Surface hardware environmental test results

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Surface devices are built to withstand rigorous conditions that help ensure optimal reliability and lower cost of ownership.



The MIL-STD-810 test standards, maintained by the US Department of Defense, help organizations evaluate how devices perform in the field. The testing program outlines multiple test methods across a range of environmental stress conditions. This is designed to test equipment limits in various conditions where it's expected to be used (environment) or transported (shocks). An independent third-party laboratory has tested the Surface devices listed below using recommended test methods.

MIL-STD-810 test results

Operational tests pass if the unit remained operational during the entire test, and non-operational tests pass if a functional verification was performed immediately after the test exposure. Tests were conducted in accordance with the MIL-STD-810 standards effective at the time of product release. The latest Surface devices – Surface Pro 9, Surface Pro 9 with 5G, Surface Laptop 5, and Surface Laptop Go 2 – meet the current standard, MIL-STD-810H. Earlier devices were tested under the previous standard, MIL-STD-810G.

Latest devices



Test	Surface Pro 9	Surface Pro 9 with 5G	Surface Laptop 5
Altitude Operating	Pass	Pass	Pass
Altitude Storage	Pass	Pass	Pass
Bench Handling Shock	Pass	Pass	Pass
Blowing Dust	Pass	Pass	Pass
Blowing Sand	Pass	Pass	Pass
Crash Safety Shock	Pass	Pass	Pass
Explosive Atmosphere	Pass	Pass	Pass
Freeze/Thaw	Pass	Pass	Pass
Functional Shock	Pass	Pass	Pass
High Temperature Operating	Pass	Pass	Pass
High Temperature Storage	Pass	Pass	Pass
Humidity	Pass	Pass	Pass
Low Temperature Operating	Pass	Pass	Pass
Low Temperature Storage	Pass	Pass	Pass
Temperature Shock	Pass	Pass	Pass
Transit Drop	Pass	Pass	Pass
Vibration (Category 24)	Pass	Pass	Pass

Test	Surface Pro 9	Surface Pro 9 with 5G	Surface Laptop 5
Vibration (Category 4)	Pass	Pass	Pass

Earlier devices

Surface Laptop family



Test	Surface Laptop Studio	Surface Laptop 4 13" AMD	Surface Laptop 4 13" Intel	Surface Laptop 4 15" AMD	Surface Laptop SE	Surface Laptop Go 2 ¹	Surface Laptop Go	Surface Laptop 4 15" Intel
Bench Handling	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Blowing Dust	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Blowing Sand	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Crash Safety Shock	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Test	Surface Laptop Studio	Surface Laptop 4 13" AMD	Surface Laptop 4 13" Intel	Surface Laptop 4 15" AMD	Surface Laptop SE	Surface Laptop Go 2 ¹	Surface Laptop Go	Surface Laptop 4 15" Intel
Explosive Atmosphere	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Freeze/Thaw	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Function Shock	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High Altitude Operation	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High Altitude Storage	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High Temperature Operating (Constant)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High Temperature Storage (Constant)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
High Temperature Storage (cyclic)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Humidity	Pass	Pass	No	Pass	Pass	Pass	Pass	Pass
Low Temperature Operating	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Low Temperature Storage	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Thermal Shock	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Test	Surface Laptop Studio	Surface Laptop 4 13" AMD	Surface Laptop 4 13" Intel	Surface Laptop 4 15" AMD	Surface Laptop SE	Surface Laptop Go 2 ¹	Surface Laptop Go	Surface Laptop 4 15" Intel
Transit Drop	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Vibration Ground Vehicle	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Vibration Minimum Integrity	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Surface Pro family



Test	Surface Pro X SQ2	Surface Pro 8	Surface Pro 7+
Bench Handling	Pass	Pass	Pass
Blowing Dust	Pass	Pass	Pass
Blowing Sand	Pass	Pass	Pass
Crash Safety Shock	Pass	Pass	Pass
Explosive Atmosphere	Pass	Pass	Pass

