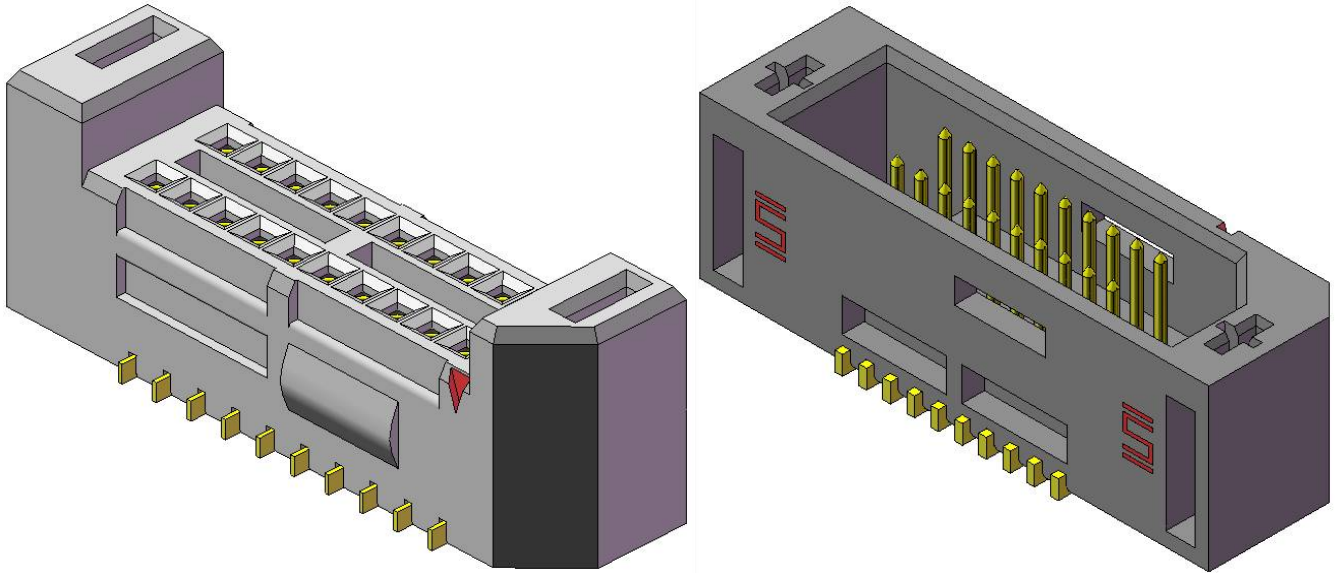




Project Number:		Tracking Code: TC0917--2413_ReportRev2		
Requested by: Jim Hahn		Date: 5/6/2009	Product Rev: N/A	
Part #: SEML-1XX-02-03.0-G-D-WT		Lot #: 1	Tech: Daniel Linton, Gary Lomax, & Rodney Riley	Eng: Troy Cook
Part description: SEML/TEM				Qty to test: 10
Test Start: 01/23/2009		Test Completed: 4/23/2009		



### PART DESCRIPTION

**SEML-110-03.0-02-G-D-WT mated with TEM-110-03.0-02-G-D-WT**

**SEML-125-03.0-02-G-D-WT mated with TEM-125-03.0-02-G-D-WT**

**SEML-150-03.0-02-G-D-WT mated with TEM-150-03.0-02-G-D-WT**

## CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to ISO 10012-1 and ANSI/NCSL 2540-1, as applicable.

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### SCOPE

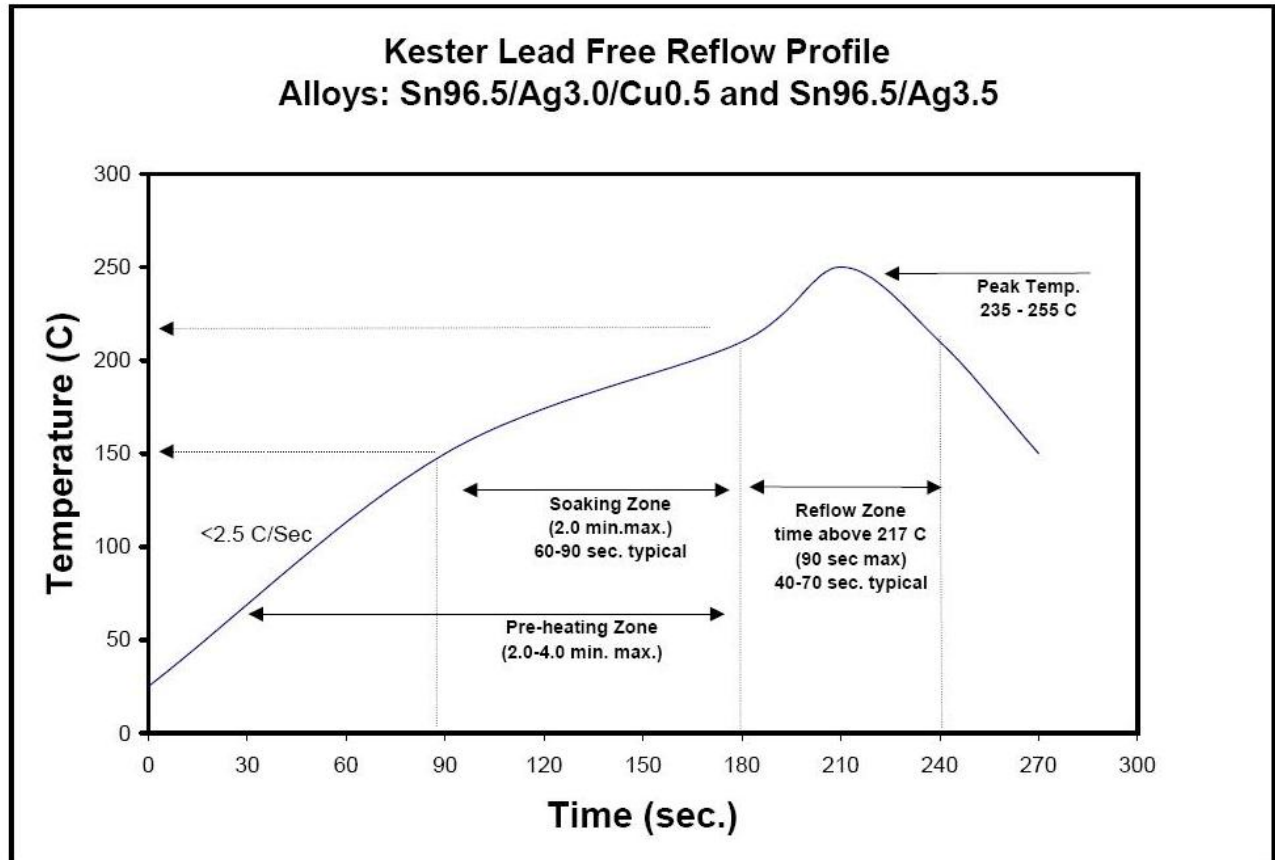
To perform the following tests: Measure mating & unmating forces of 10, 25, & 50 position SEM/TEM and SEML/TEM at 1,2,3,4,5,6,7,8,9,10,15,20,25,50,100 cycles.

### APPLICABLE DOCUMENTS

Standards: EIA Publication 364

### TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
- 4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead Free
- 9) Re-Flow Time/Temp: See accompanying profile.
- 10) Samtec Test PCBs used: PCB-100978-TST-XX

**TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)**

**FLOWCHARTS****Mating/Unmating**

<b>TEST STEP</b>	<b>GROUP A 10 Boards SEM/TEM-10 Position</b>	<b>GROUP B 10 Boards SEML/TEM-10 Position</b>	<b>GROUP C 10 Boards SEM/TEM-25 Position</b>	<b>GROUP D 10 Boards SEML/TEM-25 Position</b>	<b>GROUP e 10 Boards SEM/TEM-50 Position</b>	<b>GROUP F 10 Boards SEML/TEM-50 Position</b>	<b>Total Cycles</b>
<b>1</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>1</b>
<b>2</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>2</b>
<b>3</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>3</b>
<b>4</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>4</b>
<b>5</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>5</b>
<b>6</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>6</b>
<b>7</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>7</b>
<b>8</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>8</b>
<b>9</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>9</b>
<b>10</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>10</b>
<b>11</b>	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	
<b>12</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>15</b>
<b>13</b>	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	
<b>14</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>20</b>
<b>15</b>	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	5 Cycles	
<b>16</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>25</b>
<b>17</b>	25 Cycles	25 Cycles	25 Cycles	25 Cycles	25 Cycles	25 Cycles	
<b>18</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>50</b>
<b>19</b>	50 Cycles	50 Cycles	50 Cycles	50 Cycles	50 Cycles	50 Cycles	
<b>20</b>	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	Mating / Unmating	<b>100</b>

Mating/Un-Mating Forces = EIA-364-13

### **ATTRIBUTE DEFINITIONS**

The following is a brief, simplified description of attributes.

