White Paper
Product Quality FUJITSU Thin Client FUTRO, FUJITSU Desktop ESPRIMO, FUJITSU Workstation CELSIUS

Quality from beginning to end is the principle that guides Fujitsu from the design and planning stage up to the assembly of FUJITSU Thin Client FUTRO, FUJITSU Desktop ESPRIMO and FUJITSU Workstation CELSIUS. Fujitsu evaluates customer requirements, technology trends, market trends and competition products methodically to achieve the highest quality and full customer satisfaction. Our deskbound products are the ideal professional systems for the highest customer requirements, featuring the latest technology and delivering high performance and excellent quality.

Highlights

We at Fujitsu have more than 20 years of expert knowledge in developing and manufacturing computers. The collaboration with Fujitsu Japan provides us with access to best-in-class technologies and combines research and development investments. The development and engineering of our deskbound products takes place in Europe. Our factory in Augsburg ranks among the most advanced in Europe and stands out due to its extremely short reaction times to market requirements. Numerous quality tests are carried out in our own certified test centers in Augsburg to ensure full quality and stability of our FUTRO Thin Clients, ESPRIMO Desktops and CELSIUS Workstations. The main tests include shock tests, mechanical tests, life tests, interference tests, packaging tests, climatic tests and system integration tests.

Reliability

Technology leadership

Fujitsu has many years of experience in product development and technology integration, with expertise that covers a wide spectrum of IT issues. Our engineering experts work at Fujitsu locations in Germany and Japan as well as in the heart of Silicon Valley. This 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 research and development activities to deliver sustainable customer value. Quality, innovation, fast adaptation of new core technologies and integration of know-how form the basis of our technology strategy.

Expert knowledge

Since its formation, Fujitsu has developed many new products incorporating sophisticated 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 newly emerging digital end-user markets. We have also designed new and innovative server and storage architectures, and developed application tools to integrate these technologies.

Equally important, we work very closely with Fujitsu Japan, bringing together global IT knowledge. This collaboration provides us with access to best-in-class technologies and combines current research and development with more than 20 years of expert knowledge in developing and engineering computers.

All our deskbound products are assembled by Fujitsu in our own factory, which gives us control over the whole production process. This enables us to ensure the competence of our products while offering all the support and competitive edge our customers expect.

Outstanding reliability

Our products feature 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 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 systems.

All our systems comply with the 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.

The ESPRIMO Desktop family delivers outstanding reliability and durability due to Fujitsu's expertise in the development and optimized production of ESPRIMO Desktops and mainboards. This is reflected by our failure rates, which are the lowest on the market. We are constantly striving to ensure better PC reliability rates and we achieved an additional 24 percent improvement over the past three years on our already low failure rates[1].
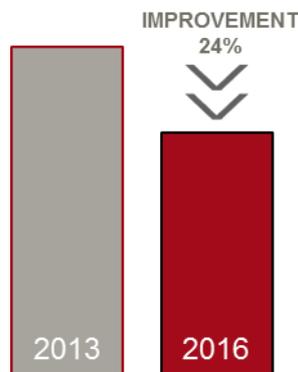
Robustness

Technology "Engineered in Germany"

The engineering and development of our FUTRO Thin Clients, ESPRIMO Desktops and CELSIUS Workstations takes place in Augsburg, Germany. Founded in 1987, the plant employs more than 1,700 people in the production of our business client products and Intel-based servers as well as keyboards and mainboards. Production capacity varies according to order volumes, with an average of 12,000 system units per day being built in a total factory area of 77,000 square meters. The production is certified in accordance with ISO9001 and ISO14001.

Research and development as well as our product management are located next to the production. For FUTRO Thin Clients, ESPRIMO Desktops and CELSIUS Workstations, the modern factory offers various advantages: the communication channels between research, development and manufacturing are extremely short. Therefore, response times to technological changes and new market requirements are kept to a minimum. Our systems offer solid quality due to an extremely high degree of automation, experience, and the highest functional stability.

