

Preparation of gaming device application

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Revision summary:

Added this revision summary chapter. Added chapter 2.6 (required items for EMC and LVD testing).

1 Application / submission form instruction

Preferably, the supplied application / submission form for testing / certification of gaming devices at SIQ ([WN121](#)) shall be used. Other application forms can be used providing that all information as requested in [WN121](#) is covered.

All main paragraphs in the application form shall be filled in and those documents and accessories supplied as listed in chapter 2 for the laboratory to start the testing. The items listed in further paragraphs can be supplied at a later stage.

Specific instructions are given below for each paragraph. The chapters are generally applicable to all types of gaming devices. Specific requirements or exceptions for individual types of gaming devices are stated below.

2 Minimum application requirements

2.1 Applicant

Besides the full name of the company (applicant) and address of the company seat the registration number of the company's register (in many cases court register) shall be given. An excerpt from the company's (or court) register shall be enclosed as well, see also par. 4, submitted items. This is needed the first time the company applies for gaming device testing and / or certification and is not needed on subsequent applications, unless the registration has been changed in any way.

This registry is known under various names, e.g.:

UK: *Excerpt from the Company's register, or Excerpt from the court register*
Austria, Germany, Switzerland: *Auszug aus dem Handelsregister*
France, Belgium: *Immatriculation au Registre du Commerce et des Sociétés*
Italy: *Infomazioni reperite presso la camere di commercio*
Slovenia: *Izpis iz sodnega registra*
Croatia: *Izvadak iz registra Trgovačkog suda*

Applicant is in most cases gaming machine manufacturer. If the applicant is NOT the gaming machine manufacturer, its relation towards the manufacturer shall be specified, e.g. regional or local sales office or local representative, distributor, etc.

In this case the applicant shall enclose:

- manufacturer's written and duly signed authorization to carry out testing or certification in manufacturer's name and behalf;
- the full name of the holder of certificate which shall appear on the certificate, e.g., the manufacturer name or the representative name;
- a separate manufacturer statement concerning full and exclusive functional identity of the gaming device with the documented specification and copyright of the software (attached form [WN116](#)).

All contact persons authorized by the applicant that can be informed about the testing process and may participate in it and provide information necessary by the laboratory shall be listed. If other authorized personnel are to be involved at later stages of the process a written authorization from the applicant shall be required.

If software is developed and manufactured by a manufacturer other than the gaming machine (hardware) manufacturer, then:

- a separate application for software shall be submitted by the software manufacturer, or,
- the applicant shall also attach a separate software manufacturer statement concerning full and exclusive functional identity of the gaming device with the documented specification and copyright of the software ([WN116](#)) and excerpt from the company's register for the software manufacturer as well.

2.2 Product - short description

Basic characteristics of the product submitted for testing / certification shall be given. For example, if only games are submitted, the relevant hardware platform for which games are intended shall also be mentioned.

If more than one platform or game is applied for, all of them shall be listed.

2.3 Scope of testing and certification

2.3.1 Purpose of application

Countries or jurisdictions for which testing and/or certification is submitted shall be stated.

For most jurisdictions a test report is required; however some jurisdictions also require a certificate of conformity (e.g. Slovenia, Croatia, Latvia), as proof of fulfilling the requirements of the applicable legislation.

2.3.2 Hardware elements

SIQ can provide gaming electrical safety and EMC testing for the equipment.

For jurisdictions where only gaming tests are specified in the gaming regulations, SIQ will only perform gaming tests unless electrical safety and EMC tests were specifically requested by the applicant.

For jurisdictions where electrical safety and / or EMC requirements are specified within the gaming machine regulation the electrical safety and EMC test reports shall be provided. It is also possible to use test reports of the manufacturer owned test laboratories.

Only those hardware elements that are subject to testing or certification should be listed. Only those hardware elements that have been stated in the application will be specified in the test report and / or certificate of conformity. The hardware elements that are not specified in the application will not be listed in the test report and/or certificate of conformity. If the applicant wants to use them later on a new application shall be made.

