

The
Yaskawa Quality Experience



Yaskawa Quality

is more than a measurement –
it's an
Experience.



**By any measurement,
the quality of Yaskawa products is second to none...**

We're the only industrial drives and motion control manufacturer to win the Deming prize – the most prestigious quality award in manufacturing. We have received the Ohm Technology Award, the Frost and Sullivan Excellence in Technology Award, and *Control Engineering* magazine's Customer Satisfaction Award.

Yaskawa constantly tracks and measures product failures in time (FIT). The actual FIT data demonstrates a high quality and reliability rate that is the envy of our Industry. This field data confirms that we do, in fact, exceed our design targets for reliability.

We earned our quality numbers long ago and have been diligent in maintaining our record of unparalleled reliability and value. We are ISO 9001:2000 certified.

The Yaskawa Quality Experience...

We also know that numbers only tell part of the quality story. What about innovative design? Knowledgeable and responsive application engineers who understand your business? Superior support and training? Those crucial aspects of any business are a vital part of how a company is ultimately judged and what we mean by the Yaskawa Quality Experience.

At Yaskawa, Quality is more than numbers, more than awards – it's the total experience of purchasing and owning Yaskawa products and working with Yaskawa people.

Reliability is Part of the Quality Experience...

- Ford Motor Company awarded Yaskawa (the first Tier Two Supplier to qualify) Green Level status. The most recent audit at Ford showed an installed base of 490 units, combined total operating time of more than 11,341,000 hours, and a statistical MTBF of more than 366,000 hours. This MTBF number is calculated using Reliasoft's Weibull ++ version 6, a program defined by Ford to be the standard analysis tool to be used for calculating MTBF.
- Another recent audit of over 3,500 Yaskawa inverter drives at one of the world's largest bottled water producers showed only 5 failures in a five-year period.



“Quality is more than just a buzzword for us and it goes beyond the product itself – it’s ingrained in the culture at Yaskawa. Quality has to be part of every facet of our business because ultimately it’s what our customers expect...”

Jody Kurtzhals, President, Yaskawa Electric America (YEA)





“Yaskawa’s quality experience begins in product design – which means we start by listening to the customer and thoroughly understanding what they need a product to be... and why...”

Nory Takada, VP, Engineering & Development, YEA

The first, important step in New Product design...

Most importantly, we begin by listening to the customer. We gain a thorough understanding of the applications, the operating environment, the performance requirements, ease of use, and other customer expectations.

Design & Development

Our obsession with Quality and Reliability drives our design. It's planned and specified just as carefully as the rest of the product. That's what we mean when we say Quality and Reliability are "designed in". High reliability design targets are set based on decades of experience, benchmarking, customer input, and industry research. We thoroughly test the reliability of new technologies, the consistency of new materials, and the failure rate of every component within a new product to be certain that the new design will achieve the reliability objectives we demand.

By consciously designing new products to preclude reoccurrence of problems in prior designs, Yaskawa has diminished the failures at introduction of the latest 7 series drives, to 1/15 that of the 3 series. The design goals for the 9 series is even more stringent.

Development QC process

- Market and Customer Requirements (Product Plan)
- Product Plan/Review
- Conceptual/Detail Design
- Design Review
- Prototype Build
- Product Qualification Test Plan/Review
- Product Qualification Test Result/Review
- Production Preparation and Manufacturing Quality Plan
- First Article Inspection
- Product Release Approval
- Mass production and Release

During the product qualification test, Yaskawa products are tested not only under normal spec conditions but also for extreme temperature, humidity, vibration, package drop, input voltage tolerance, noise immunity, electrical insulation stress, under-voltage protection, over-voltage protection, momentary power loss protection, output short protection, power on/off and start/stop iterations, overload protection, ground fault protection, surge test and input/output phase loss test.

Real World Testing...

As a final step before release, Yaskawa drives and motion control products are installed in customer beta sites to perform application testing under actual conditions. Information learned during this process is incorporated into final product design before manufacturing begins.

The result of this obsessive dedication to quality design – before we start to manufacture - is the certainty that we have it right. This process will improve performance, increase uptime, and lower cost of ownership.

How Yaskawa Calculates MTBF

The MTBF calculation starts with determining the Failure rate (FIT) for a random failure period where the failure rate is stable. Yaskawa's overall FIT is based on the failure reports received from the field for a period of time, monthly, (including Warranty and Non-Warranty items) and is as follows:

$$\text{FIT} = \text{Qty of Failures} / [(30 \text{ days} \times 24 \text{ hours per day}) \times (\text{total qty of units shipped})] \times 10 \text{ to the 9th power.}$$

Our calculations follow the Bellcore TR-332 standard.

MTBF is defined for a repairable system and is calculated as the inverse number of FIT mentioned above (MTBF = 1/FIT).

Cost control and quality go hand in hand...

