

# INTERNATIONAL IECEX CERTIFICATION SCHEME

## 'IECEX - A GLOBAL SOLUTION FOR THE Ex INDUSTRY'

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**Abstract** - This paper provides a brief look at changes to the Ex field in relation to certification of Ex equipment and introduces the relatively new IECEX Scheme set out to provide real and practical solutions to the International Ex industries with the ever difficult balancing act of:

*“facilitation of Trade in Ex equipment, systems and services while maintaining an accepted level of safety in a cost effective manner”*

This paper will also see how IECEX is working towards its Vision to be

*“The Global Centre of Excellence in the Ex field”*

### Index Terms

IEC – International Electrotechnical Commission

IECEX – Conformity Assessment Scheme of the IEC for Certification to Standards relating to equipment for use in explosive atmospheres

ISO/IEC – Joint publications of the International Organisation for Standardisation (ISO) and IEC

QMS – Quality Management System

## I. INTRODUCTION

Advances in technology along with Globalisation have produced many changes in industries and the field of Explosion Protection of Equipment is no exception. Modern day automation of processes mean more and more specialised equipment are being exposed to harsh environments, especially those where the presence of flammable gas/vapours or combustible dusts either exist or may exist.

The international Ex community (Ex equipment manufacturers, end users and regulators) have worked long and hard at providing standardization of technical requirements for Ex equipment and systems now reflected in the mature set of Standards, work on standardizing the approaches towards testing and certification, is relatively young.

The benefit of publishing international equipment standards can be overshadowed by the application of differing testing and certification practices and systems, resulting in costly re-testing/certification and lost time-to-market for manufacturers and down time for plant operators.

While for the EU, the ATEX Directive has been seen as a solution towards a common approach, the question of

“What about companies and organizations that operate Globally?”

## II. THE INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC)

The International Electrotechnical Commission (IEC) is the international organisation responsible for Standardisation in the electrical and electronic fields.

Founded in 1906, IEC was formed as a result of the resolution of the Chamber of Government Delegates at the International Electrical Congress of St Louis, USA, in September 1904.

The object of the Commission is to promote international cooperation on all questions of standardisation and related matters in the fields of electrical and electronic engineering and thus promote international understanding.

In addition to the preparation of International Standards, the IEC facilitates the operation of Conformity Assessment Schemes through the IEC Board on Conformity Assessment (IEC CAB)

In noting that IEC Celebrates 100 years titled as the “Electric Century” a dedication to the success and accomplishments of the IEC have been collated on the IEC Website, [www.iec.ch](http://www.iec.ch)

## III. STANDARDISATION BACKGROUND

In the practical world, the publication of an International Technical Standard setting out product, or process requirements, does not automatically achieve true standardisation by itself. While the written Standard ensures a common set of technical requirements, there maybe a wide variety of systems and methods used to evaluate compliance to that “*common set of Technical Requirements*”. A simple example of this, in the Ex field, is the requirement for a manufacturer to prepare or have prepared a Certificate confirming that the apparatus is in conformity with the requirements of the Standard, re *IEC 60079-0 Edition 4 Clause 28.1* [1]. The immediate questions that come to mind are:

- What are the capabilities and qualifications of those that are determining whether or not the apparatus is conforming to requirements?
- Do they have all the necessary equipment and facilities to conduct assessments?
- What level of “Technical Judgement” would be permitted, in lieu of physical testing?
- What information needs to be documented in order to justify claims of compliance?

- Others, e.g. relating to control over production?

These are just a few immediate questions that come to mind regarding the implementation of such a requirement.

This is not aimed as a criticism of the Standard, as industry should be congratulated in their efforts that now results in a mature and robust set of International Standards from IEC TC 31 and its Subcommittees. However, we must acknowledge that Technical Standards such as the IEC 60079 series are NOT intended as “training” instruments. Rather they are intended to be used by those with sufficient understanding and competence in their application.

It is questions like these that lead us into the broader and specialised field known as “Conformity Assessment”, which embodies, among others:

- **Testing**
- **Inspection**
- **Certification**
- **Accreditation**

#### IV. CONFORMITY ASSESSMENT

The very questions we have just raised, concerning the issuing of a Certificate for the Ex field, apply across all other technologies and industries, sufficient for ISO and IEC to collaborate via the ISO Conformity Assessment Committee known as CASCO to provide internationally accepted guidance and standards in this diverse area.

