94	0.97610	2.44	1.27556	2.94	1.89363
1.45	0.88566	1.95	0.97988	2.45	1.28421	2.95	1.91077
1.46	0.88560	1.96	0.98374	2.46	1.29298	2.96	1.92814
1.47	0.88563	1.97	0.98769	2.47	1.30188	2.97	1.94574
1.48	0.88575	1.98	0.99171	2.48	1.31091	2.98	1.96358
1.49	0.88595	1.99	0.99581	2.49	1.32006	2.99	1.98167
1.50	0.88623	2.00	1.00000	2.50	1.32934	3.00	2.00000

Sumber : Ebeling, C.E., *An Introduction to Reliability and Maintainability Engineering*,
Mc Graw-Hill, New York, 1997

Uji Reabilty keandalan mesin Inject Molding

Tp (hari)	Band Heater	Mold	Screw	Cooling	CPU	Oil
1	0,9115	0,8708	0,9994	0,989135	0,966	0,9999
2	0,9082	0,8686	0,9993	0,976854	0,965	0,9999
3	0,9032	0,8665	0,9992	0,964081	0,964	0,9999
4	0,9015	0,8643	0,9992	0,951042	0,963	0,9999
5	0,8980	0,8621	0,9991	0,937853	0,962	0,9999
6	0,8944	0,8599	0,999	0,924584	0,961	0,9999
7	0,8907	0,8577	0,9989	0,911283	0,960	0,9999
8	0,8869	0,8554	0,9987	0,897987	0,959	0,9998
9	0,8830	0,8531	0,9986	0,88472	0,957	0,9998
10	0,8790	0,8508	0,9985	0,871504	0,956	0,9998
11	0,8749	0,8485	0,9984	0,858355	0,955	0,9998
12	0,8729	0,8461	0,9982	0,845287	0,955	0,9997
13	0,8686	0,8438	0,998	0,832311	0,954	0,9997
14	0,8643	0,8413	0,9978	0,819437	0,952	0,9997
15	0,8599	0,8389	0,9976	0,806671	0,951	0,9996
16	0,8554	0,8365	0,9974	0,794021	0,950	0,9996
17	0,8508	0,834	0,9971	0,781491	0,948	0,9995
18	0,8461	0,8315	0,9968	0,769087	0,947	0,9995
19	0,8413	0,8289	0,9965	0,756813	0,945	0,9994
20	0,8365	0,8264	0,9962	0,744671	0,944	0,9993
21	0,8315	0,8238	0,9959	0,732664	0,943	0,9993
22	0,8264	0,8186	0,9955	0,720795	0,942	0,9992
23	0,8238	0,8159	0,9951	0,709066	0,941	0,9991
24	0,8186	0,8133	0,9948	0,697478	0,938	0,999
25	0,8133	0,8106	0,9943	0,686031	0,937	0,9989
26	0,8078	0,8078	0,9938	0,674728	0,936	0,9987
27	0,8023	0,8051	0,9932	0,663569	0,935	0,9986
28	0,7967	0,8023	0,9927	0,652554	0,933	0,9985
29	0,7910	0,7995	0,992	0,641683	0,931	0,9983
30	0,7852	0,7967	0,9913	0,630956	0,929	0,9981
31	0,7794	0,7939	0,9906	0,620374	0,928	0,9979
32	0,7734	0,791	0,9898	0,609937	0,927	0,9977
33	0,7673	0,7881	0,989	0,599643	0,925	0,9974
34	0,7642	0,8708	0,9994	0,589492	0,922	0,9972
35	0,7580	0,8686	0,9993	0,579484	0,921	0,9969
36	0,9115	0,8665	0,9992	0,569618	0,919	0,9966

