

| | | |
|--|------------|------|
| Diameter of bolt | d (mm) | 20 |
| Diameter of bolt hole | d_0 (mm) | 22 |
| End distance | e_1 (mm) | 40 |
| Edge distance | e_2 (mm) | 50 |
| Spacing between centres of bolts in the direction of load transfer | p_1 (mm) | 60 |
| Thickness of end plate | t_p (mm) | 10 |
| Horizontal distance of lever arm | B_L (mm) | 490 |
| Vertical distance of lever arm | D_L (mm) | 51.7 |

| Steel Grade | | S275 | S355 |
|-----------------------|----------|------------------|------------------|
| Dimension of Members | | UB305x16 5x40 | UC254x25 4x89 |
| Depth of Section | D (mm) | 303.4 | 260.3 |
| Width of Section | B (mm) | 165 | 256.3 |
| Thickness of Web | t (mm) | 6 | 10.3 |
| Thickness of Flange | T (mm) | 10.2 | 17.3 |
| Root Radius | r (mm) | 8.9 | 12.7 |
| Depth between Fillets | d (mm) | 265.2 | 200.3 |

Nominal Temperature 550°C

| Time (minute) | Thermocouple Average(°C) | Jack Displacement (mm) | Load Angle α(°) | Beam Rotation (°) | Column Rotation (°) | Connection Rotation (°) | Force Rotation (°) | F3 from F1 (kN) | F3 from F2 (kN) | F3 Average (kN) | Tension (kN) | Shear (kN) | Moment (kN*m) |
|------------------|-----------------------------|------------------------------|-----------------------|-------------------------|---------------------------|-------------------------------|--------------------------|-----------------------|-----------------------|-----------------------|-----------------|---------------|------------------|
| 0 | 546.039 | 0.026 | | | | | | | | | | | |
| 1 | 545.672 | 0.027 | | | | | | | | | | | |
| 2 | 545.378 | 0.025 | | | | | | | | | | | |
| 3 | 545.420 | 0.021 | 42.10 | 0.000 | 0.000 | 0.000 | 15.927 | -12.56 | -11.78 | -12.17 | -9.03 | -8.16 | -4627.36 |
| 4 | 545.579 | 1.326 | 41.87 | 0.259 | -0.019 | 0.277 | 15.955 | -9.41 | -9.44 | -9.42 | -7.02 | -6.29 | -3569.66 |
