Terminal Quality Management Process

Version 3.0 – September 2022

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1 Using this Manual

1.1 Scope

This document describes the process for a **Vendor** of an **Interface Module** (**IFM**) or a **Proximity Coupling Device** (**PCD**) to obtain a Terminal Quality Management Label (**TQM Label**) from Mastercard. It also describes the rules to be followed under the scheme and the rights of Mastercard and the **Vendor** concerning the **TQM Label**.

A **TQM Label** is granted if a **Vendor** complies with the TQM Requirements. These requirements are defined in Terminal Quality Management – Requirements [TQM/GEN/T02].

1.2 Audience

This document is intended for **Vendors** who wish to obtain a Terminal Quality Management Label.

1.3 Language Use

This document uses U.S. English spelling and grammar rules. Exceptionally, the local English spelling is used for proper nouns.

Verbal Forms: In this document, the following verbal forms are used:

— “shall” indicates a requirement;
— “should” indicates a recommendation;
— “may” indicates a permission;
— “can” indicates a possibility or a capability.

Information marked as “NOTE” is for guidance in understanding or clarifying the associated requirement.

1.4 Related Information

The following reference materials may be of use to the reader of this document.

EMVCo Specifications

The **EMVCo specifications** relate to two different documents depending on the technology:

EMVCo Specifications	For Contact (**IFM**) Technology: **EMVCo Specifications** Book 1 - Application Independent ICC to Terminal Interface Requirements For Contactless (**PCD**) Technology: EMVCo Contactless Specifications Book D: Contactless Communication Protocol EMVCo Book C-2 Kernel 2 Specification

Please check www.emvco.com for current applicable versions of these specifications as well as for test specifications, related test specification guidance and any related EMVCo bulletins.

Note 1
The component implementing the functionalities required by the Contact **EMVCo specifications** is called an **Interface Module** (**IFM**).

Note 2
The component implementing the functionalities required by the Contactless **EMVCo specifications** is called a **Proximity Coupling Device** (**PCD**).

Mastercard Information:

- Terminal Quality Management – Process [TQM/GEN/T01]
- Terminal Quality Management – Requirements [TQM/GEN/T02]
- Mastercard Contactless Reader Specification
- Terminal Integration Process Guide (EMV and Contactless)

The following Mastercard documents may be of use to the reader. Although not directly related to TQM, they describe other Mastercard processes for which a **TQM Label** is a pre-requisite.

- Mastercard Terminal Implementation Guide
- MTIP Process Guide
- **Vendor** Testing Guide
- Mastercard Contactless Reader Approval Process Guide

The use of an acronym, abbreviation or definition is shown in **Bold**, its meaning is described in the Appendices.

1.5 Revision

The information in this document supersedes and replaces all previous versions (including drafts) issued.

Information in this document is subject to change. Any such changes shall update the current version of the document.

2 Introduction

2.1 Background

Mastercard has developed and relies on comprehensive product testing and approval processes in order to promote worldwide interoperability at an acceptable time and cost to all parties.

The objective of these processes is to ensure that each **terminal**:

- Performs to the required **technical specifications**
- Terminals put into the field are representative of what was tested during Level 1
- Has worldwide interoperability
- Has an outstanding payment user experience

EMVCo Processes

- **Terminal Type Approval Level 1** (**TTA L1**). During **TTA L1**, the product is tested against **EMVCo specifications**.
- **Terminal Type Approval Level 2** (**TTA L2**). During **TTA L2**, the product is tested against **EMVCo specifications**.

Mastercard Processes

- Mastercard Level 2. During L2, the product is also tested against **Mastercard specifications**.

- Terminal Quality Management (TQM), ensures that the performance of the product placed into a L2 LoA device are:
  - Repeatable – ensuring that the delivered product is identical to those being delivered in future manufacturing volumes.
  - Reliable – ensuring that progressive developments of the tested product allow it to remain compliant with EMVCo and/or **Mastercard specifications**.

2.2 Requirements Overview

TQM defines a set of requirements, TQM/GEN/T02, which **Vendors** shall meet.

Meeting these requirements results in the granting of a **TQM Label**. Obtaining a **TQM Label** is mandatory for **Vendors** who wish to distribute products which shall be accepted by Mastercard for the **Acquirer**'s Terminal Integration Process (MTIP).

The TQM requirements mandate **Vendors** to operate a **Configuration Management System** to:

- Define and manage the **configuration** of their products and the impact of changes on their compliance with **EMVCo specifications** throughout the product life cycle
- Continually improve their **Configuration Management** processes.

The purpose is to obtain confidence that any product used in the field and embedding an **IFM** or a **PCD** that has successfully passed **Terminal Type Approval Level 1** and **Terminal Type Approval Level 2** / Mastercard L2, remains compliant with the EMVCo and **Mastercard specifications**.

2.3 TQM and Compliance with EMVCo Level 1 Approval

TQM provides **Vendors** with the means to demonstrate that their devices remain compliant with the **EMVCo specifications** without repeatedly undergoing formal testing.

During TTA L1, the **Device Under Test (DUT)** is tested against the requirements of **EMVCo specifications**. The part of the device subject to **EMVCo specifications** compliance is the component. The **DUT** can be a **terminal** or a standalone card reader.

The continuing compliance to **EMVCo specifications** of **DUT**s and components following the following categories of changes may be addressed via the TQM process:

New Component Version: Component resulting from modifications to a TTA L1 approved component where the modifications:

- have been handled in compliance with the TQM requirements for **change control**

  and

- have not resulted in change to the component specifications.

Derived Component: Component resulting from modifications to a TTA L1 approved component where the modifications:

- have been handled in compliance with the TQM requirements for **change control**

  and

- have resulted in change to the component specifications.

Derived Product:

- **Product** embedding a **TTA L1** approved component but different from the **DUT**

  and

- **Product** where the modifications impacting the interface to the Component have been handled in compliance with the TQM requirements for **change control**.

The environment in which the component is embedded is relevant for **EMVCo specifications**' compliance: a component working in a certain device could potentially not work in another device (e.g. due to power supply specifications or electro-magnetic interference).

If the **DUT** passes TTA L1 testing, a **Letter of Approval** is granted to the component. It demonstrates that the component is compliant with **EMVCo specifications** when embedded in this **DUT**.

What would happen to the EMVCo Level 1 compliance of the product if the component is embedded in another device?

It could be considered that as the component is not in the same environment, there is no evidence that it is still compliant with the **EMVCo specifications**. As a consequence, every time a component is embedded in a new device, compliance with Level 1 specifications shall be tested again.

However, if the device **Vendor** can demonstrate that the differences between the **DUT** and the new **product** do not have an impact on the **EMVCo specifications** compliance, a new TTA L1 is not required for the new device.

This is one of the benefits of TQM as it defines requirements that provide **Vendors** the means to verify that changes between devices do not affect compliance to **EMVCo specifications**, without going through formal TTA L1 testing.