#### **MATING/UNMATING:**

- 1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
- 2) The full insertion position was to within 0.003" to 0.004" of the plug bottoming out in the receptacle to prevent damage to the system under test.
- 3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

**RESULTS****Mating/Unmating: All forces were measured in pounds of force.****SEM/TEM (10 POSITON)****Mating – Unmating Forces**

- **After 1 Cycle**
  - **Mating**
    - **Min ----- 1.87**
    - **Max----- 2.17**
  - **Unmating**
    - **Min ----- 1.05**
    - **Max----- 1.56**
- **After 2 Cycles**
  - **Mating**
    - **Min ----- 1.82**
    - **Max----- 2.15**
  - **Unmating**
    - **Min ----- 1.09**
    - **Max----- 1.48**
- **After 3 Cycles**
  - **Mating**
    - **Min ----- 1.91**
    - **Max----- 2.18**
  - **Unmating**
    - **Min ----- 1.08**
    - **Max----- 1.51**
- **After 4 Cycles**
  - **Mating**
    - **Min ----- 1.94**
    - **Max----- 2.17**
  - **Unmating**
    - **Min ----- 1.09**
    - **Max----- 1.57**
- **After 5 Cycles**
  - **Mating**
    - **Min ----- 1.92**
    - **Max----- 2.16**
  - **Unmating**
    - **Min ----- 1.08**
    - **Max----- 1.64**
- **After 6 Cycles**
  - **Mating**
    - **Min ----- 1.95**
    - **Max----- 2.15**
  - **Unmating**
    - **Min ----- 1.11**
    - **Max----- 1.64**
- **After 7 Cycles**
  - **Mating**
    - **Min ----- 1.95**
    - **Max----- 2.16**
  - **Unmating**
    - **Min ----- 1.11**
    - **Max----- 1.64**

- **After 8 Cycles**
  - **Mating**
    - **Min** ----- 1.93
    - **Max** ----- 2.18
  - **Unmating**
    - **Min** ----- 1.12
    - **Max** ----- 1.64
- **After 9 Cycles**
  - **Mating**
    - **Min** ----- 1.92
    - **Max** ----- 2.15
  - **Unmating**
    - **Min** ----- 1.13
    - **Max** ----- 1.65
- **After 10 Cycles**
  - **Mating**
    - **Min** ----- 1.91
    - **Max** ----- 2.15
  - **Unmating**
    - **Min** ----- 1.12
    - **Max** ----- 1.64
- **After 15 Cycles**
  - **Mating**
    - **Min** ----- 1.84
    - **Max** ----- 2.11
  - **Unmating**
    - **Min** ----- 1.15
    - **Max** ----- 1.66
- **After 20 Cycles**
  - **Mating**
    - **Min** ----- 1.84
    - **Max** ----- 2.09
  - **Unmating**
    - **Min** ----- 1.19
    - **Max** ----- 1.71
- **After 25 Cycles**
  - **Mating**
    - **Min** ----- 1.90
    - **Max** ----- 2.10
  - **Unmating**
    - **Min** ----- 1.19
    - **Max** ----- 1.71
- **After 50 Cycles**
  - **Mating**
    - **Min** ----- 1.97
    - **Max** ----- 2.17
  - **Unmating**
    - **Min** ----- 1.27
    - **Max** ----- 1.79
- **After 100 Cycles**
  - **Mating**
    - **Min** ----- 2.09
    - **Max** ----- 2.31
  - **Unmating**
    - **Min** ----- 1.41
    - **Max** ----- 1.93

**SEML/TEM (10 POSITION)****Mating – Unmating Forces**

- **After 1 Cycle**
  - **Mating**
    - **Min ----- 2.17**
    - **Max----- 3.64**
  - **Unmating**
    - **Min ----- 2.25**
    - **Max----- 3.51**
- **After 2 Cycles**
  - **Mating**
    - **Min ----- 2.39**
    - **Max----- 3.64**
  - **Unmating**
    - **Min ----- 2.50**
    - **Max----- 3.38**
- **After 3 Cycles**
  - **Mating**
    - **Min ----- 2.44**
    - **Max----- 3.68**
  - **Unmating**
    - **Min ----- 2.55**
    - **Max----- 3.38**
- **After 4 Cycles**
  - **Mating**
    - **Min ----- 2.52**
    - **Max----- 3.69**
  - **Unmating**
    - **Min ----- 2.59**
    - **Max----- 3.45**
- **After 5 Cycles**
  - **Mating**
    - **Min ----- 2.47**
    - **Max----- 3.90**
  - **Unmating**
    - **Min ----- 2.59**
    - **Max----- 3.55**
- **After 6 Cycles**
  - **Mating**
    - **Min ----- 2.50**
    - **Max----- 3.89**
  - **Unmating**
    - **Min ----- 2.60**
    - **Max----- 3.45**
- **After 7 Cycles**
  - **Mating**
    - **Min ----- 2.53**
    - **Max----- 3.93**
  - **Unmating**
    - **Min ----- 2.58**
    - **Max----- 3.58**

- **After 8 Cycles**
  - **Mating**
    - Min ----- 2.57
    - Max----- 3.93
  - **Unmating**
    - Min ----- 2.61
    - Max----- 3.56
- **After 9 Cycles**
  - **Mating**
    - Min ----- 2.58
    - Max----- 3.98
  - **Unmating**
    - Min ----- 2.59
    - Max----- 3.57
- **After 10 Cycles**
  - **Mating**
    - Min ----- 2.62
    - Max----- 3.96
  - **Unmating**
    - Min ----- 2.57
    - Max----- 3.90
- **After 15 Cycles**
  - **Mating**
    - Min ----- 2.57
    - Max----- 4.40
  - **Unmating**
    - Min ----- 2.58
    - Max----- 3.68
- **After 20 Cycles**
  - **Mating**
    - Min ----- 2.62
    - Max----- 4.25
  - **Unmating**
    - Min ----- 2.63
    - Max----- 3.79
- **After 25 Cycles**
  - **Mating**
    - Min ----- 2.62
    - Max----- 4.30
  - **Unmating**
    - Min ----- 2.64
    - Max----- 3.80
- **After 50 Cycles**
  - **Mating**
    - Min ----- 2.65
    - Max----- 4.34
  - **Unmating**
    - Min ----- 2.71
    - Max----- 3.88
- **After 100 Cycles**
  - **Mating**
    - Min ----- 2.62
    - Max----- 4.31
  - **Unmating**
    - Min ----- 2.62
    - Max----- 3.82

**SEM/TEM (25 POSITION)****Mating – Unmating Forces**

- **After 1 Cycle**
  - **Mating**
    - **Min** ----- 3.37
    - **Max** ----- 4.82
  - **Unmating**
    - **Min** ----- 2.39
    - **Max** ----- 3.88
- **After 2 Cycles**
  - **Mating**
    - **Min** ----- 3.28
    - **Max** ----- 4.79
  - **Unmating**
    - **Min** ----- 2.54
    - **Max** ----- 3.98
- **After 3 Cycles**
  - **Mating**
    - **Min** ----- 3.33
    - **Max** ----- 4.85
  - **Unmating**
    - **Min** ----- 2.50
    - **Max** ----- 3.97
- **After 4 Cycles**
  - **Mating**
    - **Min** ----- 3.41
    - **Max** ----- 4.74
  - **Unmating**
    - **Min** ----- 2.48
    - **Max** ----- 3.99
- **After 5 Cycles**
  - **Mating**
    - **Min** ----- 3.49
    - **Max** ----- 5.04
  - **Unmating**
    - **Min** ----- 2.49
    - **Max** ----- 4.36
- **After 6 Cycles**
  - **Mating**
    - **Min** ----- 3.53
    - **Max** ----- 4.87
  - **Unmating**
    - **Min** ----- 2.48
    - **Max** ----- 4.34
- **After 7 Cycles**
  - **Mating**
    - **Min** ----- 3.34
    - **Max** ----- 4.83
  - **Unmating**
    - **Min** ----- 2.62
    - **Max** ----- 4.27

- **After 8 Cycles**
  - **Mating**
    - **Min** ----- 3.36
    - **Max** ----- 4.66
  - **Unmating**
    - **Min** ----- 2.63
    - **Max** ----- 4.23
- **After 9 Cycles**
  - **Mating**
    - **Min** ----- 3.36
    - **Max** ----- 4.60
  - **Unmating**
    - **Min** ----- 2.64
    - **Max** ----- 4.21
- **After 10 Cycles**
  - **Mating**
    - **Min** ----- 3.36
    - **Max** ----- 4.60
  - **Unmating**
    - **Min** ----- 2.63
    - **Max** ----- 4.21
- **After 15 Cycles**
  - **Mating**
    - **Min** ----- 3.40
    - **Max** ----- 4.53
  - **Unmating**
    - **Min** ----- 2.68
    - **Max** ----- 4.23
- **After 20 Cycles**
  - **Mating**
    - **Min** ----- 3.53
    - **Max** ----- 4.60
  - **Unmating**
    - **Min** ----- 2.47
    - **Max** ----- 4.26
- **After 25 Cycles**
  - **Mating**
    - **Min** ----- 3.50
    - **Max** ----- 4.59
  - **Unmating**
    - **Min** ----- 2.61
    - **Max** ----- 4.27
- **After 50 Cycles**
  - **Mating**
    - **Min** ----- 3.54
    - **Max** ----- 4.91
  - **Unmating**
    - **Min** ----- 2.78
    - **Max** ----- 4.45
- **After 100 Cycles**
  - **Mating**
    - **Min** ----- 3.79
    - **Max** ----- 4.81
  - **Unmating**
    - **Min** ----- 2.62
    - **Max** ----- 4.76

**SEML/TEM (25 POSITION)****Mating – Unmating Forces**

- **After 1 Cycle**
  - **Mating**
    - **Min** ----- 3.75
    - **Max** ----- 7.88
  - **Unmating**
    - **Min** ----- 4.05
    - **Max** ----- 6.35
- **After 2 Cycles**
  - **Mating**
    - **Min** ----- 3.82
    - **Max** ----- 7.79
  - **Unmating**
    - **Min** ----- 4.08
    - **Max** ----- 6.25
- **After 3 Cycles**
  - **Mating**
    - **Min** ----- 3.86
    - **Max** ----- 6.64
  - **Unmating**
    - **Min** ----- 4.13
    - **Max** ----- 6.06
- **After 4 Cycles**
  - **Mating**
    - **Min** ----- 3.97
    - **Max** ----- 6.31
  - **Unmating**
    - **Min** ----- 4.08
    - **Max** ----- 5.80
- **After 5 Cycles**
  - **Mating**
    - **Min** ----- 3.96
    - **Max** ----- 5.94
  - **Unmating**
    - **Min** ----- 4.04
    - **Max** ----- 5.50
- **After 6 Cycles**
  - **Mating**
    - **Min** ----- 3.92
    - **Max** ----- 5.74
  - **Unmating**
    - **Min** ----- 4.01
    - **Max** ----- 5.68
- **After 7 Cycles**
  - **Mating**
    - **Min** ----- 3.90
    - **Max** ----- 5.62
  - **Unmating**
    - **Min** ----- 3.92
    - **Max** ----- 5.41

