



ONE WORLD  OUR APPROVAL

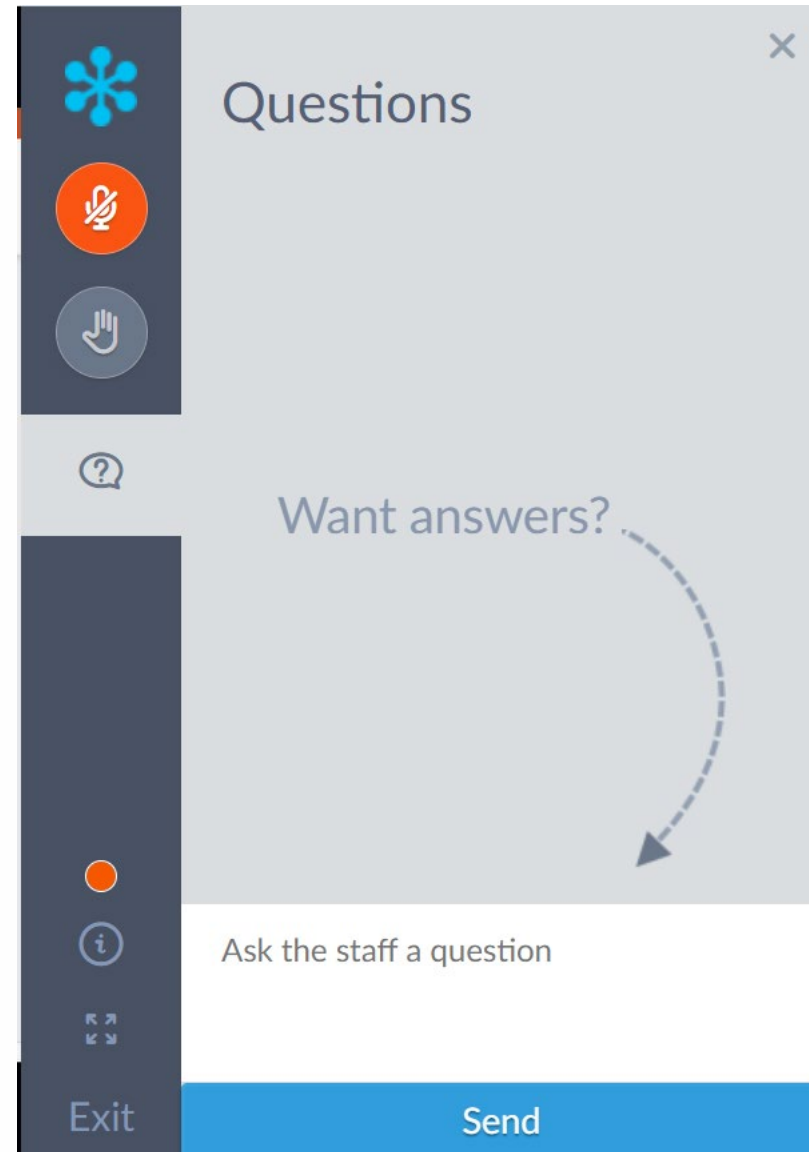


The Testing and Certification Process

Jandrew Gonzales, *Nemko*
Robert Legault, *NeuronicWorks Inc*

9/16/2021

Housekeeping



- All attendees are muted to reduce background noise.
- If you have any questions, please type them into the chat box in your GoToWebinar control panel.
- We will be distributing the on-demand webinar link and copy of presentation.

Meet the Presenters

Robert Legault



Robert Legault is a Senior Systems Engineer at NeuronicWorks Inc., with over 35 years of experience in hardware, system engineering and regulatory compliance, with specialization in information technology and audio/video products. He started his career as a hardware design engineer and has built a wealth of knowledge and expertise in regulatory compliance over the years.

Jandrew Gonzales



Jandrew Gonzales is a Key Account Manager with Nemko Canada. He began his career in the Testing, Inspection and Certification industry as an EMC Test Engineer for 4 years. Since then, Jandrew has moved into Business Development and enjoys educating and supporting device manufacturers who want to get their products to market.

