

# THE NEED FOR ACCREDITED CALIBRATION FOR COMPLIANCE TO IATF 16949

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WHITE PAPER



“The automotive industry is going through a significant transformation. Countries all over the world are pressing for greener and eco-friendly vehicles. Government policies are getting stricter and demand vehicular technologies that require smarter software and hardware...other vehicular technologies (**hybrid, autonomous, and alternate fuel**) are also driving the change in the automotive industry, and all this is pushing automotive companies to innovate. One of the pieces to make electric, hybrid, autonomous and alternate-fuel vehicles are semiconductor products, as it forms the base for the hardware required to run the software.” – Chetan Patil, Chip Industry Expert, “The Semiconductor Industry Is Driving The Automotive Industry,” 12/20/2021.

## Introduction

The International Automotive Task Force (IATF) is a group of automotive manufacturers and their respective National Automotive Industry Associations, formed to provide improved quality products to automotive customers worldwide.

IATF members include the following vehicle manufacturers: BMW Group, Daimler AG, Ford Motor Company, Geely Group, General Motors, IVECO Group, Jaguar Land Rover (JLR) Limited, Renault Group, Stellantis (ex FCA), Stellantis (ex PSA), Volkswagen AG and their respective National Automotive Industry Associations – AIAG (U.S.), ANFIA (Italy), FIEV (France), SMMT (U.K.) and VDA (Germany).



IATF publishes one of the automotive industry’s most widely used international standards; the most current version is IATF 16949:2016. IATF 16949, a technical specification for automotive sector quality management systems, was first developed in 1999 by the IATF in conjunction with ISO’s technical committee for quality management, ISO/TC 176. Since then, it has risen to be one of the most widely used international standards in the automotive industry.

## Semiconductor chip suppliers to the automotive industry are rapidly achieving IATF 16949 certification

Some of the IATF 16949 certified semiconductor manufacturers include Texas Instruments (TI), NXP Semiconductors, ONSemiconductor and STMicroelectronics as advertised online with their quality certifications. Due to flow down requirements of the latest version of the standard, even support industries and suppliers to the semiconductor manufacturers are actively pursuing certification.

“The standards that IATF 16949 represents—providing high-quality products with no defects, improving customer satisfaction, integrating processes, and utilizing evidence-based decision making—strengthen customer trust and reliability and enforce our commitment to an internal culture of improvement as we continue to evolve and grow.”

— Ross Bernson, President and COO of Indium Corporation

“The IATF 16949 quality certification is an important milestone in our 25 years of foundry experience, demonstrating our commitment to quality and reliability. Our entire organization is enthusiastically behind this effort, and with this new IATF certificate we can move forward with further improving our offering in order to provide greater value for our customers.”

— Frank Lorenz, VP Quality at X-FAB Silicon Foundries, semiconductor supplier for the automotive supply chain



## Why is IATF 16949:2016 important?

IATF 16949:2016 is relatively new but included a significant change that provides specific requirements for calibration laboratories and vendors. It can be used by any supplier, large or small, and should be applied throughout the automotive supply chain. Currently, over 65,000 suppliers worldwide are certified to IATF 16949. IATF 16949:2016 now requires certified manufacturers to use ISO/IEC 17025 accredited calibration for their test and measurement equipment when utilizing external suppliers.

This standard establishes the requirement for internal and external laboratories, as well as original equipment manufacturer-provided initial calibration.

### DEFINITIONS OF SPECIFIC REQUIREMENTS FROM THE STANDARD

**Internal Cal Lab:** IATF 16949:2016 includes this specific language regarding internal calibration activities:

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#### 7.1.5.3 Laboratory requirements

##### 7.1.5.3.1 Internal laboratory

An organization's internal laboratory facility shall have a defined scope that includes its capability to perform the required inspection, test, or calibration services. This laboratory scope shall be included in the quality management system documentation. The laboratory shall specify and implement, as a minimum, requirements for:

- a) adequacy of the laboratory technical procedures;
- b) competency of the laboratory personnel;
- c) testing of the product;
- d) capability to perform these services correctly, traceable to the relevant process standard (such as ASTM, EN, etc.); when no national or international standard(s) is available, the organization shall define and implement a methodology to verify measurement system capability;
- e) customer requirements, if any;
- f) review of the related records.

**NOTE** Third-party accreditation to ISO/IEC 17025 (or equivalent) may be used to demonstrate the organization's in-house laboratory conformity to this requirement.

