Table 1

Sample Number	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
1	No lubrication	Brass	8	100	Piezo
2	No lubrication	Brass	8	150	Piezo
3	No lubrication	Brass	8	200	Piezo
4	No lubrication	Brass	8	250	Piezo
5	No lubrication	Brass	9	100	Piezo
6	No lubrication	Brass	9	150	Piezo
7	No lubrication	Brass	9	200	Piezo
8	No lubrication	Brass	9	250	Piezo
9	No lubrication	Brass	10	100	Piezo
10	No lubrication	Brass	10	150	Piezo
11	No lubrication	Brass	10	200	Piezo
12	No lubrication	Brass	10	250	Piezo
13	No lubrication	Brass	11	100	Piezo
14	No lubrication	Brass	11	150	Piezo
15	No lubrication	Brass	11	200	Piezo
16	No lubrication	Brass	11	250	Piezo
17	No lubrication	Aluminium	2	100	Piezo
18	No lubrication	Aluminium	2	150	Piezo
19	No lubrication	Aluminium	2	200	Piezo
20	No lubrication	Aluminium	2	250	Piezo
21	No lubrication	Aluminium	3	100	Piezo
22	No lubrication	Aluminium	3	150	Piezo
23	No lubrication	Aluminium	3	200	Piezo
24	No lubrication	Aluminium	3	250	Piezo
25	No lubrication	Aluminium	4	100	Piezo
26	No lubrication	Aluminium	4	150	Piezo
27	No lubrication	Aluminium	4	200	Piezo
28	No lubrication	Aluminium	4	250	Piezo
29	No lubrication	Aluminium	5	100	Piezo
30	No lubrication	Aluminium	5	150	Piezo
31	No lubrication	Aluminium	5	200	Piezo
32	No lubrication	Aluminium	5	250	Piezo
33	Half Lubrication	Brass	8	100	Piezo
34	Half Lubrication	Brass	8	150	Piezo
35	Half Lubrication	Brass	8	200	Piezo
36	Half Lubrication	Brass	8	250	Piezo
37	Half Lubrication	Brass	9	100	Piezo

Sample Number	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
38	Half Lubrication	Brass	9	150	Piezo
39	Half Lubrication	Brass	9	200	Piezo
40	Half Lubrication	Brass	9	250	Piezo
41	Half Lubrication	Brass	10	100	Piezo
42	Half Lubrication	Brass	10	150	Piezo
43	Half Lubrication	Brass	10	200	Piezo
44	Half Lubrication	Brass	10	250	Piezo
45	Half Lubrication	Brass	11	100	Piezo
46	Half Lubrication	Brass	11	150	Piezo
47	Half Lubrication	Brass	11	200	Piezo
48	Half Lubrication	Brass	11	250	Piezo
49	Half Lubrication	Aluminium	2	100	Piezo
50	Half Lubrication	Aluminium	2	150	Piezo
51	Half Lubrication	Aluminium	2	200	Piezo
52	Half Lubrication	Aluminium	2	250	Piezo
53	Half Lubrication	Aluminium	3	100	Piezo
54	Half Lubrication	Aluminium	3	150	Piezo
55	Half Lubrication	Aluminium	3	200	Piezo
56	Half Lubrication	Aluminium	3	250	Piezo
57	Half Lubrication	Aluminium	4	100	Piezo
58	Half Lubrication	Aluminium	4	150	Piezo
59	Half Lubrication	Aluminium	4	200	Piezo
60	Half Lubrication	Aluminium	4	250	Piezo
61	Half Lubrication	Aluminium	5	100	Piezo
62	Half Lubrication	Aluminium	5	150	Piezo
63	Half Lubrication	Aluminium	5	200	Piezo
64	Half Lubrication	Aluminium	5	250	Piezo
65	Full Lubrication	Brass	8	100	Piezo
66	Full Lubrication	Brass	8	150	Piezo
67	Full Lubrication	Brass	8	200	Piezo
68	Full Lubrication	Brass	8	250	Piezo
69	Full Lubrication	Brass	9	100	Piezo
70	Full Lubrication	Brass	9	150	Piezo
71	Full Lubrication	Brass	9	200	Piezo
72	Full Lubrication	Brass	9	250	Piezo
73	Full Lubrication	Brass	10	100	Piezo
74	Full Lubrication	Brass	10	150	Piezo
75	Full Lubrication	Brass	10	200	Piezo
76	Full Lubrication	Brass	10	250	Piezo
77	Full Lubrication	Brass	11	100	Piezo
78	Full Lubrication	Brass	11	150	Piezo
79	Full Lubrication	Brass	11	200	Piezo
80	Full Lubrication	Brass	11	250	Piezo
81	Full Lubrication	Aluminium	2	100	Piezo
82	Full Lubrication	Aluminium	2	150	Piezo
83	Full Lubrication	Aluminium	2	200	Piezo
84	Full Lubrication	Aluminium	2	250	Piezo
85	Full Lubrication	Aluminium	3	100	Piezo
86	Full Lubrication	Aluminium	3	150	Piezo