Regulatory Compliance Overview

Electronic Devices in Markets Must:

- Comply with local laws and regulations
- Every country has their own set and their own AHJs or Authorities Having Jurisdiction
 - These AHJs set the laws and requirements regarding compliance

Why is regulatory so important to your business?

- **Regulatory compliance** helps you protect your business's resources and reputation. It takes time to build trust with customers, prospects, and vendors.
- **Compliance** lays the foundation on which you build your company's reputation.
- **Regulations are there for a reason:** Helps protect your business, your employees and your customers.
- **Adhere to Regulations:** Failure to adhere to regulatory compliance requirements can open you up to risks beyond just fines.
- **Compliance Regulations** aren't put in place to make life more difficult (although, in reality, they often do). But compliance with regulations benefits your company as well as internal and external individuals.

Regulatory Compliance Overview

Manufacturers and distributors of electronic and electrical devices, Industrial, IoT, Audio Video and other product areas are required to meet various global product Safety, EMC, Radio, Performance and Environmental standards established. This is mainly to increase safety and reduce risk.

Products in Markets Must:

- Comply with local laws and regulations
- Every country has their own set and their own AHJs (Authorities Having Jurisdiction)
 - These AHJs set the laws and requirements regarding compliance

Canada & USA

- ISED (Innovation, Science & Economic Development) = Emissions and Wireless Space
- SCC, Ontario ESA = Product / Electrical Safety
- FCC (Federal Communications Commission) = Emissions and Wireless Space
- OSHA, Any local municipalities = Product / Electrical Safety

Europe:

- European Economic Community
- Low Voltage Directive (LVD) or Machinery Directive (MD) – EN standards for CE mark and IEC standards CB Scheme
- EMC Directive, Radio Equipment Directive (RED)



Laboratory Accreditations

Laboratory accreditation is a means of determining the technical competence of **laboratories** to perform specific types of testing, measurement and calibration.

Laboratory accreditation requirements:

ISO/IEC 17025 accreditation provides the assurance that calibration and testing laboratories are delivering good services and consistent testing and regulatory data. The accreditation body is responsible for assessing the quality system and technical aspects of your system to determine your compliance to the requirements of ISO/IEC 17025.

ISO 17065 (ISO/IEC 17065) accreditation is a Product Certification Bodies Accreditation Standard. This certification assures the consumers, industrial and commercial markets that the product or service they are purchasing is according to international standards.

ISO 17060 (ISO/IEC 17060) accreditation - Conformity assessment

What is OSHA's (USA) "Nationally Recognized Testing Laboratory" Program?

The OSHA/NRTL Program

- Seeks to prevent accidents through assuring the safety of products used by American workers
- Recognizes a private sector testing organization's capabilities to test and certify specific types of products for workplace safety
- Regulates products for use in the workplace only
- Products for use outside the workplace may be regulated in other ways, i.e., by local government, or by the market (retailers)

What is Canada's Certification Program?

The Canadian Certification Body Program

- Canada's Provincial, territorial and Municipal Governments mandate certification via Standards Council of Canada (SCC) accredited bodies to seek to protect the public through assuring the safety of products used in society
- Recognizes a private sector certification organization's capabilities to certify specific types of products
- Regulates most all electrical products used in society

What does it mean for a product to be certified by an NRTL?

