



When Recognition Matters



EXAM PREPARATION GUIDE

PECB Certified ISO/TS 16949 Lead Implementer

The objective of the “PECB Certified ISO/TS 16949 Lead Implementer” examination is to ensure that the candidate has the knowledge and skills to support an organization in implementing and managing a Quality Management System in Automotive industry (AQMS) based on ISO/TS 16949:2009.

The target population for this examination is:

- Project managers or consultants wanting to prepare and support an organization in the implementation of a Quality Management System in automotive industry
- Automotive production quality executives and/ or automotive quality engineers
- ISO/TS 16949 auditors who wish to fully understand the AQMS implementation process
- Persons responsible for the quality, or conformity in an organization
- Members of a quality team
- Expert advisors in Automotive Quality Management Systems
- Technical experts (Quality technicians, plant managers, automotive production managers, manager of automotive services, operations managers, CEOs, CFOs, etc.) wanting to prepare for a quality function, or for an AQMS project management function.

The exam content covers the following domains:

- Domain 1: Fundamental principles and concepts of quality management in automotive industry
- Domain 2: Automotive industry QMS Best Practice based on ISO/TS 16949
- Domain 3: Planning an AQMS based on ISO/TS 16949
- Domain 4: Implementing an AQMS based on ISO/TS 16949
- Domain 5: Performance evaluation, monitoring and measurement of an AQMS based on ISO/TS 16949
- Domain 6: Continual improvement of an AQMS based on ISO/TS 16949
- Domain 7: Preparing for an AQMS certification audit

The content of the exam is divided as follows:

Domain 1: Fundamental principles and concepts of quality management in automotive industry

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can understand, interpret and illustrate the main Quality Management concepts related to an Automotive Quality Management System

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Understand and explain the operations of the ISO organization and the development of Quality Management standards. 2. Ability to identify, analyze and evaluate the Automotive Quality Management compliance requirements for an organization. 3. Ability to explain and illustrate the main concepts in Automotive Quality Management. 	<ol style="list-style-type: none"> 1. Knowledge of the application of the seven ISO management principles to Quality Management. 2. Knowledge of the main standards in Quality Management. 3. Knowledge of the different source of Automotive Quality Management requirement for an organization: laws, regulations, international and industry standards, contractors, market practices, internal policies. 4. Knowledge of the main Automotive Quality Management concepts and terminology as described in ISO/TS 16949. 5. Knowledge of the difference between preventive, detective and corrective controls and their characteristics.

Domain 2: Automotive industry QMS Best Practice based on ISO/TS 16949

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can understand, interpret and provide guidance on how to implement and manage Automotive Quality Management requirements based on best practices of ISO/TS 16949.

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to identify, understand, classify and explain the clauses with requirements from ISO/TS 16949. 2. Ability to detail and illustrate the requirements and best practices by concrete examples. 3. Ability to compare possible solutions to an Automotive Quality Management issue of an organization and identify/analyze the strengths and weaknesses of each solution. 4. Ability to select and demonstrate the best Automotive Quality Management objectives stated by the organization. 5. Ability to create and justify an action plan for implementing an Automotive Quality Management by listing the activities related. 6. Ability to analyze, evaluate and validate action plans to implement a specific requirement. 	<ol style="list-style-type: none"> 1. Knowledge of operational planning and control 2. Knowledge of various quality management methodologies and their integration with organizational automotive quality management system based on ISO/TS 16949. 3. Knowledge of Automotive Quality Management strategy. 4. Knowledge of establishing and implementing Automotive Quality Management procedures. 5. Knowledge of Automotive Quality Management Best Practices. 6. Knowledge of requirements that come from clause 4 to 8 of the ISO/TS 16949. 7. Knowledge on continual improvement philosophy and practical implementation based on ISO/TS 16949.

Domain 3: Planning an AQMS based on ISO/TS 16949

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can plan the Implementation of an AQMS in preparation for an ISO/TS 16949 certification.