Many manufacturing companies do maintain internal calibration labs, but typically these are not accredited. Proving a lab meets the requirements can be difficult without accreditation, and IATF 16949:2016 specifically calls out ISO/IEC 17025 accreditation to satisfy the requirement. For organizations with an internal calibration lab who are considering certification to IATF 16949:2016, it might be prudent to conduct an ROI comparison to see if it might be more cost effective to outsource some or all of the calibration process to an accredited external provider. [For an ROI tutorial, please see the whitepaper presented by Tektronix.](#)

**External Test & Calibration Lab:** IATF 16949 requires external calibration providers used by an IATF certified company to be ISO/IEC 17025 accredited, with this passage in the text:

##### 7.1.5.3.2 External laboratory

External/commercial/independent laboratory facilities used for inspection, test, or calibration services by the organization shall have a defined laboratory scope that includes the capability to perform the required inspection, test, or calibration, and either:

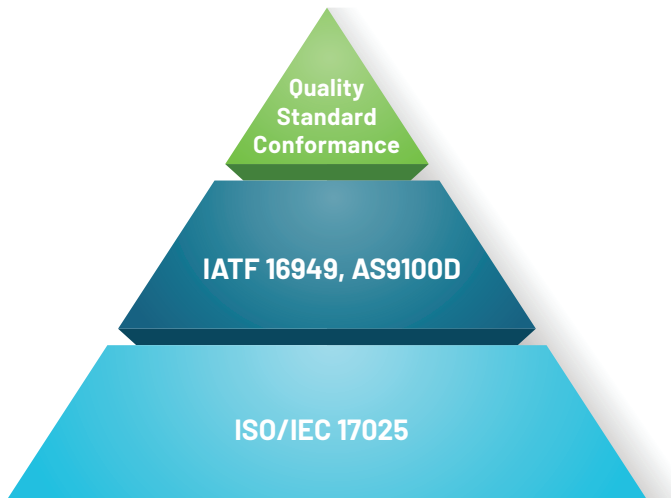
- the laboratory shall be accredited to ISO/IEC 17025 or national equivalent and include the relevant inspection, test, or calibration service in the scope of the accreditation (certificate); the certificate of calibration or test report shall include the mark of a national accreditation body; or
- there shall be evidence that the external laboratory is acceptable to the customer.

**NOTE** Such evidence may be demonstrated by customer assessment, for example, or by customer-approved second-party assessment that the laboratory meets the intent of ISO/IEC 17025 or national equivalent. The second-party assessment may be performed by the organization assessing the laboratory using a customer-approved method of assessment.

Calibration services may be performed by the equipment manufacturer when a qualified laboratory is not available for a given piece of equipment. In such cases, the organization shall ensure that the requirements listed in Section 7.1.5.3.1 have been met.

Use of calibration services, other than by qualified (or customer accepted) laboratories, may be subject to government regulatory confirmation, if required.





**Flow-Down Requirements:** Flow-down requirements push the requirements of IATF 16949 down to all suppliers of goods and services in the supply chain, from electronics suppliers to even the suppliers who supply the calibration and test labs. All suppliers must be audited and accredited to ensure compliance. By choosing accredited calibration service providers, these flow-down requirements transfer from the manufacturer to the calibration and test supplier.

**Why does IATF 16949 require ISO/IEC 17025 and not other published calibration standards?** The other common calibration standards are ANSI/NCSL Z540.1 or Z540.3. Both are American-only standards that are no longer actively reviewed and updated. ISO/IEC 17025 is the only international standard for specific calibration requirements.

ISO/IEC 17025 is a foundational standard that supports additional industry-specific standards, such as IATF 16949 and AS9100D, that require audits of test and measurement calibration status. ISO/IEC 17025 accredited calibrations deliver several benefits, including:

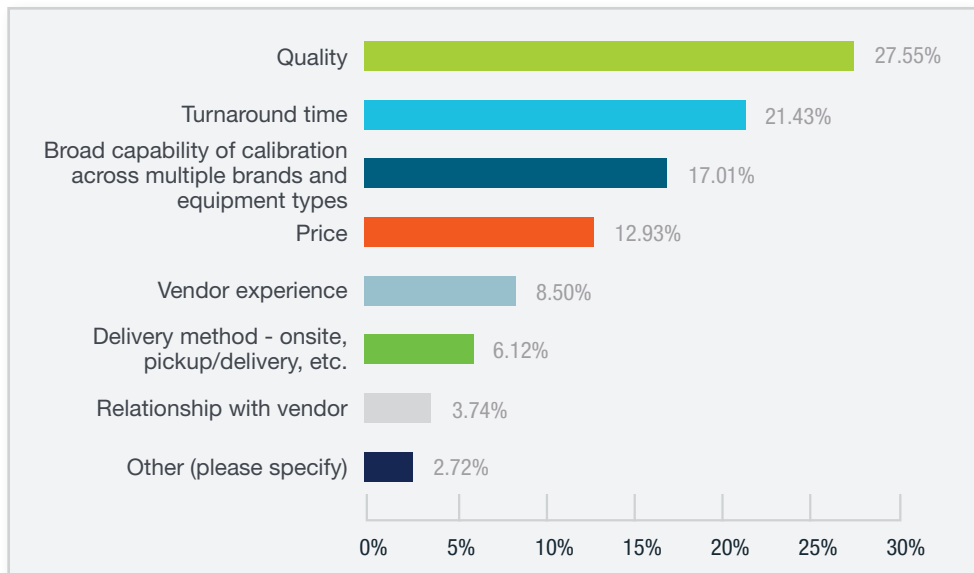
- Rigid traceability requirements
- Extensive documentation requirements
- Comprehensive training requirements
- Accountability through direct assessment from an accrediting body such as A2LA, ANAB and CNAS
- Accountability through potential corrective action processes and accountability for non-compliance

## The bottom line? To satisfy IATF 16949 requirements, be sure to perform ISO/IEC 17025 accredited calibrations for all test and measurement equipment.

As mentioned, some manufacturers do choose to establish or support existing internal ISO/IEC 17025 compliant calibration labs to meet their IATF requirements. For most manufacturers, conducting an ROI assessment will show that establishing a new accredited internal calibration capability or accrediting an existing internal lab tends to be the most expensive solution due to overhead costs of staffing, buying and maintaining equipment, facility costs, and administrative costs to maintain accreditation.

Partnering with a third-party accredited provider offers the simplest, fastest, and most cost-effective solution. In reality, many manufacturers use their internal labs, should they be accredited, to calibrate simpler equipment, typically mechanical or dimensional while using a third-party accredited calibration provider for the more sophisticated test and measurement equipment that requires expensive calibration standards, specialized training, and would require significant overhead costs. Another benefit of using an accredited calibration provider is that the manufacturer transfers the overhead and the risk/responsibility for non-compliance to the provider.





From Tektronix Survey “Top Calibration Service Trends for 2022”

When selecting a vendor, please select what is most important to you?

## Not All Accredited Calibration Providers Are the Same

If you choose to augment or outsource with a third-party calibration provider, understand that they’re not all the same in terms of quality. IATF is an exacting standard, and it is up to the company to satisfy these quality requirements by vetting the quality provided by their partner.

A recent survey by Tektronix of Top Calibration Service Trends for 2022 revealed that while price and turnaround time were key objectives for reduction in 2022, the most important factor in selecting a vendor was quality. This indicates a premium desire for capability and quality, with price and turnaround time as strong contributing factors. Customers consider many factors in a buying decision. Tektronix strongly recommends that organizations verify quality before signing contracts. This can be accomplished through a pilot program, verification of accreditation status, and other methods. Independent auditors can be a good source of calibration service provider recommendations.

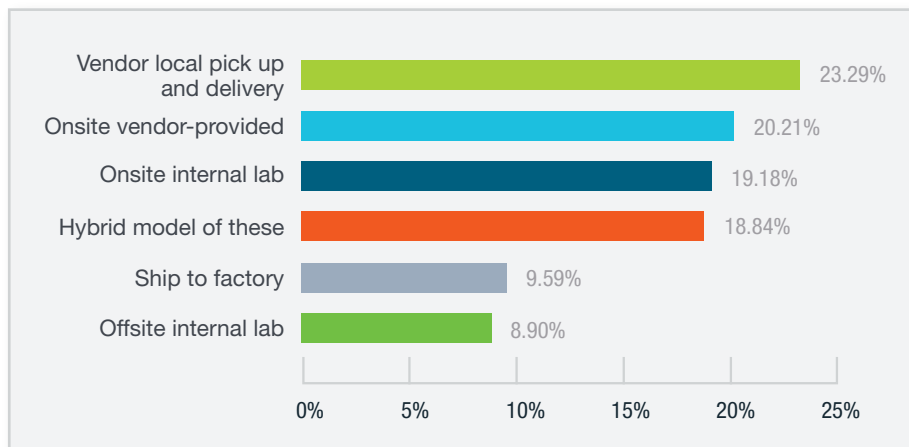
## When Interviewing Providers, Consider These Factors

Ask what calibration delivery methods a provider offers. The 2022 Calibration Service Trend Survey also showed most of the customers desire onsite service to satisfy quick turnaround time requirements, with a strong preference for additional flexibility in service delivery models with a hybrid model comprised of onsite, pickup and delivery, and ship to factory delivery models.

