

Comparison of Requirements

ISO/TS 16949:2001 vs. ISO/TS 16949:1999 & QS-9000

“A Road Map to 21st Century Automotive Quality,” Table 1

by Radley M. Smith

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
INTRODUCTION					
Process Approach	0.2	None	None	New (ISO 9001:2000)	RETHINK ENTIRE QMS
Relationship with ISO 9004*	0.3	None	None	New (ISO 9001:2000)	No new requirements
Compatibility with Other Management Systems (ISO 14001)	0.4	None	None	New (ISO 9001:2000)	No new requirements
Goal of this Technical Specification — QMS Continuous Improvement	0.5	4.1.1.4	4.2.5	Same (as 1999 edition)	New: Continually improve QMS
SCOPE					
Scope—General	1.1	None	None	New (ISO 9001:2000)	No new requirements
Application (exclusions)	1.2	None	None	New (ISO 9001:2000)	No new requirements
NORMATIVE REFERENCE					
TERMS AND DEFINITIONS					
	3	3; Annex A	Glossary	New (ISO 9001:2000)	No new requirements
QUALITY MANAGEMENT SYSTEM					
General Requirements	4.1	4.2.1	4.2.1	New (ISO 9001:2000)	New: Continually improve QMS; determine sequence and interaction of QMS processes
Documentation Requirements—General	4.2.1	4.2.2	4.2.2	Same	No change
Documentation Requirements	4.2.1	4.2.1	4.2.1	Same	No change
Quality System Procedures	4.2.2 Note	4.2.2.2	4.2.2	New (TS 16949:1999)	All requirements of standard to be addressed in QMS documentation
Quality Manual	4.2.2	4.2.1	4.2.1	New (ISO 9001:2000)	New: Describe interaction of process
Control of Documents	4.2.3	4.5.1; 4.5.2; 4.5.3	4.5.1; 4.5.2; 4.5.3	Same	No change
Engineering Specifications	4.2.3.1	4.5.2.2	4.5.2.1	New (TS 16949:2002)	New: The period for “timely review” is defined as not more than two working weeks
Control of Records	4.2.4	4.16	4.16	Same	No change
Records Retention	4.2.4.1	4.16.2	4.16.1	Same	No change
MANAGEMENT RESPONSIBILITY					
Management Commitment	5.1	None	None	New (ISO 9001:2000)	New: Management to provide evidence of commitment to QMS and its continual improvement
Process Efficiency	5.1.1	None	5.1.1	New Requirement	New: Management to monitor efficiency of product realization process
Customer Focus	5.2	None	None	New (ISO 9001:2000)	New: Management to pursue enhancement of customer satisfaction
Quality Policy	5.3	4.1.1.1	4.1.1	Modified in ISO 9001:2000	Modification: Policy to include commitment to continually improve QMS
Planning—Quality Objectives + Supplemental	5.4.1; 5.4.1.1	4.1.1.1; 4.1.1.2	4.1.4 (business plan may include)	New (ISO 9001:2000); minor TS 16949 interpretation	New: Establish quality objectives for relevant functions and levels; objectives to be measurable
Quality Management System Planning	5.4.2	4.2.3.1a; 4.2.3.2 (expan.)	4.2.3a	Management responsible for ensuring QMS planning	Preparation of “quality plans” not specified
Responsibility, Authority and communication—Responsibility and Authority	5.5.1	4.1.2.1.1	4.1.2	Simplification of earlier requirement	Documentation requirements removed, greater flexibility
Responsibility for Quality—Quality Responsible	5.5.1.1	4.1.2.1.1	4.1.2.1.1	Same	No change
Information to Management	5.5.1.1	4.1.2.1.3	4.1.2.5	Same	No change
Stopping Production for Quality Concerns	5.5.1.1	4.1.2.1.3	Note to 4.1.2.1.a recommends	Same	No change
Shift Resources	5.5.1.1	4.1.2.2.2 (expansion)	None	Same	Modification: May require Quality personnel on all shifts