The requirements defined for TQM shall also give **Vendors** the means to prove that minor changes to a component do not affect compliance to **EMVCo specifications**.

2.4 TQM and Compliance with Mastercard or EMVCo Level 2 Approval

TQM compliance is not a pre-requisite to the Mastercard Contactless Reader **LoA**. It should however, be noted that Mastercard **Acquirers** shall be required to provide either a Project Plan Number (PPN) or the **TQM labels** of the approved **Product** going through the Terminal Integration process (MTIP).

Production devices are expected to be strictly representative of the readers that have received a Mastercard or EMVCo Level 2 approval.

2.5 TQM Label

A **TQM Label** confirms that a **Vendor** that for a **product** embedding a particular component, all design sites referenced in the VOD (i.e. all implementation and implementation interface hardware and software design) as well as all **manufacturing sites**, is compliant with the TQM requirements as defined in TQM/GEN/T02.

As a consequence, all devices:

- Designed by this Vendor and all other design sites listed in the VOD have been successfully audited,
- Embedding the TTA L1-approved version of the component, or any new component version or any **derived component**,
- Embedding the TTA L2-approved version of the component, or any new component version or any **derived component**,
- All **manufacturing sites** for a particular component have been successfully audited,
- All **manufacturing sites** producing a particular component are listed,

then the **product** embedding a particular component is deemed to be **EMVCo Specifications** / **Mastercard specifications** compliant.

3 Applicability

3.1 Products Subject to TQM

The figure below identifies the different parts of the **Product** that are relevant for TQM.

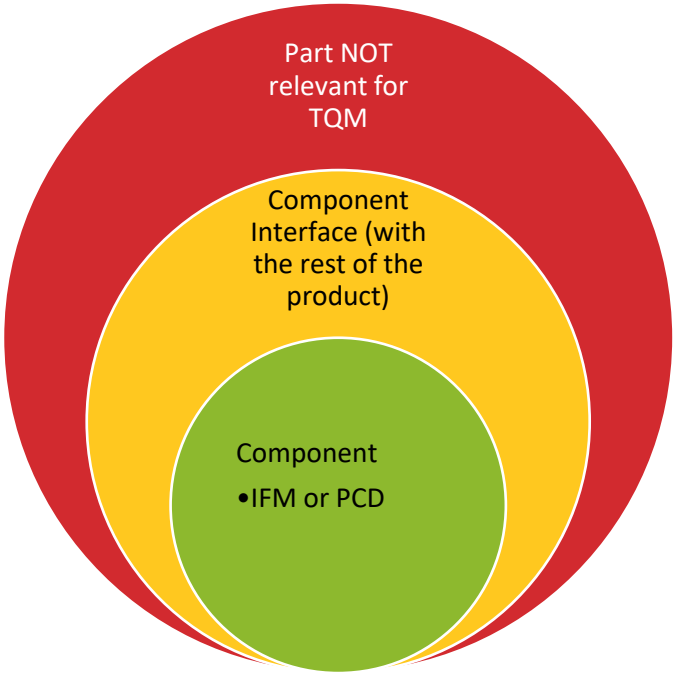

Figure 3-1 Product relevant parts

TQM focuses on two parts of the **Product**:

- The component itself, responsible for the **EMVCo Specifications** and/or **Mastercard specifications** functionalities
- The component interface, responsible for providing a correct working environment to the component.

Therefore, any **product** that embeds a component is subject to TQM.

The figure below identifies the different **product configurations** possible:

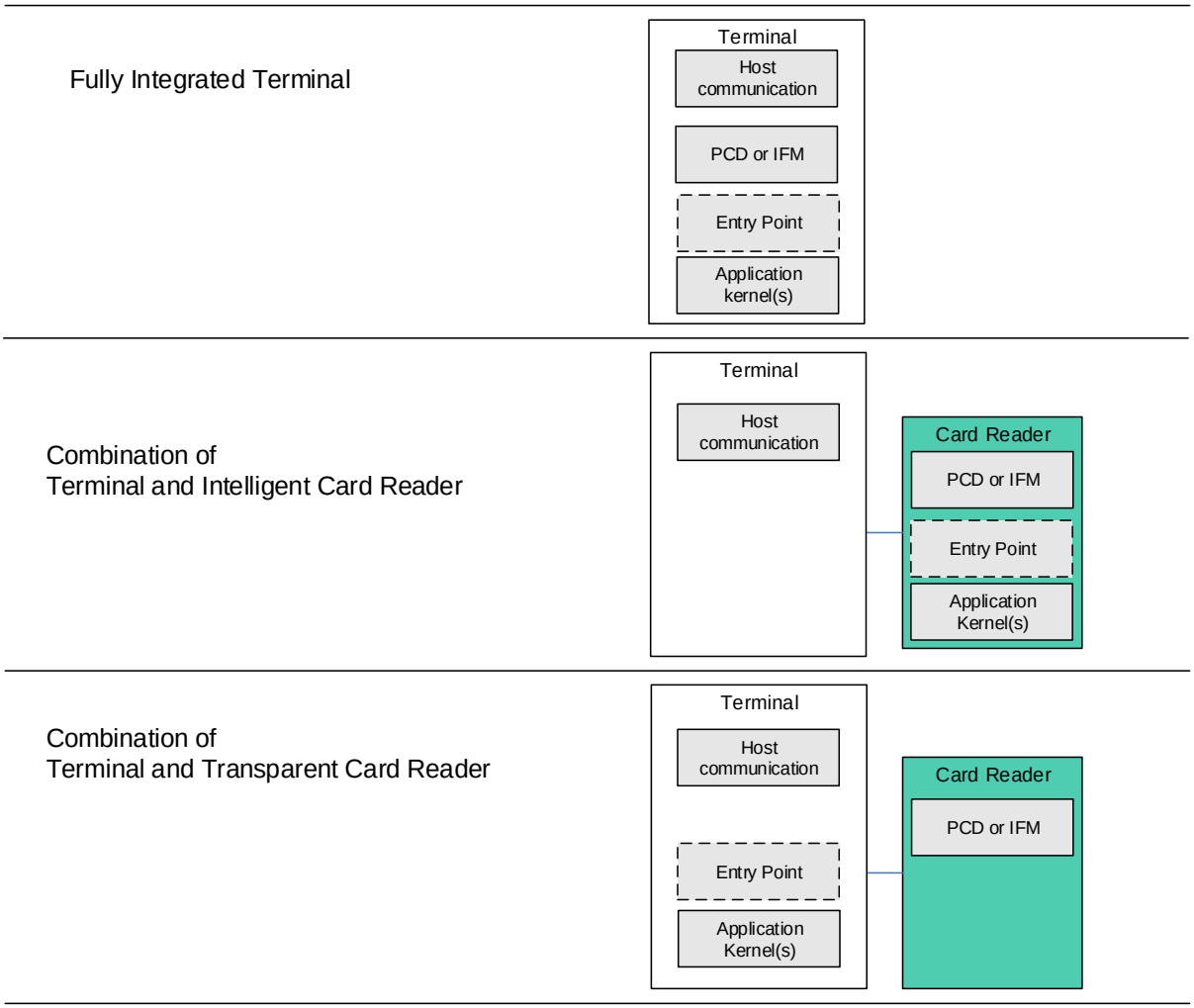

Figure 3-2 Product Configurations

Remark: Entry Point is optional in Contactless **Products**. For more information on Entry Point please go to: http://www.emvco.com/specifications.aspx?id=21

Based on these **product configurations**, the **products** that are subject to TQM are the following:

- Fully Integrated **Terminal**,
- Intelligent Card Reader,
- Transparent Card Reader.