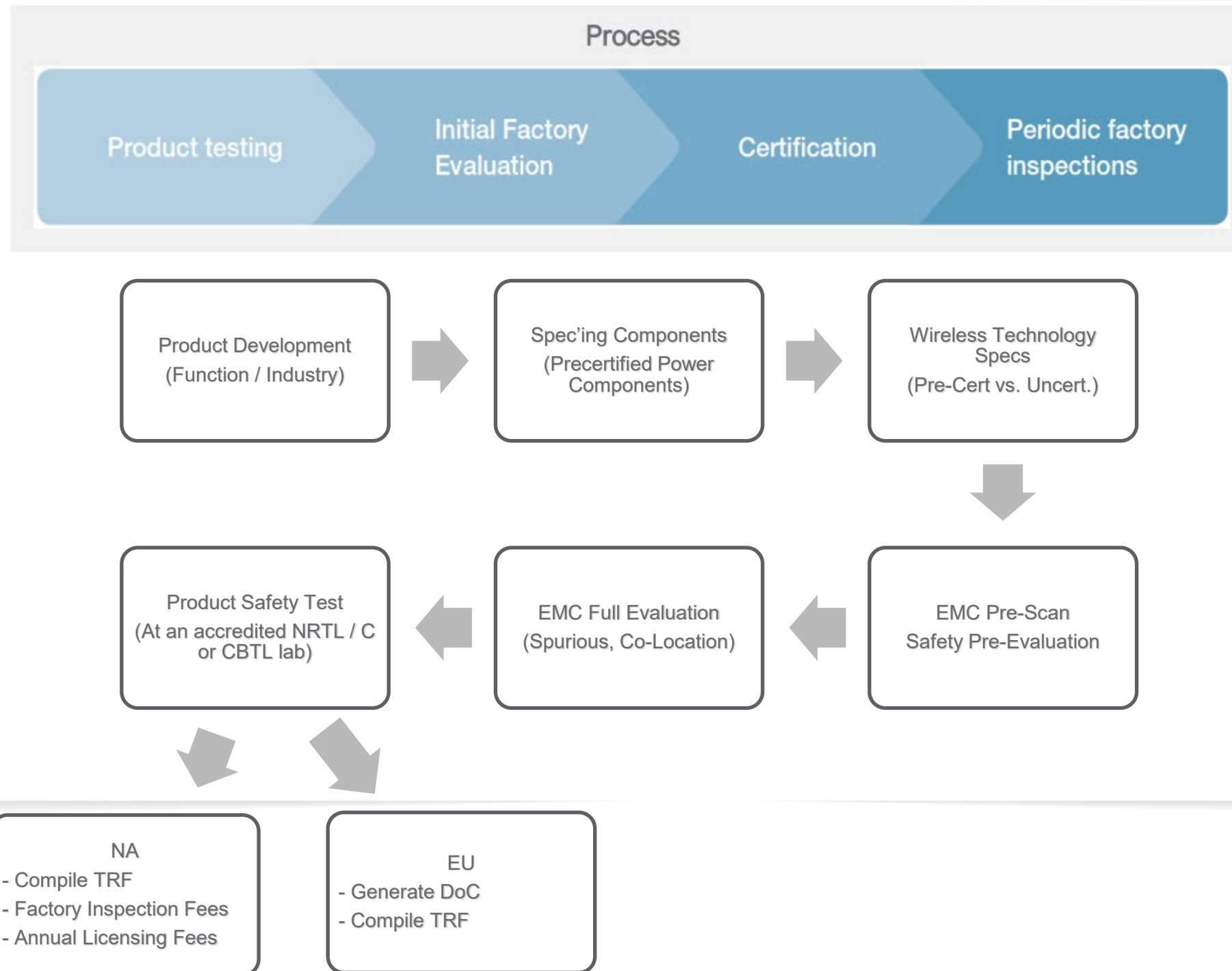
- The NRTL has certified that the product meets the requirements of the product safety standard and issues a certificate.
- The NRTL then includes this certification in its listing directory – hence a product becomes Nemko “certified” and in USA terms has become “Listed”
- The applicant indicates that the NRTL has certified the product by placing the NRTL’s certification mark on the product.
- Following the product certification, the NRTL monitors the production of the product, the marketplace, and the use of their certification mark through the inspection program.

How Do You Satisfy These Rules?

