



Debunking the myths of Ex product approvals in North America

North America is one of the largest and most lucrative markets for equipment used in explosive atmospheres. Therefore, it is vitally important to have a full and clear understanding of the regulations governing the North American product approval process and the various options available to manufacturers and exporters of Ex equipment. For instance, did you know that UL certification is NOT mandatory in the USA; and CSA certification is NOT required in Canada?

This Q&A article by Dave Adams of QPS Evaluation Services aims to shed light on the North American regulatory scene and demystify the product approval process so that Ex equipment manufacturers can make intelligent and well informed decisions to get their products to market faster and save money.

Q: What are the differences between the ATEX Directive and regulations in North America?

A: Here are some of the most important differences:

1. All electrical equipment must be

approved/certified as follows:

- In the USA, by a Nationally Recognized Testing Laboratory (NRTL) accredited by OSHA.
- In Canada, by a Certification Body accredited by the Standards Council of Canada (SCC).
- The proof of certification must be displayed on the equipment **in the form of the mark or label of the certification body**. A certificate/declaration of compliance is not sufficient.

2. The Certification Body that granted the certification must inspect each factory (defined as the location where the product is manufactured and labelled) **four times per year.**

- This is the same for every Certification Body, and each must perform their own inspections.
- This is significantly different from ATEX and IECEx where a manufacturer may have Certificates issued by a number of different Notified Bodies, but is only audited by one.

3. Ex equipment must be tested/evaluated to the applicable Ex standards as well as to the applicable general “electrical safety” standards.

- This must be performed by the

Certification Body granting the certification.

- “Self-declaration” is not an option, even for electrical safety.

Q: How is the use of “approved” products regulated in North America?

A: In both the USA and Canada, the local Authority Having Jurisdiction (AHJ) has the final authority over the installation of electrical equipment.

There are a number of AHJs in the USA and Canada, but each follows the common rules and regulations laid out in the Installation Codes.

In the USA: The National Electrical Code – Also referred to as NFPA 70, NEC or NEC500

In Canada: The Canadian Electrical Code, Part I – Sometimes referred to as the CEC or Part I

In the USA, regulations pertaining to approval of electrical products consist of:

1. Workplace safety laws of the Occupational Safety and Health Administration (OSHA)
OSHA's Regulations are federal law and stipulate that all equipment (used in the workplace) must be approved/certified by a Nationally Recognized Testing Laboratory (NRTL) accredited by OSHA.
2. Installation requirements specified in NFPA 70, the National Electrical Code (NEC),
Similarly, the NEC requires that all electrical equipment be either “approved” by the Authority Having Jurisdiction (AHJ) or “Listed”, or “Labeled” by an NRTL.
3. The laws of individual municipalities.
Some jurisdictions, will have additional requirements. These requirements are addressed by accredited Certification Bodies.

In Canada, product approval related to electrical safety is under the Jurisdiction of Provincial Governments. Typically, Provincial Regulations stipulate that “... no person may manufacture, install, offer for sale, or otherwise dispose of electrical equipment unless the equipment displays a label or mark of a certification organisation accredited

by the Standards Council of Canada (SCC)”.

Q: Many manufacturers and exporters outside of North America believe that equipment destined for North America must be certified by UL and/or CSA. Is this true?

A: Not True – In fact, this is a fallacy that is carried over from the past, and is one of the most misleading and most damaging misconceptions about certification for North America.

Looking at the regulations covered above it is quite clear that the law in the USA and Canada allows manufacturers to choose from a number of alternative NRTLs/certification bodies that are equally recognised.

As a consequence:

- In the USA, products bearing the mark of any “NRTL” satisfy both local and federal regulations.
- In Canada, a product bearing the mark of any Certification Body accredited by SCC is acceptable to all local regulatory authorities.

This is in fact similar to the ATEX Directive, which allows the manufacturer to use the services of, and obtain a Certificate of Conformity from any of the numerous Notified Bodies.