Note:
Where a **product** embeds an **IFM** and a **PCD**, each of these components need to be submitted to TQM and the **product** shall be described in each submission.

3.2 Vendors Subject to TQM

All **Vendor configurations** (components or **products**) defined in the Terminology appendix are subject to TQM.

An original equipment manufacturer who re-brands their **product** for another **Vendor** shall be subject to audit for all of the **configurations** (components or **products**) that they design and manufacture.

3.3 TQM Label Validity

A **TQM Label** is valid for a **product** embedding a component produced in a specific **manufacturing site** and when all of the following conditions are fulfilled:

- The label has not expired
- The label is owned by the **Vendor** of the **product** embedding the specific component,
- The component embedded in the **product** is strictly identical to the one referenced in the **TQM Label** (or a **new component version** or a **derived component**),
- All design and manufacturing sites are listed in the VOD and have been successfully audited
- The label refers to all of the specific **manufacturing site**(s) used to manufacture the **product**.

Refer to the **TQM Label** Granting Process section of this document for guidance on how to obtain TQM approval.

4 TQM Label Granting Process Overview

This section outlines the process **Vendors** shall follow to obtain or renew a **TQM Label**.

4.1 Vendor Registration and Agreement with Assessment Body

A **Vendor** shall contact the **Assessment Body** to express their interest in the TQM Process.

The **Assessment Body** shall provide them with the information relevant to an application. The **Vendor** shall complete a Client Account Application which shall be submitted to the **Assessment Body**. Once approved by the **Assessment Body**, the **Assessment Body** shall liaise with the **Vendor** to begin the assessment process.

4.2 Product Registration

The **Assessment Body** shall review the **Vendor**'s list of components as stated in the application form and identify which of them need to be submitted to the **Assessment Body** for TQM assessment.

The **Assessment Body** shall identify the fees to be paid by the **Vendor** for TQM assessment. This is in accordance with the scale of fees set by Mastercard.

The **Assessment Body** will require payment of all of the fees before proceeding further with the TQM process. An assessment proposal shall be issued to the **Vendor**.

Project Plan Numbers (PPN) are issued once the **Vendor** has

- submitted the required documentation to the **Assessment Body**
- committed to an audit date for design and Manufacturing facilities
- placed a formal order.

The Project Plan Number shall be used as a reference for all information exchanges during the assessment process until the **TQM Label** granting process is completed.

Project Plan Numbers are valid for a limited period of six months. It is expected that audits of the design and **manufacturing sites** are carried out during the first four months of this time frame.

4.3 TQM Questionnaire Completion

The **Vendor** shall complete and submit the Type Identification Description (TID), defining the **Product Configuration**, including all supporting documents for each component.

- A TID is required to be submitted for every component specified within the TQM application.
- When a **Vendor** has made a change to the component which affects the TTA L1 they shall submit a revised TID, all supporting documents and the new L1 LoA.
- In the case where the L1 LoA is updated and no changes have been made to the design, the previous and current L1 LoAs must accompany the revised TID and all supporting documents.

The **Vendor** shall also complete and submit a Vendor Organization Description (VOD) including all supporting documents. The VOD describes the compliance of the **Vendor**'s **product configuration management** to the TQM requirements.

- A VOD is required to be submitted for a **Vendor**'s first application and must reference all design, manufacturing and service organisations / sites. If any changes are made to the design, manufacturing or service organisations / sites an updated VOD shall be submitted.
- When a **Vendor** has made a change to their **configuration management system** that can have an impact on the last VOD assessment they shall submit a revised VOD.
- A **Vendor** shall submit a VOD for full assessment at least every 24 months, even if there have been no changes.

If all of the TID or VOD supporting documents have not been submitted within three months of the application, the application may be cancelled and the **Vendor** shall need to reapply once they are able to submit the required documentation.

4.4 TQM Compliance Assessment

The TID(s) and VOD are submitted to the **Assessment Body** for assessment.

The **Assessment Body** performs the assessment, prepares an assessment review recommendation and as a result may:

- Conclude that TQM documentation requirements are met.

- Specify further information to be supplied. Up to two requests for further information may be made.

  If the **Vendor** is unable to supply the requested information after two requests or within one month of the query / queries raised, the application may be cancelled and the **Vendor** shall need to reapply once they are able to submit the required information.

  The **Vendor** shall be charged as if for a new application in this instance.

- Mandate an audit

4.5 TQM Audit overview

Audits of all the design and manufacturing facilities within the scope of TQM (i.e. declared in the VOD) are required for all new applicants and shall be performed within three months after issuing the Project Plan Number.

For all TQM applicants, the **Assessment Body** shall prepare an **Audit Schedule** for submittal to the **Vendor**.

If deviations from TQM requirements are found during the audit, the **Vendor** shall commit to a **Corrective Action Plan**. (Refer to the detailed 'TQM audit' section)

The **Assessment Body** shall select the frequency of the next audit based upon the ranking given in the previous audit and from any additional TID and VOD assessments.

4.5.1 Multisite auditing

A **Vendor** with multiple design or manufacturing facilities shall have all sites initially audited over a 18 month period.

The **Assessment Body** shall generate an 18 month audit plan detailing the year of the first audit for all of the design and manufacturing facilities. The **Assessment Body** shall select the frequency of the next audit based upon the ranking given in the previous audit.

4.5.2 Audit duration

Vendors with ISO 9001 (or equivalent) certification
A standard audit for a **Vendor** who designs and manufactures four or less **IFM**(s) and **PCD**(s) is:

- 1.5 Day audit where the design and manufacturing are at the same facility
- Two 1 Day audits where the design and manufacturing are at different facilities.

Each additional design or manufacturing facility shall initiate a separate audit in accordance with Multisite auditing.

For **Vendor**(s) who design and manufacturer more than four **IFM**(s) and **PCD**(s), the duration of the audit shall be increased depending on the total number of **IFM**(s) or **PCD**(s) within the **configuration management system**.