Three Common Certifications & Verifications

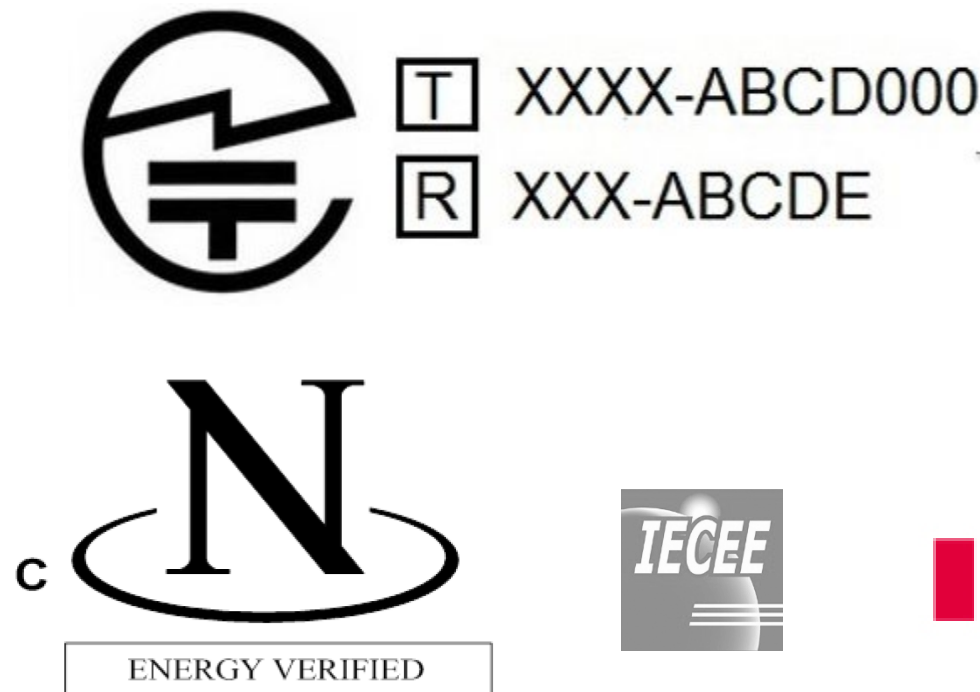
1. EMC Testing & Verification
2. Product Safety Certification & Evaluation
3. Wireless Radio Certification

Testing & Certification Roadmap (Europe / North America)



Nemko North America – Certification Body

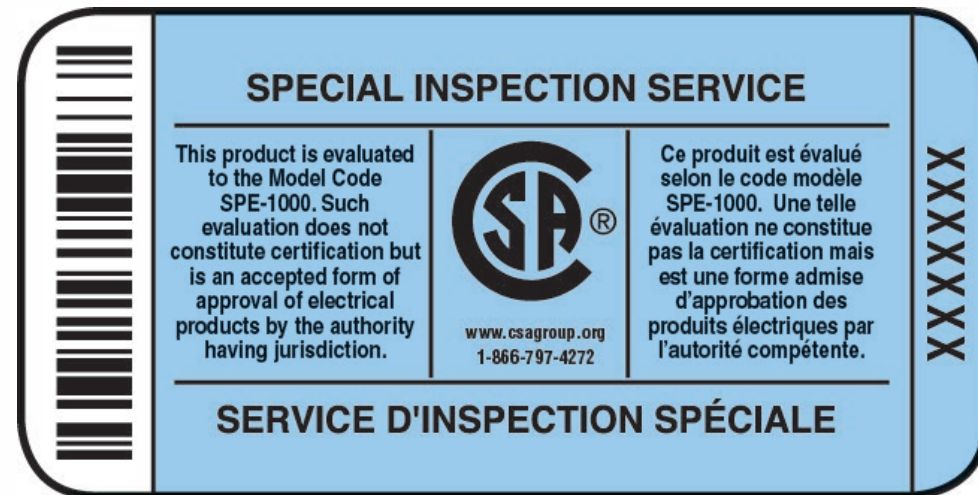
- ISO 17065 scope - https://www.scc.ca/en/system/files/client-scopes/ASB_SOA_10044-Nemko-Scope_v10_2021-01-27.pdf
- OSHA scope - <https://www.osha.gov/nationally-recognized-testing-laboratory-program/ccl>



Innovation, Science and
Economic Development Canada

North America Certification – Field Labels / Special Insp.