Through this CASCO Committee, we see a range of International Standards and Guides published as Joint ISO/IEC Publications. Some of these, used extensively in the Ex field are:

- **ISO/IEC 17025** General requirements for the competence of testing and calibration laboratories
- **ISO/IEC Guide 65** General requirements for bodies operating product certification systems
- **ISO/IEC Guide 62** General requirements for bodies operating assessment and certification/registration of quality systems
- **ISO/IEC Guide 67** Conformity assessment — Fundamentals of product certification

When one starts examining the conformity assessment chain of accountability, questions such as “Who checks the checker?” arise. So the CASCO Standards and Guides may be regarded as the “Specifications” applicable to the “Checker”.

While ISO/IEC Guide 62 deals with assessing bodies that provide Quality Management System Certification and Registration, introduction of ISO/IEC Guide 65 dealing with Bodies offering Product Certification systems has necessitated further guidance regarding Internationally recognisable Product Certification Systems, hence the birth of ISO/IEC Guide 67.

ISO/IEC Guide 67 recognises up to 8 forms of certification systems and their key elements for demonstrating conformance of products to specifications

(See Table 1 extract from ISO/IEC Guide 67, below)

Table 1 — Building a product certification system

Elements <sup>a</sup> of product certification system		Product certification systems <sup>b, c, d</sup>							
		1a	1b	2	3	4	5	6	7 <sup>e</sup>
1)	Selection <sup>f</sup> (sampling), as applicable	x	x	x	x	x	x		
2)	Determination <sup>f,g</sup> of characteristics, as applicable, by:	x	x	x	x	x	x	x	
	a) testing (ISO/IEC 17025)								
	b) inspection (ISO/IEC 17020)								
	c) design appraisal								
	d) assessment of services								
3)	Review <sup>f,g</sup> (evaluation)	x	x	x	x	x	x	x	
4)	Decision on certification Granting, maintaining, extending, suspending, withdrawing certification	x	x	x	x	x	x	x	
5)	Licensing (attestation <sup>f</sup> ) Granting, maintaining, extending, suspending, withdrawing the right to use certificates or marks		x	x	x	x	x	x	
6)	Surveillance, as applicable by:								
	a) testing or inspection of samples from the open market			x		x	x		
	b) testing or inspection of samples from the factory				x	x	x		
	c) quality system audits combined with random tests or inspections						x	x	
	d) assessment of the production process or service				x	x	x	x	
<sup>a</sup> Where applicable, the elements can be coupled with initial assessment and surveillance of the applicant's quality system (an example is given in ISO/IEC Guide 53) or initial assessment of the production process. The order in which the assessments are performed may vary.									
<sup>b</sup> A product certification system should include at least the elements 2), 3) and 4).									
<sup>c</sup> An often used and well-tried model for a product certification system is described in ISO/IEC Guide 28; it is a product certification system corresponding to system 5.									
<sup>d</sup> For product certification systems related to specific products, the term "scheme" is used (see 3.2, Note 2).									
<sup>e</sup> Reference [16] mentions system 7 (batch testing) and system 8 (100 % testing). These may be considered product certification systems if at least the elements of system 1a are included.									
<sup>f</sup> See ISO/IEC 17000 for definitions.									
<sup>g</sup> In some systems, evaluation means determination, and in other systems it means review.									

**V. APPLICATION OF ISO 9001 QMS CERTIFICATION**

Whenever the subject of Ex certification is discussed, the inevitable question arises

*“As a manufacturer/Supplier we hold ISO 9001 Certification for our Quality Management System (QMS), why do we need something else?”*

Although ISO 9001 [2] does provide a heightened level of confidence in a suppliers' overall quality, it does not provide product or component-level quality assurance. ISO 9001 provides an excellent foundation for an organisation's overall Management System.

The construction industry is an appropriate analogy to illustrate this point. We are aware that there is a general and standardised approach to creating the foundation of a home or building, that is fairly common in design. However the actual construction that is built upon the foundation is limited only by the imagination and cost

constraints placed on the architect and designers. Similarly, the ISO 9001 QMS acts as the foundation with the aim of the ISO 9001 Certificate to provide assurance of the soundness of that foundation. The soundness of what is built upon the ISO 9001 foundation requires a little more in terms of evaluation and monitoring.