Q: Given that UL and CSA develop standards in their respective countries, doesn't this mean that manufacturers must use the UL and CSA marks?

A: No, this is another fallacy based in the past and caused by a misunderstanding of the North American regulations and/or standards writing process.

In North America, there are numerous Standards Writing Bodies, including:

- In the USA: UL, ISA, FM, etc.
- In Canada: Canadian Standards Association (Not CSA International, the CB)

National Standards are designated by;

- In the USA: “ANSI” prefix to Standard designation, i.e., ANSI/ISA12.12.01
- Canada: “CAN” prefix to Standard designation, i.e., CAN/CSA C22.2 No 60079-0



There are relatively few Bodies writing Ex Standards, CSA in Canada, UL, ISA & FM in the USA. FM Standards are used only for FM Approval, which in the past was required for specific facilities within the USA. While there are no longer facilities which only accept FM Approval, FM Standards remain.

It is important to note that all NRTL Certification Bodies must meet the same national accreditation criteria, and they all must test the products to the same ANSI/UL or ANSI/ISA standards (in the USA) and the CAN/CSA standards (in Canada).

This is also similar to the situation in Europe where various Notified Bodies test/evaluate the product to the same applicable harmonised standards, and their certificates are recognized throughout the EU.

Q: Some North American end users request “CSA and/or UL Certification”. What does this mean?

A: This is a typical example that “old habits die hard”. The statement is rooted in the old days of monopoly

enjoyed in the past by UL and CSA, when manufacturers had no other choice but to use those two certification bodies. It is also perpetuated by the fact that UL and CSA also publish most of the national standards.

This means that 99% of the time when your customer tells you they require “CSA and/or UL Certification”, they are referring to the product having to be Certified and Marked by a Certification Body accredited in Canada (by SCC) and/or in the USA (by OSHA).

To recap, there are no regulations, standards, codes, etc., that require equipment to be certified only by CSA, or only by UL, for use in hazardous classified locations, or any location.

Q: Can General Electrical Safety Requirements have a significant effect on obtaining Certification for the USA or Canada?

A: Yes! - All equipment intended for use in Hazardous Locations must also comply with the applicable general Electrical Safety Standards. While this may sound simple, it can drastically affect the time and cost associated with obtaining Certification. In some cases it could even require re-design of the equipment.

I’ll use the example of a request for Canadian “Zone” Certification of a flameproof control cabinet containing some electrical components, covered by an IECEx Test Report (ExTR).

- The general Electrical Safety Standard is CSA Std C22.2 No.14, Industrial Control Equipment. This standard will require the internal components to comply with the applicable Standard for the components (i.e., Power supply Certified to CSA Std C22.2 No 60950-1).
- This means that a manufacturer has two choices;
 - Have each component evaluated to the applicable component Standard, and bear the additional time and costs associated with these evaluations, or;
 - Replace each non-compliant

component with a component which is already Certified for Canada. This may invalidate some of the evaluation and testing covered under the IECEx ExTR, i.e., Temperature Code determination, which would then have to be repeated; again with additional time and costs.

