LOADED CHAMBER HEAT PENETRATION

CYCLE No.: 1
LOAD : STERILITY TESTING MEDIA TUBES
DATE OF TEST: ………….

TIME	CHANNELS No. (TEMPEARTURE IN DEGREES CELCIUS)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11:10	36.4	36.1	44.5	36.5	37.4	36.2	37.2	36.5	39.6	39.7	38.6	37.3	38.8	36.7	38.2	37.5
11:11	39.9	37.5	44.6	44.0	44.3	38.3	38.7	38.8	43.2	42.6	40.7	39.9	41.8	39.7	40.1	37.7
11:12	46.7	39.0	46.6	44.8	44.4	39.3	41.9	40.2	47.0	44.8	42.4	40.5	46.5	39.7	40.4	44.0
11:13	50.7	44.6	49.5	45.1	45.8	49.4	44.0	42.8	48.1	47.2	45.8	41.7	50.8	44.1	42.3	49.0
11:14	54.6	49.5	53.1	45.4	48.6	52.5	47.1	46.4	52.5	47.8	50.9	49.9	52.2	50.0	45.2	55.0
11:15	56.6	52.2	55.0	47.4	51.7	52.6	50.3	50.9	59.7	48.3	56.8	62.6	53.6	51.0	48.4	61.2
11:16	56.6	55.1	60.8	49.9	54.7	62.4	50.6	52.9	64.0	48.3	59.5	64.7	56.3	57.6	54.3	63.1
11:17	57.2	55.9	66.4	56.9	70.7	62.8	51.0	55.6	65.4	52.1	60.8	76.4	64.4	60.2	54.7	68.4
11:18	58.5	58.0	67.5	57.8	71.6	66.8	57.3	62.4	69.4	53.6	63.7	82.7	66.2	67.2	55.7	72.6
11:19	61.5	59.6	69.7	59.1	74.2	69.5	60.4	70.0	70.5	57.8	64.3	86.8	68.0	67.6	58.1	74.3
11:20	63.4	82.1	76.0	74.6	75.1	74.4	64.0	70.6	72.9	66.0	65.8	86.9	83.1	70.4	64.2	77.1
11:21	66.8	85.7	76.1	76.7	79.4	74.8	75.6	74.6	78.4	69.4	69.0	87.8	86.2	73.8	69.6	77.4
11:22	68.5	94.6	76.7	81.1	85.7	83.5	82.2	78.2	79.9	70.9	72.9	88.7	86.5	81.5	70.6	77.6
11:23	69.8	96.3	78.2	86.7	86.4	93.8	90.4	81.9	86.1	75.0	75.0	89.3	95.1	83.4	73.1	79.4
11:24	77.8	98.4	86.7	95.3	90.6	99.5	90.8	88.1	90.0	78.2	82.4	89.9	97.1	86.6	74.0	83.4
11:25	86.1	98.8	88.9	95.5	93.7	99.6	93.7	89.9	96.1	80.0	86.3	97.9	101.8	93.5	79.1	88.2
11:26	91.8	104.2	89.4	97.1	101.9	99.9	96.3	95.7	98.2	80.7	98.0	104.2	102.5	96.7	82.9	88.6
11:27	94.0	104.9	90.0	104.1	105.4	100.6	100.5	97.6	98.8	85.9	98.9	104.6	102.9	97.3	92.1	95.6
11:28	100.1	105.8	95.2	105.7	107.0	101.2	101.8	97.6	107.0	86.4	100.3	110.0	103.1	97.9	100.2	96.5
11:29	100.2	110.0	97.7	107.5	109.0	103.7	103.1	109.8	108.8	87.2	103.9	111.8	104.7	102.3	102.5	96.5
11:30	100.6	112.0	101.0	109.6	111.2	107.9	103.5	110.0	109.4	95.9	104.9	113.9	105.2	106.9	106.0	100.4
11:31	101.6	114.2	106.0	112.4	112.8	115.5	104.8	111.3	115.1	100.8	110.8	114.8	116.5	110.0	112.5	108.1
11:32	103.1	114.7	106.8	112.6	113.2	117.5	106.0	115.0	116.4	101.6	113.5	117.1	118.0	114.7	118.3	109.2
11:33	108.2	114.8	120.4	116.6	120.0	118.0	110.4	115.2	120.2	104.7	117.7	120.4	118.1	116.1	119.7	116.6
11:34	123.7	121.5	121.1	123.9	123.7	121.7	122.4	124.0	121.5	122.4	121.6	123.0	121.1	122.7	123.7	123.7
11:35	121.9	121.2	123.5	123.5	123.9	121.4	123.2	123.5	121.3	122.1	123.2	123.1	121.7	123.3	121.3	121.6
11:36	124.0	123.6	122.7	123.8	122.8	122.8	123.3	123.7	122.9	122.5	121.9	121.9	122.8	123.6	124.0	123.3
11:37	124.0	121.6	121.6	123.6	123.4	121.8	122.5	121.9	121.7	121.7	122.7	121.8	122.4	123.3	123.8	122.0
11:38	123.1	123.3	122.2	122.7	122.3	122.1	123.3	121.0	123.0	121.3	123.2	123.4	123.7	123.5	121.9	122.5
11:39	123.1	122.2	121.8	122.4	121.1	123.7	122.8	123.9	123.8	123.3	122.5	122.6	123.5	121.7	122.4	123.5
11:40	123.7	121.5	122.3	121.9	121.1	122.2	123.7	123.9	122.1	121.3	121.2	122.5	123.7	123.2	123.8	123.2
11:41	122.6	121.8	121.3	121.9	122.8	121.5	123.2	123.3	122.5	121.2	121.7	121.5	122.6	123.2	121.3	122.6
11:42	121.0	121.0	124.0	121.2	123.1	121.2	121.4	123.8	121.7	123.4	121.9	122.0	123.9	122.1	122.6	122.5
11:43	121.4	123.7	122.0	122.7	121.1	122.9	121.4	121.2	123.2	122.9	121.4	121.7	121.6	121.9	123.2	123.4
11:44	123.6	122.9	123.8	121.8	121.3	121.5	123.7	122.7	122.2	121.0	121.1	122.8	121.1	124.0	121.8	122.3
11:45	122.8	124.0	121.3	123.8	121.6	122.4	122.5	123.4	123.9	122.7	123.9	122.2	124.0	122.4	123.2	122.3
11:46	123.6	123.8	122.9	123.5	122.4	121.2	121.4	121.0	122.2	121.2	121.9	121.6	122.3	122.3	123.3	122.8
11:47	122.7	122.9	123.9	122.8	123.0	121.6	124.0	122.0	123.9	122.3	121.0	123.3	122.6	121.8	121.0	123.3
11:48	123.6	121.9	123.9	121.7	122.5	122.9	121.9	123.7	121.8	123.4	122.8	122.4	121.5	123.9	121.4	122.8
11:49	121.5	122.3	121.2	121.6	122.0	123.8	122.0	122.8	121.3	122.0	121.3	123.8	121.0	121.7	123.8	123.0
11:50	121.7	122.9	121.7	122.1	122.3	121.7	122.1	122.1	122.8	122.4	121.1	121.9	122.7	122.1	121.2	122.4
11:51	121.1	122.8	124.0	123.9	123.2	121.9	123.2	123.8	121.4	123.4	122.5	121.1	121.2	122.2	122.2	122.3
11:52	123.5	121.8	122.0	123.0	123.9	123.0	123.3	121.2	122.3	123.9	121.3	121.2	122.7	123.8	123.0	123.5