Let's look at the following practical examples

**Example 1**

**ISO 9001: 2000 Clause 1.2 Application:-** Third Paragraph states

*“Where exclusions are made, claims of conformity to this International Standard are not acceptable unless these exclusions are limited to requirements within clause 7, and such exclusions do not affect the organization's ability, or responsibility, to provide product that meets customer and applicable regulatory requirements”.*

A very valid statement in a generic Standard such as ISO 9001, however those familiar with ISO 9001 would

know that Clause 7 and its sub clauses cover “Product Realisation Requirements” and have a major influence on organizations that manufacture and produce products. So the immediate question, “Who determines which Sub clauses of Clause 7 can be “excluded” and how does the end customer know which sub clauses of 7 have been excluded when looking at the ISO 9001 Certificate?

### Example 2

**ISO 9001: 2000 Clause 4.2.4 Control of Records:-**  
States

*“Records shall be established and maintained to provide evidence of conformity to requirements and of the effective operation of the quality management system. Records shall remain legible, readily identifiable and retrievable. A documented procedure shall be established to define the controls needed for the identification, storage, protection, retrieval, retention time and disposition of records “*

Again, a reasonable requirement in such a generic standard but in terms of the Ex industry, the following important questions remain:

- What are considered to be quality records?
- What is meant by readily identifiable?
- Are manufacturing drawings and certification drawings considered records?
- How long shall these records be kept?
- Is it the manufacturer or the test station that should keep test records?
- Are there sufficient records maintained to enable product traceability?
- What are the procedures and process for disposal of records?

Similar specific questions are raised in many of the sub clauses to Clause 7, especially Clause 7.4 *Purchasing* and how well the Ex manufacturer manages the supply chain verification of critical components, assemblies and processes, all of which result in an ISO 9001 certificate on its own providing limited assurance of the final products conformity to standards.

## VI. IECEX AND ATEX QUALITY ASSURANCE

In order to answer the very questions raised above, both the ATEX Framework and IECEX Scheme have each issued a clearly defined set of QMS requirements that are in addition to the base line ISO 9001 requirements, applicable to the Ex industry.

For ATEX, these are published in EN 13980 [3] and for IECEX in IECEX Operational Document OD 005 [4].

The global Ex industry deserves to be complimented in being able to achieve commonality of QMS requirements for the Ex field, in both the ATEX and IECEX systems as EN 13980 and OD 005 are fully aligned and while there may be minor differences in terminology, e.g. EN 13980 refers to an “EC Type Examination Certificate” and IECEX OD 005 to an “Ex Test Report” the QMS requirements are in line. This means that QMS systems that comply with

IECEX OD 005 will also meet EN 13980 and vice versa.

To assist industry, both EN 13980 and OD 005 have adopted the same clause numbering system of ISO 9001 and only include requirements that are in addition to those of ISO 9001. In this manner they may be considered as an extension to the base line ISO 9001 QMS requirements.

Experience with the assessment and auditing of Manufacturer’s QMS to date has revealed the need to place greater attention to the more technical areas of a manufacturer’s QMS such as:

- a) *Traceability of Measurements* – There still may be some that feel using an instrument that is calibrated addresses traceability of measurement. The use of manufacturers internal test and assessment report forms which allow for the placement of a “Tick” to indicate compliance with no recording of the actual measurement taken nor the single identification of the instrument used is not uncommon.
- b) *Authorising Final Release of Ex Products* – The need for a manufacturer’s system to provide clear identification of the position nominated and skills required, for determining whether the final production item complies with Certification requirements, cannot be over emphasized, remembering that the manufacturer is the one that finally determines the compliance of each product produced once they have achieved the necessary external certifications.
- c) *Purchasing* – The necessity for a tightening of controls over the suppliers of critical parts, components and processes to the Ex product manufacturing process along with clearly defined specifications.

These are examples of some of the more common areas that Ex Certification Bodies have had to address in some detail, even for manufacturers that hold ISO 9001 Certification.

## VII. IECEX AND ATEX SIMILARITIES

While we have identified full alignment of quality system requirements of ATEX and IECEX, the growing emergence of IEC TC 31 Standards being accepted in CENELEC mean that the technical requirements are also heading quickly down the alignment path as well. So does this mean that IECEX and ATEX are identical systems?