TP (hari)	Band Heater	Mold	Screw	Cooling	CPU	Oil
37	0,9082	0,8643	0,9992	0,559893	0,918	0,9962
38	0,9032	0,7734	0,9838	0,550308	0,916	0,9959
39	0,7324	0,7704	0,983	0,540863	0,913	0,9955
40	0,7257	0,7673	0,9817	0,531557	0,912	0,9951
41	0,7190	0,7642	0,9803	0,522387	0,910	0,9946
42	0,7123	0,7611	0,9788	0,513355	0,908	0,9941
43	0,7054	0,758	0,9772	0,504457	0,907	0,9936
44	0,7019	0,7549	0,9756	0,495694	0,903	0,9931
45	0,6950	0,7517	0,9738	0,487063	0,903	0,9922
46	0,6879	0,7486	0,9719	0,478564	0,900	0,9916
47	0,6808	0,7454	0,9699	0,470195	0,898	0,9909
48	0,6736	0,7422	0,9678	0,461955	0,894	0,9901
49	0,6664	0,7389	0,9656	0,453843	0,893	0,9893
50	0,6591	0,7357	0,9633	0,445857	0,891	0,9884
51	0,6517	0,7324	0,9608	0,437996	0,889	0,9875
52	0,6443	0,7291	0,9582	0,430259	0,887	0,9861
53	0,6368	0,7257	0,9554	0,422644	0,883	0,985
54	0,6293	0,7224	0,9535	0,415149	0,881	0,9838
55	0,6255	0,719	0,9505	0,407774	0,879	0,9826
56	0,6179	0,7157	0,9474	0,400517	0,877	0,9812
57	0,6103	0,7123	0,9441	0,393377	0,875	0,9798
58	0,6026	0,7088	0,9406	0,386351	0,871	0,9783
59	0,5948	0,7054	0,937	0,379439	0,869	0,9767
60	0,5871	0,7019	0,9332	0,37264	0,867	0,9744
61	0,5793	0,6985	0,9292	0,365951	0,864	0,9726
62	0,5714	0,695	0,9251	0,359372	0,862	0,9706
63	0,5636	0,6915	0,9207	0,3529	0,858	0,9686
64	0,5557	0,6879	0,9162	0,346535	0,855	0,9664
65	0,5478	0,6844	0,9115	0,340276	0,853	0,9641
66	0,5438	0,6808	0,9066	0,33412	0,851	0,9616
67	0,5359	0,6772	0,9015	0,328066	0,849	0,9582
68	0,5279	0,6736	0,898	0,322113	0,844	0,9554
69	0,5199	0,67	0,8925	0,31626	0,841	0,9525
70	0,5120	0,6664	0,8869	0,310504	0,839	0,9495
71	0,5040	0,6628	0,881	0,304846	0,837	0,9463
72	0,5000	0,6591	0,8749	0,299283	0,834	0,9429
73	0,9920	0,6554	0,8686	0,293813	0,829	0,9394
74	0,9840	0,6517	0,8621	0,288437	0,826	0,9357
75	0,9761	0,648	0,8554	0,283152	0,824	0,9306

Tp (hari)	Band Heater	Mold	Screw	Cooling	CPU	Oil
76	0,9681	0,6443	0,8485	0,277956	0,821	0,9265
77	0,9641	0,6406	0,8413	0,27285	0,819	0,9222
78	0,9562	0,6368	0,834	0,267831	0,813	0,9177
79	0,9483	0,6331	0,8264	0,262898	0,811	0,9131
80	0,9404	0,6293	0,8186	0,258049	0,808	0,9131
81	0,9325	0,6255	0,8106	0,253284	0,805	0,9032
82	0,9247	0,6217	0,8023	0,248602	0,800	0,8962
83	0,9168	0,6179	0,7967	0,244	0,797	0,8907
84	0,909	0,6141	0,7881	0,239478	0,794	0,8849
85	0,9013	0,6103	0,7794	0,235035	0,791	0,879
86	0,8936	0,6064	0,7704	0,230669	0,788	0,8729
87	0,8897	0,6026	0,7611	0,22638	0,782	0,8665
88	0,8821	0,5987	0,7517	0,222165	0,779	0,8599
89	0,8745	0,5948	0,7422	0,218024	0,776	0,8531
90	0,8669	0,591	0,7324	0,213956	0,773	0,8438
91	0,8594	0,5871	0,7224	0,209959	0,770	0,8365
92	0,852	0,5832	0,7123	0,206033	0,764	0,8289
93	0,8446	0,5793	0,7019	0,202176	0,761	0,8212
94	0,8372	0,5753	0,6915	0,198387	0,758	0,8212
95	0,83	0,5714	0,6808	0,194665	0,755	0,8051
96	0,8228	0,5675	0,67	0,191009	0,752	0,7967
97	0,8156	0,5636	0,6628	0,187418	0,745	0,7852
98	0,8121	0,5596	0,6517	0,183891	0,742	0,7764
99	0,805	0,5557	0,6406	0,180427	0,739	0,7673
100	0,7981	0,5517	0,6293	0,177025	0,736	0,758
101	0,7912	0,5478	0,6179	0,173683	0,732	0,7486
102	0,7843	0,5438	0,6064	0,170402	0,726	0,7389
103	0,7776	0,5398	0,5948	0,167179	0,722	0,7291
104	0,7709	0,5359	0,5832	0,164015	0,719	0,7157
105	0,7643	0,5319	0,5714	0,160907	0,716	0,7054
106	0,7578	0,5279	0,5596	0,157855	0,712	0,695
107	0,7514	0,5239	0,5478	0,154858	0,705	0,6844
108	0,7514	0,5199	0,5359	0,151916	0,702	0,6736
109	0,7451	0,516	0,5239	0,149026	0,699	0,6628
110	0,7358	0,512	0,512	0,14619	0,695	0,9265
111	0,7296	0,508	0,5	0,143404	0,692	0,9222
112	0,7236	0,504	0,996	0,140669	0,684	0,9177
113	0,7177	0,5	0,984	0,137984	0,681	0,9131
114	0,7296	1	0,9721	0,135348	0,677	0,6026
115	0,7236	0,996	0,9602	0,13276	0,674	0,591