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Management Representative	5.5.2	4.1.2.3	4.1.2.3	New (ISO 9001:2000)	New: Representative to ensure promotion of awareness of customer requirements
Customer Representative	5.5.2.1	4.1.2.1.2	None	New Requirement	New: Management to designate individual(s) to represent customer needs on QMS requirements
Internal Communication	5.5.3	None	None	New (ISO 9001:2000)	New: Management to ensure internal communication processes are created and used to address QMS effectiveness
Registrar Notification	None	None	4.1.6.1	Not Required	Requirement that registrar is notified of an OEM "downgrade" of supplier's status not specified
Management Review	5.6.1	4.1.3.1 (partially new)	4.1.3; 4.1.3.1	New (ISO 9001:2000)	Expanded: Review to include QMS improvement opportunities and need for changes
Quality Management System Performance	5.6.1.1	4.1.3.2; 4.1.5; 4.2.8	4.1.3.1; 4.1.5	Both editions go beyond QS-9000 "company level data" requirement	New: Review evidence of achievement of quality policy, business plan objectives and customer satisfaction; benchmarking and competitive data comparisons not specified
Review Input	5.6.2	None	None	New (ISO 9001:2000)	New: Specifies information on sources to be included as inputs
Review Input—Supplemental	5.6.2.1	4.14.2.3	4.14.2.1	Derived from QS-9000	New: Analysis of actual and potential field failures and effect on quality, <u>safety</u> or environment to be input
Review Output	5.6.3	None	None	New (ISO 9001:2000)	New: Specifies information on sources to be included as outputs
RESOURCE MANAGEMENT					
Provision of Resources	6.1	4.1.2.2.1	4.1.2.2	New (ISO 9001:2000)	New: Provide resources for continual improvement of QMS effectiveness
Human Resources—General	6.2.1	None	None	New (ISO 9001:2000)	New: Personnel to be competent based on education, training, skills, experience
Competence, Awareness and Training	6.2.2	4.18.1; 4.18.2	4.18; 4.18.1	ISO 9001:2000 adopts QS-9000 requirement for training effectiveness	New: Actions besides training may be needed; personnel to be aware of the importance of their activities and contributions to meeting quality objectives
Product Design Skills	6.2.2.1	4.4.2.2	4.4.2.1	Less specific than 1999 edition requirements	No change; list of required skills is deleted—organization must determine what skills are required
Training	6.2.2.2	4.18.1; 4.18.2	4.18; 4.18.1	Same (as 1999 edition)	Limits application to personnel affecting product quality; deletes note on review methods
Training on the Job	6.2.2.3	4.18.3	None	Same	New: Provide OJT for personnel in new/modified jobs affecting product quality
Employee Motivation and Empowerment	6.2.2.4	4.1.6	None	Expansion of 1999 edition	New: Process to motivate quality objective achievement, continual improvements and environment for innovation, with measurement process
Infrastructure	6.3	4.1.2.2.1	4.1.2.2	Semantics only	ISO 9001:2000 adopts QS-9000 additional requirements
Plant, Facility and Equipment Planning	6.3.1	4.2.5	4.2.6	Deletes 6 factors	No change; note recommends lean manufacturing focus instead of effectiveness metrics
Contingency Plans	6.3.2	4.9.1.3	4.9.b.2	"Field returns" added	No longer excludes natural disasters
Work Environment	6.4	None	None	Semantics only	No change; summarizes QS-9000 additional requirements
Personnel Safety	6.4.1	4.1.7.1	4.2.3.4	Deletes recommended internal safety awareness	No change
Cleanliness of Premises	6.4.2	4.9.1.2	4.9.b.1	Same	No change
PRODUCT REALIZATION					
Planning of Product Realization + Supplemental	7.1; 7.1.1	4.2.3.1; 4.2.4.1; 4.10.1.1	4.2.3.1; 4.10.1	Expands on 1999 edition	New: Quality objectives to be determined for product
Acceptance Criteria	7.1.2	4.10.1.2	4.10.1.1	Requires defined, not documented criteria	No change
Confidentiality	7.1.3	None	4.4.11	New (from QS-9000)	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Change Control	7.1.4	4.4.9.1; 4.4.9.2	4.4.9; 4.4.9.1; 4.4.9.2	Expands on 1999 edition (see also 7.3.7)	Expands to require processes to control and react to changes affecting product realization