Not quite!

ATEX serves the EU community as a regulation for the sale of Ex products and systems to the EU market for which the ATEX Directive sets out the Essential Health and Safety Requirements (EHSR). Compliance with a European Harmonised Standard is considered to give a presumption of Conformity to the EHSR, meaning that compliance with the Ex Standards are not mandatory, but would certainly make good sense. In addition there are different Conformity Assessment options depending on the product and zone of use. For example zone 2 or Ex n equipment does not require undergoing third party independent testing and assessment. Compliance with

ATEX can be done solely on the basis of self declaration.

On the other hand, IECEX is Single Concept Certification Scheme, that provides independent verification of claimed compliance to Standards, for which testing and assessment of ALL products irrespective of type and zone of use must undergo. Furthermore, compliance with IEC Standards are MANDATORY as IECEX does not use EHSR nor is self declaration used.

This fundamental difference between IECEX and ATEX is due to the fact that ATEX is part of the EU Regulatory framework, whereas IECEX is a single International Certification system which provides confidence in the compliance of products (as listed on the IECEX Certificate) with the IEC Standards (as listed on the IECEX Certificate).

Furthermore to strengthen this confidence, IECEX has implemented a robust single assessment and surveillance system to assess and monitor ALL IECEX Test Laboratories and Certification Bodies, irrespective of their experience or national/regional status.

Given the EU regulatory requirements, in Ex we see more and more Ex Test and Certification Bodies gain status as both an ATEX Notified Body and IECEX Body. This enables them to serve the International marketplace in assisting manufacturers to meet both local and international Certification requirements. Having said this, IECEX bodies located outside EU provide access to fulfilling the ATEX requirements via the global recognition framework provided by the IECEX system.

As mentioned above, we are seeing the emergence of common Ex technical standards plus the full alignment of the QMS requirements, mean that bodies can offer a single testing and assessment process that covers both ATEX and IECEX.

However, manufacturers need to think ahead, regarding their global certification needs. Primarily there is a strong recommendation that manufacturers should think ahead and obtain both ATEX and IECEX at the same time, noting that test and assessments are common to both and the additional cost to satisfy both lies largely with completion of necessary documentation, assuming of course compliance with Standards are being used to fulfill ATEX requirements.

It must also be noted that, as compliance with standards is not mandatory under ATEX, it may be found that the easier path is to convert an IECEX to ATEX rather than to use previous ATEX work to issue an IECEX Certificate, as full compliance testing to Standards may not have been used during the ATEX process.

## VIII. IECEX CERTIFICATION SCHEME

In noting the ATEX Directive and its various paths for Ex conformity assessment, for many countries and regions outside the EU the sale or use of Ex equipment and systems are heavily regulated and therefore have their own Ex Approval and/or Certification systems. For manufacturers, the trading of Ex products in a global market has been somewhat of a challenge involving the repeat testing and assessment of products, as well as multiple factory inspections and audits from different organizations to differing requirements.

Industry on the other hand also suffered as access to new technology and innovative products, for the many smaller markets, were either delayed due to repeat Ex testing and certification processes, or in many cases, even denied access as overseas manufacturers found the time,

effort and cost of repeat certification far too great with little return on their investment arriving at a commercial decision not to enter certain markets.

Problems such as these led to agreement being reached, within IEC, on the need for a single Global Certification Scheme dedicated to the Ex field and formation of Working Group, WGEx (in the early 1990s), under the Convenership of Nick Maalouf, of CSA at the time, and the WGEx Task Force under TF Leader Mr Ian Cleare, of EECs, UK, at the time (who then went on to become the first IECEX Chairman). Interest in this new activity was high, with many countries participating in this new work of developing the nucleus for an International Ex Scheme.

Immediate work for this new WGEx sought to overcome the following immediate obstacles:

- The different regulations at National and Regional Levels
- In many case the splitting of Regulations within a country, e.g. one set covering underground mining operations and another for non mining Ex areas

While of equal or greater challenge were:-

- How to generate confidence among the Ex Test houses and Certifiers?
- And then how to instill confidence among the Ex Industry?

While 2006 sees IEC enjoys 100 years of operation, IECEX itself enjoys a modest 10 years of operation, with June 1996 being the first meeting of the IECEX Management Committee, in London, where the decision was taken to move ahead and the respective officers appointed and framework for building Global confidence began.