Sample Number	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
87	Full Lubrication	Aluminium	3	200	Piezo
88	Full Lubrication	Aluminium	3	250	Piezo
89	Full Lubrication	Aluminium	4	100	Piezo
90	Full Lubrication	Aluminium	4	150	Piezo
91	Full Lubrication	Aluminium	4	200	Piezo
92	Full Lubrication	Aluminium	4	250	Piezo
93	Full Lubrication	Aluminium	5	100	Piezo
94	Full Lubrication	Aluminium	5	150	Piezo
95	Full Lubrication	Aluminium	5	200	Piezo
96	Full Lubrication	Aluminium	5	250	Piezo
Test Samples					
1	No lubrication	Brass	5	175	Unseen
2	No lubrication	Brass	8	225	Unseen
3	No lubrication	Brass	11	300	Unseen
4	Half Lubrication	Brass	5	175	Unseen
5	Half Lubrication	Brass	8	225	Unseen
6	Half Lubrication	Brass	11	300	Unseen
7	Full Lubrication	Brass	5	175	Unseen
8	Full Lubrication	Brass	8	225	Unseen
9	Full Lubrication	Brass	11	300	Unseen
10	No lubrication	Aluminium	2	175	Unseen
11	No lubrication	Aluminium	5	225	Unseen
12	No lubrication	Aluminium	8	300	Unseen
13	Half Lubrication	Aluminium	2	175	Unseen
14	Half Lubrication	Aluminium	5	225	Unseen
15	Half Lubrication	Aluminium	8	300	Unseen
16	Full Lubrication	Aluminium	2	175	Unseen
17	Full Lubrication	Aluminium	5	225	Unseen
18	Full Lubrication	Aluminium	8	300	Unseen

Sample Number	Name of files	COMPLETED ☑	Old RPM	New File Name		Data Collected
1	Piezo_1	☑	100			Wear (micro meter)
2	Piezo_2	☑	200	Piezo_Actual_2		Friction force
3	Piezo_3	☑	300	Piezo_2		Coefficient of friction
4	Piezo_4	☑	400	Piezo_Actual_4		Sensor Data
5	Piezo_5	☑	100			
6	Piezo_6	☑	200	Piezo_Actual_6		Constants
7	Piezo_7	☑	300	Piezo_6		Diameter (mm)
8	Piezo_8	☑	400	Piezo_Actual_8		Samples in Hz (Winducom)
9	Piezo_9	☑	100			
10	Piezo_10	☑	200	Piezo_Actual_10		Additional Data Point (Only for piezo)
11	Piezo_11	☑	300	Piezo_10		
12	Piezo_12	☑	400	Piezo_Actual_12		
13	Piezo_13	☑	100			
14	Piezo_14	☑	200	Piezo_Actual_14		
15	Piezo_15	☑	300	Piezo_14		
16	Piezo_16	☑	400	Piezo_Actual_16	Sea of blue	
17	Piezo_Actual_17	☑				
18	Piezo_Actual_18	☑				
19	Piezo_Actual_19	☑				
20	Piezo_Actual_20	☑				
21	Piezo_Actual_21	☑				
22	Piezo_Actual_22	☑				
23	Piezo_Actual_23	☑				
24	Piezo_Actual_24	☑				
25	Piezo_Actual_25	☑				
26	Piezo_Actual_26	☑				
27	Piezo_27	☑				
28	Piezo_28	☑				
29	Piezo_29	☑				
30	Piezo_30	☑				
31	Piezo_31	☑				
32	Piezo_32	☑				
33	Piezo_33	☑				
34	Piezo_34	☑				
35	Piezo_35	☑				
36	Piezo_36	☑				
37	Piezo_37	☑				