Providing a high quality product actually lowers manufacturing costs. Lean processes, rigorous inventory control, less defects and waste, fewer returns, and minimal repair and replacement translate to reduced costs that enable Yaskawa to offer a superior product at a very competitive price.

Operations & Manufacturing

Defect prevention is the operational key to quality...

Yaskawa manufacturing processes are designed to prevent defects. Production operators have paperless on-line resources at their workstations, providing highly detailed and up-to-date work instructions for every process step. Complex assemblies are made simple with the use of animations and video. All components are verified and approved before they are installed, and frequent in-process quality checks prevent a unit from moving down the line until quality is assured.

Our internal assembly failure rate is 0.01%

(assembly errors found in the actual assembly process)

The field assembly failure rate is 0.0062%

(assembly errors that are found after the product is installed in the field).

Quality is not an accident; We test extensively...

No other manufacturer puts its products through as many tests, or as arduous a testing process as Yaskawa. All printed circuit boards are functionally tested while under power. All Yaskawa products are 100% tested under full current.

Quality design, quality manufacturing and comprehensive quality testing create incomparable reliability. Product after product, Yaskawa's overall product failure rate is the lowest in our industry.

Kaizen: Quality through continuous improvement

Yaskawa has incorporated the Kaizen philosophy of continuous improvement into every facet of its operations. Kaizen literally means "change for the better". Key elements of the process are teamwork, personal discipline, improved morale, quality circles, and suggestions for improvement from all levels of employees. The ultimate effects of the Kaizen process – elimination of waste and inefficiency, achieving discipline and standardization – mean that every day Yaskawa is improving the quality of its products while lowering costs.



“Yaskawa incorporates the Kaizen method of continuous incremental improvements along with our Total Quality Management processes to create a unique and highly effective approach to zero-defect manufacturing...”

Craig Espevik, VP, Operations, YEA



“Yaskawa sales associates are experienced, certified problem solvers in the area of drives and motion control systems in the applications and the markets we serve. It’s our job to know what’s going on in your industry and your business so that we can deliver the lowest cost solution and the lowest cost of product ownership...”

Mike Knapek, VP, Sales & Marketing, YEA

A quality sales experience requires a knowledgeable and responsive sales team...

A critical component of the Yaskawa Quality Experience is the relationship you have with the person who helps you through your Yaskawa purchase. More than just a salesperson, every Yaskawa sales associate is a highly trained applications specialist, certified on the products they support, experienced in the industries we serve, ready to assist you in achieving the best solution for your application.

Since Yaskawa is represented in some markets by Authorized Distributors and other channels, it is equally critical that these third party partners are properly qualified so that we can entrust our customers into their hands. They must earn their authorization by training and certification testing to be Drives Specialists, Authorized Solution Centers, Motion Solution Centers, or Value Added Resellers.

Sales & Applications

Yaskawa Sales and Application Engineers are specialists in their product area.

They are certified and re-certified every 2 years
to assure they can provide the

best customer solutions.

Award-winning attention to customer satisfaction...

One of the key reasons Yaskawa received *Control Engineering* magazine's 2004 Customer Satisfaction Award was our industry leading service and support. And we received the award again in the subsequent survey in 2006.

Our extensive network of local Authorized Service Providers are retested and recertified as new products are released to ensure that, should there be any problem with a Yaskawa product, there's someone close by, ready to respond, 24 hours a day, 7 days a week. And just to assure that our customers are up and running no later than the next day, Yaskawa offers a product repair and exchange program.



Service & Support

Yaskawa has conducted **Customer Satisfaction Surveys** consecutively since 1998.


In every instance, the **satisfaction scores have improved over the prior year.**

Customer Training...

Full time training professionals conduct regularly scheduled classes on product operation, startup, and troubleshooting. Electronic Learning Modules can be downloaded from our website for those that need training but cannot commit to classroom time. Our "Roadshow" trainers bring our popular classes to various parts of the country.

Customer Satisfaction Surveys...

To ensure that our support continues to receive the highest quality ratings for customer satisfaction, we conduct annual customer surveys. These surveys cover all facets of a customer's experience but the predominant areas were after-sale support services and customer care. We present the results to every associate, and then assign improvement teams to issues, create action plans for improvement, get approval at the top management level, and monitor the results. The Yaskawa Quality Experience means that every point of contact that our customers have with Yaskawa has to be the best possible.

A man in a light blue shirt and tie is speaking to two other men in a modern office setting. He is gesturing with his hands as he speaks. The background shows a curved ceiling and a staircase with a red carpet.

“Yaskawa is one of the few companies with a bona fide Customer Relationship Management program. It’s an expensive investment but our customer’s satisfaction and sense of family are part of the Quality experience we want to provide.”

Dennis Fitzgerald, VP, Customer Satisfaction, YEA

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