Tp (hari)	Band Heater	Mold	Screw	Cooling	CPU	Oil
116	0,7005	0,992	0,9483	0,86978	0,670	0,5793
117	0,6949	0,988	0,9364	0,872274	0,663	0,5675
118	0,6894	0,984	0,9247	0,874723	0,659	0,5557
119	0,6841	0,9801	0,9129	0,877126	0,655	0,5398
120	0,6814	0,9761	0,9013	0,879486	0,655	0,5279
121	0,6762	0,9721	0,8897	0,881802	0,644	0,516
122	0,6711	0,9681	0,8783	0,884075	0,641	0,504
123	0,666	0,9641	0,8669	0,886307	0,637	0,996
124	0,6611	0,9602	0,8557	0,888497	0,637	0,984
125	0,6562	0,9562	0,8446	0,890647	0,629	0,9721
126	0,6515	0,9522	0,8372	0,892757	0,622	0,9602
127	0,6469	0,9483	0,8264	0,894827	0,618	0,9443
128	0,6423	0,9443	0,8156	0,89686	0,614	0,9325
129	0,6379	0,9404	0,805	0,898855	0,610	0,9207
130	0,6357	0,9364	0,7946	0,900812	0,606	0,9207
131	0,6314	0,9325	0,7843	0,902734	0,599	0,8974
132	0,6271	0,9286	0,7743	0,904619	0,595	0,8859
133	0,623	0,9247	0,7643	0,906469	0,591	0,8745
134	0,619	0,9207	0,7546	0,908285	0,587	0,8594
135	0,6151	0,9168	0,7451	0,910067	0,583	0,8483
136	0,6112	0,9129	0,7358	0,911815	0,575	0,8372
137	0,6075	0,909	0,7266	0,913531	0,571	0,8264
138	0,6038	0,9052	0,7177	0,915215	0,568	0,8156
139	0,6003	0,9013	0,709	0,916867	0,564	0,805
140	0,5968	0,8974	0,7005	0,918488	0,560	0,7946
141	0,5951	0,8936	0,6949	0,920078	0,552	0,7843
142	0,5918	0,8897	0,6867	0,921639	0,548	0,7709
143	0,5885	0,8859	0,6788	0,92317	0,548	0,7611
144	0,5853	0,8821	0,6711	0,924672	0,540	0,7514
145	0,5853	0,8783	0,6635	0,926146	0,536	0,742
146	0,5793	0,8745	0,6562	0,927592	0,528	0,7327
147	0,5764	0,8707	0,6492	0,929011	0,528	0,7236
148	0,5735	0,8669	0,6423	0,930403	0,520	0,7148
149	0,5708	0,8632	0,6357	0,931768	0,516	0,7033
150	0,5681	0,8594	0,6292	0,933108	0,512	0,6949
151	0,5681	0,8557	0,623	0,934422	0,504	0,6867
152	0,5643	0,852	0,617	0,935711	0,500	0,6788
153	0,5618	0,8446	0,6112	0,936975	0,998	0,6711

Tp (hari)	Band Heater	Mold	Screw	Cooling	CPU	Oil
154	0,5594	0,8409	0,6056	0,938216	0,996	0,6635
155	0,5571	0,8372	0,6056	0,939433	0,988	0,6562
156	0,5548	0,8336	0,6056	0,940627	0,988	0,6469
157	0,5526	0,83	0,5918	0,941798	0,980	0,6401
158	0,5505	0,8264	0,5918	0,942946	0,976	0,6335
159	0,5485	0,8228	0,5823	0,944073	0,972	0,6271
160	0,5465	0,8192	0,5778	0,945178	0,964	0,621

Lampiran 2. Lembar Revisi Sidang Tugas Akhir


UNIVERSITAS 17 AGUSTUS 1945 SURABAYA
FAKULTAS TEKNIK
PROGRAM STUDI TEKNIK INDUSTRI

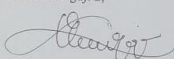
REVISI SIDANG TUGAS AKHIR


NAMA : Irsyaad Ramadhan
NBI : 1411900147
JUDUL : ANALISIS PENGGANTIAN DAN PERAWATAN BAGIAN WIRE DAN DRYER PADA UNIT PAPER MACHINE DENGAN METODE RELIABILITY CENTERED MAINTENANCE (RCM) PADA PT X
BATAS BIMBINGAN REVISI : 1 Minggu setelah Sidang