| 5 | 545.762 | 2.814 | 42.20 | 0.087 | 0.042 | 0.044 | 16.109 | -5.97 | -6.97 | -6.47 | -4.79 | -4.35 | -2464.67 |
| 6 | 545.793 | 4.410 | 42.07 | 0.219 | 0.024 | 0.195 | 16.109 | -3.51 | -2.50 | -3.00 | -2.23 | -2.01 | -1141.52 |
| 7 | 545.832 | 6.056 | 41.94 | 0.261 | 0.000 | 0.261 | 16.027 | -3.68 | -5.13 | -4.41 | -3.28 | -2.95 | -1670.86 |
| 8 | 545.860 | 7.666 | 42.26 | 0.217 | 0.000 | 0.217 | 16.300 | -3.13 | -4.54 | -3.84 | -2.84 | -2.58 | -1462.07 |
| 9 | 545.833 | 9.184 | 42.29 | 0.391 | 0.042 | 0.348 | 16.509 | -2.82 | -2.68 | -2.75 | -2.04 | -1.85 | -1050.55 |
| 10 | 545.884 | 10.807 | 42.31 | 0.478 | 0.061 | 0.417 | 16.617 | -1.94 | -0.54 | -1.24 | -0.92 | -0.83 | -472.87 |
| 11 | 545.996 | 12.436 | 42.28 | 0.566 | 0.085 | 0.481 | 16.674 | -2.01 | -1.87 | -1.94 | -1.44 | -1.31 | -740.43 |
| 12 | 546.105 | 14.082 | 42.17 | 0.650 | -0.019 | 0.668 | 16.642 | -2.69 | -3.46 | -3.07 | -2.28 | -2.06 | -1170.47 |
| 13 | 546.141 | 15.571 | 42.20 | 0.778 | 0.042 | 0.736 | 16.801 | -2.20 | -3.27 | -2.74 | -2.03 | -1.84 | -1041.83 |
| 14 | 546.172 | 17.057 | 42.14 | 0.866 | 0.024 | 0.842 | 16.826 | -2.53 | -1.67 | -2.10 | -1.56 | -1.41 | -799.73 |
| 15 | 546.296 | 18.614 | 42.09 | 0.954 | 0.000 | 0.954 | 16.864 | -2.57 | -1.34 | -1.95 | -1.45 | -1.31 | -742.41 |
| 16 | 546.384 | 20.288 | 42.08 | 1.041 | 0.042 | 0.999 | 16.947 | -2.90 | -3.47 | -3.19 | -2.37 | -2.14 | -1211.45 |
| 17 | 546.413 | 21.962 | 41.82 | 1.299 | 0.104 | 1.195 | 16.947 | -2.80 | -2.88 | -2.84 | -2.11 | -1.89 | -1073.91 |
| 18 | 546.473 | 23.405 | 41.71 | 1.563 | 0.000 | 1.563 | 17.098 | -2.40 | -2.47 | -2.44 | -1.82 | -1.62 | -920.23 |
| 19 | 546.479 | 24.775 | 41.69 | 1.555 | 0.042 | 1.513 | 17.074 | -2.01 | -0.74 | -1.37 | -1.02 | -0.91 | -518.34 |
| 20 | 546.620 | 26.444 | 41.72 | 1.651 | 0.085 | 1.566 | 17.200 | -1.14 | -1.39 | -1.26 | -0.94 | -0.84 | -477.16 |