For ISO 9001 and equivalent certification: See TQM/GEN/T02, Management System Requirements

Vendors without ISO 9001 (or equivalent) certification

As well as the time required to assess compliance to the TQM requirements, audits for **Vendors** that do not have current ISO 9001 certification or equivalent (See TQM/GEN/T02 Management System Requirements) shall require additional on site time for the audit.

This additional time is needed to assess the **Vendor**'s Quality Management System to ensure that the supporting aspects of the ISO9001 version required by TQM/GEN/T02 is present and effective.

The additional time shall be determined from the outcome of the VOD and TID assessments as well as the previous audit results (if applicable).

4.6 Recommendation to Mastercard

The **Assessment Body** shall present the TQM recommendation to Mastercard and shall make appropriate recommendations to grant, renew or reject the **TQM Label**(s).

The recommendation submission shall be subject to every TQM requirement fulfilment.

4.7 Statement of Conformity (SoC)

Mastercard shall assess the recommendation issued by the **Assessment Body** and make the final decision whether to grant, renew or reject the **TQM Label**.

The **Assessment Body** shall issue the Signed **SoC** to the **Vendor** once received from Mastercard.

The SoC is valid for 12 months. It is not linked to the audit's frequency.

4.8 Compliance Monitoring

Mastercard retains the right to monitor or examine TQM conformity as and when required.

4.9 Renewal

TID No Change Declaration (NCD)

Vendors shall supply to the **Assessment Body** a No Change Declaration if there have been no changes since the last full TID assessment, the **product** has entered the end of the life cycle (not being manufactured though requiring a SoC).

If there have been any changes to the implementation or implementation interface, then the **Vendor** shall submit an application for a full TID assessment which shall also include all of the change documentation (e.g. ECR, ECN and all supporting documents).

VOD NCD

Vendors shall supply to the Assessment Body a No Change Declaration if there have been no significant changes to the **Configuration Management System** since the last full VOD assessment. If there have been changes to the design, manufacturing or service organisations / sites, a full VOD assessment is required.

Refer to the "TQM Questionnaire Completion" section for the 'full VOD assessment' criteria.

4.10 On-going Compliance

Vendors shall maintain conformity of their **products** with the **L1 LoA** and have a robust and compliant **Configuration Management System** in place.

The following changes shall be immediately declared to the **Assessment Body**:

- Any change on **components** affecting the build state of the **product** (Part A and / or Part B1 **configuration** items) that affects the previous full TID assessment or the **L1 LoA**
- The **product** / **component** has a new **L1 LoA**
- The **product** has entered an end-of-life cycle (i.e. will no longer be manufactured and will not require a renewed SoC)
- There have been significant changes to the Configuration Management System since the last full VOD assessment
- There have been changes to the design, manufacturing or service organisations / sites
- The current SoC is no longer required.

4.11 TQM Termination

TQM Termination defines the circumstances under which either the **Vendor** or Mastercard can terminate **TQM Labels** or the **Vendor**'s involvement in the TQM program.

5 TQM Label Granting Process

This section details the procedure a **Vendor** shall follow to obtain or renew a **TQM Label**.

5.1 Vendor Registration / Application

5.1.1 Purpose

The objective of this registration is to ensure that all specifications and procedures governing Mastercard TQM are understood and accepted by the **Vendor**.

The registration also includes legal clauses regarding confidentiality, liability, etc.

Mastercard has determined that the assessment of documentation and any associated audit are undertaken by an **Assessment Body**.

TÜV SÜD - Product Service Division is the **Assessment Body** for the TQM scheme.

5.1.2 Procedure

1. The **Vendor** contacts the **Assessment Body** for a document pack containing the following documents:
    a. Terminal Quality Management Process – TQM/GEN/T01.
    b. Terminal Quality Management Requirements – TQM/GEN/T02.
    c. Type Identification Description form – TQM/TEM/T01.
    d. Vendor Organization Description form – TQM/TEM/T02.
    e. Application Form – AF054.
    f. Client Account Application form.

2. The **Vendor** completes the Application Form.

3. If the **Vendor** does not have an existing account with the **Assessment Body**, the **Vendor** shall complete the Client Account Application form.

4. The completed forms are returned to the **Assessment Body**.

5. The **Assessment Body** shall acknowledge receipt of the submitted forms.

6. The **Assessment Body** shall supply to the **Vendor** an assessment proposal.

7. The **Vendor** submits a purchase order in line with the assessment proposal.

8. For New applicants that have submitted the required documents with a purchase order and where their facilities have not been audited yet (audit dates must be agreed), the **Assessment Body** shall check the status of each **component** and assign a TQM PPN valid for six months.

9. For existing **Vendors** who hold one or more valid **TQM labels** and who have had at least one design and one **manufacturing site** audited resulting in an A or B Ranking, upon receipt of a valid purchase order the **Assessment Body** shall check the status of each **component** and assign a **TQM Label**.

10. For **Vendors**' sites audited resulting with a Rank C, the **Assessment Body** shall assess the justification for extending the PPN.

11. For existing **Vendors** with a Rank D, the **Assessment Body** shall revoke the PPN as well as informing Mastercard and MTIP accordingly.

Note 1
Should the **Vendor** company name change, this shall be advised to the **Assessment Body** in writing along with submitting supporting evidence.

Note 2
It should be noted that the **TQM Label** shall have the exact same **Vendor** company name as the one listed on both the EMVCo website and **L1 LoA** certificate. The TQM label shall reference the same 'as tested in', product name and L1 LoA number as detailed on the L1 LoA issued by EMVCo.

Note 3
Mastercard is not responsible for the terms and conditions of the contract in place between the **Vendor** and the **Assessment Body**. However, Mastercard is involved in setting the assessment fees.

5.2 Completion of TQM Documents

5.2.1 Purpose

The completion of TQM Questionnaires has the following objectives:

- To describe the current **Vendor** organization at the time of the **TQM Label** request.
- To identify the **configuration** of **components** submitted to the TTA L1 process.
- To describe the **configuration management** applied to the **components** and **products** embedding them.
- To identify any changes to the **Vendor**'s organization (site changes, process changes) or **product configuration** (**derived components**, **new component versions**, **derived products**) which have occurred since the previous **TQM Label** assessment.

5.2.2 Procedure

1. The **Vendor** shall complete a "Vendor Organization Description" form (VOD).

   The objective of the VOD is to demonstrate compliance of the **Vendor**'s **Configuration Management System** with the requirements, whatever the **component** and the related **Products**.

   Note 1
   When a **Vendor** requests **TQM Labels** for several **components**, only one VOD needs to be submitted.

   Note 2
   When submitting a VOD for assessment, the Vendor shall include all TQM terminals or implementations in order to reflect the correct status at the time of submission.

   Note 3
   Refer to the "TQM Questionnaire Completion" section for the frequency of resubmitting a full VOD for assessment.