- **After 8 Cycles**
  - **Mating**
    - **Min** ----- 3.91
    - **Max** ----- 5.26
  - **Unmating**
    - **Min** ----- 3.92
    - **Max** ----- 5.28
- **After 9 Cycles**
  - **Mating**
    - **Min** ----- 3.93
    - **Max** ----- 5.29
  - **Unmating**
    - **Min** ----- 3.82
    - **Max** ----- 5.22
- **After 10 Cycles**
  - **Mating**
    - **Min** ----- 3.91
    - **Max** ----- 5.16
  - **Unmating**
    - **Min** ----- 3.78
    - **Max** ----- 5.12
- **After 15 Cycles**
  - **Mating**
    - **Min** ----- 3.96
    - **Max** ----- 5.03
  - **Unmating**
    - **Min** ----- 3.84
    - **Max** ----- 5.13
- **After 20 Cycles**
  - **Mating**
    - **Min** ----- 3.97
    - **Max** ----- 5.15
  - **Unmating**
    - **Min** ----- 3.93
    - **Max** ----- 5.21
- **After 25 Cycles**
  - **Mating**
    - **Min** ----- 4.01
    - **Max** ----- 5.21
  - **Unmating**
    - **Min** ----- 3.95
    - **Max** ----- 5.27
- **After 50 Cycles**
  - **Mating**
    - **Min** ----- 4.14
    - **Max** ----- 5.44
  - **Unmating**
    - **Min** ----- 3.87
    - **Max** ----- 5.49
- **After 100 Cycles**
  - **Mating**
    - **Min** ----- 4.34
    - **Max** ----- 5.65
  - **Unmating**
    - **Min** ----- 3.80
    - **Max** ----- 5.74

**SEM/TEM (50 POSITION)****Mating – Unmating Forces**

- **After 1 Cycle**
  - **Mating**
    - **Min ----- 8.57**
    - **Max----- 9.50**
  - **Unmating**
    - **Min ----- 5.56**
    - **Max----- 6.25**
- **After 2 Cycles**
  - **Mating**
    - **Min ----- 8.07**
    - **Max----- 9.11**
  - **Unmating**
    - **Min ----- 5.52**
    - **Max----- 6.18**
- **After 3 Cycles**
  - **Mating**
    - **Min ----- 7.87**
    - **Max----- 8.91**
  - **Unmating**
    - **Min ----- 5.53**
    - **Max----- 6.34**
- **After 4 Cycles**
  - **Mating**
    - **Min ----- 7.80**
    - **Max----- 8.83**
  - **Unmating**
    - **Min ----- 5.52**
    - **Max----- 6.49**
- **After 5 Cycles**
  - **Mating**
    - **Min ----- 7.74**
    - **Max----- 8.90**
  - **Unmating**
    - **Min ----- 7.74**
    - **Max----- 8.90**
- **After 6 Cycles**
  - **Mating**
    - **Min ----- 5.56**
    - **Max----- 6.58**
  - **Unmating**
    - **Min ----- 7.65**
    - **Max----- 8.92**
- **After 7 Cycles**
  - **Mating**
    - **Min ----- 5.60**
    - **Max----- 6.55**
  - **Unmating**
    - **Min ----- 7.69**
    - **Max----- 8.97**

- **After 8 Cycles**
  - **Mating**
    - **Min** ----- 7.67
    - **Max** ----- 8.98
  - **Unmating**
    - **Min** ----- 5.67
    - **Max** ----- 6.69
- **After 9 Cycles**
  - **Mating**
    - **Min** ----- 7.68
    - **Max** ----- 9.04
  - **Unmating**
    - **Min** ----- 5.71
    - **Max** ----- 6.70
- **After 10 Cycles**
  - **Mating**
    - **Min** ----- 7.70
    - **Max** ----- 9.04
  - **Unmating**
    - **Min** ----- 5.74
    - **Max** ----- 6.73
- **After 15 Cycles**
  - **Mating**
    - **Min** ----- 7.73
    - **Max** ----- 9.19
  - **Unmating**
    - **Min** ----- 5.88
    - **Max** ----- 7.12
- **After 20 Cycles**
  - **Mating**
    - **Min** ----- 7.75
    - **Max** ----- 9.30
  - **Unmating**
    - **Min** ----- 5.98
    - **Max** ----- 6.99
- **After 25 Cycles**
  - **Mating**
    - **Min** ----- 7.72
    - **Max** ----- 9.27
  - **Unmating**
    - **Min** ----- 6.01
    - **Max** ----- 7.12
- **After 50 Cycles**
  - **Mating**
    - **Min** ----- 7.86
    - **Max** ----- 9.41
  - **Unmating**
    - **Min** ----- 6.17
    - **Max** ----- 7.50
- **After 100 Cycles**
  - **Mating**
    - **Min** ----- 8.01
    - **Max** ----- 9.84
  - **Unmating**
    - **Min** ----- 6.30
    - **Max** ----- 8.38

**SEML/TEM (50 POSITION)****Mating – Unmating Forces**

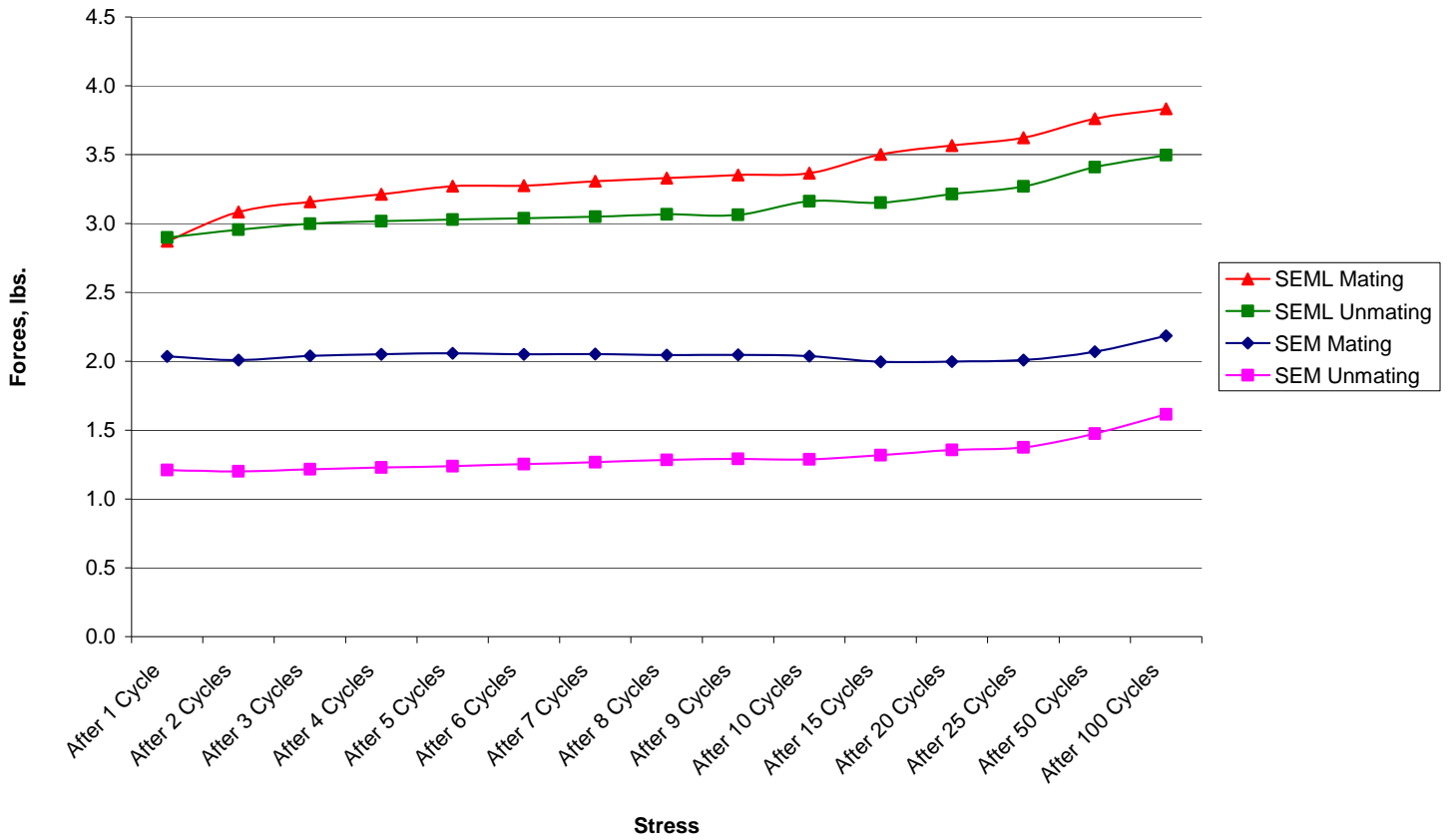
- **After 1 Cycle**
  - **Mating**
    - **Min ----- 9.89**
    - **Max-----12.47**
  - **Unmating**
    - **Min ----- 9.50**
    - **Max-----12.06**
- **After 2 Cycles**
  - **Mating**
    - **Min ----- 9.97**
    - **Max-----13.38**
  - **Unmating**
    - **Min ----- 9.89**
    - **Max-----12.71**
- **After 3 Cycles**
  - **Mating**
    - **Min -----10.22**
    - **Max-----13.68**
  - **Unmating**
    - **Min ----- 9.97**
    - **Max-----12.84**
- **After 4 Cycles**
  - **Mating**
    - **Min -----10.37**
    - **Max-----13.75**
  - **Unmating**
    - **Min ----- 9.96**
    - **Max-----12.94**
- **After 5 Cycles**
  - **Mating**
    - **Min -----10.42**
    - **Max-----13.79**
  - **Unmating**
    - **Min ----- 9.85**
    - **Max-----12.95**
- **After 6 Cycles**
  - **Mating**
    - **Min -----10.45**
    - **Max-----13.91**
  - **Unmating**
    - **Min ----- 9.87**
    - **Max-----13.00**
- **After 7 Cycles**
  - **Mating**
    - **Min -----10.38**
    - **Max-----13.86**
  - **Unmating**
    - **Min ----- 9.83**
    - **Max-----13.08**