| 21 | 546.691 | 27.927 | 41.64 | 1.731 | 0.085 | 1.646 | 17.200 | -0.70 | -1.20 | -0.95 | -0.71 | -0.63 | -358.05 |
| 22 | 546.738 | 29.466 | 41.42 | 2.036 | 0.061 | 1.975 | 17.283 | -0.52 | -1.07 | -0.79 | -0.60 | -0.53 | -298.38 |

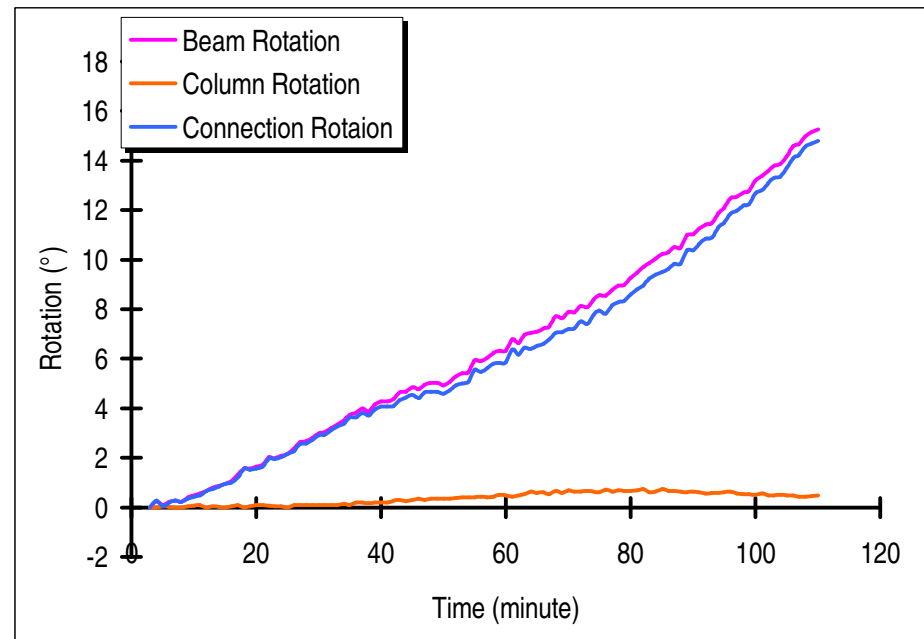
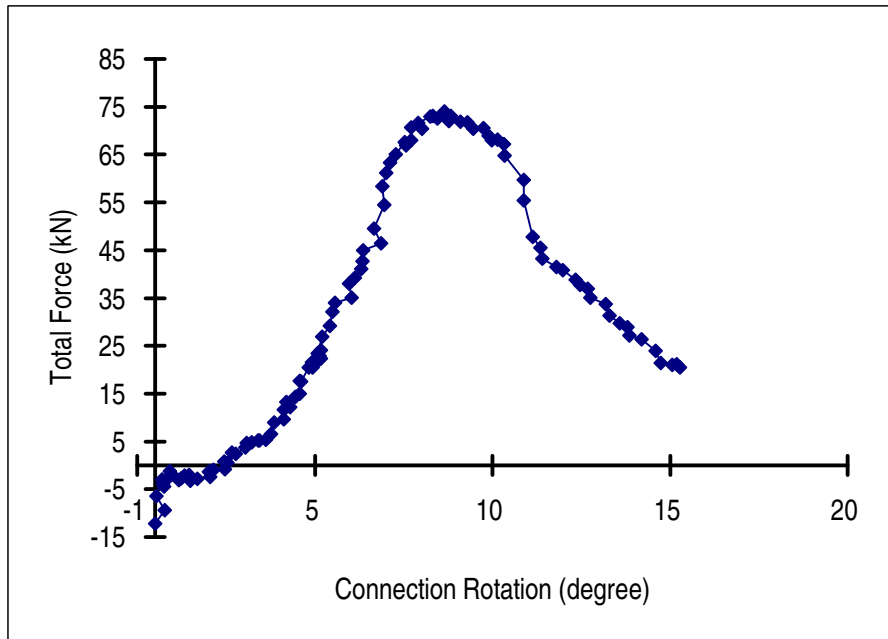
| | | | | | | | | | | | | | |
|----|---------|--------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|----------|
| 23 | 546.810 | 31.085 | 41.47 | 1.987 | 0.042 | 1.945 | 17.283 | 0.10 | 1.59 | 0.85 | 0.63 | 0.56 | 318.03 |
| 24 | 546.868 | 32.592 | 41.59 | 2.075 | 0.042 | 2.033 | 17.492 | 0.76 | 0.41 | 0.59 | 0.44 | 0.39 | 220.70 |
| 25 | 546.849 | 34.211 | 41.40 | 2.164 | 0.000 | 2.164 | 17.393 | 1.71 | 3.51 | 2.61 | 1.96 | 1.73 | 982.28 |
| 26 | 546.953 | 35.774 | 41.33 | 2.380 | 0.104 | 2.276 | 17.539 | 2.49 | 2.34 | 2.41 | 1.81 | 1.59 | 905.79 |
| 27 | 547.046 | 37.345 | 41.08 | 2.634 | 0.085 | 2.549 | 17.536 | 3.38 | 4.02 | 3.70 | 2.79 | 2.43 | 1382.32 |
| 28 | 547.145 | 38.908 | 41.13 | 2.684 | 0.104 | 2.581 | 17.642 | 3.71 | 5.70 | 4.71 | 3.55 | 3.10 | 1760.50 |
| 29 | 547.217 | 40.399 | 41.03 | 2.812 | 0.085 | 2.727 | 17.664 | 4.63 | 5.11 | 4.87 | 3.68 | 3.20 | 1818.94 |
| 30 | 547.287 | 41.995 | 40.87 | 2.989 | 0.085 | 2.904 | 17.684 | 4.65 | 5.66 | 5.15 | 3.90 | 3.37 | 1918.67 |
| 31 | 547.276 | 43.613 | 40.86 | 3.040 | 0.104 | 2.937 | 17.727 | 4.35 | 5.95 | 5.15 | 3.90 | 3.37 | 1917.50 |
| 32 | 547.309 | 45.297 | 40.75 | 3.205 | 0.085 | 3.120 | 17.785 | 5.35 | 5.30 | 5.33 | 4.04 | 3.48 | 1979.61 |
| 33 | 547.406 | 46.804 | 40.58 | 3.346 | 0.085 | 3.261 | 17.747 | 6.51 | 6.55 | 6.53 | 4.96 | 4.25 | 2418.70 |
| 34 | 547.442 | 48.287 | 40.54 | 3.511 | 0.146 | 3.365 | 17.871 | 8.26 | 9.72 | 8.99 | 6.83 | 5.84 | 3328.62 |
| 35 | 547.545 | 49.913 | 40.24 | 3.727 | 0.104 | 3.623 | 17.787 | 9.35 | 10.03 | 9.69 | 7.40 | 6.26 | 3568.28 |