2. The **Vendor** shall complete a "Type Identification Description" form (TID) for each **component** (Derived components can be added to the TID for the main **component**)

   A separate TID will be required for each **IFM component** and **PCD component**.

3. The objective of the TID is to demonstrate the compliance of the **configuration management** of the **component** and any related **products** with the TQM requirements.

Note 4
All documentation supplied to support a TID or VOD shall be in Word format.

Note 5
All documentation supplied to support a TID or VOD shall be in **English**.

6 TQM VOD and TID Assessments

6.1 Purpose

TQM Compliance Assessments have the following objectives:

- To verify the compliance with the TQM requirements of:
  - The **Vendor**'s organization
  - The **configuration management** of the **component**(s) and related **products**
- To determine what, if any, further actions are needed to obtain a **TQM Label**.

6.2 Procedure

1. The **Vendor** shall submit the following documents to the **Assessment Body** at the time of application.
   - The VOD
   - The TID for each **product**
   - The EMVCo **L1 LoA**
   - Application Form

2. For existing **Vendors** that have a Rank A following an audit(s), a **TQM Label** recommendation can be submitted to Mastercard assuming that:
   - The **Assessment Body** receives a purchase order
   - The **Vendor** has agreed audit dates for both their manufacturing and design facilities
   - The **Vendor** submits valid VOD and TID(s), as appropriate along with all the required supporting documents.

3. For existing **Vendors** that have a Rank B following an audit(s), a **TQM Label** recommendation can be submitted to Mastercard assuming that:
   - The **Assessment Body** receives a purchase order
   - The **Vendor** has agreed audit dates for both their manufacturing and design facilities
   - The **Vendor** submits valid VOD and TID(s), as appropriate along with all the required supporting documents.
   - The relevant **corrective action plan**(s) (CAP) have been accepted and signed off by the auditor.

4. For new **Vendors** entering the TQM scheme or for existing **Vendors** that have a Rank C following an audit(s), a **TQM Label** recommendation can be submitted to Mastercard assuming that:
   - The **Assessment Body** receives a purchase order
   - The **Vendor** has agreed audit dates for both their manufacturing and design facilities
   - The **Vendor** submits valid VOD and TID(s), as appropriate along with all the required supporting documents.

- The relevant **corrective action plan**(s) (CAP) as well as the corrective evidence has been accepted and signed off by the auditor.

If required, the **Assessment Body** shall assess the justification for extending the PPN.

5. For new **Vendors** entering the TQM scheme or for existing **Vendors** that have a Rank D following an audit(s), the Project Plan Number (PPN) is revoked and Mastercard and MTIP are informed accordingly.

6. Where a PPN is issued, the PPN notification shall advise of the following:
   - The **product** name and it's associated **L1 LoA**
   - The Date of expiry of the issued PPN
   - The Project Plan Number (PPN)
   - The dates of the next scheduled audits.

7. The **Assessment Body** performs the assessment of the documents submitted by the **Vendor** and prepares the assessment reports.

8. The assessment reports shall state a conclusion based upon the documented evidence of the **Vendor**'s compliance with TQM requirements for each **component**.

   a. The **Assessment Body** shall decide whether the information provided is sufficient to verify that the **Vendor** complies with TQM requirements.
      i. If the information provided is insufficient, further information will be requested from the **Vendor**.
   b. The **Assessment Body** shall determine whether the information provided is sufficient to decide for an audit to be conducted on both manufacturing and design facilities.
      i. If the information provided is insufficient, further information shall be requested from the **Vendor**.

Only three (3) document submissions may be made to the **Assessment Body**. If the information is still insufficient, the application shall be terminated and the PPN / **TQM Label** revoked. The **Vendor** shall need to re-apply once they have the required information.

In the case of a terminated application the **Assessment Body** shall charge the **Vendor** for work completed to date.

In case of a new TQM applicant, the **Vendor** shall commit to timely closure of the design and manufacturing **corrective action plans** with the **Assessment Body** before the PPN expiry date.

The period between audits shall be determined on the outcomes of the audits.

7 TQM Audit

7.1 Purpose

TQM audits are conducted to meet the following objectives:

- Verify the information submitted in the VOD and TIDs are those which are being adhered to at the design and manufacturing facilities.
- Resolve any outstanding issue(s) found during the TID and VOD assessments.
- Form part of the recommendation to Mastercard for issuing an SoC.
- Determines frequency and timing of the next audit.

Note:
(From ISO 17021-1) An audit is based on sampling within an organization's management system and therefore is not a guarantee of 100 % conformity with requirements.

7.2 Procedure

1. The **Vendor** and the **Assessment Body** agree on a date for the audit to be conducted in the design and manufacturing facilities of the **Vendor**.

2. The **Assessment Body** shall send the following documentation to the **Vendor**
   - Audit proposal
   - **Audit schedule**(s)

3. Upon receipt of a valid purchase order for the audit proposal, the **Assessment Body** shall finalize the audit details and advise the **Vendor** accordingly.

   Failure to facilitate an audit shall result in withdrawal of all **TQM Labels**.

4. The **Assessment Body** conducts the audits.

5. Upon completion of the audit, the auditor shall (within 7 days of the audit) provide a draft report to the Assessment Body along with any agreed corrective actions (corrective actions list).

6. If deviations from TQM requirements are found during the audit, the **Vendor** shall commit to a **Corrective Action Plan**.

   For both Major and Minor nonconformities, the **Assessment Body** shall assess the **corrective action plan** response of the root cause analysis as well as the proposed correction for the deviation as well as the correction for the root cause.

   The **corrective action plan** is required for all nonconformities raised and is due no later than 30 days after receiving the corrective action list from the audit.

Major nonconformities will require evidence to be provided that will be assessed for the correction of the deviation as well as the correction of the root cause and that they are likely to be effective.

The **Major nonconformity** evidence required is due no later than 90 days after receiving the corrective action list from the audit.

If extra time is required to complete the **corrective action plan** or to submit the required evidence for Major nonconformities a request shall be made to the **Assessment Body** to consider a possible extension.

7. The **Assessment Body** shall make a decision as to the **Vendor**'s audit ranking to determine the next audit date. This is based upon the number and severity of non-conformities found during the audit. Details of the audit rank descriptions can be found in Table 1.

   Acquiring a post-audit ranking of C (Major nonconformities) (see Table 1) from three consecutive audits the ranking shall be automatically be converted to a ranking of D.

   If the ranking from the previous audit was Category D, the **Vendor** shall re-submit both a VOD and TID(s) in their entirety to be evaluated. These shall be submitted within one month of the previous audit taking place. The **Assessment Body** shall arrange for an unscheduled audit to be performed at a selected date (i.e. between three and six months from the previous audit).

   Acquiring a post-audit ranking of D (see Table 1) from two consecutive audits shall be referred to Mastercard, who shall determine what appropriate action should be taken.

