

A Brief Summary of Accreditation, Certification, and Approval Requirements for Aerospace Fasteners

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Aerospace fasteners are uniquely different from industrial and automotive fasteners in a variety of way. One of the most striking differences between aerospace fasteners and other fastener market segments is the level of reliance on industry certifications, registrations, or regulatory oversight. In fact, in many segments of the market, customers only transact business with approved suppliers that have the right certifications, accreditations, or approvals.

Before we consider the different types of certificates and registrations specific to aerospace, we must consider several unique aspects of the aerospace fastener market segment. These three points may help explain the prevalence of and need for certifications, accreditations, and approvals:

- Although there are exceptions, most aerospace parts are manufactured in low volume quantities. A production lot of as few fasteners as 25,000 pieces would be considered high volume in aerospace. Lot sizes of only a few pieces are common, especially for maintenance orders or low volume aircraft.
- Whereas high volume manufacturing in segments such as automotive warrant process control philosophies and statistical control methods, it is harder to employ them with smaller lot sizes. In some cases it may be easier to conduct multiple manual inspections and checks, such as is typical in today's aerospace fastener manufacturing, than it is to employ statistical and process control.
- Overcoming industry "inertia" is difficult in any industry or market segment. If practices have worked effectively for many years, few are interested in sticking their heads out and "rocking the boat". In this way, even though there may be more up-to-date ways of doing things, manual checks and individual sign-offs have long been part of the aerospace world and are hard to change.

NADCAP

NADCAP is an acronym for National Aerospace and Defense Contractors Accreditation Program. It was established in 1990 by SAE and is administered by the Performance Review Institute (PRI), an SAE affiliated company. **NADCAP performs audits and accreditations for aerospace and defense contractors for Quality Management Systems (AS9100 or AS9120), Special Processes and Products, and Laboratory activities.** Therefore, NADCAP could provide services to a supplier as their auditor for AS9100, although they are primarily recognized for their accreditation of aerospace "Special Processes". Fastener related "Special Processes" include coatings, heat treatment, NDT, and testing and dimensional inspections. In fact, many aerospace customers mandate their suppliers' use of NADCAP accredited vendors or they possess those "Special Processes" accredited in-house. NADCAP audits are especially thorough and the entire process of getting NADCAP accreditation is often considered a particularly arduous task.



QMS

The minimum credentials that an aerospace supplier must have are an accredited Quality Management System (QMS). The aerospace segment shares this requirement with automotive, requiring a market segment specific QMS standard that must be obtained and periodically audited through an accredited, third-party, independent auditor.

In aerospace the primary QMS is AS9100 for manufacturers and AS9120 for distributors. AS9100 recently went from its "C" Revision level to its "D" Revision level. Although not as comprehensive or turbulent as previous revision changes, every time a revision does change, those organizations holding accreditations must also change and evolve to fulfill the new requirements. All current and new holders of AS9100 certification will need to upgrade to the "D" Revision level by September 2018.

AS9100 is a QMS standard that is vertically entwined with ISO9001. In other words, ISO9001 comprises its base foundation with the supplemental requirements of AS9100. In this way an aerospace specific standard emerges that combines the best practices of general industry with those specific to the aerospace market segment. With the "D" Revision level the format is aligned to be compatible to other QMS standards so that it is easier to integrate more than one system. The ISO standard component addresses basic requirements that are usually implemented across all industry segments. This incorporates universal ideas like having a Quality Policy, assessing risk, gaining management awareness and involvement, employing continuous improvement into the manufacturing process, and conducting internal audits. The AS9100 component is a Supplement which adds additional requirements that may be unique to the aerospace industry segment. Some examples of this include using "Flow Down" requirements during purchasing, using only approved "Special Operations" sources, and guaranteeing the destruction of product deemed non-conforming.

To receive AS9100 accreditation a company must prepare its QMS so that all the requirements of the standard are being met. They then must have an accredited third party auditor review their systems and confirm that they are conforming to the standard. Assuming that no major problems are found and that all minor ones can be resolved, **the applicant will receive an accreditation that is valid for three years with annual surveillance (or maintenance) check-up audits. After the three years are up, each certificate holder must go through a more comprehensive re-accreditation audit.**

Although AS9100 is usually considered a pre-requisite, on its own, it may not be all that is required. Often aerospace fasteners customers will require significantly more in the way of additional certifications, accreditations, or approvals.