Field Label Examples:



Documentation Required for Nemko NRTL/C Certification

Type of Application:
☐ Original ☐ Modification (MOD) ☐ Multiple list (ML) ☐ Addition of models (ADD) ☐ Change of factory (FAC)
☐ Transfer (TR) ☐ Canada only ☐ US only ☐ Canada & US

ITEM	DESCRIPTION	REQUIRED							Included in Submittal	Comments
		Original	MOD	ML	ADD	FAC	TR			
1	Application Form	Y	Y	Y	Y	Y	Y	☐		
2	Test Report from an authorized laboratory	Y	O	N	N	N	Y	☐		
3	Test Data Sheets, List of Test Equipment used and their Calibration Dates	Y	O	N	N	N	N	☐	Note: Not required with CBTR/CBTC and sample	
4	Draft Description Report	O	O	N	O	N	O	☐	O – include when submitted by Nemko qualified laboratory	
5	Schematics	Y	O	N	O	N	N	☐	O – include only when changed from original	
6	PCB Trace Layouts	Y	O	N	O	N	N	☐	O – include only when changed from original	
7	User's Guide	Y	O	N	Y	N	Y	☐	O – include only when changed from original	
8	Labels	Y	O	Y	Y	N	Y	☐	O – include only when changed from original	
9	Label Material Information	Y	O	N	N	N	N	☐	O – include only when changed from original	
10	Letter Stating Model Differences	O	N	N	Y	N	N	☐		
11	Letter stating Description of Modifications	N	Y	N	N	N	N	☐		
12	Multiple Listing Declaration	N	N	Y	N	N	N	☐		
13	Photographs	Y	O	N	O	N	Y	☐		
14	Certification Agreement	O	N	N	N	N	Y	☐	O – For new applicants only	
15	Initial Factory Evaluation	O	N	N	N	Y	Y	☐	O – For new factories only	
16	Sample	O	O	N	O	N	Y	☐	O – For CB Reports from non-qualified laboratories	
17	Current NRTL certificate	N	N	N	N	N	Y	☐		
18	Current NRTL description/listing report	N	N	N	N	N	Y	☐		

Y – Always required N- Not required O- Conditionally required (See comments and guidance)

EMC and Radio Products Information Sheet

- Provides to us modes of operation
- Indicates power inputs, battery operated components, helpful in testing
- Indicates to us wireless frequencies, certified and uncertified
- Instructions of operation – we need to know how to run the device
- Incorporated into the report, required


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Applicant:
[Enter applicant name](#)

Product name:
[Enter product name](#)

Model:
[Enter model](#)

Specifications:


Model variants:
[Enter model variants](#)

Report reference ID: XXXXXXX-47RFEMCPage 2 of 5



Section 9 EUT photos

Section 1 Equipment under test (EUT) details

1.1 Applicant

Company name

[Enter details](#)

Address

[Enter details](#)

1.2 Manufacturer

Company name

[Enter details](#)

Address

[Enter details](#)

1.3 Sample information

Receipt date

[Click here to enter a date.](#)

Nemko sample ID number

[Enter details](#)

1.4 EUT information

Product name

[Enter details](#)

Model

[Enter details](#)

Serial number

[Enter details](#)

Part number

[Enter details](#)

Power requirements

[Enter details](#)

Description/theory of operation

[Enter a description of what the equipment is, what it does, and how it does it.](#)

Operational frequencies

[Enter a list of all digital clocks, crystals and operational frequencies contained within the EUT](#)

Software details

[Enter firmware load, software load and other traceable software details for the EUT at the time of testing](#)

Report reference ID: XXXXXXX-47RFEMCPage 3 of 5

Language

- Canadian regulations require that Safety Warnings and markings shall be in both English and French when seeking Canadian Certification.
- The French Requirement
 - If the warning is required in order to comply with the standard then it shall be in French and English.
 - If a warning was on a product then the French equivalent will need to be on the product too.



