



# **Certification Testing Requirements**

NFC Forum™

NFCForum-Certification-Testing-Requirements-1.0

2012-07-10

## **RESTRICTIONS ON USE**

This document is copyright © 2012 by the NFC Forum, and is made available subject to the following terms:

1. You may, without charge, copy (for internal purposes only) and share this document with your members, employees, and (to the extent related to the use of this document on your behalf) consultants. You may not modify or create derivative works of this document for external distribution.
2. THIS DOCUMENT IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY, COMPLETENESS AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL NFC FORUM, ITS MEMBERS OR ITS CONTRIBUTORS BE LIABLE FOR ANY CLAIM, OR ANY DIRECT, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OF THIS DOCUMENT.

NFC Forum, Inc.  
401 Edgewater Place, Suite 600  
Wakefield, MA, USA 01880

## Contents

<b>1</b>	<b>Introduction.....</b>	<b>2</b>
1.1	Background .....	2
1.2	Objective .....	2
1.2.1	Applicable Documents or References.....	3
1.3	Glossary .....	4
<b>2</b>	<b>NFC Forum Certification Testing Requirement.....</b>	<b>5</b>
2.1	NFC Forum Certification Testing Requirements.....	<b>Error! Bookmark not defined.</b>
2.1.1	Test Tools.....	5
2.1.2	Compliance with NFC Forum Specifications and Policy.....	5
2.1.3	Lab Facilities .....	5
2.1.4	Close Environment Requirement.....	5
2.1.5	Implementation Test Plan.....	5
2.1.6	Verification of Test Tool.....	5
2.1.7	Evaluation Uncertainty.....	5
2.1.8	Summary Test Report .....	6
<b>A.</b>	<b>Revision History .....</b>	<b>7</b>

## Figures

Figure 1: Close Environment.....	<b>Error! Bookmark not defined.</b>
----------------------------------	-------------------------------------

## Tables

Table 1: Revision History.....	7
--------------------------------	---

# 1 Introduction

## 1.1 Background

The NFC Forum was formed to advance the use of Near Field Communication technology by developing specifications, ensuring interoperability among devices and services, and educating the market about NFC technology. Formed in 2004, manufacturers, application developers, financial services institutions, and more all work together to promote the use of NFC technology in consumer electronics, mobile devices, PCs, and more.

The fundamental mission of the NFC Forum's Certification Program is to perform sufficient testing on NFC-enabled devices in order to protect the brand of the NFC Forum, while at the same time helping to grow the global market for NFC Forum certified devices, products, and services. The Certification Policy defines the policies that govern the operation of the NFC Forum Certification Program, including what can be certified, what it means to be certified, and the process for achieving and maintaining certification.

## 1.2 Objective

This document is intended for candidate and existing NFC Forum Authorized Test Laboratories, and sets forth the requirements that must be satisfied in order to qualify for and maintain NFC Forum authorization. This document, in conjunction with the Certification Policy, constitutes the set of requirements and obligations for NFC Forum Authorized Test Laboratories.

### 1.2.1 Applicable Documents or References

[DEVREQS]	NFC Forum Device Requirements, Latest version as identified on the Certification Program website, NFC Forum
[ICS]	Implementation Conformance Statement (ICS) for Digital Protocol, Version 1.0.04 October 2011, NFC Forum
[IXIT]	Implementation eXtra Information for Testing (IXIT) for Digital Protocol, Version 1.0.04 October 2011, NFC Forum
[ISO/IEC_9646]	ISO/IEC 9646, Open Systems Interconnection – Conformance testing methodology and framework, 1995, ISO/IEC

## 1.3 Glossary

### *Certification Testing*

Testing that an NFC Forum Implementation must undergo to achieve certification.

### *ICS (Implementation Conformance Statement)*

A checklist of the capabilities supported by an NFC Forum Implementation. It provides an overview of the features and options of the Specifications that are implemented, including the modes of operation that the product supports (see **Error! Reference source not found.**). The ICS is used to select and parameterize test cases and as an indicator for basic interoperability between different products [ISO/IEC\_9646]. An ICS for a protocol is usually known as a PICS (Protocol Implementation Conformance Statement).

### *IUT (Implementation Under Test)*

The entity being tested against a single test specification. An NFC Forum Implementation may contain one or more IUTs at each protocol layer.

### *Specifications*

The detailed technical specifications published by the NFC Forum that define the radio frequency and protocol capabilities and behaviors that deliver NFC functionality. The Specifications may include, by reference, specifications and Standards published by other organizations.

### *TCCL (Test Case Categories List)*

A list of test cases categorized in terms of the conditions under which they are to be used in Certification Testing.

### *TCMT (Test Case Mapping Table)*

TCMT provide required test cases based on IUT's ICS values.

## 2 NFC Forum Certification Testing Requirement

### Test Tools

NFC Forum Certification testing should be performed using approved and validated test platforms as listed on NFC Forum website (<http://www.nfc-forum.org>).

### Compliance with NFC Forum Specifications and Policy

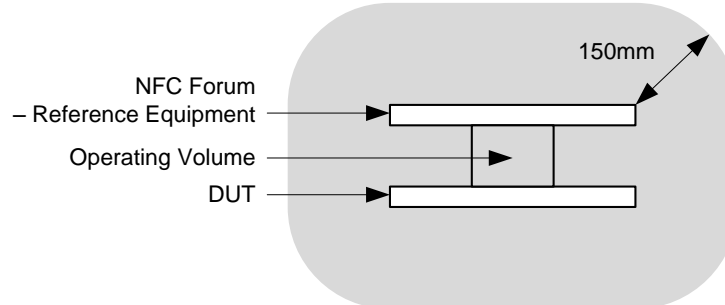
NFC Forum Certification Testing should be performed based on all NFC Forum procedures and the latest NFC Forum test specifications, ICS, IXIT, TCMT, and TCCL.

### Lab Facilities

NFC Forum Certification Testing should be performed under an environment that limits noise control from 1MHz to 100MHz to avoid interference during testing. The Authorized Test Lab shall also have a robot to avoid human error for Analog Testing.

### Close Environment Requirement

To avoid disturbing the magnetic field, a free guard distance must be observed around the equipments (NFC Forum Reference Equipment Verification Tests). This area must not contain any other conductive materials than what is needed for NFC Forum certification testing.



**Figure 1: Close Environment**

In addition to this free guard distance, no active device such as a mobile phone should be within 1m from the NFC Forum – Reference Antenna, the DUT, and the robot.

### Implementation Test Plan

NFC Forum Certification Testing must be performed based on a detailed list of tests they are capable of executing in each applicable test specification by using the latest TCCL as a check list.

The Authorized Test Lab must generate an Implementation Test Plan based on the IUT’s ICS values and applicable test specification, ICS, IXIT, TCMT, and TCCL.

### Verification of Test Tool

The Authorized Test Lab shall perform a reference antenna verification test based on “NFC Forum Reference Equipment Verification Test” before certification testing.

### Evaluation Uncertainty

NFC Forum Certification Analog Testing evaluation uncertainty shall follow “NFC Forum Analogue Test Specification”.

Summary Test Report

Certification testing results should be indicated on the NFC Forum Summary Test Report Template.



## A. Revision History

Table 1 outlines the revision history.

**Table 1: Revision History**

<b>Document Name</b>	<b>Revision &amp; Release Date</b>	<b>Status</b>	<b>Change Notice</b>	<b>Supersedes</b>
Certification Testing Requirements	Version 1.0 September 2012	Final Draft		