It is therefore important to list all elements and variations for which test report or certificate of conformity is sought. If for instance different types of cabinets, sizes of monitors, toppers, etc. need to be approved, all of them shall be listed. A description and differences shall be documented in the enclosed documentation. In most cases it shall not be necessary to have samples of all combinations sent to laboratory for testing. Only one operating sample of the gaming device and exhaustive description of all variations shall be sufficient to approve the complete (hardware) family of products.

If only games / software are / is to be tested, this table should be left blank.

2.3.3 Sample form – hardware elements

Opis, funkcija <i>Description, function</i>	Model / Part number	Predhodno poročilo, certifikat / <i>Previous report, certificate</i>	Opomba / <i>Remark</i>
Vzorec naprave (platforma) Gaming device (platform)			
Ohišje / Cabinet			
Procesorska plošča ali računalnik / Processor board or computer			
Povezovalna plošča / Backplane board			
Komunikacijsko vezje / Communication board			
Monitor			
Ekran na dotik / Touch screen			
Napajalnik / Power supply			
Sprejemnik bankovcev / Bill acceptor (validator)			
SW sprejemnika bankovcev / Bill acceptor (validator) SW			
Sprejemnik kovancev / Coin acceptor			
Vrhnji del / Top box			

2.3.4 Software elements

Only those software elements that are subject to testing or certification should be listed. Only those software elements will be specified in the test report and / or certificate of conformity that have been stated in the application

If only hardware is to be tested, this table should be left blank.

For machines that use no software, e.g. classical table games, electromechanical lottery devices, raffling drums, etc, this table should also be left blank.

2.3.5 Sample form – software elements

Opis, funkcija <i>Description, function</i>	Model / Part number	Checksum and / or other ID code	Predhodno poročilo, certifikat / <i>Previous report, certificate</i>
Ime igre 1 / Name of game 1			
Glavni program 1 / Main program 1			
Glavni program 2, itd. / Main program 2, etc.			
Podatki 1 / Data 1			
Podatki 2, itd. / Data 2, etc.			
Grafika 1 / Graphics 1			
Grafika 2 / Graphics 2			
Grafika 3, itd. / Graphics 3, etc.			
Zvok 1 / Sound 1			
Zvok 2, itd. / Sound 2, etc.			
Komunikacija 1 / Communication 1			
Komunikacija 2, itd. / Communication 2, etc.			
Ime igre 2 / Name of game 2			
Glavni program 1, itd. / Main program 1, etc.			

2.3.6 Communication system

Supported communication protocols for connection to on-line supervisory information systems (SIS) or for other communications shall be listed. In case no particular or industry standard protocol is used, supported type and version of SIS shall be stated.

For devices that do not support external communication this shall be left blank.

2.4 Documentation supplied

2.4.1 General documents

If the manufacturer is the applicant the following general documents shall be supplied:

- Excerpt from the company's register (only for the first application from the client and upon changes in the company's register,

If the manufacturer is NOT the applicant, also:

- authorization of the manufacturer,
- a separate manufacturer statement concerning full and exclusive functional identity of the gaming device with the documented specification and copyright of the software (attached form [WN116](#)),

2.4.2 Hardware documentation

Following items shall be documented and submitted (it is up to the manufacturer as to how these items are organized; it is possible to have everything covered with a single document):

- user (operating) guide,
- technical description of the device,
- installation,
- maintenance,
- troubleshooting,
- wiring diagram,
- parts list,
- third party item manuals (e.g. bill acceptor / validator, coin acceptor, hopper, etc.)

2.4.3 Game documentation

For each submitted game following documents shall be available:

- detailed game description with playing rules, including bonus game,
- game setup information,
- description of symbols, e.g. virtual reel layout, cards in a deck, number of decks used in the game, including what conditions need to be met for the deck(s) to be reshuffled, etc.,
- full paytable or win table,
- excel or other file with winning probability calculations,
- for bonus games, winning probability calculation formulas, including probability calculation for entering bonus game

2.4.4 Game artwork

Pictures of artwork shall be provided.

2.4.5 Software

Basic software description shall be included describing program structure, functions of each program modules (e.g. EPROM, Flash Rom etc. sets, executables and binaries on the hard disk, etc.), and setup possibilities.