Customer-Related Processes—Determination of Requirements Related to Product	7.2.1	4.3.2.1; 4.4.4.1	4.3.2; 4.4.4	Expands on 1999 edition	New: Requirements not stated by customer but necessary to be determined
Customer-Designated Special Characteristics	7.2.1.1	4.2.4.7	4.2.3.2	Generic requirement to meet customer requirements	No change
Review of Requirements Related to the Product	7.2.2	4.3.2.1	4.3.2	Expands on 1999 edition	No change; ISO 9001:2000 note refers to review of Internet situations
Organization Manufacturing Feasibility	7.2.2.1	4.2.4.8	4.2.3.3	Adds risk analysis	New: Must document feasibility and include risk analysis
Customer Communication	7.2.3	None	None	New (ISO 9001:2000)	New: To have process to communicate with customer
Customer Communication—Supplemental	7.2.3.1	4.2.4.6 (Partially new)	4.4.4.1	Less specific than 1999 edition on CAD applicability	No change
Design and Development—Design and Development Planning	7.3.1	4.4.2.1	4.4.2	Deletes list of required skills	No change
Multidisciplinary Approach	7.3.1.1	4.2.4.4	4.2.3.7	Both editions expand the QS-9000 requirement	New (minor): Use approach to determine SCs and develop FMEAs as well as control plans
Design and Development Inputs	7.3.2	4.4.4.1	4.4.4	Adds list of inputs	New: Lists inputs to be included
Product Design Input	7.3.2.1	4.4.4.2; 4.4.4.3	None	Expands on 1999 edition	New: Inputs to be identified, documented and reviewed
Manufacturing Process Design Input	7.3.2.2	4.2.4.9.2	None	New requirement in 1999 edition	New: Identify, document and review the identified inputs
Special Characteristics	7.3.2.3	4.2.4.7	4.2.3.2	Same	No change
Design and Development Outputs	7.3.3	4.4.5.1	4.4.5	Adds requirement	New: Appropriate information to purchasing, production and for service provision
Product Design Outputs—Supplemental	7.3.3.1	4.4.5.2	4.4.5.1	Rewritten	No change
Manufacturing Process Design Output	7.3.3.2	4.2.4.9.3	4.2.3.1; 4.2.3.5; 4.2.3.6	Rewritten	New: Specific outputs to be included
Design and Development Review	7.3.4	4.4.6	4.4.6	Rewritten; note added	Design reviews should include manufacturing process design and development
Monitoring	7.3.4.1	None	None	New requirement	New: Measurements at specified stages to be management review input
Design and Development Verification	7.3.5	4.4.7	4.4.7	Same	No change
Design and Development Validation + Supplemental	7.3.6; 7.3.6.1	4.4.8.1; 4.4.8.2	4.4.8	Expanded in 1999 edition	New: To be conducted to customer requirements (e.g., program timing)
Prototype Programme	7.3.6.2	4.4.8.3	4.4.10	Same	No change
Product Approval Process	7.3.6.3	4.2.4.11	4.2.4	QS-9000 recommendation now requirement	New: PPAP to be applied to suppliers
Control of Design and Development Changes	7.3.7	4.4.9	4.4.9; 4.4.9.1; 4.4.9.2	Same	No change
Purchasing—Purchasing Process	7.4.1	4.6.1.1; 4.6.2.2	4.6.1; 4.6.2	Adds note in line with IASG Interpretations	Note adds verification of supplier system if its ownership changes
Regulatory Compliance	7.4.1.1	4.6.1.3	4.6.1.2	Same	No change
Supplier Quality Management System Development	7.4.1.2	4.6.2.2	4.6.2.1	Changed into new requirement	New: Suppliers to be registered to ISO 9001:2000 and comply with TS, but customer may mandate alternatives
Customer-Approved Sources	7.4.1.3	4.6.1.2	4.6.1.1; 4.6.2.1	Same	No change
Purchasing Information	7.4.2	4.6.3	4.6.3	Same	No change
Verification of Purchased Products	7.4.3	4.6.4.1; 4.6.4.2; 4.10.2	4.6.4.1; 4.6.4.2; 4.10.2	Simplified per ISO 9001:2000	No change; deletes specified requirements for release for urgent production
Incoming Product Quality	7.4.3.1	4.10.2.4	4.10.2.4	Option added by 2002 edition	New: Customer may specify alternative methods
Supplier Monitoring	7.4.3.2	4.6.2.3	4.6.2.2	Expands QS-9000 required monitoring	New: Performance to be monitored by indicators beyond delivery performance
Production and Service Provision—Control of Production and Service Provision	7.5.1	4.9.1.1	4.9	Same	No change
Control Plan	7.5.1.1	4.2.4.10	4.2.3.7	Rewritten	No change
Work Instructions	7.5.1.2	4.9.2	4.9.1	Deletes list of items to be included	No change
