

# »»» ISO/TS 16949:2009 Quality Management Systems and Quality Core Tools (Global Benchmarks)



Based on ISO 9001, ISO/TS 16949 is the global benchmark for an international fundamental quality management system (QMS) for the automotive industry and it is the first International Organization for Standardization (ISO) Technical Specification.

The International Automotive Task Force (IATF) and the Japanese Automobile Manufacturers Association (JAMA) produced TS 16949 with support from ISO Technical Committee 176 (TC 176), the ISO committee that deals with quality management standards. TS 16949 evolved from the successful global Chrysler, Ford and General Motors quality system requirements (QS-9000), and is now being specified by other customers, e.g. U.S. Army.

There is additional emphasis on content related to meeting specific customer satisfaction requirements, which include:

- Delivered part quality performance;
- Prevention of customer disruptions (including field returns);
- Delivery schedule performance (including incidents of premium freight);
- Customer notifications related to quality or delivery issues.

Another key generic QMS requirement of the automotive industry is the control of process design. ISO 9001 addresses product design and development but completely ignores process design and development. This subject has been given significant treatment in the automotive Core Tools reference manuals and in TS 16949.

There is a specific third party certification scheme that supports this global automotive standard. AIAG offers

additional deliverables that provide the rules governing this process as well as a guideline for auditing. AIAG trains organizations and third party auditors with regard to the standard and certification process. AIAG is a member of the International Automotive Task Force (IATF), which is one of several global oversight bodies for the certification process. Related publications are:

- *ISO/TS16949:2009 Quality Management System*
- *Automotive Certification Scheme for ISO/TS16949:2002, Rules for Achieving IATF Recognition, Third Edition for ISO/TS16949:2002*
- *IATF Auditor Guide for ISO/TS16949*

## ***Advanced Product Quality Planning and Control Plan (APQP)***

Chrysler, Ford and GM produced this manual to communicate common product quality planning guidelines intended to produce a product quality plan that supports the successful product or service realization that satisfies the customer. It is a robust process that can be utilized by any supplier whether they have design or manufacturing capability or not. One outstanding APQP feature is the Control Plan methodology which provides direction on use of the appropriate Plan for various processes with different dominant process variables, e.g. set up, tooling, operator. This AIAG manual is also a supplier requirement for other sector customers, e.g. U.S. Army. Another very valuable APQP feature are the various checklists that can be used to generate an effective Control Plan. Use of these checklists will prevent an organization from overlooking key considerations. AIAG offers training to support organizations and auditors with this process.

## ***Production Part Approval Process (PPAP)***

Customer organizations often require this production part qualification activity of suppliers. There are

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a number of requirements that the supplier must successfully complete prior to receiving customer approval to ship production parts.

These include a making an initial run of parts and checking for compliance with dimensional, metallurgical and any appearance requirements as well as determining process capability or performance generally expressed in an index, e.g. Cpk, Ppk. There are also requirements regarding the measurement process and development of documents also addressed in the APQP process, e.g. FMEA, Control Plan. PPAP approval does not guarantee ongoing part quality, but can be used to understand the process potential for producing product that consistently meets specified requirements at the quoted production rate. AIAG offers training to support organizations and auditors with this process.

## ***Measurement Systems Analysis (MSA)***

All work is a process, and measurement is no different. The amount of variation in the measurement process should be known and determined to be acceptable to ensure that product meets all specified requirements. Where measurement process variation is high and part characteristic tolerances are tight, parts could be out of specification but not detected by the organization. The MSA manual provides guidance in the analysis of the measurement system, e.g. gages operators, environment to prevent such occurrence. Measurement analysis is a PPAP requirement. AIAG offers training to support organizations and auditors with this process.

## ***Statistical Process Control (SPC)***

Originally based on the successful Ford SPC manual, the SPC manual describes basic statistical methods that can be used in pursuit of continual improvement, a requirement of ISO/TS16949. The manual is targeted for practitioners and managers beginning



the application of statistical methods but also serve as an effective reference for users of more advanced techniques. All basic statistical methods are not included. The basic tools, e.g. check sheets, flowcharts, pareto charts, fishbone diagrams are covered in other documents referenced in the manual. The SPC manual focuses

on control charting and process capability analysis. AIAG offers training to support organizations and auditors with this process.

## ***Failure Mode and Effects Analysis (FMEA)***

FMEA in general is a very effective and accepted methodology to identify and quantify potential risk so resources can be effectively directed at the highest priority areas. The FMEA manual describes the basic principles and implementation of the FMEA process and how it is integrated with the product and process development cycle. It includes documentation of the process and how FMEA analysis can be applied for timely necessary improvement of a product or process. It provides alternate and supporting methods for analysis, listing their advantages and limitations and offers guidance for FMEA analysis to maximize reliability improvement and/or mitigation of potential risks. For maximum benefit, FMEA output should be used in the identification of key or special characteristics to be controlled and the development of the Control Plan and Job Instructions required by ISO/TS16949. The AIAG FMEA manual is also a specified supplier requirement in other sectors.