Test	Surface Pro X SQ2	Surface Pro 8	Surface Pro 7+
Freeze/Thaw	Pass	Pass	Pass
Function Shock	Pass	Pass	Pass
High Altitude Operation	Pass	Pass	Pass
High Altitude Storage	Pass	Pass	Pass
High Temperature Operating (Constant)	Pass	Pass	Pass
High Temperature Storage (Constant)	Pass	Pass	Pass
High Temperature Storage (cyclic)	Pass	Pass	Pass
Humidity	Pass	Pass	Pass
Low Temperature Operating	Pass	Pass	Pass
Low Temperature Storage	Pass	Pass	Pass
Thermal Shock	Pass	Pass	Pass
Transit Drop	Pass	Pass	Pass
Vibration Ground Vehicle	Pass	Pass	Pass
Vibration Minimum Integrity	Pass	Pass	Pass

Surface Book family



Test	Surface Book 3	Surface Book 2
Bench Handling	Pass	Pass
Blowing Dust	Pass	Pass
Blowing Sand	No	No
Crash Safety Shock	Pass	Pass
Explosive Atmosphere	Pass	Pass
Freeze/Thaw	Pass	Pass
Function Shock	Pass	Pass
High Altitude Operation	Pass	Pass
High Altitude Storage	Pass	Pass
High Temperature Operating (Constant)	Pass	Pass
High Temperature Storage (Constant)	Pass	Pass
High Temperature Storage (cyclic)	Pass	Pass

Test	Surface Book 3	Surface Book 2
Humidity	Pass	Pass
Low Temperature Operating	Pass	Pass
Low Temperature Storage	Pass	Pass
Thermal Shock	No	No
Transit Drop	Pass	Pass
Vibration Ground Vehicle	Pass	Pass
Vibration Minimum Integrity	Pass	Pass

Surface Go family



Test	Surface Go 3	Surface Go 2	Surface Go 2 (LTE)
Bench Handling	Pass	Pass	Pass
Blowing Dust	Pass	Pass	Pass
Blowing Sand	Pass	No	Pass
Crash Safety Shock	Pass	Pass	Pass

Test	Surface Go 3	Surface Go 2	Surface Go 2 (LTE)
Explosive Atmosphere	Pass	Pass	Pass
Freeze/Thaw	Pass	Pass	Pass
Function Shock	Pass	Pass	Pass
High Altitude Operation	Pass	Pass	Pass
High Altitude Storage	Pass	Pass	Pass
High Temperature Operating (Constant)	Pass	Pass	Pass
High Temperature Storage (Constant)	Pass	Pass	Pass
High Temperature Storage (cyclic)	Pass	Pass	Pass
Humidity	Pass	Pass	Pass
Low Temperature Operating	Pass	Pass	Pass
Low Temperature Storage	Pass	Pass	Pass
Temperature Shock	n/a	Pass	Pass
Thermal Shock	Pass	Pass	Pass
Transit Drop	Pass	Pass	Pass
Vibration Ground Vehicle	Pass	Pass	Pass
Vibration Minimum Integrity	Pass	Pass	Pass

Surface Duo



Test	Surface Duo 2
Bench Handling	Pass
Blowing Dust	Pass
Blowing Sand	Pass
Crash Safety Shock	Pass
Explosive Atmosphere	Pass
Freeze/Thaw	Pass
Function Shock	Pass
High Altitude Operation	Pass
High Altitude Storage	Pass
High Temperature Operating (Constant)	Pass
High Temperature Storage (Constant)	Pass
High Temperature Storage (cyclic)	Pass
Humidity	Pass

Test	Surface Duo 2
Low Temperature Operating	Pass
Low Temperature Storage	Pass
Thermal Shock	Pass
Transit Drop	Pass
Vibration Ground Vehicle	Pass
Vibration Minimum Integrity	Pass

① Note

Lab tests simulate but don't duplicate real-world environmental stresses. A device that passes lab tests may not withstand real-world field conditions.

References

1. MIL-STD-810H results shown for Surface Laptop Go 2. MIL-STD-810G results shown for earlier devices.