2.4.6 Sample form

Vrsta dokumenta <i>Document type</i>	ID / Part number	Revizija in datum <i>izdaje / Revision and issue date</i>	Opomba / Remark
Izpis iz registra / Excerpt from the Company's register			
Pooblastilo proizvajalca / Authorization of the manufacturer			
Strojna oprema / Hardware:			
Navodilo za uporabnika / User guide			
Namestitev / Instalacija			
Vzdrževanje / Maintenance			
Odpravljanje težav / Troubleshooting			
Ožičenje / Circuit diagrams			
Sestavni deli / Parts list			
Sprejemnik bankovcev / Bill acceptor			
Drugo / Other			
Igra / Game			
Podroben opis igre vklj. bonus / Detailed game description incl. bonus			
Opis nastavitvev / Game setup information			
Opis simbolov / Symbol description			
Tabela dobitkov / Paytable			
Matematični izračuni / Mathematical calculations			
Simboli igre / Game artwork			
Fotografije / Photos			
Programska oprema / Software			
Opis programa / Software description			
Diagrami poteka / Flow charts			

2.5 Accessories supplied

2.5.1 Gaming device sample

An operating sample of a gaming device is needed in the laboratory. It shall be equipped with:

- all necessary keys,
- highest priority setup cards and / or RAM reset keys,
- tokens,
- equipment for testing with door open, if needed,

- any other simulation accessories,

If only games are to be approved the testing laboratory needs an operating gaming device platform to test the games themselves.

2.5.2 Software

Manufacturer approved binaries of all software defining game outcome, game functionality, accounting and external communication shall be delivered either on their original media or in a form of a data file.

All other software requirements are given in a separate chapter 4 Rough description of SIQ's testing procedure. It is possible to supply them later which shall be stated in the appropriate table of the application (e.g. "to be supplied later").

2.5.3 Sample form

Pripomoček Accessory	ID / Part number	Komentar / Comment	Opomba / Remark
Vzorec igralne naprave / Gaming device sample			
Vsi potrebni ključi / All keys			
Kartice z najvišjo prioriteto dostopa / Highest priority level access card			
Oprema za testiranje pri odprtih vratih / equipment for testing with door open			
RAM reset IC			
Simulacijski pripomočki / Simulation accessories			
Žetoni / Tokens			
Programska oprema / Software			
Datoteke z binarno kodo / Binary datafiles			
Izvorna koda / Source code			not necessary if valid test report available
Komentarji izvirne kode / Comments to source code			not necessary if valid test report available
Emulator procesorja / Processor emulator			not necessary if valid test report available
Priročnik emulatorja ali šolanje / Emulator manual or training			not necessary if valid test report available
Prekinitve v programu / Breakpoints			not necessary if valid test report available
Prevajalnik / Compiler			not necessary if valid test report available
Program za preverjanje RNG / RNG autoplay program			not necessary if valid test report available
Drugo / Other			

2.6 Items required for electro-magnetic compatibility and electrical safety testing

If testing of electro-magnetic compatibility and/or electrical safety is applied for, a device sample and the following documentation is required:

- User manuals (operator manual as well as a manual for maintenance / servicing)
- Mounting instructions
- Schemes and PCB layouts
- Complete safety reports from an accredited laboratory for critical parts (power supply, monitor, UPS) according to a valid IEC/EN standard
- Specifications of other critical parts (power cords, terminal blocks, motors, PCBs, EMI filters, transformers, plastic materials, ...)
- Complete parts list

2.7 Agreement on mutual obligations of the applicant and the SIQ

This agreement forms a part of the application. In this agreement the applicant commits to full and exclusive functional identity of the gaming device with the documented specification and declares possession of copyright of the submitted software. SIQ commits itself to full confidentiality regarding all data received from the manufacturer.

The applicant consents to having mechanical measurements, if applicable to the particular product, performed by SIQ subcontracted laboratory. Mechanical measurements referred to concern dimensional measurements of roulette wheels and dimensional and mass measurements of lotto or bingo balls. Upon request SIQ shall reveal full identity of the subcontracted laboratory to the applicant. SIQ uses only accredited calibration labs to perform these measurements.

The person signing the application and this agreement must be duly authorized to sign it.