Sample Number	Name of files	COMPLETED ☑	Old RPM	New File Name		Data Collected
38	Piezo_38	☑				
39	Piezo_39	☑				
40	Piezo_40	☑				
41	Piezo_41	☑				
42	Piezo_42	☑				
43	Piezo_43	☑				
44	Piezo_44	☑				
45	Piezo_45	☑				
46	Piezo_46	☑				
47	Piezo_47	☑				
48	Piezo_48	☑				
49	Piezo_49	☑				
50	Piezo_50	☑				
51	Piezo_51	☑				
52	Piezo_52	☑				
53	Piezo_53	☑				
54	Piezo_54	☑				
55	Piezo_55	☑				
56	Piezo_56	☑				
57	Piezo_57	☑				
58	Piezo_58	☑				
59	Piezo_59	☑				
60	Piezo_60	☑				
61	Piezo_61	☑				
62	Piezo_62	☑				
63	Piezo_63	☑				
64	Piezo_64	☑				
65	Piezo_65	☑				
66	Piezo_66	☑				
67	Piezo_67	☑				
68	Piezo_68	☑				
69	Piezo_69	☑				
70	Piezo_70	☑				
71	Piezo_71	☑				
72	Piezo_72	☑				
73	Piezo_73	☑				
74	Piezo_74	☑				
75	Piezo_75	☑				
76	Piezo_76	☑				
77	Piezo_77	☑				
78	Piezo_78	☑				
79	Piezo_79	☑				
80	Piezo_80	☑				
81	Piezo_81	☑				
82	Piezo_82	☑				
83	Piezo_83	☑				
84	Piezo_84	☑				
85	Piezo_85	☑				
86	Piezo_86	☑				

Sample Number	Name of files	COMPLETED ☑	Old RPM	New File Name		Data Collected
87	Piezo_87	☑				
88	Piezo_88	☑				
89	Piezo_89	☑				
90	Piezo_90	☑				
91	Piezo_91	☑				
92	Piezo_92	☑				
93	Piezo_93	☑				
94	Piezo_94	☑				
95	Piezo_95	☑				
96	Piezo_96	☑				
Test Samples						
1	Test_1	☑				
2	Test_2	☑				
3	Test_3	☑				
4	Test_4	☑				
5	Test_5	☑				
6	Test_6	☑				
7	Test_7	☑				
8	Test_8	☑				
9	Test_9	☑				
10	Test_10	☑				
11	Test_11	☑				
12	Test_12	☑				
13	Test_13	☑				
14	Test_14	☑				
15	Test_15	☑				
16	Test_16	☑				
17	Test_17	☑				
18	Test_18	☑				

Sample Number		Stats	
1		Total number of readings in Piezo	96
2		Total number of readings in MPU	
3			
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7	102		
8	60		
9			
10	No vibration data i.e. noise	Mean is around 2600	
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12			
13		Clarifications	
14		Piezo_Actual_ is the data based on new RPM values. For those data points, Piezo_ is not useful	
15		Without lubrication Brass has 100, 200, 300 and 400 rpm values whereas without lubrication aluminium has 100, 150, 200 and 250 rpm values	
16		For half lubrication, lubricant is switched on for 2 seconds and switched off after which data is collected	
17		Instead of 100, 200, 300 and 400, I've changed brass no lubrication to 100, 150, 200 and 250. Therefore, all 4n+2 will change to 4n+3. Further 4n+2 and 4n readings have to be repeated (n=0, 1, 2, 3)	
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Sample Number		Stats	
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Sample Number		Stats	
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Test Samples			
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Table 1

