



Quality Resume

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ALIO, Latin, "A new way, a better way".

The following ALIO QC Resume is intended to reflect the level of commitment ALIO has to quality and to demonstrate ALIO's impressive record. ALIO also has a long standing history of honesty, integrity and open communication.

ALIO has been audited/site visited by but not limited to:

- Lockheed Martin
- General Atomics
- Ball Aerospace
- Nikon (came from Japan)
- FujiFILM Dimatix
- Nova Measurement Instruments (Israel)
- iTi – imaging Technology international
- Adept
- Parker
- Cox Automation/Ixmation

Customers willing to do volume production:

- Intel (100's to 1,000's)
 - Prototype delivered
 - Waiting on full system approval (ALIO only one piece of the pie)
 - ALIO portion approved
- FujiFILM Dimatix (50+, \$90,000 system)
 - Japan cancelled program for other reasons, not product viability.
- Intelligent Micro Patterns
 - Qualified vendor
 - *Our company switched all of our stage business to ALIO Industries (from Aerotech) recently for a number of reasons, both technical and commercial. The stage portion of our system is critical to the overall system performance so we need a reliable supplier who can deliver repeatable, high quality products that operate in the nanometer range. The stages we buy from ALIO exceed our expectations and we know that they will be able to support our rapid growth and expansion. Current forecasts call for over 240 stages to be delivered from ALIO over the next 12 months. We know they'll do the job for us, exceed the performance requirements required, and we'll get the level of technical support needed for our company to be successful.*

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- Dover
 - Custom Integrated Stages
- ficonTEC (German manufacture)
 - ALIO positioned to be motion vendor for all high precision applications
 - Controller, customer supplied ACS.
- PV Laser Integration Company
 - Replacing Aerotech, Nutec, etc.
 - Total stage potential will be large, variety of stages
- Semi Tool Company (China)
 - Volume OEM, providing test data this month
 - No volume issue concerns
- Automation Engineering Inc.
 - Sales down due to economic environment
 - Peak volume was 25 stages a month
- Semiconductor Measuring Instruments Company (Israel)
 - We didn't meet on price, they wanted it below our cost
 - Was for five to ten 3-axis systems per month
 - Very high accuracy, they were not worried about ALIO quality
- ALIO also has customer that we are under NDA with. We are not allowed to mention their names as they view their association with ALIO as a competitive advantage and do not want their competition to know.

Production Capabilities:

While with JDSU, ALIO's VP personally designed production cells for telecom product manufacturing. These production lines manufactured products that were Belcore Certified. Belcore makes any other certification system, documentation process look like archaic. JDSU developed these production cells using the Toyota Production System. The Wavelocker™ line was one of the highest, if not the highest yield production line JDSU had. It was literally one of the only production lines not shipped overseas because it ran so well. This work cell had 16 stations and was run by 14 operators per shift. Not only was it the highest yield cell, it was also one of the lowest manned work cells. It was the model for "how to" at the Connecticut division. Quality was maintained by not having too many hands involved, proper training and clear concise instructions. ALIO operates under these same core proven methods.

ALIO Growth:

ALIO has never had trouble attracting talent. Located near the foothills of the Rocky Mountains west of Denver puts us in a prime geographic location. We receive many unsolicited resumes each year.



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Quality:

ALIO has no issue maintaining quality for the large variety of stages we sell to a broad customer base. While Aperio is concerned with volume quality concerns, ALIO believes it is more difficult to maintain quality on a large variety of smaller runs for which we have an excellent track record.

ALIO's current RMA tracking system has been in place since 2006. Previously the system was less electronic and therefore data is harder to review.

RMA Summary from 2006 to present (almost 4 years):

- 38 total RMA
 - 5 defined as ALIO's fault or ALIO assuming fault
 - 2 ALIO fault
 - 3 ALIO assumed responsibility/fault
 - 18 defined as Customer's fault
 - 10 defined as Vendor's fault
 - 5 defined as No fault (return of unused materials, upgrades, etc)
- 5 Total as ALIO's fault or ALIO assuming fault
 - 4 associated with stages built with Nanomotion motors, described below in the next section
 - 1 associated with non Nanomotion motor driven stages
 - Bearing creep in linear motor stage. This stage was used in a high offset load application. The mounting surface the stage was mounted to was very flexible. ALIO believed the excessive twisting of the stage led to the bearing creep. Stage was rebuilt with anti-creep bearing. Customer stiffened the mounting surface. No issues to date. ALIO now builds all linear motor stages with anti-creep bearings if possible for the application. In RMA tracking, ALIO assumed responsibility.
- 34 RMAs involved stages using Nanomotion motors
 - 10 Vendor's fault
 - ALIO has pushed Nanomotion over the years into many corrective action implementations.
 - For all applicable instances, ALIO has added pre and post assembly tests to our procedures to test for Nanomotion failure modes before, during and after assembly.
 - 16 Customer's fault
 - Customer faults generally revolve around exceeding duty cycles and burning up motors.
 - Other examples:
 - Vacuum stage didn't run well at customer site. Ran well at ALIO. Finally ALIO traveled to Argonne National Labs after customer installed equipment. ALIO diagnosed the problem and fixed it. It was ultimately not the ALIO stage but in the cable configuration our customer supplied to Argonne. (Letter of reference from Argonne National Labs, Jörg Maser available upon request)
 - Same customer previously burned up motors due to the same cable incident.



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- 4 No fault
 - Return of non-used materials, controller upgrade or no issues were found with stage. Tested and returned to customer.
- 4 ALIO's fault or assumed fault
 - 1 had loose set screws. Corrective action implemented. No additional occurrences since.
 - 1 home sensor in the wrong location on a custom rotary stage that we now do lower volume. Corrective action implemented on assembly documentation. No additional occurrences since.
 - Returned stage with complaint of not running well. Completed full post production tests, found no problems. Assumed responsibility and returned stage. No additional issues reported.
 - Loose bearings on X stage. When the stage was returned, the looseness was not evident. ALIO rebuilt, retested and returned stage to customer. Assumed responsibility. No additional occurrences since.

Quality Controls in Manufacturing Process

- ALIO's VP of Engineering
 - Responsible for QC System
 - Former Applied Materials
 - ALIO uses a subset of AMAT's system
- Procedures for component inspection prior to assembly
- 100% inspection of critical surfaces of manufactured parts
 - This is something we work hard to do on all machined parts. The CMM is located adjacent to the CNC and therefore our operator can multitask without hindering work flow. 100% could potentially be lowered depending on the final specifications of stages.
- 100% run-in to ALIO defined procedures
 - ALIO is probably the only stage manufacturer that does this. This run-in is also the lead-in to final test.
- 100% final test – ALIO defined procedure developed over years of experience
 - We have defined tests for spotting infancy failures and therefore test for these prior to shipment. These tests are why ALIO has such a low "ALIO fault" RMA history.
- Approved sign-off prior to shipping (see Traveler)
- ALIO has been built on quality and getting it right the first time. All employees know we will not compromise in this area.