8. Once the **Vendor** has completed and submitted the corrective actions to the auditor the **Assessment Body** shall liaise with the auditor to determine whether the **corrective action plan** is acceptable.

9. Once the **corrective action plan** (and, if applicable, **Major nonconformity** evidence) is accepted, the **Assessment Body** shall submit its recommendation to Mastercard.

   It is expected that the implementation of corrective actions for nonconformities and their root causes are within three months of receiving the corrective action list.

Audit Ranking	Description
A	Previous audit Rank A or B and no non-conformities found at this audit. Action plan is not required.
B	Previous audit Rank C: No non-conformities found at this audit. Action plan is not required. Previous audit Rank A, B or C: Minor non-conformity(s). **Corrective action plan** required. Time frame for delivery of action plan 30 days.
C	Initial audit: No non-conformities found. Action plan is not required. Initial audit: Minor non-conformity(s). **Corrective action plan** required. Time frame for delivery of action plan 30 days. Previous audit Rank D: No non-conformities found at this audit. Action plan is not required. Previous audit Rank D: Minor non-conformity(s). **Corrective action plan** required. Time frame for delivery of action plan 30 days. All audits: Major non-conformity(s). **Corrective action plan** required. Time frame for delivery of action plan 30 days. Verification of effectiveness of implemented actions to prevent reoccurrence to be submitted within 90 days.
D	If a finding is found that raises significant doubt that control of the manufactured **products** is in place, the **TQM Label** shall be postponed / suspended until the next audit and corrective actions plan required within 30 days. The next audit will be planned for the earliest convenient date to validate the resolution of actions taken to prevent re-occurrence of non-conformities.

Table 1 - Audit Rank Descriptions

Audit Rank	Previous Rank	Re-assessment after remote audit no later than *(When remote audits are allowed by Mastercard)*	Re-assessment after on-site audit no later than
A	A	36 months	36 months
	B	24 months	
B	A or B	24 months	24 months
	C	18 months	
C	A, B, C, D Initial Audit	12 months	12 months
D	Any	Decided by Mastercard on a case-by-case basis	Re-audit ASAP
Note:	Rank can only improve by one step from the previous audit. The best result from an initial audit is C.		

Table 2 - Audit Frequency

There is no Link between the Audit frequency and the SoC validity that is limited to 12 months.

8 TQM Label(s) Recommendation

8.1 Purpose

The **TQM Label**(s) Recommendation is designed to advise Mastercard that the **Assessment Body** has assessed all documents submitted in relation to the TQM application.

The **TQM Label**(s) recommendation confirms that the **Vendor** meets the TQM requirements and that the **Assessment Body** has no objection to a SoC being granted.

8.2 Procedure

The **Assessment body** submits its recommendation to Mastercard.

9 Statement of Compliance (SoC)

9.1 Purpose

Issuing an SoC assigns a valid **TQM Label** to a **Vendor**'s **product** enabling it to be used with an EMVCo approved payment **terminal**.

9.2 Procedure

Once Mastercard receives the recommendation pack from the **Assessment Body**, Mastercard shall:

1. Review the **Assessment Body**'s recommendation and assess the documents submitted with the recommendation
2. Issue the SoC to the **Assessment Body**

Upon reception of Mastercard's feedback, the **Assessment Body** shall:

1. Send the SoC to the **Vendor**
2. Grant **TQM Label**(s) for the submitted **products**

Note
If Mastercard disagrees with the recommendation submitted by the **Assessment Body**, the **Vendor** would be required to re-apply for **TQM Label**(s) and restart the assessment process.

10 Renewal

10.1 Purpose

A **Statement of Compliance** has a validity of twelve months. If a **Vendor** requires their **SoC** to be renewed after the 12 month period, this procedure shall be followed.

10.2 Procedure

1. Three months before a **SoC** expires the **Assessment Body** shall contact the **Vendor** to ascertain whether they wish to maintain the validity of the **SoC**(s), whether a **component** is end of life or whether a **component** no longer requires a **SoC**(s).

2. If the **Vendor** informs the **Assessment Body** by means of an e-mail that there have been no changes to the **product** (Part A and / or Part B1 **configuration items**) since the previous full TID assessment or significant changes to the **Configuration Management System** since the previous full VOD assessment and that they wish to apply for a further year's validity, if all audits have been completed according to the schedule agreed with the **Assessment Body** and all **corrective action plans** are closed, the following simplified process shall apply:

    a. The **Assessment Body** shall send the **Vendor**:
        i. an assessment proposal
        ii. a TID 'no change declaration' (NCD) (if applicable)
        iii. a VOD NCD (if applicable)
    b. The **Vendor** shall agree to the next audit date for their design and manufacturing facilities, based on the audit frequency determined by the audit ranking specified in Table 2.
    c. Upon receipt of a signed No Change Declaration and a valid purchase order a brief assessment will be conducted. Upon successful completion of the assessment(s), the **SoC** shall be re-issued to the **Vendor** for a further twelve month period.

3. If the **Vendor** advises that there have been significant changes to the **Configuration Management System** since the previous full VOD assessment or if there have been any changes to the **product** (Part A and / or Part B1 **configuration items**) since the previous full TID assessment, then the **SoC** shall not be renewed until the **Assessment Body** has re-assessed the **Vendor**'s TQM Documentation to verify that the **L1 LoA** validity has not been compromised.
    a. The **Assessment Body** shall issue an assessment proposal to the **Vendor**.
    b. The **Vendor** shall submit an updated TID(s) and VOD documenting the changes, as appropriate.
    c. Upon receipt of a valid purchase order, the **Assessment Body** shall verify the changes by means of the submitted documentation.
    d. If the **Assessment Body** cannot verify the changes from the documentation review, then an audit may be mandated.

Changes, including changes planned up to the time of the **SoC** expiry date, are to be submitted to the **Assessment Body** no later than 3 months prior to the **SoC** expiry date. Failure to do so may cause delays to issuing the **SoC**.
The **SoC** shall only be renewed after:

a. The **Assessment Body** has verified the declared changes.
b. All audits have been completed according to the schedule agreed with the **Assessment Body** and all **corrective action plans** have been closed.
c. The **Vendor** has agreed to the next audit date for their design, manufacturing and service facilities, based on the audit frequency determined by the audit ranking specified in Table 2.

The **Vendor** shall then comply with the Ongoing Compliance Procedure.

Only three (3) document submittals may be made to the **Assessment Body**. If the information is still insufficient, the application shall be terminated, the PPN revoked and the **Vendor** shall need to re-apply once they have the required information.

In the case of a terminated application, the **Assessment Body** shall charge the **Vendor** for work completed to date.

4. If the **Vendor** advises that a **component** is no longer being manufactured, but still requires a valid **SoC**, an End of Life declaration is to be submitted to the **Assessment Body**.