	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
1	No lubrication	Brass	8	100	MPU
2	No lubrication	Brass	8	200	MPU
3	No lubrication	Brass	8	300	MPU
4	No lubrication	Brass	8	400	MPU
5	No lubrication	Brass	9	100	MPU
6	No lubrication	Brass	9	200	MPU
7	No lubrication	Brass	9	300	MPU
8	No lubrication	Brass	9	400	MPU
9	No lubrication	Brass	10	100	MPU
10	No lubrication	Brass	10	200	MPU
11	No lubrication	Brass	10	300	MPU
12	No lubrication	Brass	10	400	MPU
13	No lubrication	Brass	11	100	MPU
14	No lubrication	Brass	11	200	MPU
15	No lubrication	Brass	11	300	MPU
16	No lubrication	Brass	11	400	MPU
17	No lubrication	Aluminium	2	100	MPU
18	No lubrication	Aluminium	2	200	MPU
19	No lubrication	Aluminium	2	300	MPU
20	No lubrication	Aluminium	2	400	MPU
21	No lubrication	Aluminium	3	100	MPU
22	No lubrication	Aluminium	3	200	MPU
23	No lubrication	Aluminium	3	300	MPU
24	No lubrication	Aluminium	3	400	MPU
25	No lubrication	Aluminium	4	100	MPU
26	No lubrication	Aluminium	4	200	MPU
27	No lubrication	Aluminium	4	300	MPU
28	No lubrication	Aluminium	4	400	MPU
29	No lubrication	Aluminium	5	100	MPU
30	No lubrication	Aluminium	5	200	MPU
31	No lubrication	Aluminium	5	300	MPU
32	No lubrication	Aluminium	5	400	MPU
33	Half Lubrication	Brass	8	100	MPU
34	Half Lubrication	Brass	8	200	MPU
35	Half Lubrication	Brass	8	300	MPU
36	Half Lubrication	Brass	8	400	MPU
37	Half Lubrication	Brass	9	100	MPU
38	Half Lubrication	Brass	9	200	MPU
39	Half Lubrication	Brass	9	300	MPU
40	Half Lubrication	Brass	9	400	MPU
41	Half Lubrication	Brass	10	100	MPU
42	Half Lubrication	Brass	10	200	MPU
43	Half Lubrication	Brass	10	300	MPU
44	Half Lubrication	Brass	10	400	MPU
45	Half Lubrication	Brass	11	100	MPU
46	Half Lubrication	Brass	11	200	MPU

	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
47	Half Lubrication	Brass	11	300	MPU
48	Half Lubrication	Brass	11	400	MPU
49	Half Lubrication	Aluminium	2	100	MPU
50	Half Lubrication	Aluminium	2	200	MPU
51	Half Lubrication	Aluminium	2	300	MPU
52	Half Lubrication	Aluminium	2	400	MPU
53	Half Lubrication	Aluminium	3	100	MPU
54	Half Lubrication	Aluminium	3	200	MPU
55	Half Lubrication	Aluminium	3	300	MPU
56	Half Lubrication	Aluminium	3	400	MPU
57	Half Lubrication	Aluminium	4	100	MPU
58	Half Lubrication	Aluminium	4	200	MPU
59	Half Lubrication	Aluminium	4	300	MPU
60	Half Lubrication	Aluminium	4	400	MPU
61	Half Lubrication	Aluminium	5	100	MPU
62	Half Lubrication	Aluminium	5	200	MPU
63	Half Lubrication	Aluminium	5	300	MPU
64	Half Lubrication	Aluminium	5	400	MPU
65	Full Lubrication	Brass	8	100	MPU
66	Full Lubrication	Brass	8	200	MPU
67	Full Lubrication	Brass	8	300	MPU
68	Full Lubrication	Brass	8	400	MPU
69	Full Lubrication	Brass	9	100	MPU
70	Full Lubrication	Brass	9	200	MPU
71	Full Lubrication	Brass	9	300	MPU
72	Full Lubrication	Brass	9	400	MPU
73	Full Lubrication	Brass	10	100	MPU
74	Full Lubrication	Brass	10	200	MPU
75	Full Lubrication	Brass	10	300	MPU
76	Full Lubrication	Brass	10	400	MPU
77	Full Lubrication	Brass	11	100	MPU
78	Full Lubrication	Brass	11	200	MPU
79	Full Lubrication	Brass	11	300	MPU
80	Full Lubrication	Brass	11	400	MPU
81	Full Lubrication	Aluminium	2	100	MPU
82	Full Lubrication	Aluminium	2	200	MPU
83	Full Lubrication	Aluminium	2	300	MPU
84	Full Lubrication	Aluminium	2	400	MPU
85	Full Lubrication	Aluminium	3	100	MPU
86	Full Lubrication	Aluminium	3	200	MPU
87	Full Lubrication	Aluminium	3	300	MPU
88	Full Lubrication	Aluminium	3	400	MPU
89	Full Lubrication	Aluminium	4	100	MPU
90	Full Lubrication	Aluminium	4	200	MPU
91	Full Lubrication	Aluminium	4	300	MPU
92	Full Lubrication	Aluminium	4	400	MPU
93	Full Lubrication	Aluminium	5	100	MPU
94	Full Lubrication	Aluminium	5	200	MPU
95	Full Lubrication	Aluminium	5	300	MPU