| 36 | 547.610 | 51.468 | 40.19 | 3.816 | 0.189 | 3.628 | 17.830 | 10.85 | 12.37 | 11.61 | 8.87 | 7.49 | 4271.41 |
| 37 | 547.641 | 52.943 | 40.05 | 3.996 | 0.189 | 3.807 | 17.871 | 11.38 | 13.04 | 12.21 | 9.35 | 7.86 | 4480.85 |
| 38 | 547.721 | 54.450 | 40.14 | 3.869 | 0.165 | 3.705 | 17.830 | 12.71 | 13.90 | 13.30 | 10.17 | 8.57 | 4889.48 |
| 39 | 547.786 | 55.957 | 39.91 | 4.158 | 0.207 | 3.951 | 17.893 | 13.95 | 14.60 | 14.27 | 10.95 | 9.16 | 5225.14 |
| 40 | 547.836 | 57.473 | 39.78 | 4.284 | 0.207 | 4.077 | 17.891 | 14.86 | 15.01 | 14.94 | 11.48 | 9.56 | 5455.44 |
| 41 | 547.908 | 59.035 | 39.70 | 4.284 | 0.207 | 4.077 | 17.808 | 16.97 | 18.25 | 17.61 | 13.55 | 11.25 | 6421.97 |
| 42 | 547.921 | 60.582 | 39.71 | 4.374 | 0.268 | 4.106 | 17.913 | 17.57 | 17.41 | 17.49 | 13.45 | 11.18 | 6380.62 |
| 43 | 548.071 | 62.097 | 39.44 | 4.644 | 0.311 | 4.333 | 17.913 | 20.17 | 20.80 | 20.48 | 15.82 | 13.01 | 7436.28 |
| 44 | 548.086 | 63.524 | 39.33 | 4.679 | 0.250 | 4.430 | 17.830 | 20.40 | 20.62 | 20.51 | 15.87 | 13.00 | 7429.17 |
| 45 | 548.101 | 64.982 | 39.29 | 4.840 | 0.311 | 4.529 | 17.956 | 21.56 | 21.15 | 21.36 | 16.53 | 13.52 | 7731.16 |
| 46 | 548.178 | 66.280 | 39.30 | 4.769 | 0.353 | 4.416 | 17.893 | 21.77 | 21.28 | 21.52 | 16.66 | 13.63 | 7792.66 |
| 47 | 548.193 | 67.540 | 39.10 | 4.950 | 0.311 | 4.639 | 17.873 | 22.48 | 23.34 | 22.91 | 17.78 | 14.45 | 8264.66 |
| 48 | 548.284 | 68.934 | 38.99 | 5.020 | 0.353 | 4.667 | 17.830 | 24.23 | 24.04 | 24.13 | 18.76 | 15.18 | 8687.60 |
| 49 | 548.294 | 69.961 | 39.07 | 5.020 | 0.353 | 4.667 | 17.913 | 22.66 | 22.12 | 22.39 | 17.39 | 14.11 | 8073.20 |
| 50 | 548.291 | 71.129 | 39.14 | 4.930 | 0.353 | 4.577 | 17.893 | 23.35 | 23.60 | 23.47 | 18.21 | 14.82 | 8473.98 |
| 51 | 548.282 | 72.396 | 39.06 | 5.055 | 0.347 | 4.707 | 17.935 | 26.51 | 27.36 | 26.93 | 20.92 | 16.97 | 9708.35 |
