

Product quality LIFEBOOK Series Professional notebooks

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Quality from the very first is Fujitsu Siemens Computers' guideline right from the design and planning stage up to assembly of LIFEBOOK Series on the way to full customer satisfaction. Basis for that builds methodical evaluation of customer requirements, technology trends, market trends, and competition analysis.

LIFEBOOKs are the ideal professional notebooks for highest customer requirements, featuring latest technology, high performance, and excellent quality. The LIFEBOOK Series guarantee reliable usage in combination with highly attractive lifestyle products.



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Highlights

We at Fujitsu Siemens Computers have more than 20 years of expert knowledge in developing and manufacturing mobile computers. The collaboration with our parent companies, Fujitsu and Siemens, provides us access to best-in-class technologies and combines research and development investments of about 9 billion Euro.

The development and assembly of all LIFEBOOK Series takes place in Germany. Our factory in Augsburg ranks among the most advanced in Europe and stands out by extremely short reaction times to market requirements. The factory is awarded with the "Industry Excellence Award 2003".

Numerous quality tests certified in our own test centers in Augsburg are done to ensure full quality and stability of our LIFEBOOK Series. Main test chapters are shock tests, mechanical tests, life tests, interference tests, package tests, thermal tests, and system integration tests.

Reliability

Technology leadership

Fujitsu Siemens Computers has many years of experience in product development and technology integration, with expertise that covers a wide spectrum of IT issues. Our engineering staff is working at our locations in Germany and Japan as well as in the heart of Silicon Valley. That helps us to integrate diverse quality requirements into our products.

Our understanding of the long-term significance of emerging technologies allows us to meet the business computing requirements of our customers. Our objective is to leverage our R&D activities to deliver sustainable customer value. Quality, innovation, fast adaptation of new core technologies, and integration know-how form the basis of our technology strategy.

Expert knowledge

Since its formation in 1999, Fujitsu Siemens Computers has developed many new products incorporating state-of-the-art technologies. In addition to delivering outstanding time-to-market, life-cycle management, and benchmark performance with mature products for established markets, we have expanded IT technologies into new emerging digital end-user markets, designed new and innovative server and storage architectures, and developed application tools to integrate these technologies.

Equally important, we work very closely together with our parent companies, Fujitsu and Siemens. This collaboration provides us access to best-in-class technologies and combines research and development investments of about 9 billion Euro, and more than 15 years of expert knowledge in developing and manufacturing mobile computers.

All LIFEBOOK Series are manufactured by Fujitsu Siemens Computers, which gives us control over the whole production process. This allows us to ensure the competence of our products while offering all the support and competitive edge our customers expect.

Outstanding reliability

The LIFEBOOK Series offer the latest technologies, high levels of component consistency and expandable models to assure system continuity and long product life cycles. Low failure and complaint rates lead to a further reduction of overall IT costs.

Fujitsu Siemens Computers takes great care over the selection and qualification of suppliers. Huge importance is attached to compliance with international standards and to exhaustive function tests both on system components and on the overall system.

All systems comply with regulations of various international standards in matters of product safety and electromagnetic compatibility. They are certified through Microsoft for Microsoft Operating Systems and listed in the Microsoft Hardware Compatibility List (HCL). Additional individual certifications for projects are possible.

Robustness

Quality made in Germany

The development and assembly of all LIFEBOOK Series takes place in Augsburg, Germany. Founded in 1987, the plant employs more than 2,000 people in the production of professional PCs, Intel-based servers, and professional notebooks, as well as keyboards and mainboards. Production capacity varies according to order volumes, with average 10,000 system units per day being built in a total area of 77,000 square meters. The production is certified in accordance to ISO9001 and ISO14001.

R&D and Product Management are located next to the production. For the notebooks, the state-of-the-art factory offers various advantages: The feedback circles between research and development and the PC assembly are extremely short. Therefore, reaction times to technological changes and new market requirements are led to a minimum. The LIFEBOOK Series offer solid quality due to an extremely high degree of automation, experience, and highest function stability.

Industrial Excellence



The Fujitsu Siemens Computers factory in Augsburg ranks among the most advanced in Europe. The production site stands out by virtue of its high level of automation and outstanding flexibility. It is also highly competitive in terms of the global market. With its excellent supply chain management, the factory in Augsburg won the Industrial Excellence Award 2003. Created by the French management school INSEAD and the German business school WHU, the competition examines process quality, including customer and supplier integration, innovation management and strategy implementation. The factory in Augsburg gained top marks in the Supply Chain, Operational Strategy, Product and Process management categories.

Putting it to the test

To ensure the full stability and quality, and to fulfill the various certifications, the professional notebooks are tested and evaluated in our company own certified test centers.