LOADED CHAMBER HEAT PENETRATION

TIME	CHANNELS No. (TEMPEARTURE IN DEGREES CELCIUS)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
11:53	121.8	123.0	123.6	122.6	123.2	122.2	123.6	121.9	122.2	123.6	121.0	123.0	123.5	121.9	123.3	123.7
11:54	121.3	121.3	122.9	121.1	122.1	121.9	122.4	121.5	122.0	122.7	123.6	122.8	122.6	122.4	122.8	123.3
11:55	122.4	123.6	121.8	121.2	123.7	123.5	123.9	121.1	123.1	121.6	123.8	123.9	121.1	121.0	124.0	122.3
11:56	123.5	122.5	123.8	123.8	121.8	121.1	123.7	121.9	122.0	121.3	123.7	121.9	122.3	121.7	123.9	123.6
11:57	123.5	123.2	122.0	121.9	121.4	123.0	123.2	121.3	122.0	123.3	121.2	122.6	123.2	121.1	122.3	123.5
11:58	122.3	122.2	123.0	121.9	123.9	121.4	121.1	122.8	121.2	123.6	121.6	124.0	122.9	121.0	122.2	121.5
11:59	123.7	122.4	123.0	122.1	123.8	122.5	122.1	123.5	121.5	121.6	123.0	122.4	123.0	122.2	123.8	122.4
12:00	123.3	121.3	122.9	122.5	121.4	122.5	121.9	123.2	122.6	123.2	122.0	121.3	121.2	121.3	121.3	121.9
12:01	123.6	123.0	122.1	123.9	121.8	122.4	122.6	121.4	122.3	122.7	122.8	122.2	123.8	123.0	123.9	121.4
12:02	121.7	122.7	121.6	122.6	124.0	122.4	123.0	123.5	122.0	123.9	122.1	122.2	121.3	121.9	123.0	122.1
12:03	121.9	122.4	121.1	121.8	122.8	121.5	122.4	122.3	123.9	122.1	121.3	122.4	121.6	123.5	122.0	121.6
12:04	123.1	121.4	121.8	123.3	121.8	123.7	122.8	122.6	122.4	122.2	123.5	121.1	122.9	123.6	121.6	123.7
12:05	122.1	122.5	123.4	123.9	123.6	123.0	123.5	122.8	121.4	123.3	121.0	121.8	122.9	122.5	122.5	122.4
12:06	122.5	123.0	121.4	121.6	121.5	121.4	121.0	121.1	122.7	122.1	123.2	123.3	121.3	122.8	122.3	124.0
12:07	122.9	123.7	121.8	121.6	122.8	122.8	123.7	121.2	123.0	121.8	122.7	123.7	123.6	123.0	121.9	121.9
12:08	122.6	122.8	123.1	121.6	122.2	121.1	122.1	123.8	122.9	123.0	123.0	121.1	122.2	123.5	122.2	121.7
12:09	121.9	121.9	122.5	123.1	123.1	121.1	121.9	123.1	123.8	123.9	122.9	124.0	121.2	123.6	121.4	122.5
12:10	121.6	123.3	121.9	123.1	121.7	123.8	122.9	122.1	121.8	122.9	123.0	124.0	123.8	121.8	123.5	123.2
12:11	123.7	123.5	121.5	122.7	122.9	122.8	121.9	123.7	123.1	122.2	122.3	123.0	123.7	121.5	123.7	122.3
12:12	122.0	122.7	123.3	121.4	122.0	123.0	121.7	121.1	122.5	121.3	121.7	121.1	122.9	121.8	123.4	121.2
12:13	122.9	121.4	122.0	122.7	122.3	122.2	122.6	122.6	121.9	123.0	123.5	122.6	122.6	121.2	124.0	123.8
12:14	121.9	123.6	122.6	122.4	123.7	122.9	121.5	121.1	123.8	122.0	122.5	121.0	123.5	122.8	123.9	121.9
12:15	121.3	121.9	122.9	123.4	122.5	123.9	121.7	121.2	122.6	122.0	121.2	123.1	122.7	122.8	121.8	121.9