Choose Scandinavian trust

Mississauga & West



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Choose Scandinavian trust



**“We hope to Welcome You
for a tour soon!”**

Thank you

www.nemko.com



Compliance without Complexity

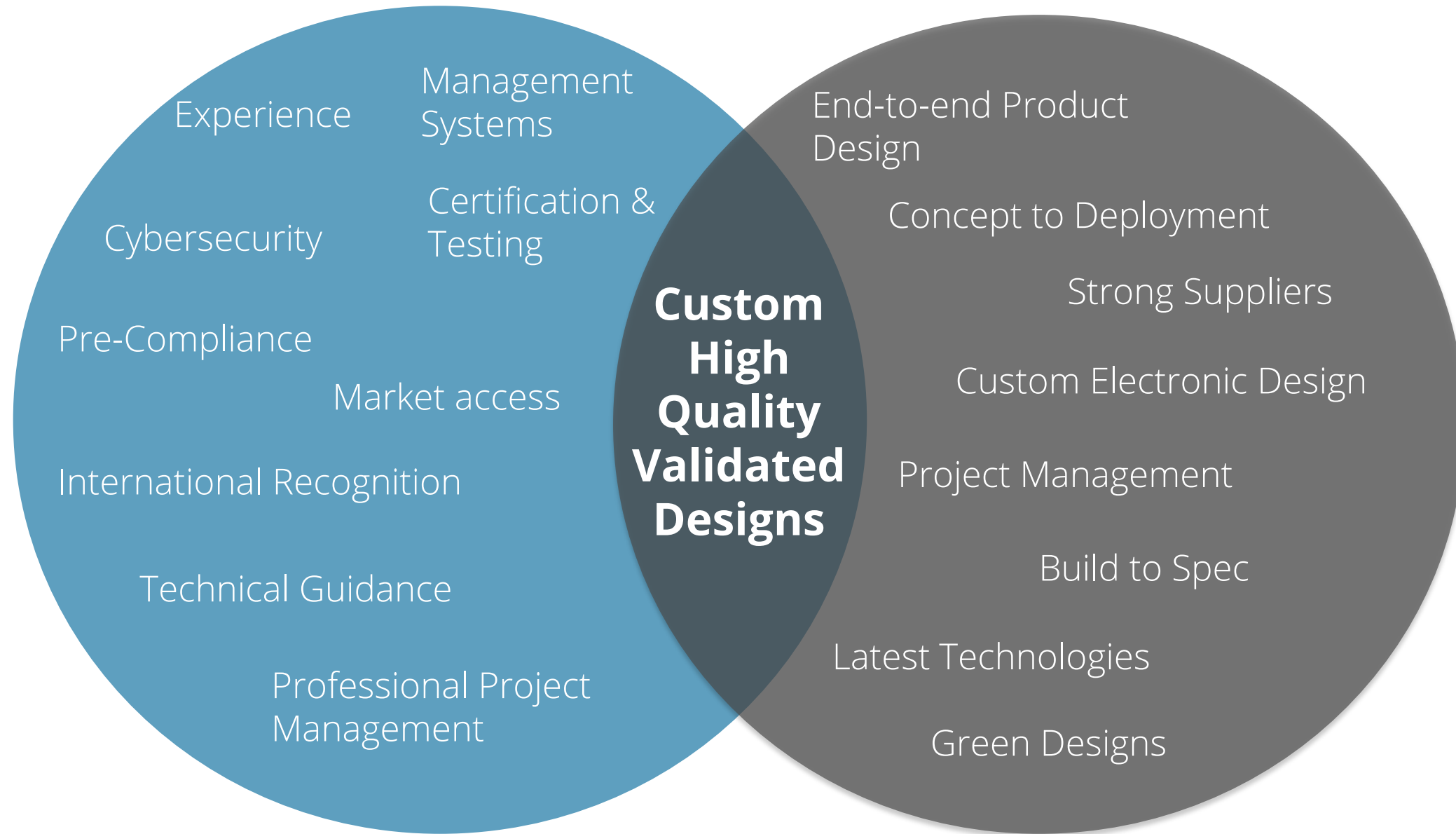
The Testing and Certification Process

September 16, 2021



REVIEW OF SEMINAR 2

- Product Development Process
- Planning for EMC Testing
- Checklist(s) to Provide before Entering the Lab
- Common Mistakes to Avoid



NeuronicWorks Inc.