- **After 8 Cycles**
  - **Mating**
    - **Min** -----10.36
    - **Max** -----13.92
  - **Unmating**
    - **Min** ----- 9.78
    - **Max** -----13.02
- **After 9 Cycles**
  - **Mating**
    - **Min** -----10.32
    - **Max** -----13.92
  - **Unmating**
    - **Min** ----- 9.75
    - **Max** -----13.07
- **After 10 Cycles**
  - **Mating**
    - **Min** -----10.17
    - **Max** -----13.91
  - **Unmating**
    - **Min** ----- 9.69
    - **Max** -----13.02
- **After 15 Cycles**
  - **Mating**
    - **Min** -----10.12
    - **Max** -----13.88
  - **Unmating**
    - **Min** ----- 9.77
    - **Max** -----13.10
- **After 20 Cycles**
  - **Mating**
    - **Min** -----10.12
    - **Max** -----13.98
  - **Unmating**
    - **Min** ----- 9.79
    - **Max** -----13.26
- **After 25 Cycles**
  - **Mating**
    - **Min** -----10.13
    - **Max** -----13.91
  - **Unmating**
    - **Min** ----- 9.79
    - **Max** -----13.35
- **After 50 Cycles**
  - **Mating**
    - **Min** -----10.41
    - **Max** -----14.61
  - **Unmating**
    - **Min** -----10.22
    - **Max** -----13.92
- **After 100 Cycles**
  - **Mating**
    - **Min** -----10.78
    - **Max** -----14.53
  - **Unmating**
    - **Min** -----10.67
    - **Max** -----14.41

### DATA SUMMARIES

#### MATING/UNMATING:

#### 10 POSITION Mating/Unmating Comparison



**SEML/TEM (10 POSITION)**

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	29.9	1.87	16.8	1.05	29.1	1.82	17.5	1.09
Maximum	34.7	2.17	24.9	1.56	34.3	2.15	23.7	1.48
<b>Average</b>	<b>32.5</b>	<b>2.0</b>	<b>19.4</b>	<b>1.2</b>	<b>32.1</b>	<b>2.0</b>	<b>19.2</b>	<b>1.2</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	30.6	1.91	17.2	1.08	31.1	1.94	17.4	1.09
Maximum	34.8	2.18	24.2	1.51	34.7	2.17	25.1	1.57
<b>Average</b>	<b>32.6</b>	<b>2.0</b>	<b>19.4</b>	<b>1.2</b>	<b>32.8</b>	<b>2.0</b>	<b>19.6</b>	<b>1.2</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	30.8	1.92	17.3	1.08	31.1	1.95	17.7	1.11
Maximum	35.1	2.19	25.3	1.58	34.5	2.16	26.0	1.62
<b>Average</b>	<b>32.9</b>	<b>2.1</b>	<b>19.8</b>	<b>1.2</b>	<b>32.8</b>	<b>2.1</b>	<b>20.0</b>	<b>1.3</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	31.2	1.95	17.7	1.11	30.8	1.93	17.9	1.12
Maximum	34.5	2.16	26.2	1.64	34.4	2.15	26.3	1.64
<b>Average</b>	<b>32.8</b>	<b>2.1</b>	<b>20.3</b>	<b>1.3</b>	<b>32.7</b>	<b>2.0</b>	<b>20.5</b>	<b>1.3</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	30.8	1.92	18.1	1.13	30.6	1.91	17.9	1.12
Maximum	34.4	2.15	26.5	1.65	34.4	2.15	26.3	1.64
<b>Average</b>	<b>32.8</b>	<b>2.0</b>	<b>20.6</b>	<b>1.3</b>	<b>32.6</b>	<b>2.0</b>	<b>20.6</b>	<b>1.3</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	29.4	1.84	18.3	1.15	29.4	1.84	19.1	1.19
Maximum	33.8	2.11	26.6	1.66	33.4	2.09	27.4	1.71
<b>Average</b>	<b>31.9</b>	<b>2.0</b>	<b>21.1</b>	<b>1.3</b>	<b>31.9</b>	<b>2.0</b>	<b>21.7</b>	<b>1.4</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	30.4	1.90	19.1	1.19	31.6	1.97	20.4	1.27
Maximum	33.6	2.10	27.4	1.71	34.8	2.17	28.6	1.79
<b>Average</b>	<b>32.2</b>	<b>2.0</b>	<b>22.0</b>	<b>1.4</b>	<b>33.1</b>	<b>2.1</b>	<b>23.6</b>	<b>1.5</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	33.5	2.09	22.5	1.41				
Maximum	36.9	2.31	30.9	1.93				
<b>Average</b>	<b>35.0</b>	<b>2.2</b>	<b>25.8</b>	<b>1.6</b>				