12:16	121.1	121.2	122.2	121.2	123.2	122.9	123.5	121.2	122.8	121.5	123.8	121.8	122.5	122.5	122.5	121.0
12:17	122.2	121.0	121.4	121.1	123.5	122.5	121.3	122.0	123.2	122.4	123.9	123.4	121.6	122.0	121.5	122.2
12:18	123.5	121.2	123.2	123.7	123.9	121.2	121.6	121.6	121.1	123.9	122.8	123.2	124.0	123.5	123.9	121.9
12:19	121.6	122.1	122.5	122.0	123.7	122.5	122.0	123.3	123.1	122.9	123.4	123.8	121.2	121.9	122.6	122.6
12:20	122.9	121.5	122.1	122.2	122.0	123.1	123.2	121.4	122.0	122.5	121.2	123.1	121.8	123.5	122.7	123.3
12:21	122.7	123.9	123.4	122.4	123.0	121.5	122.9	121.8	123.3	123.6	122.1	123.1	121.9	121.1	123.4	122.7
12:22	123.2	122.0	123.1	122.4	121.3	123.9	122.1	121.1	121.2	121.4	122.0	121.2	123.0	121.9	123.8	122.4
12:23	121.5	121.1	122.9	122.7	122.8	121.0	121.7	121.6	123.0	123.4	121.0	121.8	122.9	122.7	123.4	123.5
12:24	121.3	123.8	122.8	122.6	123.8	123.1	122.7	122.4	121.8	222.9	124.0	121.6	121.5	122.6	121.6	124.0
12:25	121.3	121.3	121.5	122.0	122.9	121.5	123.3	122.4	123.4	122.4	122.4	121.6	121.4	122.3	123.9	121.4
12:26	121.1	123.4	122.2	122.6	121.1	121.7	121.8	123.0	122.5	122.0	121.2	123.9	121.3	121.9	124.0	122.3
12:27	121.0	122.1	123.8	123.9	121.8	121.8	122.5	122.5	123.8	122.3	121.1	122.9	122.5	123.1	121.5	123.6
12:28	122.3	122.1	123.8	123.7	121.6	122.2	123.8	121.7	123.5	121.2	121.3	123.2	122.3	123.7	122.3	122.1
12:29	124.0	122.3	121.2	121.2	122.4	122.1	121.3	121.4	122.1	123.3	122.6	121.5	123.6	123.5	123.4	123.4
12:30	123.0	122.4	122.7	122.7	122.7	122.7	122.5	122.0	123.5	121.4	121.5	122.0	122.6	121.3	121.6	123.6
12:31	123.1	122.3	121.6	123.6	123.1	121.2	123.3	123.5	123.8	121.1	121.8	123.9	123.8	123.8	123.2	121.8
12:32	122.8	122.6	121.6	123.8	123.7	122.8	122.4	122.7	122.7	122.2	123.3	121.5	121.9	121.7	122.3	122.6
12:33	121.7	121.0	122.2	121.2	123.8	122.5	121.6	122.3	123.8	122.0	121.0	122.7	123.4	122.6	122.1	121.5
12:34	113.8	117.7	113.1	115.2	118.0	117.1	110.1	117.7	114.1	115.4	109.6	114.0	113.1	116.7	117.5	117.8
12:35	113.1	116.2	112.1	114.9	114.9	111.0	109.7	116.9	113.9	114.9	109.4	112.5	111.0	115.8	116.0	116.0
12:36	105.9	116.0	111.9	109.9	114.8	104.9	107.9	116.3	107.6	113.3	108.2	111.6	108.3	114.7	115.0	114.1
12:37	104.8	114.9	110.4	107.5	112.2	103.2	107.1	115.6	105.5	107.8	107.6	109.1	104.7	114.1	114.7	110.1
12:38	103.1	114.9	109.3	104.2	111.1	100.7	102.5	113.2	100.4	107.5	106.6	105.8	104.7	113.3	104.9	109.5
12:39	103.1	113.6	108.6	100.4	108.2	100.2	102.3	108.6	99.7	106.9	102.2	105.5	103.9	111.5	98.4	109.0