In just 10 years with an IECEX Management Committee comprising representatives of 25 countries, IECEX has developed a complete suite of Rules, Operational Manuals and Procedures and Standardised Forms to create a single Ex test and certification system with the many IECEX Certification Bodies operating as IECEX Certification providers.

The IECEX rules have been published as IEC documents known as:

- IECEX 01** ***IEC Scheme for the Certification to Standards relating to Equipment for use in Explosive Atmospheres (IECEX Scheme) – Basic Rules***
- IECEX 02** ***IEC Scheme for the Certification to Standards for Electrical Equipment for Explosive Atmospheres (IECEX Scheme) – Rules of Procedure***
- IECEX 03** ***IEC Scheme for the Certification to Standards relating to equipment for use in Explosive Atmospheres (IECEX Scheme) – Certified Service Facility Program***

IECEX 01, 02 and 03 are available for free download

from the IECEx website [www.iecex.com](http://www.iecex.com) as well as the IEC webstore.

It is important to note the principle aim of the IECEx Scheme is:

*To facilitate international trade of Ex equipment by eliminating the need for duplication of testing and certification while preserving an acceptable level of safety.*

This results in the following core objectives of the IECEx Scheme:

- reduced testing and certification costs to industry;
- reduced time to market;
- international confidence in the product assessment process;
- one international database listing;
- maintaining International Confidence in equipment and services covered by IECEx Certification

The IECEx Scheme comprises the following two Global Certification Programs

### 1. The IECEx Certified Equipment Program

### 2. The IECEx Certified Service Facilities Program

#### 1. The IECEx Certified Equipment Program

This IECEx Certified Equipment Program is an International Certification Scheme covering products that meet the requirements of International Standards, e.g. IEC Standards prepared by TC 31.

The IECEx Certified Equipment Program provides Ex industry with a choice of:

- A single International Certificate of Conformity that requires manufacturers to successfully complete:-
  - Testing and Assessment of samples for compliance with Standards
  - Assessment and auditing of manufacturers premises
  - On-going surveillance audits of manufacturers premises

Or

- A “fast-track” process for countries where regulations still require the issuing of national Ex Certificates or approval. This is achieved by way of global acceptance of IECEx equipment Test and Assessment Reports.

**Electronic “On-Line” IECEx Certificates** - Certificates issued by the IECEx Certified Equipment Program are issued as “Electronic Certificates” and are live via the IECEx Website. This enables full public access for viewing and printing. The key word search capabilities act as somewhat of a “buyers guide” when selecting Ex equipment covered by IECEx Certification.

### IECEX Standardised Test Report and QA Forms –

While standardisation of testing and certification processes are an essential aspect of the IECEx scheme, standardisation of Scheme documentation is of equal significance.

During the early stages of IECEx development an informal survey of Ex Test Report Formats was undertaken of Ex Test Laboratories and Certification Bodies. This survey revealed a wide disparity among the bodies in both the type and level of reporting documentation issued to industry, with some Ex Test bodies advising that they did not issue a formal test report through to some bodies that issue 30 or more pages of a formal test report.

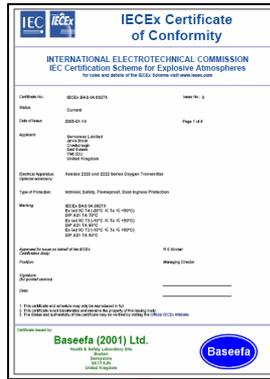
The IECEx Management Committee soon agreed on the need to standardize the test report formats and for some time now, through the work of the IECEx Technical Committee, ExTAG, IECEx maintain a full suite of IECEx Standardised Test Report Forms. To assist industry, these “Test Report Blanks” are also available for purchase from the IEC webstore as they also serve a useful tool in providing a standardised reporting record for general assessment of Ex plant and equipment.

Similarly standardised report forms exist for the reporting of IECEx audits which have been aligned with the audit reporting format developed by the ATEX ExNB Group.