Industrial excellence

The Fujitsu 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.

Widely recognized as Europe's most modern facility for the manufacturing, development, configuration and staging of PCs, notebooks and servers, the Fujitsu factory in Augsburg won the 2013 Bavarian Quality Award for its exceptional quality and innovation, quality of research and development, production and service.

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[1] Based on Fujitsu quality statistics, 04/2013-03/2016

Mainboard development and manufacturing

Fujitsu develops and manufactures mainboards in Augsburg, Germany in line with stringent quality standards. We guarantee the highest level of quality, best logistics and excellent support combined with innovative product features.

Fujitsu mainboards have proven their outstanding profile continuously in thin clients, PCs, workstations and servers.

Mainboards designed by Fujitsu are well known in many PC test magazines as stable and up-to-date platforms with an elegant design and outstanding features. Additionally we often find our mainboards in first place, crowned with various awards.

Environmentally conscious products

The Fujitsu Green PC concept provides environmental guidelines for the entire value chain from product development to the use of materials, transport and recycling. We remain deeply committed to Green IT in all of our products and processes. As further proof of our innovative thinking on this topic, we have launched our own Green IT label, which now appears on all of our qualifying products. Furthermore most of our products meet stringent requirements for environmental certificates such as Blue Angel, ENERGY STAR® and EPEAT.

These examples underline how we have successfully changed our production processes to protect our environment. Sophisticated lead-free soldering methods, along with nitrogen environment, water-soluble flux, and the reduction of halogens in the printed circuit board (PCB), reduce the emission of environmental pollutants. The chlorine and bromine content in printed circuit boards was, for example, reduced from 12 to less than 0.15 percent. The mainboards from Fujitsu no longer contain PBB and PBDE. In addition, only batteries that are free from mercury and cadmium are used.

Water use has been drastically cut throughout production. For example, there is no need to wash the mainboard after soldering. All production media are cleaned in one cycle. To ease the recycling process, the case and molded plastic parts are labeled. Our production is Halogen-free since flame retardants containing bromine and chlorine are no longer used, yet the equipment still complies with existing fire protection guidelines. The mainboard also contains halogen-free flame retardants. Designing the packaging more intelligently reduces the volume and increases the transport capacities, making the transportation itself more efficient and environmentally conscious. Last, but not least, all manuals are printed on paper bleached without the use of chlorine.

Putting it to the test

To ensure full stability and the highest quality, and to fulfill the various certifications, our products are tested and evaluated in our own company test center. This test center is legally certified. 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 carried out. Electromagnetic compatibility, interference immunity, and noise emission are also certified. Selected client computing devices are even certified to fulfill the stringent requirements for use in the healthcare industry. The test results are the basis for regulatory approvals such as CE, FCC, and GS.

Examples of approvals:

Testing procedures

Vibration and shock test
Reliability in protecting data on hard disk drives and optical disc drives is evaluated under accelerated, severe conditions. This test contains operating and non-operating vibration tests and shock tests.

Vibration test on the shaker
After the vibration testing procedure the unit and all programs have to work normally.

Vibration test on vibration test machine
After 30 minutes of vibration testing per axis, at a frequency of 5 to 500 Hz, the test unit and all test programs have to work normally.

Display test
The same approvals and standards apply to displays as well. They undergo to thermo vision tests, packaging tests and a safety check. The system integration test with Fujitsu thin clients, PCs and workstations is mandatory.

Hinge test
As new desktop form factors like All-in-one PCs are available on the market, new functions are introduced. The innovative Fujitsu ESPRIMO X Line features an adjustable display which enables a fully flat working position. The hinges are rigorously tested to ensure excellent functionality over the product's lifecycle.

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

Keyboard abrasion test
Solid, quality keyboards with laser print lettering guarantee very high keyboard abrasion resistance.