OEM Certification



Many OEMs maintain their own supplier certification program. For example, Boeing is one of the best examples of this and maintains a rigid and demanding certification program for companies seeking to supply Boeing directly or perhaps indirectly through distribution with Boeing specific part numbers. **In some instances the only way to supply OEM parts is to obtain their certification.** Because of the difficulty in obtaining these certifications, companies take great pride in their accomplishment when they receive them and work very, very hard to make sure that they do not lapse. OEM certification can mean a certain level of exclusivity for a company and is generally closely guarded.

QSLM/QSLD

Suppliers to the U.S. Defense Department must obtain a supplier certification to do so. This is referred to as a QSLM or QSLD supplier, which is short for Qualified Supplier List Manufacturers or Qualified Supplier List Distributors. Although the rules are unique and administered by the Defense Logistics Agency (DLA) of Philadelphia, Pennsylvania, they basically involve having a QMS in-place, being willing to undergo announced or unannounced audits, and possessing a U.S. CAGE Code (unique identifier for suppliers to U.S. federal agencies). There are several QSL's related to fasteners; 1. Class 2 threaded fasteners, 2. Class 3 threaded fasteners, and, 3. Pins, rivets and quick release parts.

QPL Parts

QPL parts refer to the Qualified Products List. This is similar to OEMs which often maintain approved supplier listings, but is for parts supplied to the U.S. Defense Department. The QPL is administered by the Naval Air Warfare Center and is applicable to a subset of parts deemed "critical fasteners". Companies listed on the QPL require pre-certification and approval. **If an RFQ lists a part as a QPL, only those suppliers that are approved may bid on and be awarded the parts.**

DFARS- Specialty Metal

DFARS is an acronym for the U.S. Defense Federal Acquisition Requirement. There are many Federal Acquisition requirements in-place. The one specifically relevant to aerospace fasteners has to do with some of the raw materials used to produce the fasteners and is known as the Berry Amendment (10USC-25336). The Berry Amendment is designed to give preference for domestically produced parts. Originally DFAR regulation 48CFR.252.227-700x stipulated that all specialty metals were subject to the Berry Amendment. This meant that many alloy and specialty metals used for U.S. fastener production had to be made with materials from a domestic or NATO qualified country source. Since original inception there has been some relief provided, with a provision that companies may self-certify using a "market basket" approach. This means that they are able to certify that no less than 50% of their annual material purchase across their entire commercial product line is from U.S. or NATO Qualified Country sources. The bottom line is that the customer's purchase requirements must be carefully reviewed for DFARS requirements. **Distributors will often purchase all DFARS compliant parts to provide flexibility, since their customer base may be a mix of entities requiring DFARS compliant parts and those that do not.**



ITAR

ITAR refers to the US State Department's requirement for "International Traffic in Arms Regulations" and specifically deals with products that end up on the U.S. Munitions List. In the past, the ITAR requirements were relatively silent regarding standard fasteners that were used to make an item that showed up on the Munitions List, so that many companies wishing to be sure they were compliant felt compelled to practice ITAR requirements. **Fortunately in October 2013 most fasteners, including aerospace standard fasteners, were excluded from the U.S. Munitions List relieving many of the burdens experienced by fastener suppliers required to comply with the ITAR rules.**



FAA TSOs

For parts that are not OEM specific but may be used for MRO purposes on multiple aircraft, the U.S. and other countries establish Technical Standard Orders (TSO). These are common standards for parts or materials that are intended to extend across multiple aircraft platforms. **To receive design and production approval, suppliers wishing to fulfill TSO must apply with the government (FAA in the U.S) for a TSOA or Technical Standard Order Authorization.** A TSOA usually requires a self-certification of design compliance and demonstration that an appropriate and effective QMS is in-place.

Aerospace fasteners and aerospace suppliers require considerably more regulation and accreditation than suppliers operating in automotive and industrial markets. The result of this is that suppliers currently conducting business in aerospace markets or companies wishing to, must fully understand and fulfill the requirements mandated by their customers and regulatory entities. The difficulty this entails elevates aerospace fastener companies to levels above many of their peers serving other industry segments and makes it difficult and, perhaps, expensive for new entrants to "get their foot in the door".