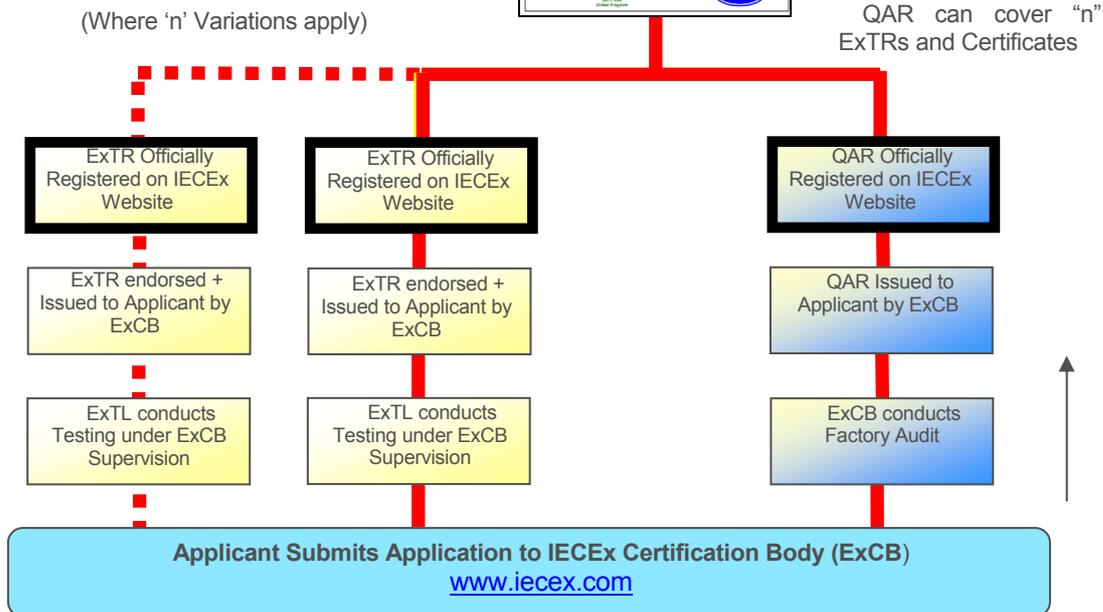
**IECEX Certification Process** – The IECEx certification process is managed by the IECEx Certification Body (ExCB) to which the manufacturer has applied. Type Testing of samples, representative of production, is undertaken by the Ex Test Laboratory associated with the ExCB or another ExTL operating in the Scheme. An audit of the manufacturer’s site(s) is conducted, again by the ExCB to whom the application for a certificate was made or another ExCB operating in the System.

When successful Testing is completed, an ExTR is issued, with a QAR issued following on-site auditing. Once the ExTR and QAR are completed, the ExCB (to whom application for an IECEx Certificate was made) conducts a “Certification Review” to ensure all IECEx requirements have been met and then proceeds to issue the IECEx “On-Line” Electronic Certificate. In doing so, this ExCB now has the role of managing the “Certification Maintenance”, meaning that this ExCB ensures that on-going surveillance audits are either done by themselves or else another ExCB qualified to do so.

Below is a diagrammatical presentation of the process that leads to the issuing of an IECEx Certificate of Conformity, noting that the manufacturer may opt for the issuing of just an ExTR or QAR, which may be used to achieve National Certification via a fast track process, re Clause 10.1 of IECEx 02.



IECEX Certificate Issued Live on Line. Full Public Access to Original Electronic Master Version



**IECEX Process Summary** - To summarise, under the IECEX Certified Equipment Program we note the following items:

- **Test Report** (ExTR) ⇒ Demonstrates that only the item(s) tested complied
- **Quality Assessment Report** (QAR) ⇒ Verify QMS meets ISO 9001 + IECEX Requirements
- **IECEX Certificate of Conformity** (CoC) ⇒ Demonstrates Capability of the supplier to consistently comply

While somewhat of a simplified overview, each stage of the IECEX process is covered by detailed rules, operational documents and forms all standardised to ensure that each of the ExCBs (Currently 26 + Others undergoing the application process) all conduct the testing and certification operations in, what is now known as, the "IECEX Way".

An up to date list of ALL IECEX Certification Bodies, detailing their location, scope of IECEX acceptance and contact point is maintained on the IECEX website at <http://www.iecex.com/bodies.htm>

## 2. The IECEX Certified Service Facilities Program

This IECEX Program is an International Certification Scheme that covers the assessment and the on-site audit of organizations that provide a Repair and Overhaul service to the Ex industry.