PHARMA DEVILS
QUALITY ASSURANCE DEPARTMENT

LOADED CHAMBER HEAT PENETRATION

TIME	CHANNELS No. (TEMPEARTURE IN DEGREES CELCIUS)

TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
12:40	101.7	112.7	106.0	94.8	105.8	96.2	96.3	107.0	97.5	104.2	96.9	105.0	100.3	109.0	95.0	105.7
12:41	101.4	110.2	105.6	94.8	105.4	89.9	94.1	104.2	96.3	103.9	96.5	101.3	100.0	105.6	94.8	104.9
12:42	99.5	106.9	104.7	89.0	103.3	89.8	90.1	101.8	95.4	101.3	94.7	97.0	98.0	102.6	85.3	104.5
12:43	99.2	105.3	101.0	88.4	101.1	86.4	89.3	93.4	94.2	100.4	93.9	94.4	97.3	100.9	83.0	102.3
12:44	98.1	101.4	98.8	88.2	101.0	86.3	88.3	90.2	91.2	99.3	90.2	92.9	96.8	98.1	82.2	101.0
12:45	95.6	101.4	98.0	85.4	100.7	84.3	87.5	87.3	88.9	93.8	84.2	91.4	94.4	97.8	80.6	100.3
12:46	94.4	97.8	97.1	83.9	98.5	83.6	86.5	83.7	87.8	91.4	82.6	89.5	88.0	97.6	79.8	98.1
12:47	93.7	96.3	96.4	83.5	97.9	82.8	85.1	82.1	87.3	90.2	80.6	88.5	87.0	96.1	79.0	96.1
12:48	93.1	95.3	95.0	83.0	97.7	79.9	83.8	80.6	85.1	89.4	80.4	86.1	86.8	93.9	72.6	92.7
12:49	92.8	94.6	94.2	78.2	96.7	78.0	78.4	78.3	84.8	83.8	79.5	85.7	85.4	93.2	71.9	92.3
12:50	92.7	93.4	91.0	76.4	94.5	76.5	74.7	76.9	80.8	79.6	73.2	85.7	83.0	90.5	70.9	92.2
12:51	91.7	91.1	87.7	74.8	91.8	72.5	74.0	76.4	80.6	79.6	72.9	85.0	82.7	87.3	68.6	90.5
12:52	89.9	91.0	86.4	74.5	90.3	69.8	73.7	76.1	75.5	78.4	71.9	84.2	81.4	87.0	68.4	87.5
12:53	88.2	85.1	74.1	70.9	89.2	67.9	69.2	74.9	72.1	77.2	69.4	84.2	80.8	84.3	66.4	87.4
12:54	84.8	84.0	72.7	70.8	86.8	65.6	68.5	74.4	71.6	75.0	69.1	83.0	76.5	83.8	66.2	86.0
12:55	77.4	82.4	71.0	68.8	86.2	62.9	66.4	67.2	70.3	72.7	65.4	80.2	76.3	80.4	62.5	84.1
12:56	76.6	82.2	69.9	63.3	86.2	62.9	65.7	65.2	66.6	72.4	64.4	80.0	75.6	80.3	61.2	78.1
12:57	74.9	74.3	61.9	62.7	85.2	61.0	64.8	62.8	66.1	68.8	62.1	78.8	75.1	80.2	59.1	72.5
12:58	72.8	72.3	61.8	62.5	82.5	60.4	64.0	62.5	64.7	67.4	57.7	78.7	73.5	79.3	55.3	70.0
12:59	71.3	72.3	60.8	60.8	82.5	58.3	60.5	62.1	61.2	64.2	56.6	77.5	69.0	69.6	54.0	66.7
13:00	67.2	71.4	60.3	60.5	78.5	57.9	59.5	62.0	60.5	62.0	55.6	71.2	68.6	67.7	53.8	66.6
13:01	65.4	63.3	60.3	59.9	78.5	57.5	57.6	61.7	58.4	61.8	52.7	69.8	66.0	62.3	53.7	61.4
13:02	63.4	62.2	59.2	59.6	78.1	55.9	56.6	60.4	56.8	57.7	50.0	69.0	60.8	61.6	52.8	60.6
13:03	61.2	60.9	57.1	55.4	68.9	53.9	50.8	59.7	55.0	55.4	48.3	67.4	52.7	59.4	52.8	57.2
13:04	57.8	58.4	56.2	54.9	67.1	51.7	50.7	57.5	54.6	49.9	47.6	62.8	52.2	58.3	52.4	54.8
13:05	57.7	56.9	54.2	54.0	66.1	51.5	49.7	57.4	53.0	47.3	46.4	62.3	52.1	57.0	52.0	54.6
13:06	56.6	54.2	53.3	53.7	55.1	49.1	43.0	53.6	51.5	47.0	45.0	59.8	49.5	55.1	48.7	53.3
13:07	55.0	42.9	52.8	50.6	52.9	48.8	42.2	52.6	51.0	46.8	44.0	58.0	47.5	52.9	48.5	48.8
13:08	50.7	41.9	48.3	50.5	52.7	48.6	41.7	49.7	50.7	46.6	43.0	57.4	45.0	49.3	47.3	48.3
13:09	48.3	40.2	47.4	47.5	44.0	46.5	40.1	48.8	46.3	46.4	41.8	57.3	43.6	44.8	42.5	45.9
13:10	42.5	40.0	47.1	42.8	40.4	40.8	39.3	45.1	44.4	42.6	41.5	56.7	43.0	44.6	38.4	39.2
13:11	39.4	39.6	46.2	39.3	40.2	38.0	38.1	43.9	41.7	40.2	39.6	52.4	41.8	43.1	38.3	39.1
13:12	37.6	38.2	41.6	37.1	38.4	36.9	37.5	43.4	41.1	39.9	38.1	47.4	38.7	40.9	35.6	37.8
13:13	36.8	35.9	35.5	36.8	38.3	36.5	35.9	40.1	35.3	39.3	35.7	43.5	36.9	40.0	35.4	35.6
Avg.	122.5	122.4	122.4	122.5	122.6	122.3	122.5	122.4	122.5	122.4	122.3	122.5	122.5	122.5	122.7	122.6
Min.	121.0	121.0	121.1	121.1	121.1	121.0	121.0	121.0	121.1	121.0	121.0	121.0	121.0	121.0	121.0	121.0
Max.	124.0	124.0	124.0	123.9	124.0	123.9	124.0	124.0	123.9	123.9	124.0	124.0	124.0	124.0	124.0	124.0