| 52 | 548.271 | 73.969 | 38.76 | 5.291 | 0.371 | 4.919 | 17.873 | 28.89 | 29.40 | 29.14 | 22.73 | 18.24 | 10446.67 |

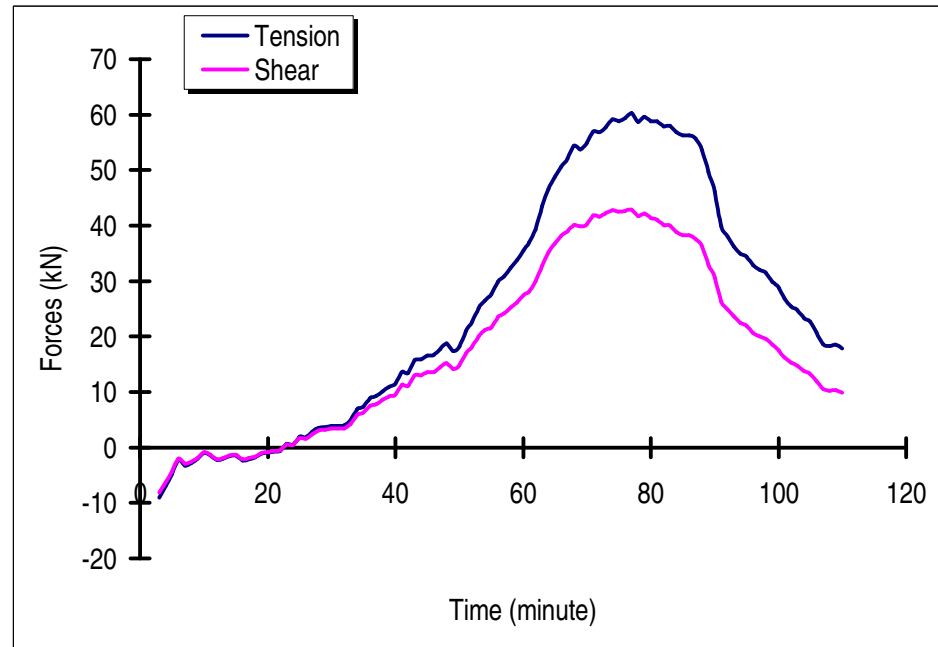
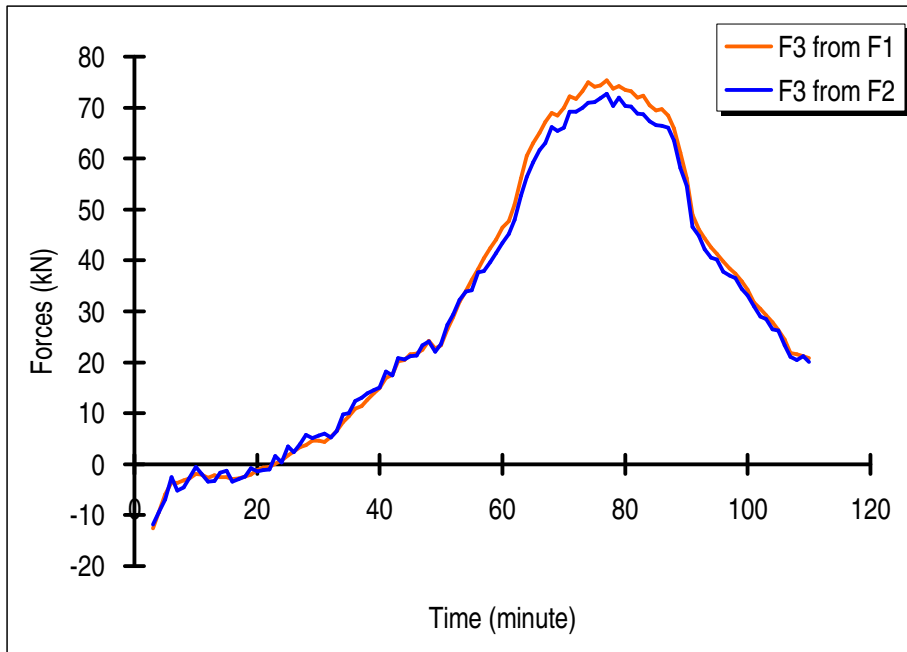
27 April 2007 Fin-plate Test Result

| | | | | | | | | | | | | | |
|----|---------|---------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|----------|
| 53 | 548.224 | 75.387 | 38.57 | 5.416 | 0.414 | 5.002 | 17.810 | 31.90 | 32.21 | 32.06 | 25.06 | 19.99 | 11450.00 |
| 54 | 548.239 | 76.862 | 38.62 | 5.472 | 0.396 | 5.076 | 17.913 | 34.01 | 33.93 | 33.97 | 26.55 | 21.20 | 12146.00 |
| 55 | 548.309 | 78.408 | 38.05 | 5.936 | 0.396 | 5.540 | 17.810 | 36.10 | 34.13 | 35.12 | 27.65 | 21.64 | 12420.33 |
| 56 | 548.346 | 80.019 | 38.21 | 5.903 | 0.438 | 5.464 | 17.933 | 38.28 | 37.61 | 37.95 | 29.82 | 23.47 | 13462.26 |
| 57 | 548.331 | 81.390 | 38.10 | 6.027 | 0.396 | 5.631 | 17.956 | 40.47 | 37.96 | 39.21 | 30.86 | 24.20 | 13884.62 |
| 58 | 548.313 | 83.057 | 37.83 | 6.242 | 0.438 | 5.803 | 17.893 | 42.48 | 39.66 | 41.07 | 32.44 | 25.19 | 14464.33 |
| 59 | 548.319 | 84.740 | 37.80 | 6.333 | 0.499 | 5.834 | 17.956 | 44.05 | 41.38 | 42.72 | 33.75 | 26.18 | 15036.17 |
| 60 | 548.341 | 86.263 | 37.67 | 6.333 | 0.481 | 5.852 | 17.830 | 46.40 | 43.44 | 44.92 | 35.56 | 27.45 | 15774.47 |
| 61 | 548.403 | 87.892 | 37.17 | 6.789 | 0.420 | 6.369 | 17.787 | 47.72 | 45.17 | 46.45 | 37.01 | 28.06 | 16152.70 |
| 62 | 548.464 | 89.479 | 37.37 | 6.639 | 0.481 | 6.158 | 17.830 | 51.01 | 47.91 | 49.46 | 39.31 | 30.02 | 17265.92 |
| 63 | 548.523 | 91.034 | 36.99 | 6.976 | 0.524 | 6.453 | 17.787 | 56.13 | 52.76 | 54.45 | 43.49 | 32.76 | 18864.98 |
| 64 | 548.513 | 92.531 | 37.05 | 7.036 | 0.627 | 6.409 | 17.913 | 60.51 | 56.34 | 58.42 | 46.63 | 35.20 | 20269.83 |
| 65 | 548.528 | 94.118 | 36.99 | 7.099 | 0.584 | 6.515 | 17.913 | 63.03 | 59.23 | 61.13 | 48.83 | 36.78 | 21181.95 |