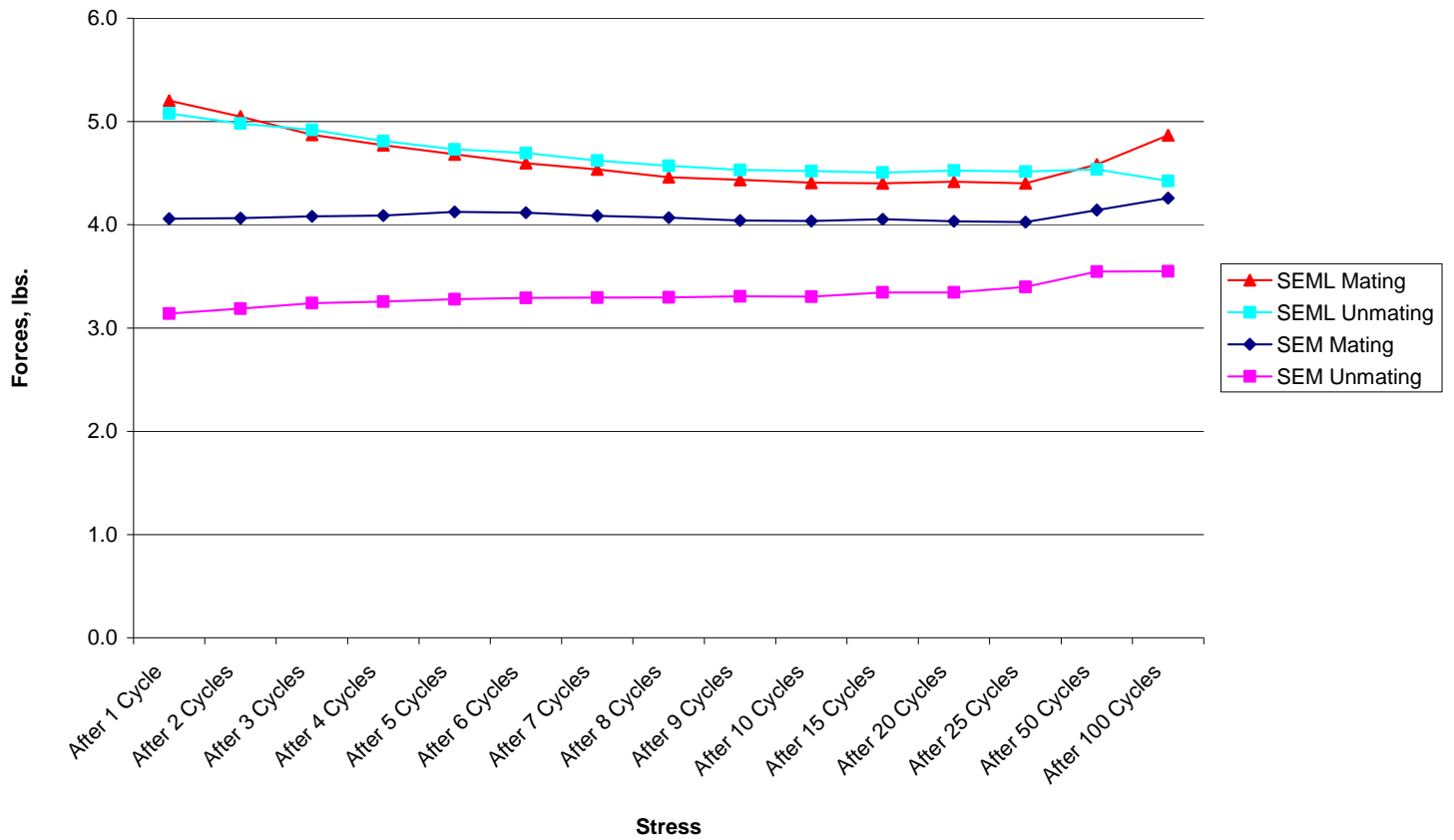
## DATA SUMMARIES Continued

## SEML/TEM (10 POSITION)

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	34.7	2.17	35.9	2.25	38.3	2.39	40.0	2.50
Maximum	58.2	3.64	56.2	3.51	58.2	3.64	54.1	3.38
<b>Average</b>	45.9	<b>2.9</b>	46.4	<b>2.9</b>	49.3	<b>3.1</b>	47.3	<b>3.0</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	39.1	2.44	40.9	2.55	40.3	2.52	41.4	2.59
Maximum	58.9	3.68	54.1	3.38	59.0	3.69	55.2	3.45
<b>Average</b>	50.5	<b>3.2</b>	48.0	<b>3.0</b>	51.4	<b>3.2</b>	48.3	<b>3.0</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	39.5	2.47	41.5	2.59	40.0	2.50	41.5	2.60
Maximum	62.4	3.90	56.8	3.55	62.2	3.89	56.6	3.54
<b>Average</b>	52.4	<b>3.3</b>	48.5	<b>3.0</b>	52.4	<b>3.3</b>	48.6	<b>3.0</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	40.5	2.53	41.3	2.58	41.1	2.57	41.7	2.61
Maximum	62.9	3.93	57.3	3.58	62.9	3.93	57.0	3.56
<b>Average</b>	52.9	<b>3.3</b>	48.8	<b>3.1</b>	53.3	<b>3.3</b>	49.1	<b>3.1</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	41.3	2.58	41.5	2.59	41.9	2.62	41.1	2.57
Maximum	63.7	3.98	57.1	3.57	63.4	3.96	62.4	3.90
<b>Average</b>	53.6	<b>3.4</b>	49.0	<b>3.1</b>	53.9	<b>3.4</b>	50.6	<b>3.2</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	41.1	2.57	41.2	2.58	41.9	2.62	42.1	2.63
Maximum	70.4	4.40	58.9	3.68	68.0	4.25	60.6	3.79
<b>Average</b>	56.0	<b>3.5</b>	50.4	<b>3.2</b>	57.1	<b>3.6</b>	51.4	<b>3.2</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	41.9	2.62	42.3	2.64	42.4	2.65	43.3	2.71
Maximum	68.8	4.30	60.8	3.80	69.4	4.34	62.1	3.88
<b>Average</b>	58.0	<b>3.6</b>	52.3	<b>3.3</b>	60.2	<b>3.8</b>	54.6	<b>3.4</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	41.9	2.62	42.0	2.62				
Maximum	69.0	4.31	61.1	3.82				
<b>Average</b>	61.3	<b>3.8</b>	56.0	<b>3.5</b>				

### DATA SUMMARIES Continued

#### 25 POSITION Mating/Unmating Comparison



## DATA SUMMARIES Continued

## SEM/TEM (25 POSITION)

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	53.9	3.37	38.2	2.39	52.5	3.28	40.6	2.54
Maximum	77.1	4.82	62.1	3.88	76.6	4.79	63.7	3.98
<b>Average</b>	65.0	<b>4.1</b>	50.2	<b>3.1</b>	65.0	<b>4.1</b>	51.0	<b>3.2</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	53.3	3.33	40.0	2.50	54.6	3.41	39.7	2.48
Maximum	77.6	4.85	63.5	3.97	75.8	4.74	63.8	3.99
<b>Average</b>	65.3	<b>4.1</b>	51.8	<b>3.2</b>	65.4	<b>4.1</b>	52.1	<b>3.3</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	55.8	3.49	39.8	2.49	56.5	3.53	39.7	2.48
Maximum	80.6	5.04	69.8	4.36	77.9	4.87	69.4	4.34
<b>Average</b>	66.0	<b>4.1</b>	52.5	<b>3.3</b>	65.9	<b>4.1</b>	52.7	<b>3.3</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	53.4	3.34	41.9	2.62	53.8	3.36	42.1	2.63
Maximum	77.3	4.83	68.3	4.27	74.6	4.66	67.7	4.23
<b>Average</b>	65.4	<b>4.1</b>	52.7	<b>3.3</b>	65.1	<b>4.1</b>	52.7	<b>3.3</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	53.8	3.36	42.2	2.64	53.8	3.36	42.1	2.63
Maximum	73.6	4.60	67.4	4.21	73.6	4.60	67.4	4.21
<b>Average</b>	64.6	<b>4.0</b>	52.9	<b>3.3</b>	64.6	<b>4.0</b>	52.9	<b>3.3</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	54.4	3.40	42.9	2.68	56.5	3.53	39.5	2.47
Maximum	72.5	4.53	67.7	4.23	73.6	4.60	68.2	4.26
<b>Average</b>	64.8	<b>4.1</b>	53.5	<b>3.3</b>	64.5	<b>4.0</b>	53.5	<b>3.3</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	56.0	3.50	41.8	2.61	56.6	3.54	44.5	2.78
Maximum	73.4	4.59	68.3	4.27	78.6	4.91	71.2	4.45
<b>Average</b>	64.4	<b>4.0</b>	54.4	<b>3.4</b>	66.3	<b>4.1</b>	56.8	<b>3.5</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	60.6	3.79	41.9	2.62				
Maximum	77.0	4.81	76.2	4.76				
<b>Average</b>	68.1	<b>4.3</b>	56.8	<b>3.6</b>				