Competencies	Knowledge statements
1. Ability to manage an AQMS implementation project following project management best practices.	1. Knowledge of the main project management concepts, terminology, process and best practice as described in ISO 10006.
2. Ability to assemble, analyze and interpret the necessary information to plan the AQMS implementation.	2. Knowledge of the principal approaches and methodology frameworks to implement an AQMS.
3. Ability to observe, analyze and interpret the external and internal environment of an organization	3. Knowledge of the main concepts and terminology related to organizations.
4. Ability to perform a gap analysis and clarify the Automotive Quality Management objectives of an organization.	4. Knowledge of an organization's external and internal environment.
5. Ability to state and justify an AQMS scope adapted to the quality objectives of a specific organization.	5. Knowledge of the main interested parties related to an organization and their characteristics.
6. Ability to justify the selected approach and methodology adapted to the needs of the organization.	6. Knowledge of techniques to assemble information on an organization and to perform a gap analysis of a management system
	7. Knowledge of the characteristics of an AQMS scope in terms of organizational, technological and physical boundaries.

Domain 4: Implementing an AQMS based on ISO/TS 16949

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can implement the processes of an AQMS required for an ISO/TS 16949 certification.

Competencies	Knowledge statements
1. Ability to understand, analyze needs and provide guidance on the attribution of roles and responsibilities in the context of the implementation and management of an AQMS.	1. Knowledge of the roles and responsibilities of the key actors during the implementation of an AQMS and in its operation after the end of the implementation project.
2. Ability to define the document and record management processes needed to support the implementation and the operations of an AQMS.	2. Knowledge of the main organizational structures applicable for an organization to manage Automotive Quality Management.
3. Ability to define and design processes and document them.	3. Knowledge of the best practices on document and record management processes and the document management cycle.
4. Ability to define and write an AQMS policy and Automotive Quality Management policies & procedures.	4. Knowledge of the characteristics and the differences between the different documents related to AQMS policy, procedures, guideline, standard, baseline, worksheet, and so on.
5. Ability to implement the required processes of an AQMS.	5. Knowledge of model-building controls and processes techniques, and best practices.
6. Ability to define and implement appropriate Automotive Quality Management training, awareness and communication plans.	6. Knowledge of controls and processes deployment techniques and best practices.
7. Ability to define and implement a customer support process based on Automotive Quality Management best practices.	7. Knowledge of techniques and best practices to write Quality Management policies, procedures and other types of documents included in an AQMS.
8. Ability to transfer an AQMS project to operations and manage the change management process.	8. Knowledge of the characteristics and the best practices to implement

	<p>Automotive Quality Management training, awareness and communication plans.</p> <p>9. Knowledges of the characteristics and main processes of an Automotive Quality Management customer support process based on best practices.</p> <p>10. Knowledge of change management techniques best practices.</p>
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Domain 5: Performance evaluation, monitoring and measurement of an AQMS based on ISO/TS 16949

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can evaluate, monitor and measure the performance of an AQMS in the context of an ISO/TS 16949 certification

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to monitor and evaluate the effectiveness of an AQMS in operation. 2. Ability to verify the extent to which identified Automotive Quality Management requirements have been met. 3. Ability to define and implemented an internal audit program for ISO/TS 16949. 4. Ability to perform regular and methodical reviews regarding the suitability, adequacy, effectiveness and efficiency of an AQMS with policies and objectives of an organization. 5. Ability to define and implement a management review process and counsel management on it. 	<ol style="list-style-type: none"> 1. Knowledge of the techniques and best practices to monitor the effectiveness of an AQMS. 2. Knowledge of the main concepts and components related to an Automotive Quality Management measurement programme: measures, attributes, indicators, dashboard, etc. 3. Knowledge of the characteristics and the differences between an operational, tactical and strategic Automotive Quality Management indicators and dashboard. 4. Knowledge of the techniques and methods to define and document an adequate and reliable indicator. 5. Knowledge of the main concepts and components related to the implementation and operation of an AQMS internal audit program. 6. Knowledge of the differences between the concepts of major nonconformity, minor nonconformity, anomaly and observation. 7. Knowledge of the guidelines and best practices to write nonconformity report. 8. Knowledge of the best practices on how to perform reviews.