(Avg.) Average Temperature during the sterilization hold period

(Max.) Maximum Temperature during the sterilization hold period

(Min .) Minimum Temperature during the sterilization hold period

COMPILED BY   **CHECKED BY**

LOADED CHAMBER HEAT PENETRATION

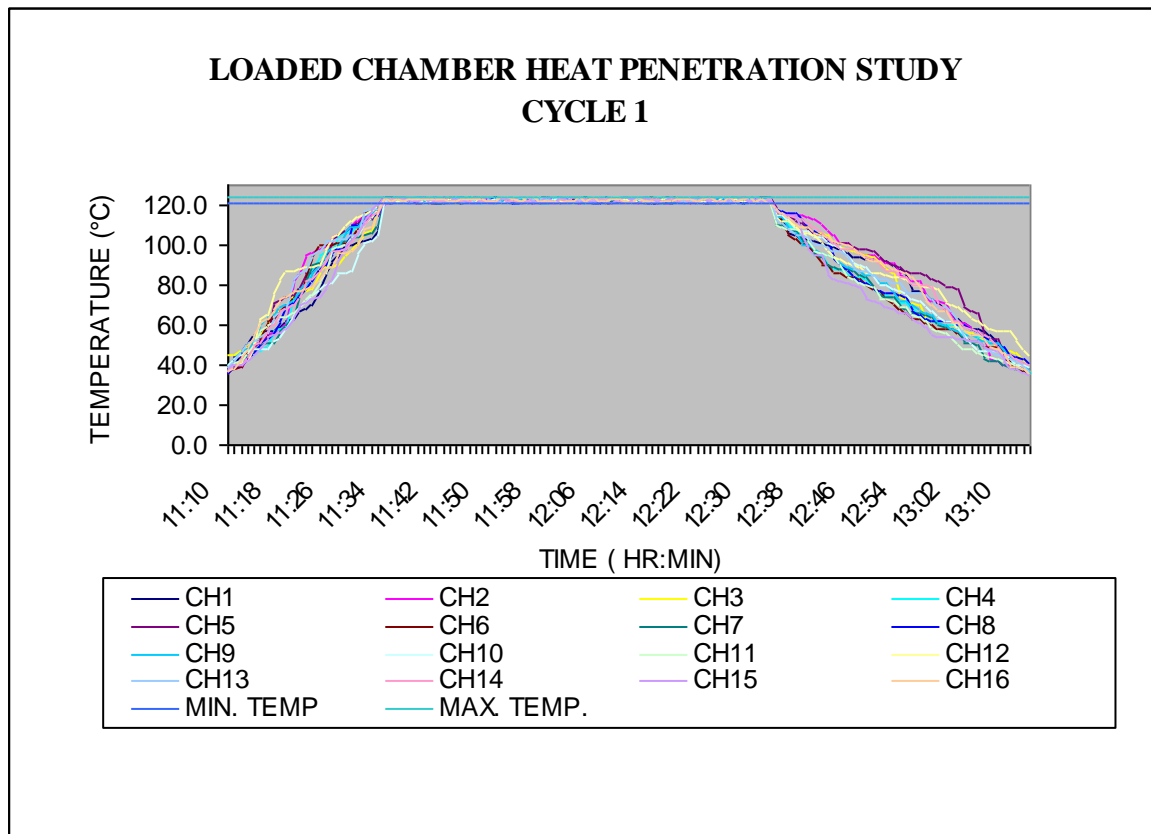### GRAPHICAL REPRESENTATION SHOWING THE TEMPERATURE PATTERN DURING MAPPING

**LOADED CHAMBER HEAT PENETRATION STUDY
CYCLE 1**

Fig 4

S.No.	Particulars	Observation
1.	Sterilization started at	11:10
2.	Sterilization completed at	13:13
3.	Sterilization Hold Period	60 minutes
4.	Minimum Sterilization temp	121.0 ° C
5.	Maximum Sterilization temp	124.0 ° C

	Name	Signature	Date
Compiled By			
Checked By			

LOADED CHAMBER HEAT PENETRATION

F0 VALUE CALCULATION

Basis of calculation:
The actual observations obtained during the Heat Penetration studies at different temperature sensing locations were complied in the table and the observed temperature were subjected for calculation of F0 values at that particular location. The calculations are done by using the following formula and the lethality factor computed (during the sterilization period) are given in the following table.

$$F_0 = dt \sum 10^{(T-121)/Z} \quad \ldots\ldots (a)$$

$$F_0 = dt \sum (\text{Sum of lethality factors})$$

Where,

dt = The time interval between successive temperature measurements (1 min).

T = The observed temperature at that particular time (as per the actual temperatures recorded)

Z = The change in the heat resistance of *Bacillus stearothermophillus* spores as temperature is changed (10°C)

LOADED CHAMBER HEAT PENETRATION

F0 Calculation for the Sterilization Cycle - Loaded Chamber Heat Penetration Study