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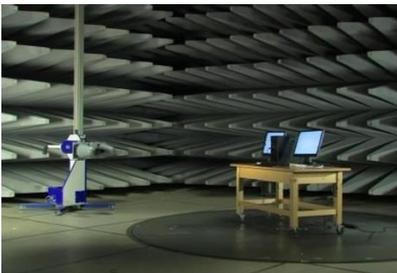
Our accredited test centre is equipped to test functionality and conformity to international standards and customer-specific requirements. It is specialized in the following test fields: electromagnetic compatibility, product safety, climatic, mechanical and reliability tests and noise emission.

The test centre consults and debugs during the development process and performs tests and measurements. The test centre also arranges compliance certification (national and international).

All tests are carried out under realistic operating conditions.
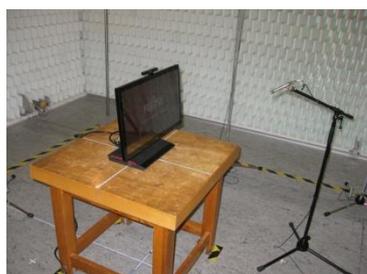
Acoustic emission test
All thin clients, PCs and workstations have to pass acoustic emission tests in the test centre. Volume, loudness, sound pressure and sound power level are measured in the anechoic noise chamber. One-third-octave-band and FFT analyses are also carried out.

With sophisticated cooling concepts, the thin clients, PCs and workstations are silent and provide the optimum working environment.

Packaging durability test

Reliability of packaging is evaluated to make sure that the system arrives in perfect condition. This includes a packaging vibration test, packaging free fall test, packaging strength test, packaging pressure test and temperature / humidity cycle test on package.

Bounce test

Vibrations on packaging are measured to simulate transport and storage conditions. Fujitsu improved the transport protection with a special shock-absorbing packaging solution.

To minimize the negative impact on the environment and therefore reduce waste, we are constantly optimizing our packaging. The materials used are selected with a focus on environmental sustainability. Packaging is balanced to fulfill the transportation requirements and minimize the use of materials.

Packaging drop test

After packaging freefalls from different heights, no damage or cracks must be found on mechanical parts, and the operating system and test program must work normally. Fujitsu tests the thin clients', PCs' and workstations' packaging in three different ways.

1 x corner

6 x areas

3 x edge test
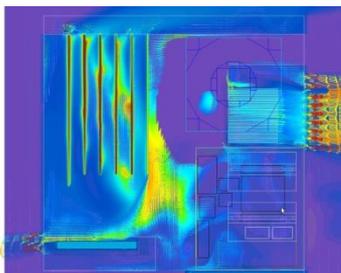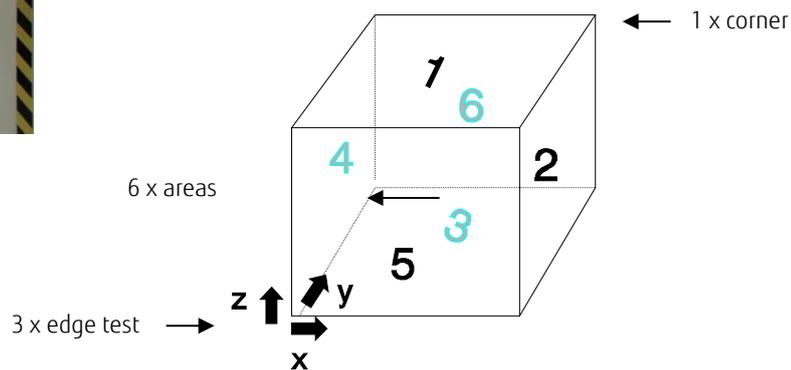
Climatic stress test

All FUTRO Thin Clients, ESPRIMO Desktops and CELSIUS Workstations have to pass climatic tests in the climate-testing laboratory to ensure reliability under extreme operating conditions. The system has to pass different benchmark tests when subjected to extreme temperature changes. Components as well as housing surface temperatures must not exceed strict limits under this procedure.

System integration and compatibility test

System integration and system compatibility, e.g. LAN and display interfaces, are strictly tested by engineers before the systems are released. This guarantees system reliability under all common scenarios in the complex network environments of the modern office.