Domain 6: Continual improvement of an AQMS based on ISO/TS 16949

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can provide guidance on the Continual improvement of an AQMS in the context of ISO/TS 16949

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to understand the principles and concepts related to continual improvement. 2. Ability to counsel an organization on how to continually improve the effectiveness and the efficiency of an AQMS. 3. Ability to implement AQMS continual improvement processes in an organization. 4. Ability to determine the appropriate business improvement tools to support continual improvement processes of a specific organization. 5. Ability to identify, analyze the root-causes of nonconformities and proposed action plans to treat them. 6. Ability to identify, analyze the root-cause of potential nonconformities and proposed action plans to treat them 	<ol style="list-style-type: none"> 1. Knowledge of the main concepts related to continual improvement. 2. Knowledge of the characteristics and the difference between the concept of effectiveness and the efficiency. 3. Knowledge of the concept and techniques to perform a benchmarking. 4. Knowledge of the main processes, tools and techniques used by professionals to identify the root-causes of nonconformities. 5. Knowledge of the characteristics and the difference between corrective actions and preventive actions. 6. Knowledge of the main processes, tools and techniques used by professionals to develop and propose the best corrective and preventive action plans.

Domain 7: Preparing for an AQMS certification audit

Main objective: To ensure that the ISO/TS 16949 Lead Implementer candidate can prepare and assist an organization for the certification of an AQMS against the ISO/TS 16949 standard

Competencies	Knowledge statements
<ol style="list-style-type: none"> 1. Ability to understand the main steps, processes and activities related to an ISO/TS 16949 certification audit 2. Ability to understand, explain and illustrate the audit evidence approach in the context of an ISO/TS 16949 audit. 3. Ability to counsel an organization to identify and select a certification body that meets their needs. 4. Ability to review the readiness of an organization for an ISO/TS 16949 certification audit 5. Ability to coach and prepare the personnel of an organization for an ISO/TS 16949 certification audit 6. Ability to argue and challenge the audit findings and conclusions with external auditors 	<ol style="list-style-type: none"> 1. Knowledge of evidence based approach in an audit. 2. Knowledge of the different types of evidences: physical, mathematical, confirmative, technical, analytical, documentary and verbal. 3. Knowledge of the differences between stage 1 audit and stage 2 audit. 4. Knowledge of stage 1 audit requirements, steps and activities. 5. Knowledge of the documentation review criteria. 6. Knowledge of stage 2 audit requirements, steps and activities. 7. Knowledge of follow-up audit requirements, steps and activities. 8. Knowledge of surveillance audits and recertification audit requirements, steps and activities. 9. Knowledge of the requirements, guidelines and best practices to develop action plans following a ISO/TS 16949 certification audit

Based on these 7 domains and their relevance, 12 questions are included in the exam, as summarized in the following table:

		Level of Understanding (Cognitive/Taxonomy) Required		Number of Questions per competency domain	% of test devoted to each competency domain	Number of Points per competency domain	% of Points per competency domain	
		Questions that measure Comprehension, Application and Analysis	Questions that measure Synthesis and Evaluation					
Competency/Domains	Fundamental principles and concepts of quality management in automotive industry	5	X	2	16.67	10	13.33	
		5	X					
	Automotive industry QMS Best Practice based on ISO/TS 16949	5	X	3	25.00	15	20.00	
		5	X					
		5	X					
	Planning an AQMS based on ISO/TS 16949	10	X	3	25.00	20	26.67	
		5	X					
		5	X					
	Implementing an AQMS based on ISO/TS 16949	10	X	1	8.33	10	13.33	
	Performance evaluation, monitoring and measurement of an AQMS based on ISO/TS 16949	10		X	1	8.33	10	13.33
	Continual improvement of an AQMS based on ISO/TS 16949	5		X	1	8.33	5	6.67
	Preparing for an AQMS certification audit	5		X	1	8.33	5	6.67
Total points		75						
Number of Questions per level of understanding		8		4				
% of Test Devoted to each level of understanding (cognitive/taxonomy)		66.67		33.33				

The passing score is established at 70%.

After successfully passing the exam, candidates will be able to apply for the credentials of Certified ISO/TS 16949 Lead Implementer, depending on their level of experience.

TAKE A CERTIFICATION EXAM

Candidates will be required to arrive at least thirty (30) minutes before the beginning of the certification exam. Candidates arriving late will not be given additional time to compensate for the late arrival, and may be denied entry to the exam room (if they arrive more than 5 minutes after the beginning of the exam scheduled time).

All candidates shall present a valid identity card with a picture such as a driver's license or a government ID to the invigilator.

The exam duration is three (3) hours. Non-native speakers receive an additional half an hour.

The passing score is established at 70%.

