

Durability Test Results

Dell Precision™ M4700 and M6700 Mobile Workstations Summary of Internal Testing

August 2012



MIL-STD 810G Dell-Internal Testing Summary

| Test Category | Test Method | Test Parameters | Test Result |
|---|--|---|-------------------|
| Altitude Storage/Air Transport | Method 500.5 Procedure I ² | Test Pressure: Equivalent to cabin altitude of 15,000ft Temperature: 21°C Altitude Change Rate: <10 m/s Duration: 1 hour Unit is non-operational during test. | Pass |
| Altitude Operation/Air Carriage | Method 500.5 Procedure II ² | Test Pressure: Equivalent to cabin altitude of 15,000ft Temperature: 21°C Altitude Change Rate: <10 m/s Duration: 1 hour Unit is operational during test. | Pass |
| High Temperature Storage and Transition | Method 501.5 Procedure I ² | Duration: 7 day exposure (7 X 24 hr. cycles) Temperature: 33 - 71°C Table 501.5 - III High temperature cycles, climate category A1 Hot Dry Unit is non-operational during test. | Pass |
| High Temperature Operational | Method 501.5 Procedure II ² | Duration: 5 day exposure (5 X 24 hr. cycles) Temperature: 60°C cycling temperature exposure Unit is operational during test. | Pass ³ |
| Low Temperature (Exaggerated) | Method 502.5 Procedure I ² | Duration: 24 hour exposure Temperature: -51°C Unit is non-operational during test. | Pass |
| Low Temperature | Method 502.5 Procedure II ² | Duration: 24 hour exposure Temperature: -29°C Unit is operational during test. | Pass ¹ |
| Sand and Dust Blowing Dust | Method 510.5 Procedure I ² | Duration: 12 hours Air velocity = 1.5 m/s (300 ft/min) to 8.9 m/s (1750 ft/min) Temperature: 60°C Relative Humidity: 30% | Pass ¹ |
| Shock Material to be Packaged | Method 516.5 Procedure II | 30G, 304ips Square Wave Shock 1 shocks/axis/direction for a total of 6 shocks. Unit is non-operational during test. | Pass ¹ |
| Shock Crash Hazard | Method 516.5 Procedure V | 185g, 2ms Half Sine 2 shocks/axis/direction for a total of 12 shocks. Unit is non-operational during test. | Pass ¹ |
| Shock Functional Shock | Method 516.6 Procedure I | 185g, 2ms Half Sine 1 shock/axis/direction for a total of 6 shocks. Unit is operational during test. | Pass ¹ |
| Shock Bench Handling | Method 516.6 Procedure VI | Angle drops onto solid wooden bench thickness least 4.25cm (1.675 inch). Test height judgement as two conditions as rise test units at one edge 100mm (4 inch) or rise an angle of 45° about a solid wooden bench top, whichever is less. Unit is operational during test. | Pass |
| Vibration Operational | Method 514.6 Procedure I Category 4 | Operational Vibration, 10-500 Hz, 1.04 Grms, random 1 hour on Bottom, Left and Back side. Unit is operational during test. | Pass ¹ |
| Humidity Aggravated Cycle | Method 507.5 Procedure II | Exposed to 23°C and 50% relative humidity for 24 hours - then 10 day exposure (10 X 24 hr. cycles) with tempature ranges between 30°C and 60°C and 95% relative humidity. Unit is powered off during test. | Pass |
| Humidity Hot-Humid | Method 507.5 Procedure I | 10 day exposure (10 X 24 hr. cycles) with tempature ranges between 33 - 71°C. Induced (Storage & Transit) and Natural and Cycles Table 507.5 - I Hot-humid (Cycle B3) High. Unit is powered off during test. | Pass |

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IEC Ingress Protection

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|--|-----------------------|---|-------------|
| IP5x Dust Ingress Protection | IEC60529 ² | Test Duration: 8 hours Exposure to fine-grained circulating talcum powder in a dust chamber. Unit is not operational. Dust must not penetrate into the item in such quantities, or in such a position, as to prevent satisfactory operation of the item or to present a safety risk. Operational test performed at end of cycle. | Pass |

Additional Testing

| Test Category | Test Parameters | Test Result |
|----------------------------|--|-------------|
| Keyboard Spill Test | While unit is operating, 2oz of water is dispersed across the keyboard. The unit is drained after 3 seconds by placing it on its left side for 45 seconds. The unit is returned to its normal position, powered off and allowed to dry. Unit is tested for functionality. These steps are then repeated for draining on right, back and front sides. Test is then performed using Diet Coke [®] on highest risk location. | Pass |

Pass Criteria and Test Scope Information

- A Pass indicates that a unit remained operational during the test for tests that were run with unit operating. A functional verification was performed immediately after the test exposure. After 24 hours, the unit again underwent functional verification.
- Due to battery runtime limitations, operational tests that exceed 2 hours in duration are excluded from being tested using battery power.
- Cosmetic damage does not constitute a failure unless there is a safety concern (crack greater than 1mm diameter)
- HDD, SDD, LCD (non-touch/touch), keyboard, battery, ODD are represented in the tests unless otherwise noted.

Important Information

1. Tests were performed with SSD configuration
2. Tests completed by independent 3rd party ISO/IEC-17025 certified laboratories.
3. Up to 50% throttling allowed