CUSTOM ELECTRONIC PRODUCT DEVELOPMENT

400+

years of combined
experience

200+

successfully completed
projects

50+

highly skilled engineers
and designers

16

industries disrupted
with innovative
technology

6

months - average
project completion

Customer owns
the IP

Customer has
full control of
the design
process

Total
transparency of
the work
process

Total
confidentiality is
guaranteed

Support during
all stages and
post-delivery
process

Hardware Design



Firmware Design



Software Design



Web and App
Design



UX/UI Design



FPGA Design



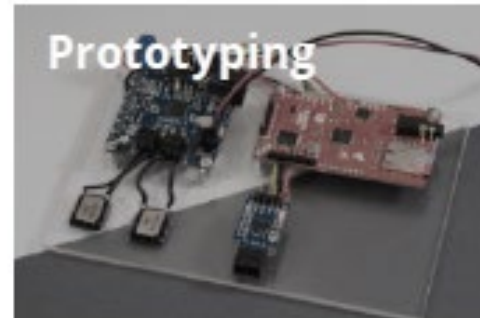
Mechanical
Design



Industrial Design



Prototyping



Testing Support



Certification
Support



Manufacturing
Support



OUR CAPABILITIES

NeuronicWorks provides turnkey, end-to-end, custom electronics and embedded systems product development services.



Scientific &
Medical

Transportation

Industrial
Control

Tele-
communication
IOT

Payment
Processing

Edge
Computing &
Wearables

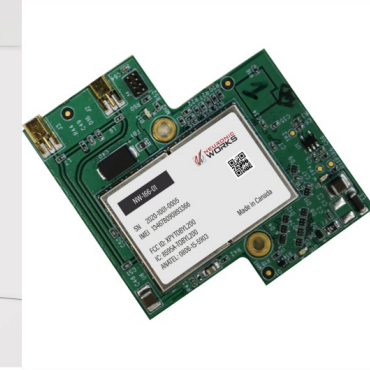
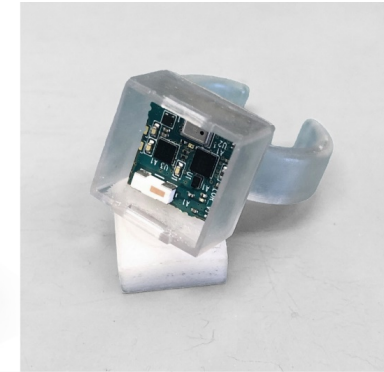
INDUSTRIES SERVED

Our breadth of expertise has strengthened our presence in key industries, which today represent 85% of our portfolio.

Gaming

Consumer
Electronics

Agriculture



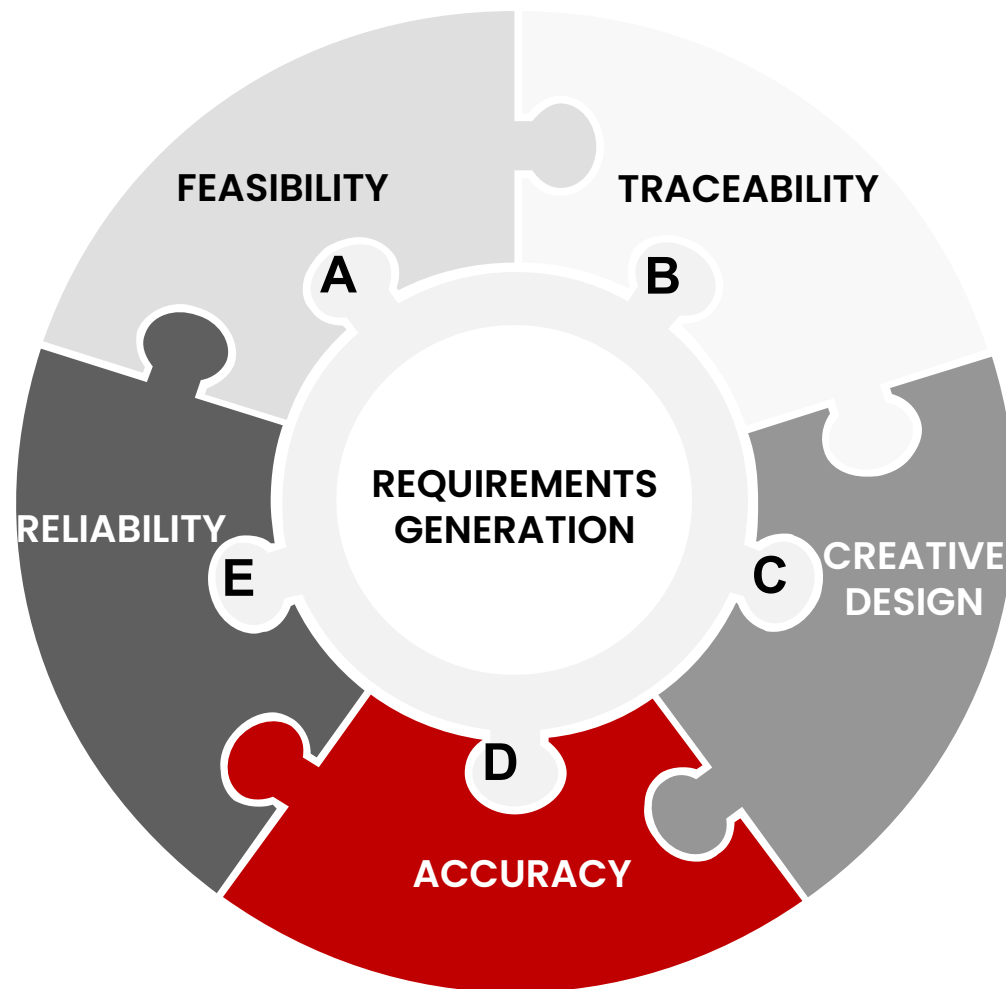
OUR DESIGN,
YOUR SUCCESS!