Verification of Job Set-ups	7.5.1.3	4.9.4	4.9.4	Same	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Preventive and Predictive Maintenance	7.5.1.4	4.9.1.5	4.9.g.1	Removes information on predictive maintenance methods	No change
Management of Production Tooling	7.5.1.5	4.2.6	4.2.6.2	1999 edition added a tool identification requirement, including status	New: Tool identification to be covered by tooling management system
Production Scheduling	7.5.1.6	4.15.6.3	4.15.6.2	Rewritten	No change
Feedback of Information from Service	7.5.1.7	4.19.2	4.19.1	Same	No change
Servicing Agreement With Customer	7.5.1.8	4.19.3	None	1999 edition added new subclause	New: Effectiveness in servicing customer to be verified if servicing agreement exists
Validation of Processes for Production and Service Provision + Supplemental	7.5.2; 7.5.2.1	4.9.1.1	4.9	ISO 9001:2000 specifies arrangements to be established; 2002 edition expands applicability	New: Validation to apply to all processes, not just those that cannot be verified by monitoring and measurement
Identification and Traceability + Supplemental	7.5.3; 7.5.3.1	4.8	4.8	Same	No change
Customer Property	7.5.4	4.7.1	4.7	Same	Documentation of procedures not required
Customer-Owned Production Tooling	7.5.4.1	4.7.2	4.7.1	Same	No change
Preservation of Product	7.5.5	4.15	4.15	Covers ISO 9001:1994 Clause 4.15	No change
Storage and Inventory	7.5.5.1	4.15.3.1; 4.15.3.2	4.15.3; 4.15.3.1	Repeats 4.15.3 of ISO 9001:1994	No change
Control of Monitoring and Measuring Devices	7.6	4.11.1.1; 4.11.2	4.11.1; 4.11.2	Simplified language in 2002 edition	No change
Measurement System Analysis	7.6.1	4.11.1.2	4.11.4	Does not refer to MSA manual in either edition	No change
Calibration Records	7.6.2	4.11.3	4.11.3	2002 adds items to be included in records	New: Records to include equipment identification, revisions following engineering changes and assessment of out-of-specification impacts
Laboratory Requirements— Internal Laboratory	7.6.3.1	4.10.6	4.10.6	Rewritten	No change
External Laboratory	7.6.3.2	4.10.6	4.10.7	Expanded	New: Lab to be accredited to ISO/IEC 17025 or acceptable via customer-approved 2nd-party audit
MEASUREMENT, ANALYSIS AND IMPROVEMENT					
General	8.1			New (ISO 9001:2000)	New: Organization to plan and implement the processes needed
Identification of Statistical Tools	8.1.1	4.20.3	4.20.3	Same	No change
Knowledge of Basic Statistical Concepts	8.1.2	4.20.4	4.20.4	Added (ISO 9001:2000)	New: Concepts to be used as well (as "understood") throughout the organization
Monitoring and Measurement— Customer Satisfaction + Supplemental	8.2.1; 8.2.1.1	4.1.1.3; 4.1.5	4.1.5; 4.1.6	Expanded (ISO 9001:2000)	New: Methods and monitor customer perception of quality
Internal Audit	8.2.2	4.17.1	4.17	Clarification (ISO 9001:2000)	New: Auditor not to audit his/her own work; otherwise, no change
Quality Management System Audit	8.2.2.1	4.17.2.2	4.17	Added to account for ISO 9001:2000	New: Audit must verify QMS compliance with TS 16949:2002
Manufacturing Process Audit	8.2.2.2	4.17.2.3	None	New requirement in 1999 edition	New: Audit each manufacturing process for effectiveness
Product Audit	8.2.2.3	4.17.2.4	4.10.2.4;	1999 edition expanded QS-9000 requirement	New: Audits to include in-process as well as final product audit
Internal Audit Plans	8.2.2.4	4.17.2.1; 4.17.2.2	4.17.1	Expanded (IASG Interpretations and 1999 edition)	New: Audits must cover all shifts and QMS activities per an annual schedule
Internal Auditor Qualification	8.2.2.5	4.17.3	None	Modification of 1999 edition requirement	New: Auditors to be qualified to audit against TS 16949:2000
Monitoring and Measurement of Processes	8.2.3	None	None	New (ISO 9001:2000)	New: Monitor and/or measure effectiveness of QMS processes and take corrective action to ensure product conformity
Monitoring and Measurement of Manufacturing Processes	8.2.3.1	4.9.3	4.9.2	Same	No change
Monitoring and Measurement of Product	8.2.4	4.10.2; 4.10.3; 4.10.4	4.10.2; 4.10.3; 4.10.4	Rewritten; expanded (ISO 9001:2000)	New: Records to indicate who authorized release
Layout Inspection and Functional Testing	8.2.4.1	4.10.4.2	4.10.4.1	Same	No change