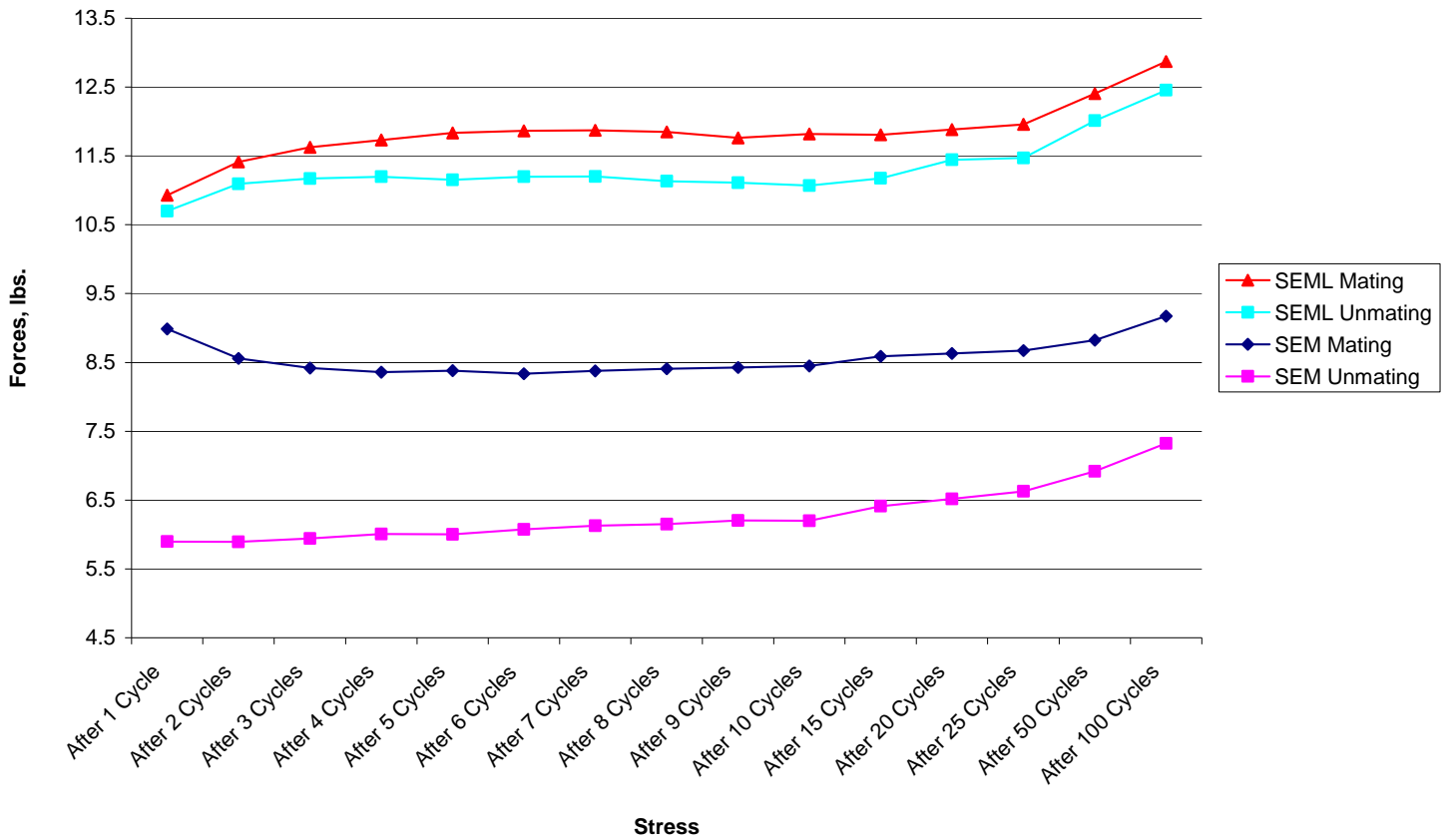
## DATA SUMMARIES Continued

## SEML/TEM (25 POSITION)

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	60.0	3.75	64.8	4.05	61.1	3.82	65.3	4.08
Maximum	126.1	7.88	101.6	6.35	124.6	7.79	100.0	6.25
<b>Average</b>	<b>83.2</b>	<b>5.2</b>	<b>81.3</b>	<b>5.1</b>	<b>80.8</b>	<b>5.0</b>	<b>79.7</b>	<b>5.0</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	61.8	3.86	66.1	4.13	63.5	3.97	65.3	4.08
Maximum	106.2	6.64	97.0	6.06	101.0	6.31	92.8	5.80
<b>Average</b>	<b>78.0</b>	<b>4.9</b>	<b>78.7</b>	<b>4.9</b>	<b>76.3</b>	<b>4.8</b>	<b>77.0</b>	<b>4.8</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	63.4	3.96	64.6	4.04	62.7	3.92	64.2	4.01
Maximum	95.0	5.94	88.0	5.50	91.8	5.74	90.9	5.68
<b>Average</b>	<b>74.9</b>	<b>4.7</b>	<b>75.7</b>	<b>4.7</b>	<b>73.6</b>	<b>4.6</b>	<b>75.1</b>	<b>4.7</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	62.4	3.90	62.7	3.92	62.6	3.91	62.7	3.92
Maximum	89.9	5.62	86.6	5.41	84.2	5.26	84.5	5.28
<b>Average</b>	<b>72.6</b>	<b>4.5</b>	<b>73.9</b>	<b>4.6</b>	<b>71.4</b>	<b>4.5</b>	<b>73.2</b>	<b>4.6</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	62.9	3.93	61.1	3.82	62.6	3.91	60.5	3.78
Maximum	84.6	5.29	83.5	5.22	82.6	5.16	81.9	5.12
<b>Average</b>	<b>70.9</b>	<b>4.4</b>	<b>72.5</b>	<b>4.5</b>	<b>70.5</b>	<b>4.4</b>	<b>72.3</b>	<b>4.5</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	63.4	3.96	61.4	3.84	63.5	3.97	62.9	3.93
Maximum	80.5	5.03	82.1	5.13	82.4	5.15	83.4	5.21
<b>Average</b>	<b>70.4</b>	<b>4.4</b>	<b>72.1</b>	<b>4.5</b>	<b>70.7</b>	<b>4.4</b>	<b>72.4</b>	<b>4.5</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	64.2	4.01	63.2	3.95	66.2	4.14	61.9	3.87
Maximum	83.4	5.21	84.3	5.27	87.0	5.44	87.8	5.49
<b>Average</b>	<b>70.4</b>	<b>4.4</b>	<b>72.3</b>	<b>4.5</b>	<b>73.3</b>	<b>4.6</b>	<b>72.6</b>	<b>4.5</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	69.4	4.34	60.8	3.80				
Maximum	90.4	5.65	91.8	5.74				
<b>Average</b>	<b>77.9</b>	<b>4.9</b>	<b>70.8</b>	<b>4.4</b>				

**DATA SUMMARIES Continued**

**50 POSITION  
Mating/Unmating Comparison**



**DATA SUMMARIES Continued**

**SEM/TEM (50 POSITION)**

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	137.0	8.57	88.9	5.56	129.1	8.07	88.3	5.52
Maximum	152.0	9.50	100.0	6.25	145.8	9.11	98.8	6.18
<b>Average</b>	143.8	<b>9.0</b>	94.4	<b>5.9</b>	136.9	<b>8.6</b>	94.3	<b>5.9</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	125.9	7.87	88.5	5.53	124.7	7.80	88.4	5.52
Maximum	142.6	8.91	101.4	6.34	141.2	8.83	103.9	6.49
<b>Average</b>	134.7	<b>8.4</b>	95.1	<b>5.9</b>	133.7	<b>8.4</b>	96.1	<b>6.0</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	123.9	7.74	88.9	5.56	122.4	7.65	89.6	5.60
Maximum	142.4	8.90	105.2	6.58	142.7	8.92	104.8	6.55
<b>Average</b>	134.1	<b>8.4</b>	96.1	<b>6.0</b>	133.4	<b>8.3</b>	97.2	<b>6.1</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	123.0	7.69	90.3	5.64	122.7	7.67	90.7	5.67
Maximum	143.5	8.97	105.9	6.62	143.6	8.98	107.0	6.69
<b>Average</b>	134.0	<b>8.4</b>	98.0	<b>6.1</b>	134.5	<b>8.4</b>	98.4	<b>6.1</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	122.9	7.68	91.4	5.71	123.2	7.70	91.9	5.74
Maximum	144.7	9.04	107.1	6.70	144.7	9.04	107.7	6.73
<b>Average</b>	134.8	<b>8.4</b>	99.2	<b>6.2</b>	135.2	<b>8.4</b>	99.2	<b>6.2</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	123.7	7.73	94.0	5.88	124.0	7.75	95.6	5.98
Maximum	147.0	9.19	113.9	7.12	148.8	9.30	111.9	6.99
<b>Average</b>	137.4	<b>8.6</b>	102.6	<b>6.4</b>	138.1	<b>8.6</b>	104.3	<b>6.5</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	123.5	7.72	96.1	6.01	125.8	7.86	98.7	6.17
Maximum	148.3	9.27	114.0	7.12	150.5	9.41	120.0	7.50
<b>Average</b>	138.8	<b>8.7</b>	106.0	<b>6.6</b>	141.2	<b>8.8</b>	110.7	<b>6.9</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	128.2	8.01	100.7	6.30				
Maximum	157.5	9.84	134.0	8.38				
<b>Average</b>	146.7	<b>9.2</b>	117.2	<b>7.3</b>				

## DATA SUMMARIES Continued

## SEML/TEM (50 POSITION)

	After 1 Cycle				After 2 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	158.2	9.89	152.0	9.50	159.5	9.97	158.2	9.89
Maximum	199.4	12.47	192.9	12.06	214.1	13.38	203.4	12.71
<b>Average</b>	174.9	<b>10.9</b>	171.2	<b>10.7</b>	182.6	<b>11.4</b>	177.5	<b>11.1</b>
	After 3 Cycles				After 4 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	163.5	10.22	159.5	9.97	165.9	10.37	159.3	9.96
Maximum	218.8	13.68	205.4	12.84	220.0	13.75	207.1	12.94
<b>Average</b>	186.0	<b>11.6</b>	178.8	<b>11.2</b>	187.7	<b>11.7</b>	179.1	<b>11.2</b>
	After 5 Cycles				After 6 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	166.8	10.42	157.6	9.85	167.2	10.45	158.0	9.87
Maximum	220.6	13.79	207.2	12.95	222.5	13.91	208.0	13.00
<b>Average</b>	189.3	<b>11.8</b>	178.4	<b>11.2</b>	189.8	<b>11.9</b>	179.1	<b>11.2</b>
	After 7 Cycles				After 8 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	166.0	10.38	157.2	9.83	165.8	10.36	156.5	9.78
Maximum	221.8	13.86	209.3	13.08	222.7	13.92	208.3	13.02
<b>Average</b>	190.0	<b>11.9</b>	179.2	<b>11.2</b>	189.6	<b>11.9</b>	178.1	<b>11.1</b>
	After 9 Cycles				After 10 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	165.2	10.32	156.0	9.75	162.7	10.17	155.1	9.69
Maximum	222.6	13.92	209.1	13.07	222.5	13.91	208.4	13.02
<b>Average</b>	188.2	<b>11.8</b>	177.7	<b>11.1</b>	189.1	<b>11.8</b>	177.1	<b>11.1</b>
	After 15 Cycles				After 20 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	162.0	10.12	156.3	9.77	161.9	10.12	156.7	9.79
Maximum	222.0	13.88	209.6	13.10	223.6	13.98	212.2	13.26
<b>Average</b>	188.9	<b>11.8</b>	178.8	<b>11.2</b>	190.1	<b>11.9</b>	183.1	<b>11.4</b>
	After 25 Cycles				After 50 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	162.0	10.13	156.6	9.79	166.6	10.41	163.6	10.22
Maximum	222.6	13.91	213.6	13.35	233.7	14.61	222.7	13.92
<b>Average</b>	191.3	<b>12.0</b>	183.5	<b>11.5</b>	198.5	<b>12.4</b>	192.2	<b>12.0</b>
	After 100 Cycles							
	Mating		Unmating					
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)				
Minimum	172.5	10.78	170.7	10.67				
Maximum	232.4	14.53	230.6	14.41				
<b>Average</b>	206.0	<b>12.9</b>	199.3	<b>12.5</b>				

## DATA

## MATING/UNMATING:

## SEM/TEM (10 POSITION)

	After 1 Cycle		After 2 Cycles		After 3 Cycles		After 4 Cycles		After 5 Cycles		After 6 Cycles		After 7 Cycles	
Sample#	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	2.07	1.10	2.01	1.12	2.04	1.13	2.03	1.16	2.06	1.18	2.05	1.20	2.03	1.23
2	1.87	1.10	1.95	1.13	1.96	1.15	2.01	1.16	2.04	1.15	2.00	1.21	2.02	1.22
3	2.17	1.21	2.14	1.24	2.10	1.26	2.10	1.24	2.09	1.24	2.09	1.24	2.07	1.27
4	2.11	1.56	1.82	1.13	1.98	1.15	2.01	1.16	2.04	1.20	1.99	1.20	1.99	1.20
5	2.09	1.25	2.06	1.34	2.09	1.33	2.11	1.35	2.06	1.37	2.07	1.37	2.09	1.39
6	2.16	1.16	2.01	1.15	2.02	1.14	2.01	1.15	2.00	1.15	2.02	1.14	2.04	1.15
7	1.92	1.05	2.04	1.15	2.04	1.18	2.05	1.19	2.09	1.18	2.09	1.20	2.10	1.21
8	1.96	1.13	1.89	1.09	1.91	1.08	1.94	1.09	1.92	1.08	1.95	1.11	1.95	1.11
9	1.99	1.14	2.15	1.18	2.18	1.22	2.17	1.21	2.19	1.24	2.16	1.24	2.16	1.25
10	2.01	1.40	2.03	1.48	2.08	1.51	2.07	1.57	2.09	1.58	2.11	1.62	2.07	1.64
	After 8 Cycles		After 9 Cycles		After 10 Cycles		After 15 Cycles		After 20 Cycles		After 25 Cycles		After 50 Cycles	
Sample#	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	2.02	1.23	1.99	1.23	2.00	1.22	1.97	1.27	2.00	1.31	1.99	1.32	2.08	1.32
2	2.00	1.23	2.01	1.24	1.97	1.24	1.95	1.26	1.93	1.29	1.93	1.29	2.02	1.39
3	2.05	1.28	2.03	1.26	2.02	1.26	1.98	1.30	1.98	1.32	1.99	1.34	2.01	1.43
4	2.00	1.24	2.01	1.25	1.99	1.25	1.98	1.29	1.97	1.32	2.00	1.38	1.97	1.50
5	2.08	1.40	2.09	1.41	2.09	1.41	1.99	1.43	1.99	1.46	2.04	1.47	2.11	1.54
6	2.04	1.17	2.05	1.19	2.07	1.15	2.02	1.17	2.01	1.19	2.03	1.22	2.09	1.27
7	2.12	1.24	2.14	1.25	2.15	1.26	2.11	1.29	2.09	1.38	2.07	1.40	2.11	1.56
8	1.93	1.12	1.92	1.13	1.91	1.12	1.84	1.15	1.84	1.19	1.90	1.19	2.01	1.35
9	2.15	1.27	2.15	1.30	2.13	1.32	2.08	1.37	2.09	1.39	2.10	1.41	2.17	1.59
10	2.07	1.64	2.08	1.65	2.03	1.64	2.05	1.66	2.08	1.71	2.05	1.71	2.11	1.79
	After 100 Cycles													
Sample#	Mating	Unmating												
1	2.23	1.54												
2	2.15	1.52												
3	2.09	1.56												
4	2.10	1.59												
5	2.15	1.72												
6	2.19	1.41												
7	2.22	1.69												
8	2.17	1.49												
9	2.31	1.71												
10	2.24	1.93												