Due to the very high capital investment made by industry for most Ex equipment it is much more economical to repair and overhaul equipment rather than to replace it with new. This also has obvious environmental benefits.

The challenge for industry is to ensure that all the very unique Ex safety features, included in the design and manufacturing of Ex equipment, are not compromised during the repair process.

Ex Repair and Overhaul Facilities and Workshops, certified under the IECEX Certified Service Facilities Program, provide industry with the assurance that repairs and overhaul to Ex equipment will be undertaken according to the strict requirements of IECEX Scheme and to the International Standard IEC 60079-19 [5]

Like the IECEX Certified Equipment Program, only "Electronic Certificates" are issued via the "On-Line" system thereby giving industry full access to both the viewing and printing of certificates.

**IECEX Confidence** - In the early days of IECEX the challenges on how to instill international confidence, not only among the IECEX Test and Certification bodies but also by the end users, manufacturers and Regulators was a significant issue that needed to be addressed.

From the outset, IECEX set a global benchmark for all ExTLs and ExCBs to achieve in order to gain acceptance into the IECEX Scheme. In doing so, IECEX established the IECEX Assessment and Surveillance Process which addressed the following:

- Assessment of test and assessment facilities and equipment
- Assessment of the TL or CB's internal quality system for compliance with base ISO/IEC Standards and Guides, 17025 + Guide 65
- Evaluation of staff competence to conduct test/assessment and their working knowledge of standards
- Ability to apply IECEX own internal procedures, rules and manuals, in short to be sure the bodies conduct work "The IECEX Way"
- Satisfactory completion of IECEX TGDs (Technical Guidance Documents)

## IX. ACCEPTANCE OF THE IECEX CERTIFIED EQUIPMENT PROGRAM

There are two levels of IECEX acceptance –

- a) **Desired Level** – enabling a product covered by an IECEX Certificate to go direct to market without any further review or administrative process at National Level.
- b) **Mandatory Acceptance** – Acceptance of the conformity assessment results (i.e. testing and quality reports) that underpin the IECEX Certification System

**Use of the IECEX Certificates of Conformity – By end users-** While the IECEX Certificate of Conformity provide confidence in product compliance with Standards, it is paramount that when an user, purchasing Ex equipment on the basis of the IECEX Certification, or for that matter any form of certification, they assure themselves, at least, of the following:

ITEM	COMMENT
a) Is the Certificate Current?	For IECEX, simply visit <a href="http://www.iecex.com">www.iecex.com</a> and select "Online" Certificates then "Enter On-Line Certificates" or type in <a href="http://domino.iec.ch/IECEX/IECEXWeb.nsf">http://domino.iec.ch/IECEX/IECEXWeb.nsf</a> and enter the Certificate number. The Certificate status is displayed as determined by the IECEX Certification Body, responsible for that Certificate.
b) Is the Certificate authentic?	For this very reason, IECEX developed the concept of issuing an electronic master that resides on the internet system. Any printing or downloading means that an individual is in possession of an un-controlled copy with the onus on the reader to visit the IECEX website.
c) Does the product listed on the certificate match the product you have been presented?	The obvious first check is the markings as these must match the Certificate. The next is for someone with an appreciation of what the product should be to check this. Also, if there is doubt, the user may contact the ExCB issuing the Certificate for their guidance
d) Are there any special conditions on safe use associated with the certificate?	In accordance with the requirements of IEC Standards, any conditions of safe that may apply warrant the application of an "X" after the Certificate number. These conditions are listed within the Certificate and must be followed along with any other manufacturer's recommendation, in order for the Certificate to remain valid.
e) Does the Ex protection assigned meet my zonal classification and any special environmental requirements, e.g. weather, likelihood of mechanical damage?	This is something that should be clarified prior to placing the order for the product but nevertheless is still a worthy check, just in case since placing the order, there have been changes to the plant design or other influences.

In adopting the On-Line Electronic system of Certificates, IECEX have utilised the secure network of the IEC Central Office IT system, the same used to protect IEC's intellectual property of IEC Standards. Each ExCB is assigned two distinct sets of passwords.

1. **First Level Password** – enables the preparation and drafting of IECEX Certificates by a number of the ExCB's technical staff BUT without the permission to set the Certificate live as

CURRENT.