Requirement	ISO/TS 16949:2002 Reference	ISO/TS 16949:1999 Reference	QS-9000 Reference	ISO/TS 16949:2002 Content	Impact vs. QS-9000
Appearance Items	8.2.4.2	4.9.5	4.9.6	Same	No change
Control of Nonconforming Product + Supplement	8.3; 8.3.1	4.13.1.1; 4.13.1.2; 4.13.2	4.13.1; 4.13.2	Simplified (ISO 9001:2000)	Need to document and segregate nonconformity product not specified
Control of Reworked Product	8.3.2	4.13.3	4.13.3	Simplified (2002 edition)	Prohibition of rework visibility not specified
Customer Information	8.3.3	None	None	New (ISO 9001:2000)	New: Customer to be alerted if nonconforming product was shipped
Customer Waiver	8.3.4	4.13.4	4.13.4	Same	No change
Analysis of Data	8.4	4.20.1; 4.20.2	4.20.1; 4.20.2	New (ISO 9001:2000)	New: Collect and analyze data to verify QMS suitability and effectiveness and evaluate improvement opportunities; lists what analysis will relate to
Analysis and Use of Data	8.4.1	4.1.5	4.1.5	Expanded (1999 edition)	New: Trends to support information system to report data from product usage
Improvement— Continual Improvement	8.5.1	4.1.1.4; 4.1.3.2	4.2.5	ISO 9001:2000 modification of QS-9000	New: QMS effectiveness to be continually improved through various QMS elements
Continual Improvement of the Organization	8.5.1.1	None	None	New (ISO 9001:2000)	New: Process for continual improvement of organization to be defined
Manufacturing Process Improvement	8.5.1.2	4.2.7	4.2.5.1; 4.2.5.2	Modified	New: Focus to be on control and reduction of variation; deletes references to improvement in cost, delivery, timing
Corrective Action	8.5.2	4.14.1.1; 4.14.2.1	4.14.1; 4.14.2	Rewritten (ISO 9001:2000)	No change
Problem Solving	8.5.2.1	4.14.1.2	4.14.1.1	Modified (1999 edition)	New: Customer-prescribed format to be used if one exists
Error-Proofing	8.5.2.2	4.14.1.3	4.14.1.2	Minor change	Applying methods "to the degree appropriate" not mentioned
Corrective Action Impact	8.5.2.3	4.14.2.2	4.14.2.2	Same	No change
Rejected Product Test/Analysis	8.5.2.4	4.14.2.3	4.14.2.1	Modified (1999 edition)	New: Cycle time (of analysis) to be minimized
Preventive Action	8.5.3	4.14.3	4.14.3	Rewritten for clarity (ISO 9001:2000)	No change

*0.3.1, IATF Guidance to ISO/TS 16949:2002, refers users to a document of the same title developed by the IATF along with ISO/TS 16949:2002 to provide assistance to suppliers on applying the second edition of this TS.

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