   Contact the **Assessment Body** for the End of Life form (mastercard.tqm@tuv-sud.co.uk)

   a. The **Assessment Body** shall then send the **Vendor** an End of Life Declaration along with an Assessment Proposal.
   b. Upon receipt of a signed End of Life Declaration and a valid purchase order, the **SoC** shall be re-issued to the **Vendor** for a further twelve-month period.
   c. The **Assessment Body** shall set the **product** status as End of Life and shall not contact the **Vendor** regarding subsequent renewals.

5. If the **Vendor** advises that a **component** no longer requires a **SoC**, the **Assessment Body** shall reference the **product** as "**SoC** not required"

Note
Changes are defined in TQM/GEN/T02, Change Control.

11 Ongoing Compliance

11.1 Purpose

Vendors shall maintain the conformity of **component**(s) throughout the **component**(s) lifecycle and shall immediately notify the **Assessment Body** of any changes to a **component**

The **Assessment Body** shall ensure that the composition of all **products** referenced within a **SoC** is accurately recorded throughout the **component**(s) lifecycle.

Level 2 is within the scope of the audit programme.

11.2 Procedure

1. Once a **PCD** or **IFM** has been integrated into a Level 2 device, the Level 2 **configuration** control is within the scope of the audit.

2. The **Assessment Body** shall be notified immediately of any change on components affecting the build state of the product (Part A and / or Part B1 configuration items) that affects the previous full TID assessment or the **L1 LoA**, renewal of the **L1 LoA** or any significant change to the **Configuration Management System** since the previous full VOD assessment.

3. The following documentation shall be submitted to the **Assessment Body** following any change
    - A revised TID detailing the change to the build standard of the **component** as well as all supporting documents.
    - The new **L1 LoA** associated with the changes
    - In the case where the **L1 LoA** is updated and no changes have been made to the design, the previous and current **L1 LoA**s must accompany the revised TID and all supporting documents.
    - A revised VOD detailing the changes to the **Configuration Management System**, design, manufacturing or service organisations and sites as well as all supporting documents.

4. Upon receipt of a valid purchase order and of assessment documentation, the **Assessment Body** shall verify the changes by reviewing the submitted documentation.

5. If the **Assessment Body** is unable to verify the changes by reviewing the documentation, an audit may be mandated.

12 TQM Termination

Both Mastercard and the **Vendor** reserve the right to terminate a **TQM Label** application at any time.

Should the **Vendor** terminate the application, an assessment as to the level of work completed shall be estimated and appropriate charges shall be passed on to the **Vendor**.

12.1 Termination of TQM Labels by Mastercard

Mastercard retains the right to terminate with immediate effect a specific **TQM Label** or all **TQM Labels** granted to the **Vendor**.

This termination may occur under certain conditions, including, but not limited to:

- Non-compliance to the Mastercard TQM program.
- Non-adherence to TEM/GEN/T01 and TEM/GEN/T02 (among which can be listed field interoperability issues based on suspected discrepancies between approved **products** and deployed **products**).
- Failure to perform acceptable corrective actions.

If Mastercard is considering termination, the **Vendor** shall be notified by letter. The letter may specify corrective action(s) with timescales and potentially a probation period. Should Mastercard remain dissatisfied with the **Vendor**'s performance, the **TQM Label**(s) shall be terminated.

Mastercard shall notify the **Vendor** that the **TQM Label** has been terminated.

Should a non-conformity or misrepresented information be discovered, Mastercard shall judge the seriousness of the non-conformity, or non-conformities and may decide not to grant / renew **TQM Label**(s) or to revoke the current Label(s).

In this case Mastercard shall inform the **Vendor** within four weeks and give the reasons for its decision.

12.2 Termination of TQM Labels by the Vendor

Should the **Vendor** decide to be no longer associated with the TQM program, the **Vendor** shall immediately inform the **Assessment Body**.

The **Assessment Body** shall notify Mastercard and the validity of the **Vendor**'s **TQM Label**s shall be terminated immediately.

Any advertisements regarding the **component**(s) previously issued **TQM Label** shall be stopped with immediate effect.

13 TQM Management

13.1 Improvement Proposals

Mastercard welcomes any proposals to improve the TQM process.

Improvement proposals should be sent to Mastercard directly at the email address below.

tqm_support@mastercard.com

Mastercard shall review all proposals for improvement and respond to them within one month.

13.2 Resolution of Conflicts

All conflicts concerning the application of the procedures of Mastercard TQM should be directed to:

tqm_support@mastercard.com

Mastercard shall take all necessary steps to resolve any conflicts.

Appendices

Appendix 1 - Acronyms

The following acronyms are used in this document:

Abbreviation	Description
DUT	Device Under Test
IFM	Interface Module
LoA	Letter of Approval
L1 LoA	EMVCo Level 1 - Letter of Approval
L2 LoA	EMVCo or Mastercard Level 2 - Letter of Approval
MTIP	Mastercard Terminal Integration Process
NCD	No Change Declaration
PCD	Proximity Coupling Device
PPN	Project Plan Number
SoC	Statement of Compliance
TID	Type Identification Description
TTA L1	Terminal Type Approval Level 1
TTA L2	Terminal Type Approval Level 2
TQM	Terminal Quality Management
VOD	Vendor Organization Description

Appendix 2 - Terminology

The following terminology is used in this document:

Acquirer: An individual or organization that procures **components**. An acquiring bank (or acquirer) is a bank or financial institution that processes credit or debit card payments on behalf of a merchant.

Assessment Body: Entity accredited and mandated by Mastercard to assess whether **Vendors** comply with **TQM Label** requirements.

Audit Schedule: Mastercard's mandate to carry out an audit within the scope of TQM.

Change Control: Element of **Configuration Management** comprising the evaluation, coordination, approval and implementation of changes to **Configuration Items** after formal approval of their **Configuration Information**. The change may also be rejected after evaluation.

Component: IFM or **PCD** devices embedding Contact, Contactless or both payment technologies. A Component may also be referred to as a module.

Configuration: Functional and physical characteristics of a **product**, as defined in technical documents and achieved in the **product**.

Configuration Information: Requirements for **product** design, realization, verification, operation and support. **Product configuration information** comprises both **product** definition and **product** operational information. [ISO 10007:2017]

Configuration Item (CI): Entity within a **Configuration** that satisfies an end use function. [ISO 10007:2017].

Configuration Management: Coordinated activities to direct and control **configuration**. [ISO 10007:2017]

Configuration Management System: Systems, processes and tools used to control and manage **configuration items** and **configuration information**.

Corrective Action Plan: Documented response to nonconformities raised at audit stating the root cause as well as the proposed correction for the nonconformity as well as the correction for the root cause.
Note: Root cause statements such as 'Mistake', 'Typo', 'Human error' etc. are symptoms of a root cause and will not be accepted as the root cause.