NO	URAIAN	BAB	HALAMAN
1.	Hal. 66. Tabel 4.44. perbandingan Reliability dicek lagi (data ditambah)		

NO	URAIAN	BAB	HALAMAN
1	Sesuaiakan tujuan dengan kesimpulan		

Telah Direvisi,
Dosen Penguji 1,

Dr. Ir. Zainal Arief, MT


Dosen Penguji 2,

Dr. Ir. I Nyoman Lokajaya, ST., MM

Surabaya, 08 Juni 2023
Mengetahui
Dosen Pembimbing,

Wiwin Widiastih, ST., MT

Lampiran 3. Kartu Bimbingan

JURNAL BIMBINGAN TUGAS AKHIR
PRODI TEKNIK INDUSTRI
SEMESTER GENAP 2022/2023

Nama : Mohammad Rizal Nur Alamsyah
 NBI : 1411900171
 Judul Penelitian :
 Dosen Pembimbing: Wiwon Widiasih, S.T., M.T.



No.	Tanggal	Materi Bimbingan	Catatan Pembimbing	Paraf Pembimbing
1.	8/3 2023	bab topik	topik perawatan	
2.	15/3 2023	bab 1	latar belakang	
3.	15/3 2023	bab 2	penelitian terdahulu, narasi	
4.	16/3 2023	bab 3	Flowchart	
5.	16/3 2023	daftar pustaka	dimasukkan yg disebutkan	
6.	16/3 2023	ack		
7.	4/4 2023	bab 4	OPC, data MTBF, MTR	
8.	4/5 2023	bab 4	hitung RPN dgn FMEA Analisis pareto → komponen kritis	
9.	19/5 2023	bab 4	analisis fit in distribusi	
10.	16/5 2023	bab 4	uji parameter, MTR	
11.	17/5 2023	bab 4	hitung Reliability (R)	
12.	22/5 2023	bab 4	mencari PE	
13.	23/5 2023	bab 4	olah FTA	
14.	25/5 2023	bab 5	penarikan simpulan	
15.	29/5 2023	bab 5	Revisi saran	
16.	30/5 2023	all	abstrak	

Lampiran 4. Surat Ijin Penelitian

PT. ANGKADA RAYA
Jl Rangkah II No 19A Kec. Tambak Sari, Surabaya

Surabaya, 15 Maret 2023
Nomor : 036/HRD/AR/III/2023
Perihal : Izin Penelitian Tugas Akhir

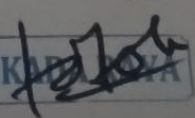
Kepada Yth:
Dekan Fakultas Teknik
Universitas 17 Agustus 1945 Surabaya
di Tempat

Dengan hormat,
Berdasarkan dengan surat izin penelitian Tugas Akhir Nomor : 759/K/FT/Akd/III/2023 Pada tanggal 15 Maret 2023 dalam rangka persyaratan untuk menyelesaikan studi program Strata 1, maka kami memberikan izin untuk melakukan penelitian Tugas Akhir di PT. ANGKADA RAYA kepada:

Nama Mahasiswa : Muhammad Rizal N.A
NBI : 1411900171
Program Studi : Teknik Industri

Demikian Surat ini kami sampaikan atas kerjasamanya kami ucapkan trimakasih

Hormat kami,
MANAGER, hrd


PT. ANGKADA RAYA
IOHANIS

Biografi Penulis



Muhammad Rizal Nur Alamsyah, laki-laki lahir di Bondowoso, 10 Nopember 2000. Anak pertama dari tiga bersaudara dari orang tua Muhammad Nur Aslam dan Yulie Wahyuningsih. Penulis pertama kali memasuki pendidikan dasar formal di SDN Prajekan Lor 1 Bondowoso pada tahun 2007 dan lulus pada tahun 2013. Pada tahun yang sama penulis melanjutkan pendidikan di SMPN 1 Prajekan Bondowoso dan lulus pada tahun 2016.

Setelah lulus SMP, penulis melanjutkan ke SMKN 1 Panji Situbondo Dengan Jurusan Rekayasa Perangkat Lunak dan lulus pada tahun 2019. Dan pada tahun 2019, penulis terdaftar sebagai mahasiswa di Universitas 17 Agustus 1945 Surabaya Fakultas Teknik Jurusan Teknik Industri dan lulus pada tahun 2023.