| 66 | 548.567 | 95.609 | 37.02 | 7.219 | 0.603 | 6.617 | 18.059 | 65.07 | 61.64 | 63.36 | 50.59 | 38.14 | 21964.56 |
| 67 | 548.674 | 97.254 | 36.78 | 7.311 | 0.524 | 6.787 | 17.913 | 67.14 | 63.03 | 65.08 | 52.13 | 38.97 | 22457.53 |
| 68 | 548.706 | 98.777 | 36.38 | 7.710 | 0.670 | 7.040 | 17.913 | 69.00 | 66.17 | 67.59 | 54.41 | 40.09 | 23136.31 |
| 69 | 548.718 | 100.268 | 36.55 | 7.648 | 0.584 | 7.064 | 18.018 | 68.39 | 65.41 | 66.90 | 53.75 | 39.84 | 22978.62 |
| 70 | 548.734 | 101.902 | 36.26 | 7.894 | 0.688 | 7.206 | 17.976 | 69.96 | 66.07 | 68.02 | 54.85 | 40.23 | 23227.29 |
| 71 | 548.770 | 103.505 | 36.29 | 7.863 | 0.645 | 7.217 | 17.976 | 72.16 | 69.21 | 70.68 | 56.97 | 41.83 | 24152.23 |
| 72 | 548.760 | 105.060 | 36.20 | 8.139 | 0.627 | 7.512 | 18.164 | 71.67 | 69.20 | 70.43 | 56.84 | 41.60 | 24024.38 |
| 73 | 548.844 | 106.543 | 36.26 | 8.077 | 0.670 | 7.407 | 18.164 | 73.25 | 69.94 | 71.60 | 57.73 | 42.35 | 24452.37 |
| 74 | 548.850 | 108.018 | 35.91 | 8.383 | 0.627 | 7.756 | 18.122 | 74.93 | 71.02 | 72.97 | 59.10 | 42.80 | 24746.61 |
| 75 | 548.914 | 109.621 | 35.86 | 8.567 | 0.609 | 7.958 | 18.247 | 74.15 | 71.07 | 72.61 | 58.85 | 42.53 | 24593.51 |
| 76 | 548.949 | 111.135 | 35.68 | 8.538 | 0.713 | 7.825 | 18.039 | 74.33 | 71.87 | 73.10 | 59.38 | 42.63 | 24668.18 |
| 77 | 548.964 | 112.642 | 35.45 | 8.781 | 0.627 | 8.154 | 18.060 | 75.29 | 72.74 | 74.02 | 60.29 | 42.93 | 24863.69 |
| 78 | 549.034 | 114.165 | 35.42 | 8.966 | 0.688 | 8.278 | 18.206 | 73.74 | 70.29 | 72.02 | 58.69 | 41.73 | 24172.38 |
| 79 | 549.044 | 115.705 | 35.30 | 8.994 | 0.670 | 8.324 | 18.122 | 74.25 | 71.91 | 73.08 | 59.64 | 42.23 | 24472.15 |
| 80 | 549.125 | 117.156 | 35.15 | 9.272 | 0.670 | 8.602 | 18.247 | 73.42 | 70.29 | 71.86 | 58.75 | 41.37 | 23985.50 |
| 81 | 549.163 | 118.758 | 34.92 | 9.485 | 0.688 | 8.797 | 18.226 | 73.16 | 70.24 | 71.70 | 58.79 | 41.04 | 23815.24 |