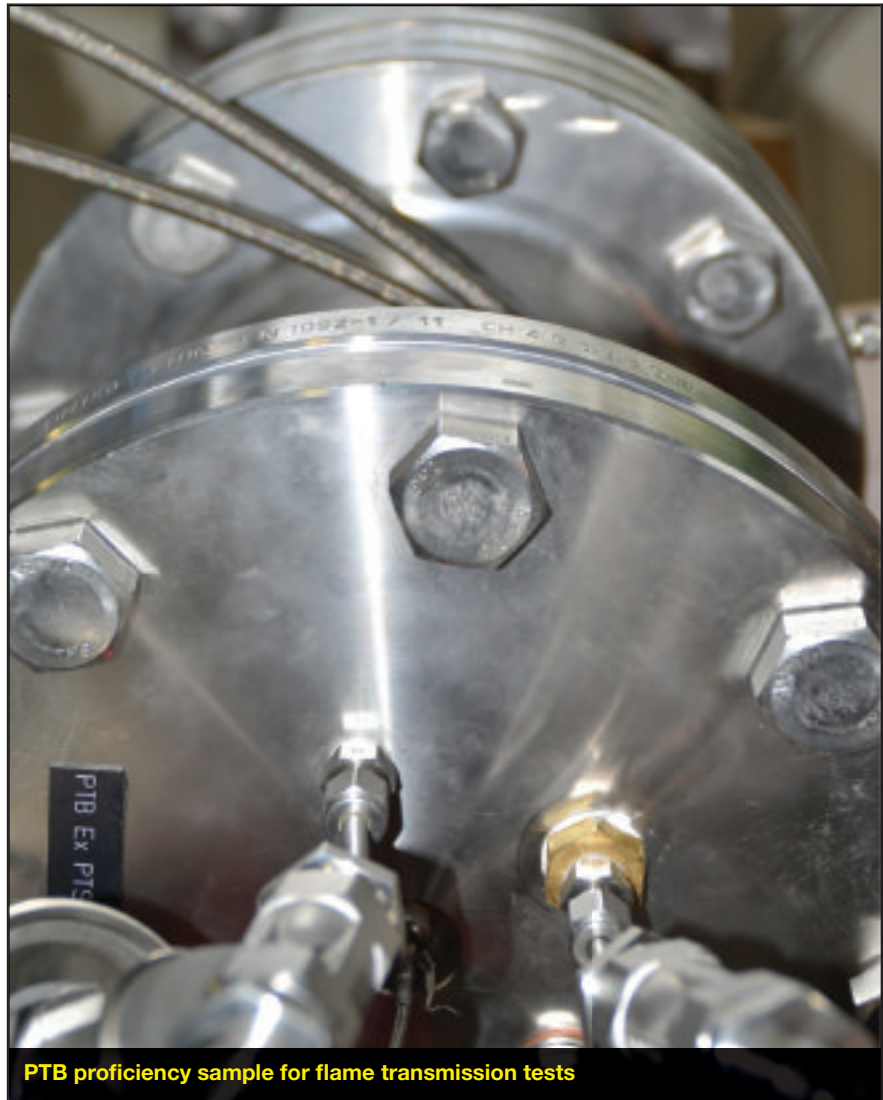
The example above highlights the importance of determining the general Electrical Safety standard(s) to ensure your equipment is in compliance before submitting the equipment for final approval.

Q: Do the USA and Canada recognise and use both the 3-Zone and 2-Division Area Classification systems?

A: Yes - Both systems are recognised and used;

- In Canada, all new installations must be classified using the 3-Zone system. In the USA, new installations still have a choice between the 2-Division and 3-Zone systems.
- As such, the 3-Zone system is used significantly more in Canada than in the USA.
- Each of these systems has their own "set" of Equipment Certification Standards:
- The 3-Zone System uses the Canadian/USA adoptions of the IEC60079 Series of Standards, with National Deviations.
- The 2-Division System uses the traditional Canada/US Hazardous Locations Standards, i.e., CSA Std 30/UL1203, CSA157/UL913, etc.
- The Installation Codes in Canada (CEC) and the USA (NEC) both allow for "Zone equipment" to be used in Division classified areas and vice versa, but it is somewhat limited.

3 Zone Area Classification System	2 Division Area Classification System
Zone 0	Division 1
Zone 1	Division 1
Zone 2	Division 2



PTB proficiency sample for flame transmission tests

- Note that Zone 1 equipment cannot be used in Division 1 locations as Division 1 includes both Zone 0 and Zone 1.
- Certification requires quarterly Factory Inspections which cannot be replaced by yearly (or every 18 months) audits.

Q: Is an IECEx Certificate (or Mark) recognised in the USA or Canada?