TIME	CHANNEL No. (LETHALITY FACTOR)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14:07	1.0173	1.4427	1.7897	1.7933	1.4120	1.1522	1.4555	1.3512	1.6031	1.0727	1.1260	1.6128	1.0701	1.1099	1.2086	1.2664
14:08	1.1498	1.6166	1.0688	1.1323	1.8538	1.4300	1.3469	1.8433	1.3988	1.1293	1.0694	1.0344	1.2559	1.7034	1.1813	1.7265
14:09	1.4577	1.7520	1.8907	1.6253	1.2985	1.1629	1.1001	1.4311	1.2555	1.8211	1.4946	1.6018	1.7827	1.2234	1.5360	1.2472
14:10	1.3385	1.6173	1.8137	1.2285	1.3582	1.1181	1.4865	1.0572	1.4403	1.0539	1.2206	1.7548	1.1783	1.7090	1.4639	1.2830
14:11	1.7960	1.7044	1.2005	1.3781	1.0433	1.3366	1.2840	1.6110	1.2035	1.0078	1.6084	1.3487	1.1386	1.6513	1.5004	1.8225
14:12	1.7190	1.1635	1.3493	1.6944	1.2452	1.2181	1.3830	1.1021	1.3043	1.6376	1.4135	1.2879	1.6823	1.5587	1.7980	1.2508
14:13	1.7899	1.5962	1.7990	1.5883	1.6272	1.0870	1.4162	1.2339	1.4974	1.0384	1.2556	1.3439	1.3239	1.1834	1.0703	1.2821
14:14	1.4181	1.6087	1.0697	1.4094	1.0362	1.3482	1.4766	1.5685	1.2929	1.1599	1.7435	1.2698	1.5768	1.2465	1.2871	1.1548
14:15	1.8685	1.2558	1.4053	1.3848	1.1668	1.0144	1.2440	1.0744	1.8626	1.2134	1.6609	1.6067	1.4187	1.8314	1.3827	1.3218
14:16	1.1419	1.2181	1.5957	1.6595	1.4819	1.5215	1.7892	1.6628	1.2676	1.8233	1.7469	1.0554	1.0924	1.1604	1.5627	1.0033
14:17	1.0138	1.8907	1.1853	1.3272	1.6202	1.2792	1.0097	1.2910	1.2957	1.3481	1.7568	1.6969	1.8510	1.3995	1.6212	1.2282
14:18	1.8781	1.3503	1.5978	1.3120	1.3937	1.2763	1.7669	1.8699	1.5298	1.7415	1.4926	1.2113	1.6444	1.2130	1.8923	1.1223
14:19	1.3307	1.3228	1.6242	1.4752	1.0317	1.8649	1.2098	1.8867	1.3953	1.6442	1.8308	1.6053	1.4885	1.1330	1.1904	1.6515
14:20	1.4072	1.1834	1.0002	1.6349	1.6320	1.5144	1.4062	1.2170	1.0834	1.3690	1.5724	1.2046	1.6848	1.8903	1.8504	1.6066
14:21	1.1059	1.8570	1.0993	1.4575	1.2691	1.0301	1.3096	1.1325	1.3011	1.8457	1.6819	1.0015	1.8478	1.5142	1.8691	1.0428
14:22	1.0050	1.1563	1.8036	1.5231	1.7260	1.8531	1.2279	1.2377	1.0620	1.6522	1.1310	1.7003	1.8217	1.1787	1.6290	1.1204
14:23	1.4288	1.2704	1.0484	1.3505	1.3537	1.2563	1.0793	1.6769	1.5340	1.1615	1.6780	1.5015	1.7926	1.0518	1.2049	1.7840
14:24	1.0399	1.2898	1.2806	1.3134	1.6465	1.2380	1.1633	1.0729	1.3025	1.1539	1.5223	1.1275	1.2347	1.4032	1.0452	1.3596
14:25	1.4238	1.8287	1.5394	1.7053	1.4676	1.1088	1.4898	1.0910	1.2793	1.2346	1.6269	1.1083	1.7956	1.1218	1.0888	1.4153
14:26	1.7202	1.2216	1.6499	1.7874	1.0278	1.1831	1.6279	1.1292	1.3117	1.6491	1.1200	1.0908	1.5416	1.6225	1.0332	1.0929