| 82 | 549.229 | 120.506 | 34.72 | 9.698 | 0.731 | 8.968 | 18.247 | 72.01 | 68.76 | 70.38 | 57.85 | 40.09 | 23283.27 |

27 April 2007 Fin-plate Test Result

| | | | | | | | | | | | | | |
|-----|---------|---------|-------|--------|-------|--------|--------|-------|-------|-------|-------|-------|----------|
| 83 | 549.267 | 122.069 | 34.63 | 9.857 | 0.609 | 9.248 | 18.310 | 72.29 | 68.69 | 70.49 | 58.00 | 40.06 | 23272.06 |
| 84 | 549.300 | 123.640 | 34.37 | 10.031 | 0.645 | 9.386 | 18.226 | 70.43 | 67.37 | 68.90 | 56.87 | 38.90 | 22621.99 |
| 85 | 549.320 | 125.315 | 34.23 | 10.217 | 0.731 | 9.486 | 18.269 | 69.50 | 66.60 | 68.05 | 56.27 | 38.28 | 22273.85 |
| 86 | 549.361 | 126.878 | 34.20 | 10.310 | 0.670 | 9.640 | 18.331 | 69.73 | 66.42 | 68.07 | 56.30 | 38.26 | 22266.35 |
| 87 | 549.323 | 128.344 | 34.01 | 10.496 | 0.670 | 9.826 | 18.331 | 68.41 | 66.07 | 67.24 | 55.74 | 37.61 | 21905.44 |
| 88 | 549.428 | 129.914 | 34.12 | 10.470 | 0.627 | 9.842 | 18.414 | 65.92 | 63.56 | 64.74 | 53.60 | 36.31 | 21140.49 |
| 89 | 549.423 | 131.678 | 33.60 | 10.988 | 0.609 | 10.379 | 18.414 | 61.16 | 58.13 | 59.64 | 49.68 | 33.01 | 19256.49 |
| 90 | 549.509 | 133.418 | 33.64 | 11.013 | 0.627 | 10.386 | 18.477 | 56.19 | 54.62 | 55.41 | 46.13 | 30.69 | 17904.18 |
| 91 | 549.527 | 135.150 | 33.41 | 11.244 | 0.609 | 10.635 | 18.477 | 48.91 | 46.61 | 47.76 | 39.87 | 26.30 | 15353.50 |
| 92 | 549.561 | 136.761 | 33.18 | 11.412 | 0.566 | 10.846 | 18.414 | 46.11 | 44.86 | 45.48 | 38.07 | 24.89 | 14547.43 |
| 93 | 549.655 | 138.526 | 33.11 | 11.481 | 0.584 | 10.897 | 18.414 | 44.38 | 42.16 | 43.27 | 36.24 | 23.63 | 13817.08 |
| 94 | 549.690 | 140.001 | 32.69 | 11.881 | 0.584 | 11.296 | 18.393 | 42.55 | 40.53 | 41.54 | 34.96 | 22.43 | 13139.75 |
| 95 | 549.725 | 141.683 | 32.56 | 12.092 | 0.609 | 11.483 | 18.477 | 41.29 | 40.23 | 40.76 | 34.35 | 21.94 | 12856.23 |