Onsite internal labs remain popular due to a perceived reduction in turnaround time and price. While this initially may seem attractive, there are additional hidden costs to consider such as facility costs, technician training, lab accreditations, and more. We recommend thorough ROI calculations to ensure time, cost, and quality considerations are factored in when relying on internal calibration labs. To satisfy onsite needs, vendor-provided services may be a strong alternative. Pickup and delivery options remain in strong demand, indicating a preference for a local service provider.

From Tektronix Survey “Top Calibration Service Trends for 2022”

What type of calibration services delivery would you like to have in the future?



Accredited calibration laboratories must submit to regular technical audits both internally and by independent Accrediting Bodies (Also ISO based), which provides greater confidence in capability and ability to compare multiple third-party providers.

All accredited labs also have publicly available Scopes of Accreditation (SOA's) which are searchable and describe all the disciplines a Lab is qualified to perform as well as their level of Measurement Uncertainty or the measurement capability they possess. This allows for comparison between calibration vendors by location as well as data to determine if the capability of the Lab meets a customer's needs.

Ask for a sample certificate, scrubbed of customer specifics if necessary. Ensure that the measured values, the tolerances, the uncertainties, and PASS/FAIL statement, with a defined decision rule, are clearly stated. Ensure the certificate carries the appropriate accredited logo that must include the lab's accreditation identification number.



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Clarify under what conditions the provider will make adjustments to your equipment. For example, are they qualified to perform the adjustments themselves? Do they provide pre- and post- data on any adjustment performed?

Discuss information and physical security: In mission-critical industries, security of data is of paramount concern. This is one major reason some companies build calibration capability in-house. Accredited calibration providers must demonstrate commitment to confidentiality and impartiality as part of their accreditation process at all levels of the organization. ISO/IEC 17025 accreditation ensures data integrity and protection.

Ensure the calibration provider calibrates your equipment to the manufacturers published specifications and that the procedure cited on the certificate matches the procedure specified by the manufacturer.

## What are the Consequences of not Choosing an Accredited Calibration Supplier?

The Automotive Supplier Requirements of IATF 16949:2016 make it clear that companies need to evaluate their calibration program, and its conformance to ISO/IEC 17025, in meeting this specification. Without IATF certification, there will be an inability to maintain automotive contracts or win new automotive contracts.

If a company's internal lab is currently not accredited, consider the cost and responsibility for keeping up with standards and requirements, ensuring the passing of audits. Choosing an accredited external provider shifts accountability to that provider to maintain the accreditation.

Consider the documentation requirements. IATF 16949 requires extensive documentation, which is met through ISO/IEC 17025 accreditation. Without this documentation, and strict documentation governance, a company may fail an audit, potentially resulting in downtime and lost business.

## Conclusion

The automotive industry gets more automated every day, with human life depending on the safety and reliability of computer-driven systems throughout any given vehicle. As a result, every company throughout the automotive supply chain, including semiconductor providers, are required to understand and comply with IATF 16949:2016. Regarding the role of test and measurement equipment in the design and development of these systems, the fastest path to IATF 16949 compliance is with the internationally recognized ISO/IEC 17025 standard for accredited calibrations on a company's test and measurement equipment.

Simplifying and assuring compliance with a thoughtful, ROI-proven path toward ISO/IEC 17025 accredited calibrations will result in simplifying and assuring compliance with IATF 16949:2016.

Tektronix is the leading accredited calibration services provider with 75+ years of experience in serving the world's largest mission-critical manufacturers in aerospace and defense, semiconductor, automotive, medical, communications, and other industries. Tektronix works as a strategic partner, delivering tailored solutions that save time and cost in achieving accredited and/or compliant calibrations on over 140,000 different electronic test & measurement equipment models from more than 9,000 manufacturers. Tektronix employs over 180 ISO/IEC 17025 accredited parameters and offers an extensive global service network that encompasses 100-plus locations with more than 1,100 experienced technical associates.

## Start The Conversation Today

Contact Tektronix to get started on your calibration service program.

### [Tektronix.com/calibration-services](https://www.tektronix.com/calibration-services)

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## Sources

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