3 Available test reports

Any available test reports shall be considered by the laboratory and can contribute to decrease needed time and cost of the testing process.

However, only those relevant tests that were performed by the other test laboratories and reported in their test reports shall not be repeated by the SIQ, fulfilling following conditions:

1. the other laboratory is accredited according to ISO/IEC 17025,
2. the accreditation body that granted the accreditation to the laboratory is a signatory to the multilateral or bilateral recognition agreement to the EA (European cooperation for accreditation, see also www.european-accrreditation.org and follow links to MLA),
3. if conditions 1 and 2 are not met, it is possible to use the other test laboratory's reported results, if SIQ has conducted second-party assessment of its competence according to ISO/IEC 17025,
4. the test reports presents clear and unambiguous test results, test conditions and procedures used; only those requirements actually tested and reported shall be skipped by the SIQ,
5. the tests reported refer to the same HW / SW versions as applied to SIQ; it should be possible to authenticate the binary code of the tested software using an appropriate authentication code (digital signature, digital fingerprint, message digest, etc.) as agreed with the other laboratory; or the other laboratory shall send directly the approved binaries to SIQ,

If valid test reports cover software analysis, the tests referred to in chapter 4 Rough description of SIQ's testing procedure shall not be performed in the SIQ and the items stated therein are not required.

4 Rough description of SIQ's testing procedure

4.1 General

Testing procedure is roughly divided into six different segments. These six segments are:

- Electromagnetic compatibility tests (EMC tests)*;
- Electrical safety tests*;
- Functional tests;
- Randomness of draw;
- Payout ratio;
- Software analysis.

* Electromagnetic compatibility and electrical safety tests can be performed at SIQ laboratories. For Croatian jurisdiction EMC and safety test reports need additional evaluation of one of Croatian EMC and Electrical safety laboratories. For Slovenian and all other European jurisdictions these test reports are directly accepted.

4.2 Functional tests

The complete functionality of the gaming device is examined by performing functional tests. These tests are performed in accordance with the jurisdiction for which the testing is performed. Functional tests in general can include the following activities:

- verifying general hardware design requirements;
- verifying protection of unauthorized access to the gaming device (access to components, connections, gaming device settings, etc.);
- evaluating all applicable electronic and electro-mechanical meters;
- evaluating all critical settings that influence the behaviour of the gaming device;
- examining the behaviour of the gaming device in some specific situations according to the jurisdiction (e.g. opening the main door, stacker door, power cut, stacker removal, logic box doors, accessing inside the cabinet, etc.);
- reporting all required events and meters to an online system if applicable;

Additional tests are performed in accordance to specific jurisdiction to which the testing procedure applies.

4.3 Randomness of draw

For testing of randomness, one of the following shall be made available to the test laboratory:

- a special RNG auto-play program (a test EPROM) to allow rerouting of the game results / outcomes (e.g. virtual reel positions, cards dealt during a poker game, etc) to a test port for the purpose of the RNG testing, with a description of the protocol used for the test port and look-up table between output numbers and symbols (on virtual reel, maybe already in the virtual reel layout), or
- a possibility to log game outcomes during the auto-play sequence to a special log file, or,
- a possibility for game outcome acquisition via supervisory information system using standard communication protocol (has to be agreed with the gaming device manufacturer and the supervisory system manufacturer),
- if none of these is available, a possibility to simulate the complete algorithm on the SIQ computer will be discussed.

After the RNG results are gathered the statistical analysis according to the legislation and internal procedure is performed.

4.4 Payout ratio

The payout ratio tests can be performed in the following ways:

- mathematical calculation of pay tables (or similar depending on the type and rules of the game);
- executing automated playing of the games (the newer games have quite long game cycle so it is not possible to use this method as it would take too long to perform the tests);
- emulating the pay table by SIQ's custom made software.

The fastest way to perform this segment of the testing procedure is to perform mathematical analysis.

4.5 Software analysis

4.5.1 Software review procedure

At beginning the detailed overview of a manufacturer software platform will be performed. This involves general understanding of the organization of the source code, implementation of the: RNG, payable, game loop, the compile/build process, emulator use, etc. The most efficient way to achieve this is to organize a meeting between SIQ software engineers and manufacturer's developers. Such a meeting may take 1-3 working days, depending on the complexity of the software platform. During the platform software review at least one game will be also analysed.