2. **Second Level Password** – enabling the ExCB's selective Certification Manager or Officer, with all the authority rights of Level 1 Password with the addition of being able to convert the hidden draft IECEX Certificate to CURRENT and Live.

Further safeguards in the IECEx “On-Line” system include:

- a) Automatic Certificate Numbering generation – To prevent the situation of the one certificate number being issued more than once;
- b) Each IECEx Certificate number identifies the ExCB issuing the Certificate;
- c) Prevention from any ExCB to delete a certificate, even those they issued. Once a certificate is created (even in draft form) only the IECEx Secretariat or IEC Central Office have access for deletion. Prevents inadvertent deletion;
- d) ExCBs can only issue IECEx Certificates to Standards for which they have been assigned as part of their scope. An internal system block prevents ExCBs from issuing IECEx Certificates to Standards outside their scope;
- e) Reviews of issued IECEx Certificates by the IECEx Secretariat for editorial errors that may detract from the credibility of the system;
- f) Others.

## X. IECEx CURRENT AND FUTURE INITIATIVES

An IECEx initiative of recent times worth noting has been the previous revision of its field of activity moving from just certification of electrical equipment to the certification to Standards that relate to equipment in Ex areas, which positions IECEx to meet industry needs in Conformity Assessment.

IECEx latest initiative is the rolling out of its new service offering “IECEx Certified Service Facility Program” – covering assessment and certification of Ex Repair workshops. This new service has been keenly awaited by both Ex End Users as well as Ex Repair Workshops that wish to differentiate themselves from those operations that may not be complying with minimum Standards, e.g. IEC 60079-19.

This new service has been the culmination of work conducted by the IECEx Working Group ExMC WG10 for which a meeting is planned to coincide with the PCIC Europe Conference.

A further IECEx initiative has been the formation of a new ExMC WG looking into the demand and possibility of Ex Competency Assessment and Certification. While only at the very early stage of consideration, it is further evidence that IECEx is prepared to deal with the practical day to day problems associated with Conformity Assessment in the highly specialised Ex field.

## XI. CONCLUDING COMMENTS

While those that remember the early days of IECEx may be forgiven in thinking it was some time coming, however since introduction of the IECEx “On-Line” Certificate of Conformity in 2003, IECEx has enjoyed rapid growth and expansion.

Main reasons for this growth being that IECEx is developed by the very industry it serves. Early days of the annual IECEx Management meetings saw minimal industry representation, whereas 2004 IECEx meetings saw 10% of

the annual delegates coming from industry and then during the October 2005 IECEx meetings this figure double to 20% with many of the country delegations now led by an industry representative.

In addition, we see Regulatory representation which includes a representative from the US Mining Regulator, MSHA for each of the past few meetings.

With introduction of the IECEx Certified Service Facilities Program it is expected that IECEx will see a growing presence of Ex equipment End Users actively participating in the Scheme.

It is the effective cooperation and networking of all parties and stakeholders in this Ex community that ensures IECEx continue along its path of serving the International Ex community.

For additional information, please consult the IECEx Website at [www.iecex.com](http://www.iecex.com) any of the IECEx Certification Bodies (ExCBs) or the IECEx Secretary directly.

## XII. ACKNOWLEDGEMENTS

The IECEx Scheme is the result of much more than a single individual's efforts. The IECEx work and success is the result of the many contributions from the World wide network of Ex experts that come together to contribute to the development and operation of the System, its procedures and processes along with the companies that support the involvement of their management and staff.

Many of the industry organizations involved in the development, management and operation of the IECEx Scheme, are now listed as IECEx certificate holders utilizing the very system they have developed.

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- Mr Patrick Leroux – TOTAL
- Dr Uwe Klausmeyer – PTB (IECEx Chairman)

## XIII. REFERENCES

Documents referenced in this paper include:

- [1] IEC 60079 – 0: Electrical apparatus for explosive gas atmospheres – Part 0: General requirements
- [2] ISO 9001: Quality management systems— Requirements
- [3] EN 13980: Potentially explosive atmospheres - Application of quality systems
- [4] OD 005: IECEx quality system requirements for manufacturers
- [5] IEC 60079-19: Electrical apparatus for explosive gas atmospheres  
Part 19 - Repair and overhaul for apparatus used in explosive atmospheres ( other than mines or explosives)