The questions are essay type questions. This type of format was chosen because the intent is to determine whether an examinee can write a clear coherent answer/argument and to assess problem solving techniques. Because of this particularity, the exam is set to be "open book" and does not measure the recall of data or information. The examination evaluates, instead, comprehension, application, analysis, synthesis and evaluation, which mean that even if the answer is in the course material, candidates will have to justify and give explanations, to indicate they really understood the concepts. At the end of this document, you will find sample exam questions and their possible answers.

As the exams are "open book"; the candidates are authorized to use the following reference materials:

- A copy of the ISO/TS 16949:2009 standard,
- Course notes from the Participant Handout,
- Any personal notes made by the student during the course, and
- A hard copy dictionary.

The use of electronic devices, such as laptops, cell phones, etc., is not allowed.

All attempt to copy, collude or otherwise cheat during the exam will automatically lead to the exam's failure.

PECB exams are available in English. For availability of the exam in a language other than English, please contact examination@pecb.com

RECEIVE YOUR EXAM RESULTS

Results will be communicated by email in a period of 6 to 8 weeks, after taking the exam. The results will not include the exact grade of the candidate, only pass or fail.

After successfully passing the exam, candidates will be able to apply for the credentials of PECB Certified ISO/TS 16949 Lead Implementer, depending on their level of experience.

In the case of a failure, the results will be accompanied with the list of domains in which the candidate had a low grade, to provide guidance for exams' retake preparation.

Candidates who disagree with the exam results may file a complaint by writing to examination@pecb.com. For more information, please refer to www.pecb.com

EXAM RETAKE POLICY

There is no limitation on how many times a candidate can retake the same exam. However, there are some limitations in terms of allowed time-frame in between exams.

When candidates fail the examination, they are only allowed to retake the examination once within 12 months after the first attempt. If second examination is unsuccessful, candidates will be allowed to retake the exam only after 1 year (12 months). Retake fee applies.

Only candidates, who have completed a full PECB training but fail the written exam, are eligible to retake the exam for free, under one condition:

“A candidate can only retake the exam once and this retake must occur within 12 months from the initial exam's date.”

When candidates fail the same examination for the second time, their file is automatically closed for 1 year.

CLOSING FILES

Closing a file is equivalent to rejecting a candidate's application. As a result, when candidates request that their file be reopened, PECB will no longer be bound by the conditions, standards, policies, candidate handbook or exam preparation guide that were in effect before their file was closed.

Candidates who want to request that their file be reopened must do so in writing, and pay the required fees.

EXAMINATION SECURITY

A significant component of a successful and respected professional certification credential is maintaining the security and confidentiality of the examination. PECB relies upon the ethical behaviour of certificate holders and applicants to maintain the security and confidentiality of PECB examinations. When someone who holds PECB credentials reveals information about PECB examination content, they violate the PECB Code of Ethics. PECB will take action against individuals who violate PECB Policies and the Code of Ethics. Actions taken may include permanently barring individuals from pursuing PECB credentials and revoking certifications from those who have been awarded the credential. PECB will also pursue legal action against individuals or organizations who infringe upon its copyrights, proprietary rights, and intellectual property.

SAMPLE EXAM QUESTIONS AND POSSIBLE ANSWERS

1. Interpretation of ISO clauses

For each of the following clauses of the ISO 16949 standard, please provide an action plan with at least two concrete actions that would be acceptable to ensure conformity to the clause and fulfill control objectives.

Clause 6.4 Work environment

Possible answers:

- *Ergonomics analyses of each workstation*
- *Elaboration and distribution of a survey to gather employees' perception about work environment*

2. Development of metrics

For each of the following clauses of the ISO/TS 16949 standard, please provide two examples of metrics that would be acceptable to measure the conformity to the clause.

Clause 5.1 Management Commitment

Possible answers:

Management review meetings completed to date
Average participation rates in management review meetings to date

3. Ethics

An organization has been audited and a non-conformity has been reported by the auditor. Propose corrective actions for the non-conformity and justify it.

A non-conformity has been raised because it was found that testing room and equipment were not calibrated for a period of 14 months, which rose suspicions on the accuracy of test results.

Possible answers:

Root causes: The employee did not accomplish its duties in the company

Corrective action: Understand why the employee did not accomplish the duties assigned by the company. If it was lack of training, train the employee on how and when to perform calibration and testing. If the employee has been trained but has not been completing his duties, terminate his contract, and employ a new employee to perform these duties.