## DATA Continued

## SEML/TEM (10 POSITION)

Sample#	After 1 Cycle		After 2 Cycles		After 3 Cycles		After 4 Cycles		After 5 Cycles		After 6 Cycles		After 7 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	2.17	2.25	2.39	2.50	2.44	2.55	2.52	2.60	2.47	2.59	2.50	2.60	2.53	2.58
1	2.63	3.04	2.97	3.21	3.21	3.35	3.44	3.45	3.49	3.55	3.43	3.54	3.53	3.58
3	3.24	3.12	3.19	3.04	3.17	3.13	3.06	2.92	3.01	2.96	3.04	2.93	2.99	2.95
4	2.58	3.51	3.20	2.73	3.55	2.77	3.59	2.92	3.90	2.79	3.89	2.90	3.85	3.01
5	3.05	2.86	3.09	2.87	3.08	2.84	3.14	2.79	3.17	2.74	3.14	2.75	3.22	2.79
6	3.02	2.75	3.23	2.98	3.08	2.91	3.09	2.92	3.06	2.93	3.09	2.94	3.11	2.89
7	2.84	2.83	3.19	3.12	3.18	3.13	3.25	3.16	3.36	3.23	3.39	3.24	3.41	3.24
8	2.59	2.44	2.67	2.53	2.65	2.58	2.68	2.59	2.77	2.63	2.74	2.68	2.78	2.65
9	2.96	2.95	3.26	3.19	3.53	3.38	3.68	3.43	3.78	3.49	3.86	3.51	3.93	3.50
10	3.64	3.24	3.64	3.38	3.68	3.34	3.69	3.39	3.71	3.38	3.68	3.31	3.72	3.31
Sample#	After 8 Cycles		After 9 Cycles		After 10 Cycles		After 15 Cycles		After 20 Cycles		After 25 Cycles		After 50 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	2.57	2.61	2.58	2.59	2.62	2.57	2.57	2.58	2.62	2.63	2.62	2.64	2.65	2.71
2	3.52	3.56	3.52	3.57	3.53	3.57	3.62	3.68	3.76	3.72	3.74	3.78	3.89	3.88
3	3.00	2.96	3.03	2.96	3.05	2.98	3.10	3.08	3.16	3.13	3.20	3.20	3.49	3.51
4	3.93	2.99	3.98	3.01	3.94	3.90	4.01	3.06	4.02	3.04	4.08	2.99	4.23	3.01
5	3.22	2.75	3.24	2.77	3.27	2.77	3.27	2.77	3.31	2.75	3.42	2.75	3.40	2.99
6	3.11	2.98	3.14	2.86	3.13	2.85	3.28	2.91	3.42	3.00	3.55	3.11	4.02	3.62
7	3.47	3.26	3.50	3.29	3.51	3.32	3.82	3.41	3.99	3.54	4.11	3.61	3.99	3.62
8	2.82	2.70	2.85	2.70	2.85	2.72	3.06	2.93	3.25	3.04	3.35	3.19	3.49	3.25
9	3.92	3.52	3.91	3.53	3.96	3.53	4.40	3.68	4.25	3.79	4.30	3.80	4.34	3.80
10	3.74	3.34	3.77	3.35	3.81	3.41	3.89	3.42	3.88	3.50	3.87	3.61	4.12	3.72
Sample#	After 100 Cycles													
	Mating	Unmating												
1	2.62	2.62												
2	3.94	3.81												
3	3.59	3.63												
4	4.04	3.28												
5	3.71	2.96												
6	4.23	3.82												
7	3.94	3.76												
8	3.84	3.58												
9	4.31	3.78												
10	4.12	3.73												

**DATA Continued****SEM/TEM (25 POSITION)**

Sample#	After 1 Cycle		After 2 Cycles		After 3 Cycles		After 4 Cycles		After 5 Cycles		After 6 Cycles		After 7 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	3.48	2.90	3.28	2.93	3.33	3.02	3.41	3.03	3.50	3.02	3.54	3.02	3.63	2.94
2	3.37	2.39	3.38	2.54	3.42	2.50	3.47	2.48	3.49	2.49	3.53	2.48	3.34	2.62
3	3.65	2.81	3.62	2.91	3.70	3.02	3.77	3.09	3.79	3.15	3.78	3.18	3.73	3.13
4	4.53	3.83	4.62	3.73	4.59	3.71	4.49	3.70	4.38	3.49	4.30	3.57	4.36	3.55
5	3.75	3.06	3.92	3.00	3.86	3.03	3.88	3.11	3.92	3.16	4.03	3.15	4.04	3.18
6	4.53	3.29	4.55	3.42	4.53	3.47	4.54	3.46	4.49	3.42	4.46	3.47	4.42	3.52
7	3.47	2.64	3.54	2.70	3.62	2.74	3.63	2.78	3.68	2.81	3.73	2.81	3.71	2.85
8	4.77	3.88	4.71	3.98	4.68	3.97	4.71	3.99	5.04	4.36	4.87	4.34	4.83	4.27
9	4.82	3.08	4.79	3.11	4.85	3.22	4.74	3.24	4.68	3.28	4.59	3.31	4.49	3.33
10	4.23	3.51	4.24	3.57	4.23	3.72	4.24	3.67	4.28	3.62	4.35	3.58	4.32	3.54
Sample#	After 8 Cycles		After 9 Cycles		After 10 Cycles		After 15 Cycles		After 20 Cycles		After 25 Cycles		After 50 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	3.63	2.94	3.57	2.96	3.63	2.97	3.74	3.00	3.63	2.88	3.68	2.90	3.72	2.95
2	3.36	2.63	3.36	2.64	3.36	2.63	3.40	2.68	3.53	2.47	3.50	2.61	3.54	2.78
3	3.74	3.14	3.75	3.17	3.74	3.15	3.71	3.21	3.68	3.22	3.65	3.26	3.81	3.37
4	4.43	3.60	4.42	3.70	4.43	3.75	4.53	3.86	4.60	3.97	4.59	4.11	4.91	4.36
5	3.99	3.25	3.99	3.31	3.98	3.37	4.08	3.45	4.11	3.49	4.12	3.56	4.32	3.74
6	4.42	3.54	4.36	3.54	4.33	3.50	4.30	3.51	4.24	3.53	4.22	3.56	4.35	3.73
7	3.73	2.82	3.73	2.82	3.73	2.81	3.74	2.85	3.71	2.85	3.69	2.85	3.75	2.94
8	4.66	4.23	4.60	4.21	4.60	4.21	4.49	4.23	4.45	4.26	4.41	4.27	4.48	4.45
9	4.42	3.32	4.33	3.27	4.27	3.24	4.29	3.28	4.29	3.36	4.30	3.40	4.38	3.58
10	4.31	3.49	4.29	3.45	4.29	3.42	4.25	3.38	4.10	3.41	4.10	3.46	4.17	3.57
Sample#	After 100 Cycles													
	Mating	Unmating												
1	3.79	3.61												
2	3.81	2.86												
3	3.88	3.11												
4	4.27	2.62												
5	4.81	3.99												
6	4.43	3.76												
7	3.92	3.15												
8	4.62	4.76												
9	4.68	3.85												
10	4.37	3.79												