Preparing for Certification

~ *The Design Perspective*



Requirements Generation Process



- A** FEASIBILITY:
Product Design Specification: Determining Requirements & Considerations
- B** TRACEABILITY:
Determine Mandatory Certifications based on Function. Obtain Voluntary Certifications
- C** CREATIVE DESIGN
Incorporate specific design elements throughout the HW, SW, Mechanics of the product
- D** ACCURACY
In terms of functional standards (industry standards or proprietary to customer)
- E** RELIABILITY



Preparing for Certification: Design Phase

- Target Market:
 - Determine the markets where the product will be sold
 - Determine the safety related marks required and work with an NRTL accredited laboratory.
- Select components suitable for the applicable system standards
 - Evaluate components to product's safety reference standards for the geographic regions where the system is to be marketed.
 - Review and test the component to the applicable component standard (as listed in the system standard).



Preparing for Certification: Design Phase

- Obtain Component Certification
 - Use databases from certification agencies to search for accurate certification approval listings
 - Components are UL recognized and systems are typically UL listed
 - Use components according to datasheet specifications with suitable derating
 - Conditions of Acceptability: are you using components according to its rating?
 - Double check if certifications are current and updated



Preparing for Certification : Design Phase

- Design a suitable enclosure
 - Material selection, thickness, thermal control/ventilation, enclosure tests, robustness and suitability for applicable environments....
- Determine required spacings (creepage and clearance)
 - Identification of circuits, block diagrams, insulation level, etc.
- Single Fault Examination
 - Prepare for single fault tests. The design should withstand fault applied and remain safe.
 - Temperature tests for critical components and enclosure

A horizontal bar with a black left half and a red right half.

Pre and Post Certification Support

- Pre-certification support:
 - Prototype units are taken to an accredited lab for EMC scan to applicable test standards.
 - RoHS compliance
- Full Certification:
 - We take the system to the lab and assist with testing. We provide all the documents, certifications, critical parts, instruction manuals, labels, special test firmware, PCBA assemblies..etc.



Pre and Post Certification Support

- Post Certification Support:
 - Validation test for manufacturing
 - Ground Test and Dielectric testing
 - Additional features to the product etc.
 - Component Obsolescence Management
 - Ongoing critical component certification status
 - Declaration of conformity support
 - Review of instruction manuals and guides

THANK YOU!

QUESTION PERIOD



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COMING NEXT: COMPLIANCE WITHOUT COMPLEXITY IV

- **Beyond Certification**
- Date: October 21, 2021
- Topics:
 - Why and How often are inspections necessary?
 - Who regulates inspections?
 - Is mandatory retesting required once certification is complete?
 - what types of testing is needs to be completed on the production line?