A: No – But an IECEx Test Report (ExTR) can be used as a basis for obtaining USA or Canadian Certification.

Because of the reasons stated above, namely;

- Certification requires evaluation and testing by an accredited Certification Body to National Standards, including general Electrical Safety Standards (IECEx National Deviations for Canada/ USA),
- Certification is verified by the Recognized Certification Mark applied to the equipment's markings,

The IECEx Certificate (or Mark) cannot be directly accepted in Canada or the USA.

However, the IECEx Test Report (ExTR) can be used by an IECEx Certification Body (ExCB) that is also SCC and/ or OSHA accredited, as a basis for obtaining Certification under the 3-Zone Area Classification system for the USA and/ or Canada. This will require;

- The manufacturer making an application for Certification to an SCC and/ or OSHA accredited Certification Body, noting an IECEx ExTR will be provided.
- Providing the complete ExTR and associated documentation.

- Providing representative test samples.
- The manufacturer may need to supply additional documentation in order to support the Factory Inspections.

The accredited Certification Body will:

- Review the ExTR as verification of compliance of the equipment to the Canadian/USA adoptions of the IEC60079 Series of Standards.
- Evaluate and test the construction against the requirement of the applicable General Purpose Standards.
- Document the critical constructional aspects of the equipment, summarise the testing performed and results and describe the overall construction of the equipment in a Certification Report.

Note: Prior to the Certification being issued and authorization to affix the Certification Mark to the equipment, the customer must enter into a Service Agreement with the Certification Body. The Service Agreement specifies the requirements which must be met in order to continue the use of the Certification Mark. One of these conditions is the quarterly Factory Inspections.

Summary:

- IECEX Certification is not recognised in the USA and Canada.
- An IECEX Test Report (ExTR) can be used as the basis for USA/Canadian Certification.
- The Certification Body will evaluate the equipment to the applicable general Electrical Safety Standards.
- The manufacturer must enter into a Service Agreement with the Certifying Body which will result in quarterly Factory Inspections.

Q: Are an EC Type Certificate, Type Certificate and/or Declaration of Conformity recognised in the USA or Canada?



Measuring and safety components in control box

A: No – For the same reasons as an IECEX Certificate, an “ATEX Certificate” or Declaration of Conformity is not recognised in the USA or Canada. There is a chance that the Test Report on which the Certificate is based upon can be utilized to obtain Zone Certification for the USA or Canada, but the following would apply;

- The Notified Body that issued the Certificate and Report is also an IECEX Certification Body (ExCB).
- The Certificate, Test Report and all associated documentation must be provided.
- The Certificate must be less than 5 years old AND issued to the EN60079 Series Standards.

If the above conditions are fulfilled, the Certification Body may accept parts of or all of the evaluation and/or testing as verification of compliance of the Ex protection aspects of the equipment. The Certification Body would still complete the remaining Ex assessment, as well as assessment of the General Purpose requirement.

Note: The Certification Body is NOT obligated to accept this or any outside test data.

Q: Can Non-Electrical equipment for Hazardous Locations be Certified for the USA or Canada?

A: No – There are no recognised National Standards addressing Non-Electrical Ignition Hazardous for the USA or Canada. As a result, there are no Certification Programs for Certification of Non-Electrical Equipment for use in Hazardous Locations. There may be some industries, jurisdictions or facilities that enforce their own and/or adopted requirements, but there is no National Certification available for Non-Electrical equipment for use in Hazardous Locations.

Certification Bodies and Manufacturers have one thing in common; we must both

understand standards, codes, regulations and processes for certification schemes all over the world. It’s in our best interests if the correct information is freely shared between all parties. ■

About the author:



Dave Adams has been in the certification business of Ex products for over a quarter century, working for a large certification body, and heavily involved in the IECEX System. He is currently the manager of the Haz Loc department at QPS Evaluation Services, a Canadian-based Certification Body accredited in both Canada and the USA.