

MLL100: Introduction to Materials Science and Engineering – Lab Session

Student Name:

Entry No:

Lab Group No:

Experiment 06: To study the creep deformation of solder wire

Reading reference:

Creep Section (pp. 287 – 291) of Chapter 11 in Material Science and Engineering book (5th. Edition.) by V. Raghavan.

Safety precautions:

1. Handle the equipment and all related accessories safely and with utmost care.

I. Conducting creep experiment on solder wire (Pb-based)

a Experimental Procedure:

1. Measure the initial length (gauge length) of the solder wire.
2. Note down the temperature (i.e. room temperature) before starting the experiment and after completing the experiment.
3. Note down the load applied to the solder wire. Note down the initial time.
4. Measure all the required sample dimensions using Callipers or rulers.
5. Note down the time (minutes and sec) and elongation in the below Table in *section c* for every 1 mm elongation for the first 20 mm and subsequently for every 3 mm elongation till the solder wire breaks.

b Observation and Calculations:

S. No	Sample and Experiment details	
1	Initial length (i.e. Gauge length) (<i>mm</i>)	52
2	Initial temperature (°C)	25
3	Final temperature (°C)	25
4	Applied load (in <i>kg</i>)	1.4 kg
	(in <i>N</i>)	13.72 N
5	Time (<i>sec</i>) (start)	0
	(finish)	16 min

c Creep experiment data:

S. No .	Time (after every 1 mm elongation) <i>min s</i>		Elongation (for every 1 mm)	S. No .	Time (after every 3 mm elongation) <i>min s</i>		Elongation (for every 3 mm)
1	0	00	0	21	3	29	24
2	0	07	1	22	4	03	27
3	0	15	2	23	4	27	30
4	0	24	3	24	5	05	33
5	0	31	4	25	5	34	36
6	0	35	5	26	5	56	39
7	0	43	6	27	6	29	42
8	0	52	7	28	6	54	45
9	1	01	8	29	7	17	48
10	1	09	9	30	7	45	51
11	1	15	10	31	8	14	54
12	1	20	11	32	8	39	57
13	1	31	12	33	9	15	60
14	1	42	13	34	9	34	63
15	1	55	14	35	9	57	66
16	2	04	15	36	10	20	69
17	2	15	16	37	10	55	72
18	2	24	17	38	11	22	75
19	2	30	18	39	11	52	78
20	2	40	19	40	12	13	81
21	2	50	20	41	12	45	84
22	3	04	21	42	13	12	87
				43	13	29	90

				44	13	53	93
				45	14	16	96
				48	14	31	99
				49	14	51	102
				50	15	10	105
				51	15	26	108
				52	16	05	111