System tests include mechanical and climatic stress tests, packaging testing and transport simulation tests. Furthermore, a number of tests regarding electrical and mechanical safety and fire resistance are done. Additionally, electromagnetic compatibility, interference immunity, and noise emission are certified. The test results are basis for approvals like CE mark, FCC, and GS.



Testing procedures

In the following, some examples of our numerous test procedures are explained.

Vibration and shock test

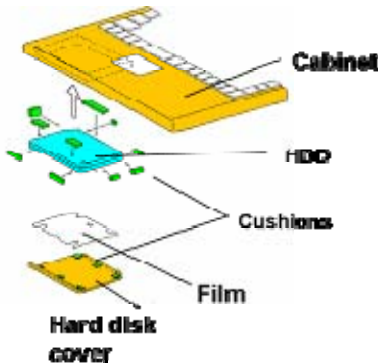
Reliability in protection for data on hard disk drive, durability of LCD, and optical disc drive is evaluated under accelerated severe conditions. This test contains operating and non-operating vibration test, shock test, and operating and non-operating fall-down tests.



Vibration test on the shaker

After vibration testing procedure the unit and all programs have to work normally.

Advanced hard disk drive protection design through sophisticated hard disk drive cushions prevents from data loss.



Mechanical test

Mechanical strength is evaluated under severe conditions. This test chapter contains pressure tests on display and display cover, torque test, free-fall test, stress test on touch panel, and tensile test on Kensington lock.



Free-fall test

After a number of free-fall tests from different heights in various fall down directions, the unit and all programs have to work normally. No damage or crack must be found in any part of test sample. Also, no damage and no pulling out must be found in cards and cables.



Concentrated pressure test on display cover

After imposing concentrated pressure force on display cover, no damage or crack must be found on display and display cover, and no functional failure must be found on display. All LIFEBOOK Series are equipped with a robust magnesium lid, to provide highest durability with slim design and at lightest weights.

Life test

Reliability in regular usage condition is evaluated in the life test procedure. This test chapter contains open and shut test on display cover, keyboard hammering test, switch durability test, magnetic resistance test, and tapping test.



Open-and-shut durability test on display cover

After several thousand test cycles, display must work normally in any angle.



Keyboard hammering test

After heavy duty simulation by hammering on keys, no damage or crack must be found on mechanical parts, and operating system and test program must work normally.



Keyboard abrasion test

Solid quality with laserprint caption process guarantees very low keyboard abrasion factors.

Interference and acoustic test

This test chapter contains electromagnetic compatibility, interference immunity, and noise emission tests.



Our accredited test centre is equipped to test functionality and conformity to international standards and customer-specific requirements. It is specialized in the following test fields: electromagnetic compatibility, product safety, climatic, mechanical and reliability tests, and noise emission.

The test centre performs tests and measurements, arranges compliance certification (national and international) and consults and debugs during the development process. All tests are carried out under realistic operating conditions.



Noise emission test

All LIFEBOOK Series have to pass noise emission tests in the test centre. Volume, loudness, sound pressure, and sound power level are measured in the anechoic noise chamber. Also, terz and FFT analysis are done.

Package durability test

Reliability of package is evaluated. This test chapter contains package vibration test, package free fall test, package strength test, package pressure test, and temperature / humidity cycle test on package.



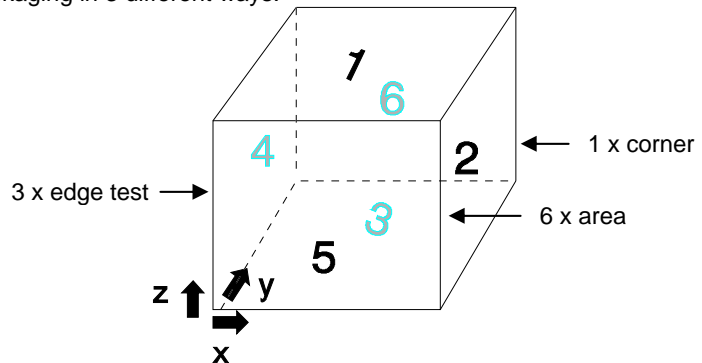
Bounce test

Vibrations on package are measured to simulate transport and storing conditions. Fujitsu Siemens Computers improved the transport protection with a special shock absorbing package solution.



Package drop test

After package free-fall from different heights, no damage or crack must be found on mechanical parts, operating system and test program must work normally. Fujitsu Siemens Computers tests the LIFEBOOK packaging in 3 different ways.



Thermal tests



Climatic stress test

All LIFEBOOK Series have to pass thermal tests in the climate-testing laboratory to ensure reliability under extreme operating conditions. The system has to pass different benchmark tests with extreme temperature changes. Components as well as housing surface temperatures must not exceed strict temperature limits under this procedure.

System test



System integration and compatibility test

System integration and system compatibility, e.g. LAN and VGA interfaces, are strictly tested from engineers before notebooks are released, to ensure system reliability in all possible scenarios of network environments.