| 96 | 549.760 | 143.326 | 32.14 | 12.468 | 0.627 | 11.841 | 18.435 | 39.75 | 37.85 | 38.80 | 32.86 | 20.64 | 12121.24 |
| 97 | 549.770 | 144.875 | 31.99 | 12.540 | 0.566 | 11.973 | 18.352 | 38.44 | 37.09 | 37.77 | 32.03 | 20.01 | 11755.10 |
| 98 | 549.845 | 146.365 | 31.89 | 12.702 | 0.524 | 12.179 | 18.414 | 37.42 | 36.59 | 37.00 | 31.42 | 19.55 | 11491.32 |
| 99 | 549.885 | 148.008 | 31.79 | 12.774 | 0.524 | 12.250 | 18.393 | 35.87 | 34.39 | 35.13 | 29.86 | 18.51 | 10885.63 |
| 100 | 549.905 | 149.651 | 31.33 | 13.195 | 0.505 | 12.690 | 18.352 | 34.30 | 33.16 | 33.73 | 28.81 | 17.54 | 10338.41 |
| 101 | 549.932 | 151.366 | 31.16 | 13.362 | 0.566 | 12.796 | 18.352 | 31.71 | 30.96 | 31.34 | 26.81 | 16.22 | 9566.06 |
| 102 | 549.963 | 153.008 | 30.91 | 13.573 | 0.481 | 13.092 | 18.310 | 30.45 | 29.01 | 29.73 | 25.51 | 15.27 | 9020.63 |
| 103 | 549.997 | 154.651 | 30.76 | 13.783 | 0.481 | 13.302 | 18.373 | 29.20 | 28.50 | 28.85 | 24.79 | 14.76 | 8722.52 |
| 104 | 550.017 | 156.360 | 30.57 | 13.857 | 0.505 | 13.352 | 18.247 | 27.88 | 26.54 | 27.21 | 23.43 | 13.84 | 8187.71 |
| 105 | 550.048 | 157.953 | 30.28 | 14.182 | 0.481 | 13.701 | 18.289 | 26.40 | 26.27 | 26.33 | 22.74 | 13.28 | 7867.71 |
| 106 | 550.081 | 159.676 | 29.86 | 14.581 | 0.481 | 14.100 | 18.269 | 24.47 | 23.35 | 23.91 | 20.74 | 11.91 | 7070.06 |
| 107 | 550.112 | 161.319 | 29.66 | 14.656 | 0.420 | 14.236 | 18.143 | 21.89 | 21.03 | 21.46 | 18.65 | 10.62 | 6312.63 |
| 108 | 550.175 | 162.947 | 29.32 | 14.979 | 0.420 | 14.559 | 18.123 | 21.55 | 20.47 | 21.01 | 18.32 | 10.29 | 6126.70 |
| 109 | 550.161 | 164.534 | 29.19 | 15.151 | 0.463 | 14.688 | 18.164 | 21.19 | 21.16 | 21.17 | 18.49 | 10.33 | 6154.70 |
| 110 | 550.202 | 166.072 | 29.06 | 15.264 | 0.481 | 14.783 | 18.145 | 20.83 | 20.05 | 20.44 | 17.87 | 9.93 | 5920.88 |





Photographs after Test