Derived Component: Component resulting from modifications to a TTA L1-approved or TTA L2-approved component where the modifications:

(1) have been handled in compliance with the TQM requirements for **change control** and
(2) did result in change to the component specifications.

Derived Product:

(1) **Product** embedding a TTA L1 and TTA L2 approved components, but different from the **DUT** tested during TTA L1 and/or TTA L2

(2) where the modifications impacting the interface to the component have been handled in compliance with the TQM requirements for **change control**.

Device Under Test (DUT): Product that was manufactured and submitted for testing to TTA L1 (includes debug testing prior to the formal TTA run).

EMVCo Specifications: Reference Specifications against which the component is tested for TTA L1 or TTA L2. (See section "Related Information").

Interface Module (IFM): Implementation of the **Technical Specifications** for Contact **Terminal** Level 1.

Item: Non-specific term used to denote any **product**, including systems, subsystems, assemblies, sub-assemblies, units, sets, accessories, components, computer programs, computer software or parts.

Letter of Approval (LoA): See "**Terminal** Type Approval Level 1 Letter of Approval".

Major Nonconfority:
ISO/IEC 17021-1 defines a Major nonconformity as:
'nonconformity that affects the capability of the management system to achieve the intended results'

The choice of category reflects the significance of the nonconformity. The most serious category or Major nonconformity relates to:

- The absence of a required process or its total breakdown
- The absence of, or the failure to implement and maintain, all aspects of one or more requirements.
- A number of findings related to the same clause of a requirement or element of a planned arrangement
- A **minor nonconformity** that was previously issued and not addressed effectively.
- A situation that raises significant doubt about the ability of the management system to achieve its intended outputs
- Where planned arrangements have not been followed and where these lapses would have a serious impact on the organisation or product configuration
- A significant error or omission in the VOD (the VOD shall be re-submitted for assessment)

  Examples (but not limited to):

  A manufacturing site not declared. [such as PCB assembly (SMT) manufacturing]

  A design site not declared.

  A site with incorrectly declared scope of activities, such as (but not limited to):

  Manufacturing site declared as a product assembly site but PCB assembly is also carried out at that site

  A site carrying out software design only when declared as hardware and software design.

  A site carrying out hardware design only when declared as hardware and software design.

  A site carrying out hardware and software design when declared as software design only.

  A site carrying out hardware and software design when declared as hardware design only.

  etc.

Minor Nonconfority:
ISO/IEC 17021-1 defines a Minor nonconformity as:
'nonconformity that does not affect the capability of the management system to achieve the intended results'

A Minor nonconformity would be where planned arrangements have been followed but not strictly to the letter and where these isolated lapses would not have a serious impact on the organisation or **product configuration**.

Management System: A set of interrelated or interacting elements of an organisation to establish policies, objectives and processes to achieve those objectives.

Manufacturing site: A manufacturing site or organisation (which includes a Vendor manufacturing department) may be a **Vendor** or **supplier** entity. Manufacturing activities included in TQM (but not limited to) are PCB assembly, **Component** and **Product** assembly, Software loading, Functional testing.

Mastercard Specifications: Reference Specifications against which the component is tested for TTA L2.

New Component Version: Component resulting from modifications to a TTA L1 approved component where the modifications (1) have been handled in compliance with the TQM requirements for **change control** and (2) did not require a change to the component specifications.

Proximity Coupling Device (PCD): Implementation of the **Technical Specifications** for Contactless **Terminal** Level 1.

Product: Device embedding the Implementation and the Implementation Environment (Component). It can be either a **terminal** or a standalone card reader.

Statement of Compliance (SoC): Document issued by Mastercard via the **Assessment Body** and renewed annually, which lists the Labels issued to the **Vendor**.

Supplier: Entity having an agreement with the **Vendor** (or a **Vendor**'s Supplier) for the design, development, manufacture, maintenance, , service, repair, modification or supply of **items** or components.

Supply Chain: The sequence of entities and processes involved in the production and distribution of **items** in order to manufacture, supply and repair **products**.

Technical Specifications: Document defining the specifications against which an implementation is tested and approved for TTA L1.

Terminal: Device used at the point of transaction to perform a financial transaction and incorporating the host communication. It may also include other interfaces and Implementations or be connected to other devices (Card Readers) containing needed Implementations.

Test Laboratory: A facility accredited by EMVCo for performing TTA L1 tests and/or by Mastercard for performing TTA L2 tests.

Terminal Type Approval Level 1 Process (TTA L1 Process): Process used by EMVCo to verify and acknowledge that an Implementation within a Product is compliant with the relevant **Technical Specifications**.

Terminal Type Approval Level 1 Letter of Approval (TTA L1 LoA): Written acknowledgement by EMVCo that the TTA L1 Test results for **Vendor**'s Implementation is compliant with the relevant **Technical Specifications**.

Terminal Type Approval Level 2 Letter of Approval (TTA L2 LoA): Written acknowledgement by EMVCo that the TTA L2 Test results for **Vendor**'s Implementation is compliant with the relevant **Technical Specifications**.

Terminal Type Approval Level 1 Test (TTA L1 Test): Set of tests established by EMVCo to determine whether an Implementation meets the requirements of the related **Technical Specifications**.

Terminal Type Approval Level 2 Test (TTA L2 Test): Set of tests established by EMVCo (EMVCo L2 contact type approval) & Mastercard (Mastercard L2 Contactless Approval) to determine whether an Implementation meets the requirements of the related **Technical Specifications**.

Terminal Type Approved Level 1 Component: Component that has been successfully tested during contact or contactless Terminal Type Approval Level 1 and has received an EMVCo LoA.

TQM Label: Formal recognition from Mastercard that Products:

(1) which embed a specific Implementation which has been granted an EMVCo TTA L1 LoA,
(2) designed by the owner of this LoA
(3) and produced in specified **manufacturing sites**, are compliant with TQM requirements [TQM/GEN/T02].

See also: **SoC** (**Statement of Compliance**)

Vendor: Entity responsible for the design, development and production of Products or Modules. The Vendor is the entity requesting **TQM Label** for an Implementation. If this request is accepted, the Vendor is the owner of the **TQM Label**.

Appendix 3 - Technology-specific Terminology and Information

Contact Terminal Level 1

Implementation Name: **Interface Module** or **IFM**

Definition: Virtual or abstract Implementation that contains the necessary hardware and software to power the ICC and to support communication between the Product and the Integrated Circuit Card (ICC) up to the transport layer, as specified in the **Technical Specifications**.

Contactless Terminal Level 1

Implementation Name: **Proximity Coupling Device** or **PCD**

Definition: Peripheral Implementation of the Product, that uses inductive coupling to provide power to a Proximity Integrated Circuit Card (PICC) and also to control the data exchange with the PICC, up to the transport layer (included), as specified in the **Technical Specifications**.