14:27	1.4174	1.3450	1.4569	1.6330	1.3763	1.1485	1.5308	1.8732	1.1017	1.3499	1.8883	1.4676	1.7820	1.0965	1.8042	1.5848
14:28	1.0148	1.0059	1.8947	1.3224	1.5068	1.6234	1.7551	1.4923	1.8585	1.8178	1.2346	1.8314	1.1111	1.2765	1.2738	1.0965
14:29	1.3258	1.1515	1.8412	1.7232	1.3086	1.6441	1.3586	1.5118	1.0392	1.2732	1.2384	1.3541	1.2212	1.5306	1.4493	1.5407
14:30	1.6056	1.0154	1.3118	1.7191	1.0472	1.2300	1.0470	1.8603	1.2828	1.5205	1.1291	1.2829	1.3585	1.2492	1.1519	1.8785
14:31	1.5092	1.0014	1.3006	1.1152	1.0736	1.4679	1.6639	1.8168	1.5674	1.1958	1.0719	1.6731	1.0513	1.8213	1.3995	1.1013
14:32	1.5195	1.2867	1.8327	1.3527	1.2383	1.8562	1.2281	1.1934	1.4009	1.3076	1.2386	1.6031	1.6737	1.0651	1.1727	1.5197
14:33	1.0373	1.0628	1.0640	1.2192	1.6887	1.8252	1.7209	1.0980	1.1155	1.7777	1.0956	1.0754	1.5022	1.5183	1.5435	1.2796
14:34	1.7999	1.5223	1.8432	1.0985	1.8072	1.1318	1.0731	1.0636	1.5888	1.1374	1.7110	1.6287	1.6992	1.4467	1.4985	1.5059
14:35	1.0569	1.2016	1.5165	1.2533	1.2060	1.4260	1.2668	1.0571	1.0370	1.3440	1.6290	1.3099	1.8035	1.0036	1.3416	1.0796
14:36	1.1284	1.7218	1.2429	1.1397	1.7152	1.0059	1.3093	1.3623	1.6914	1.3557	1.1973	1.6005	1.6008	1.1566	1.0264	1.8163
14:37	1.5017	1.7386	1.1451	1.7599	1.6470	1.5631	1.4597	1.0380	1.3352	1.5569	1.6632	1.1747	1.2678	1.5536	1.6553	1.4623
14:38	1.4851	1.3848	1.3658	1.3587	1.4555	1.8009	1.6021	1.8836	1.1093	1.1491	1.6013	1.3142	1.1443	1.8862	1.5099	1.0153
14:39	1.0722	1.4821	1.3065	1.8789	1.0188	1.0848	1.1705	1.7369	1.8340	1.6831	1.4365	1.4904	1.7999	1.7736	1.0551	1.4204
14:40	1.7350	1.5373	1.2015	1.2156	1.1031	1.8140	1.0253	1.5339	1.4559	1.7790	1.6467	1.0729	1.3251	1.2230	1.0747	1.7808
14:41	1.3004	1.6957	1.2984	1.1689	1.2021	1.0642	1.4367	1.6726	1.5035	1.4237	1.7803	1.0392	1.0007	1.2272	1.1865	1.1538
14:42	1.0477	1.7519	1.0850	1.3912	1.0267	1.4206	1.6795	1.0477	1.3239	1.3770	1.3668	1.4262	1.0723	1.0929	1.4830	1.0383
14:43	1.8305	1.1986	1.6910	1.6069	1.2147	1.2625	1.1998	1.5491	1.0739	1.0879	1.0853	1.4509	1.4245	1.1041	1.6241	1.2583
14:44	1.7857	1.1072	1.7756	1.3304	1.1721	1.6461	1.0218	1.1768	1.4291	1.3686	1.3239	1.0220	1.2943	1.7871	1.6943	1.3624
14:45	1.4836	1.1923	1.6635	1.0409	1.2321	1.1252	1.4995	1.6745	1.3439	1.1937	1.0465	1.5756	1.0069	1.0617	1.3562	1.1334
14:46	1.3918	1.0372	1.8788	1.8122	1.1905	1.0852	1.1300	1.6332	1.2020	1.7185	1.5711	1.2257	1.0052	1.4350	1.7867	1.5319
14:47	1.6999	1.4567	1.8600	1.2049	1.0677	1.2218	1.2468	1.8622	1.1969	1.1454	1.0373	1.3491	1.2188	1.2347	1.7132	1.3537