	Lubrication Condition	Pin Material	Weight (kg)	RPM	Sensor
96	Full Lubrication	Aluminium	5	400	MPU

	Name of files	COMPLETED ☑		Data Collected		
1	MPU_1	☑		Wear (micro meter)		
2	MPU_2	☑		Friction force		
3	MPU_3	☑		Coefficient of friction		
4	MPU_4	☑		Sensor Data		
5	MPU_5	☐				
6	MPU_6	☐		Constants		
7	MPU_7	☐		Diameter (mm)	102	
8	MPU_8	☐		Samples in Hz (Winducom)	60	
9	MPU_9	☐				
10	MPU_10	☐				
11	MPU_11	☐				
12	MPU_12	☐				
13	MPU_13	☐				
14	MPU_14	☐				
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16	MPU_16	☐				
17	MPU_17	☐				
18	MPU_18	☐				
19	MPU_19	☐				
20	MPU_20	☐				
21	MPU_21	☐				
22	MPU_22	☐				
23	MPU_23	☐				
24	MPU_24	☐				
25	MPU_25	☐				
26	MPU_26	☐				
27	MPU_27	☐				
28	MPU_28	☐				
29	MPU_29	☐				
30	MPU_30	☐				
31	MPU_31	☐				
32	MPU_32	☐				
33	MPU_33	☐				
34	MPU_34	☐				
35	MPU_35	☐				
36	MPU_36	☐				
37	MPU_37	☐				
38	MPU_38	☐				
39	MPU_39	☐				
40	MPU_40	☐				
41	MPU_41	☐				
42	MPU_42	☐				
43	MPU_43	☐				
44	MPU_44	☐				
45	MPU_45	☐				
46	MPU_46	☐				

	Name of files	COMPLETED ☑		Data Collected		
47	MPU_47	☐				
48	MPU_48	☐				
49	MPU_49	☐				
50	MPU_50	☐				
51	MPU_51	☐				
52	MPU_52	☐				
53	MPU_53	☐				
54	MPU_54	☐				
55	MPU_55	☐				
56	MPU_56	☐				
57	MPU_57	☐				
58	MPU_58	☐				
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61	MPU_61	☐				
62	MPU_62	☐				
63	MPU_63	☐				
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65	MPU_65	☐				
66	MPU_66	☐				
67	MPU_67	☐				
68	MPU_68	☐				
69	MPU_69	☐				
70	MPU_70	☐				
71	MPU_71	☐				
72	MPU_72	☐				
73	MPU_73	☐				
74	MPU_74	☐				
75	MPU_75	☐				
76	MPU_76	☐				
77	MPU_77	☐				
78	MPU_78	☐				
79	MPU_79	☐				
80	MPU_80	☐				
81	MPU_81	☐				
82	MPU_82	☐				
83	MPU_83	☐				
84	MPU_84	☐				
85	MPU_85	☐				
86	MPU_86	☐				
87	MPU_87	☐				
88	MPU_88	☐				
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90	MPU_90	☐				
91	MPU_91	☐				
92	MPU_92	☐				
93	MPU_93	☐				
94	MPU_94	☐				
95	MPU_95	☐				

	Name of files	COMPLETED ☑		Data Collected		
96	MPU_96	☐				

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