**DATA Continued****SEML/TEM (25 POSITION)**

Sample#	After 1 Cycle		After 2 Cycles		After 3 Cycles		After 4 Cycles		After 5 Cycles		After 6 Cycles		After 7 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	5.68	5.15	5.40	5.02	5.28	4.97	5.16	5.01	5.06	5.12	5.00	5.22	5.04	5.22
2	5.14	5.62	4.96	5.55	5.04	5.56	4.82	5.29	4.73	5.12	4.59	5.03	4.54	4.97
3	4.74	4.07	4.71	4.27	4.77	4.19	4.53	4.08	4.61	4.04	4.52	4.01	4.42	3.92
4	4.45	4.73	4.31	4.58	4.27	4.55	4.26	4.41	4.27	4.43	4.24	4.28	4.24	4.29
5	3.75	4.05	3.82	4.08	3.86	4.13	3.97	4.16	3.96	4.12	3.92	4.12	3.90	4.09
6	5.08	5.69	5.02	5.41	4.82	5.31	4.80	5.18	4.70	5.13	4.60	5.01	4.51	4.88
7	7.88	6.35	7.79	6.25	6.64	6.06	6.31	5.80	5.94	5.50	5.74	5.68	5.62	5.41
8	6.44	5.46	6.00	5.27	5.75	5.26	5.66	5.28	5.40	5.15	5.29	5.03	5.14	4.99
9	4.46	5.09	4.31	4.82	4.20	4.62	4.14	4.48	4.13	4.43	4.02	4.33	4.02	4.29
10	4.40	4.58	4.16	4.54	4.09	4.55	4.06	4.43	4.02	4.26	4.05	4.25	3.93	4.15
Sample#	After 8 Cycles		After 9 Cycles		After 10 Cycles		After 15 Cycles		After 20 Cycles		After 25 Cycles		After 50 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	5.06	5.19	5.01	5.15	4.96	5.11	5.03	5.13	5.15	5.21	5.21	5.27	5.44	5.49
2	4.49	4.88	4.41	4.82	4.42	4.78	4.39	4.72	4.43	4.71	4.45	4.67	4.45	4.62
3	4.33	3.92	4.25	3.82	4.22	3.78	4.24	3.84	4.25	3.93	4.31	3.95	4.40	4.11
4	4.23	4.26	4.23	4.29	4.26	4.31	4.27	4.39	4.20	4.31	4.02	4.28	4.16	3.87
5	3.91	4.04	3.93	4.01	3.91	4.00	3.97	3.98	3.97	4.02	4.02	4.02	4.14	4.16
6	4.33	4.85	4.26	4.73	4.17	4.67	4.12	4.58	4.15	4.50	4.01	4.46	4.35	4.44
7	5.26	5.28	5.29	5.22	5.16	5.12	4.91	4.94	4.82	4.90	4.70	4.77	4.65	4.52
8	5.07	4.90	5.01	4.90	4.95	4.89	4.96	4.89	4.97	4.92	4.99	4.94	5.15	5.09
9	3.98	4.29	3.98	4.26	3.96	4.27	3.96	4.28	3.98	4.31	4.01	4.31	4.51	4.28
10	3.95	4.11	3.97	4.10	4.07	4.28	4.18	4.31	4.26	4.44	4.30	4.49	4.58	4.78
Sample#	After 100 Cycles													
	Mating	Unmating												
1	5.65	5.74												
2	4.92	4.55												
3	4.60	4.26												
4	4.70	3.80												
5	4.53	4.22												
6	4.84	4.60												
7	4.77	4.57												
8	4.34	4.05												
9	5.15	4.44												
10	5.16	4.02												

**DATA Continued****SEM/TEM (50 POSITION)**

<b>Sample#</b>	<b>After 1 Cycle</b>		<b>After 2 Cycles</b>		<b>After 3 Cycles</b>		<b>After 4 Cycles</b>		<b>After 5 Cycles</b>		<b>After 6 Cycles</b>		<b>After 7 Cycles</b>	
	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	9.13	6.25	8.18	6.15	7.89	6.34	7.80	6.49	7.74	6.58	7.65	6.55	7.69	6.62
1	8.59	5.91	8.32	5.96	8.32	6.00	8.35	6.04	8.40	5.97	8.42	6.06	8.46	6.11
3	8.61	5.80	8.44	5.86	8.44	5.82	8.45	5.90	8.48	5.90	8.53	5.98	8.56	6.05
4	9.47	6.16	9.11	6.18	8.91	6.19	8.83	6.24	8.90	6.33	8.92	6.37	8.97	6.44
5	9.42	5.97	8.88	5.89	8.78	5.96	8.71	6.00	8.75	5.90	8.68	6.00	8.70	6.03
6	8.57	5.56	8.07	5.52	7.87	5.53	7.80	5.52	7.78	5.58	7.69	5.60	7.69	5.64
7	8.78	5.67	8.74	5.70	8.59	5.83	8.53	5.90	8.58	5.89	8.52	5.99	8.55	6.03
8	8.82	5.74	8.30	5.75	8.10	5.63	8.04	5.67	8.03	5.56	8.01	5.76	8.04	5.80
9	9.50	6.03	8.98	6.04	8.85	6.18	8.74	6.30	8.76	6.35	8.63	6.37	8.72	6.43
<b>Sample#</b>	<b>After 8 Cycles</b>		<b>After 9 Cycles</b>		<b>After 10 Cycles</b>		<b>After 15 Cycles</b>		<b>After 20 Cycles</b>		<b>After 25 Cycles</b>		<b>After 50 Cycles</b>	
	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	7.79	6.69	7.79	6.70	7.82	6.73	8.26	7.12	8.05	6.95	8.25	7.09	8.75	7.50
2	8.48	6.14	8.49	6.19	8.54	6.17	8.62	6.39	8.67	6.52	8.71	6.71	8.79	7.17
3	8.62	6.08	8.66	6.12	8.75	6.04	8.84	6.28	8.92	6.39	8.95	6.46	9.02	6.58
4	8.98	6.49	9.04	6.52	9.04	6.61	9.19	6.80	9.30	6.99	9.27	7.12	9.41	7.48
5	8.78	6.07	8.77	6.09	8.76	6.07	8.92	6.27	8.93	6.41	9.02	6.50	9.04	6.82
6	7.67	5.67	7.68	5.71	7.70	5.74	7.73	5.88	7.75	5.98	7.72	6.01	7.86	6.17
7	8.58	5.90	8.61	6.13	8.66	6.09	8.75	6.31	8.86	6.54	8.86	6.63	9.08	7.04
8	8.07	5.82	8.09	5.83	8.09	5.81	8.24	6.01	8.31	6.11	8.32	6.15	8.41	6.35
9	8.72	6.49	8.71	6.55	8.69	6.55	8.77	6.66	8.88	6.79	8.96	6.97	9.06	7.18
<b>Sample#</b>	<b>After 100 Cycles</b>													
	<u>Mating</u>	<u>Unmating</u>												
1	9.53	8.38												
2	9.17	7.84												
3	9.31	7.05												
4	9.84	7.79												
5	9.37	7.24												
6	8.01	6.30												
7	9.23	7.14												
8	8.84	6.77												
9	9.24	7.40												

**DATA Continued****SEML/TEM (50 POSITION)**

Sample#	After 1 Cycle		After 2 Cycles		After 3 Cycles		After 4 Cycles		After 5 Cycles		After 6 Cycles		After 7 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	11.85	11.36	12.27	11.58	12.51	11.62	12.67	11.84	12.88	11.80	13.08	11.90	13.13	11.96
2	10.84	9.70	11.08	10.10	11.34	10.33	11.48	10.42	11.49	10.48	11.46	10.64	11.51	10.68
3	12.47	12.06	13.38	12.71	13.68	12.84	13.75	12.94	13.79	12.95	13.91	13.00	13.86	13.08
4	11.00	10.87	11.09	10.71	10.80	10.64	10.69	10.40	10.68	10.24	10.58	10.11	10.57	10.02
5	11.13	10.75	11.39	11.00	11.41	10.92	11.43	10.86	11.35	10.77	11.29	10.73	11.24	10.71
6	10.80	10.60	10.76	10.74	10.62	10.70	10.60	10.59	10.57	10.36	10.45	10.32	10.38	10.34
7	10.35	10.43	11.35	11.05	11.84	11.06	12.03	11.15	12.39	11.10	12.47	11.20	12.49	11.22
8	10.91	11.03	11.75	11.60	12.14	11.72	12.36	11.84	12.56	11.88	12.60	11.99	12.55	11.96
9	9.89	10.70	11.11	11.57	11.69	11.94	11.95	11.96	12.20	12.11	12.28	12.21	12.40	12.23
10	10.07	9.50	9.97	9.89	10.22	9.97	10.37	9.96	10.42	9.85	10.54	9.87	10.59	9.83
Sample#	After 8 Cycles		After 9 Cycles		After 10 Cycles		After 15 Cycles		After 20 Cycles		After 25 Cycles		After 50 Cycles	
	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	12.95	11.42	11.99	11.15	12.88	11.80	12.54	11.46	13.02	13.20	13.03	13.02	13.36	13.24
2	11.51	10.74	11.52	10.77	11.58	10.73	11.65	11.11	11.71	11.33	12.03	11.48	12.79	12.47
3	13.92	13.02	13.92	13.07	13.91	13.02	13.88	13.10	13.98	13.26	13.91	13.35	14.61	13.92
4	10.48	9.96	10.48	9.90	10.39	9.75	10.37	9.77	10.35	9.79	10.45	9.79	10.72	10.22
5	11.19	10.71	11.23	10.70	11.17	10.58	11.11	10.62	11.05	10.62	10.99	10.66	11.41	11.15
6	10.36	10.25	10.32	10.19	10.17	10.02	10.12	10.04	10.12	10.04	10.13	9.99	10.41	10.36
7	12.58	11.16	12.60	11.25	12.60	11.18	12.54	11.35	12.41	11.40	12.28	11.53	12.55	12.06
8	12.56	12.03	12.59	12.00	12.57	11.84	12.78	12.11	12.98	12.34	13.22	12.36	13.91	13.14
9	12.43	12.27	12.45	12.31	12.45	12.09	12.51	12.36	12.58	12.44	12.86	12.53	13.39	13.07
10	10.53	9.78	10.54	9.75	10.49	9.69	10.60	9.84	10.64	10.02	10.69	10.01	10.90	10.51
Sample#	After 100 Cycles													
	Mating	Unmating												
1	14.53	14.41												
2	13.35	13.17												
3	14.44	13.78												
4	11.55	10.67												
5	11.87	11.55												
6	10.78	10.72												
7	12.45	11.78												
8	14.36	13.89												
9	14.02	13.55												
10	11.38	11.04												

**EQUIPMENT AND CALIBRATION SCHEDULES****Equipment #:** TCT-04**Description:** Dillon Quantrol TC21 25-1000 mm/min series test stand**Manufacturer:** Dillon Quantrol**Model:** TC2 I series test stand**Serial #:** 04-1041-04**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;  
... Last Cal: 5/6/2008, Next Cal: 5/6/2009**Equipment #:** LC-50N-3**Description:** 50 N icell load cell for Dillon Test Stand**Manufacturer:** Mecmesin (Dillon/Quantrol)**Model:** ILC**Serial #:** 08-0093-02**Accuracy:** .10% of Capacity

... Last Cal: 2/15/2009, Next Cal: 02/15/2010