LOADED CHAMBER HEAT PENETRATION

TIME	CHANNEL No. (LETHALITY FACTOR)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
14:48	1.4291	1.4746	1.1971	1.2113	1.0745	1.4685	1.1845	1.5277	1.3498	1.0276	1.7420	1.5439	1.0725	1.4244	1.4080	1.4668
14:49	1.3663	1.3854	1.3623	1.0075	1.7562	1.0042	1.5171	1.3640	1.5252	1.5278	1.7929	1.2714	1.7608	1.4272	1.6408	1.3187
14:50	1.1255	1.2484	1.1164	1.2842	1.1852	1.5684	1.6027	1.3717	1.3281	1.0348	1.8944	1.7649	1.2853	1.6856	1.7527	1.6364
14:51	1.8914	1.6969	1.8646	1.2174	1.2985	1.0132	1.2006	1.0996	1.1298	1.7251	1.8523	1.3372	1.5368	1.8559	1.5585	1.6822
14:52	1.0332	1.2218	1.4191	1.4102	1.5953	1.3270	1.4599	1.2228	1.0349	1.2538	1.5410	1.1489	1.0277	1.6656	1.4717	1.1151
14:53	1.1802	1.6967	1.4499	1.6290	1.8177	1.4778	1.3596	1.1841	1.8544	1.3827	1.0235	1.1556	1.0706	1.1770	1.3949	1.7286
14:54	1.2202	1.0280	1.6631	1.4424	1.0029	1.2294	1.2188	1.5413	1.5067	1.7986	1.8664	1.3226	1.6116	1.3255	1.7618	1.2038
14:55	1.5450	1.2085	1.8271	1.3436	1.1410	1.4063	1.8564	1.5014	1.4451	1.7217	1.3392	1.5772	1.0831	1.4805	1.5388	1.2117
14:56	1.4861	1.4437	1.6734	1.7016	1.0567	1.2518	1.7483	1.4985	1.0305	1.1514	1.3536	1.6895	1.5527	1.1281	1.2842	1.0794
14:57	1.1106	1.3968	1.1345	1.8814	1.3527	1.0282	1.8704	1.4349	1.0750	1.4731	1.0331	1.3204	1.1090	1.6015	1.0485	1.2810
14:58	1.0868	1.3274	1.8537	1.0982	1.3538	1.0211	1.6323	1.6006	1.4808	1.1631	1.1702	1.0915	1.4250	1.8770	1.2046	1.0999
14:59	1.0764	1.2060	1.8769	1.3131	1.3598	1.7758	1.1720	1.7274	1.1147	1.8955	1.0974	1.3033	1.1027	1.6858	1.0945	1.7296
15:00	1.3747	1.5514	1.1104	1.7253	1.1110	1.2700	1.8595	1.0247	1.1242	1.3250	1.7431	1.5248	1.4028	1.1901	1.1773	1.2657
15:01	1.3229	1.7719	1.3269	1.2583	1.3583	1.2524	1.0045	1.6768	1.7083	1.6224	1.4363	1.1168	1.4070	1.4194	1.6627	1.8347
15:02	1.7513	1.7142	1.6578	1.6511	1.5226	1.7556	1.8561	1.0614	1.0638	1.6745	1.3071	1.1073	1.2112	1.8895	1.3365	1.1873
15:03	1.4086	1.0757	1.1434	1.7466	1.1477	1.1089	1.8813	1.1570	1.5722	1.0664	1.5052	1.5967	1.1661	1.0816	1.3380	1.2949
15:04	1.8011	1.8335	1.5982	1.1917	1.8358	1.4281	1.6053	1.8401	1.1339	1.6777	1.3522	1.7872	1.0330	1.4639	1.4269	1.7102
15:05	1.2223	1.1652	1.3124	1.4198	1.8224	1.4518	1.3113	1.3055	1.7469	1.6221	1.1300	1.4795	1.5723	1.1625	1.0273	1.3442
15:06	1.6506	1.4120	1.2758	1.1058	1.4126	1.7912	1.6378	1.1160	1.6940	1.3112	1.0687	1.5413	1.3491	1.0119	1.5973	1.4403
F0	83.88	84.10	88.25	85.76	81.19	81.07	84.68	84.93	81.63	84.77	85.99	82.81	83.36	84.00	84.94	82.33

CALCULATIONS

$F_0 = dt \sum 10^{(T-121)/Z}$ ……. (a)

$F_0 = dt \sum$ (Sum of lethality factors)

Where,

dt = The time interval between successive temperature measurements (1 min).

T = The observed temperature at that particular time (as per the actual temperatures recorded)

Z = The change in the heat resistance of *Bacillus stearothermophillus* spores as temperature is changed ($10^{\circ}C$)

CALCULATED BY: **CHECKED BY:**