When additional games need to be verified, it is not necessary to analyse the software platform again which means that it will take much less time for approval of the game. This methodology is based on the assumption that the general software platform remains relatively unchanged over a period of time.

To arrange the meeting between SIQ software engineers, manufacturer's developers may visit SIQ, or the other way around. We recommend the latter option, because it is assumed that SIQ software engineers will have a better support regarding various software aspects at manufacturer's premises and if only one or two of manufacturer's developers visit SIQ, they might not be able to answer all our questions adequately or they might not have all the necessary tools to perform necessary analysis therefore this option is less desirable.

The software analysis of the games for already approved platform can be performed in the following ways:

- arranging the meeting between SIQ software engineers and manufacturer's developers and performing the software review, or
- SIQ engineers can perform the software review without the presence of manufacturer's developers.

The decision that the software review can be performed without manufacturer's developers is made by SIQ based on the complexity of the games and is a result of a direct communication between SIQ and manufacturer.

4.5.2 Confidentiality of information

SIQ warrants complete confidentiality of all information disclosed to it for the purpose of gaming device testing. However, due to the very sensitive nature of the information needed, the applicant may require additional measures to safeguard the confidentiality of its proprietary information. SIQ offers in general two options:

- signing of non-disclosure agreement; SIQ offers a generic form of NDA ([WN115](#)), which may be further adapted in agreement with SIQ to serve particular needs; in this case the information is archived by the SIQ,
- archiving the information at the office of SIQ attorney at law; in this case manufacturer signs a special declaration (WN116) and provides an authorized person to be present during all tests, usually supervising the handling of sensitive information and providing explanations during source code review.

These options need to be clarified before proceeding with actual analysis.

For software analysis following items shall be needed:

4.5.3 Additional requirements concerning the software documentation

- A) Complete documentation of gaming device functionality.
- B) Game flowchart(s), including boot sequence, main loop, bonus/gamble games, AutoPlay, log writing, error handling, Pay-In/Pay-Out, and communication with On-Line system (if implemented).
- C) RNG documentation, including:
 - randomness principle,
 - source code listing with comments,
 - conversion principle from random number to game outcome.
- D) (*only card & reel games*) All major algorithm and data structure descriptions, including payable, bonus/gamble game implementation, reels symbol sequences, etc.
- E) (*only card & reel games*) Game rules for the player, including bonus/gamble game rules.
- F) If the software accesses any external code, such as external libraries, database, operating system files (e.g. Registry), microcontrollers, etc, this functionality must be fully documented.

4.5.4 Required hardware & tools

- A) All EPROMs, microcontrollers, Flash Cards, and other non-volatile memory types (hard disks excluded), containing the compiled source code, graphics, sound, animation data, etc.
- B) (*only card & reel games*) An option to edit, compile and test the source code. Testing can be done in any of the following ways:
 - run on a development platform - PC,
 - run on a development platform - emulator,
 - program an EPROM (or similar memory), install it into the test gaming device and run the game.

4.5.5 Archiving

The sealed binary + source code CD envelope may be stored:

- either within the institute, based on the non-disclosure agreement; see also generic Non-disclosure agreement, [WN115](#), or
- at the office of the attorney at law (the attorney shall be a specialist in domestic and foreign patent legislation and having a cooperation contract with the institute), based on manufacturer's declaration, see also generic Declaration of the manufacturer, WN116.

If the latter option is chosen, the manufacturer may keep the sealed envelope until the depositing at the lawyer's office takes place.

The binary code CD will not be sealed, and will be stored within the institute. It will be used by the institute for confirming the identity of the software in gaming devices (control procedures).

5 Contacts

Services can be ordered with SIQ personnel at the laboratory location:

SIQ Gaming technologies,

Poljanska cesta 71b, SI-1000 Ljubljana, e-mail: info.igre@siq.si, fax: +386 1 4778 303

Head of laboratory: Damjan Semec, tel.: +386 1 4778 341, e-mail: damjan.semec@siq.si