

# IECEX International Conference 2012

## IECEX Certification of Personnel Competence Scheme



*Mr Ralph Wigg &  
Mr Thierry Houeix*

**IECEX 2012, Dubai,  
20+21 March 2012**

# **An overview of the new IECEX Certification of Personnel Competence Scheme**

**Mr Ralph C Wigg**

Chair – IECEx Ex Personnel Competence Committee

IECEX Lead Assessor

Whenever there is discussion on Personnel Competence we find the people are:

- *Guaranteed to respond*
- *Passionate*
- *Fearful*
- *Concerned*

**The concept of competence focuses on what is expected of an employee in the workplace rather than the learning process.**

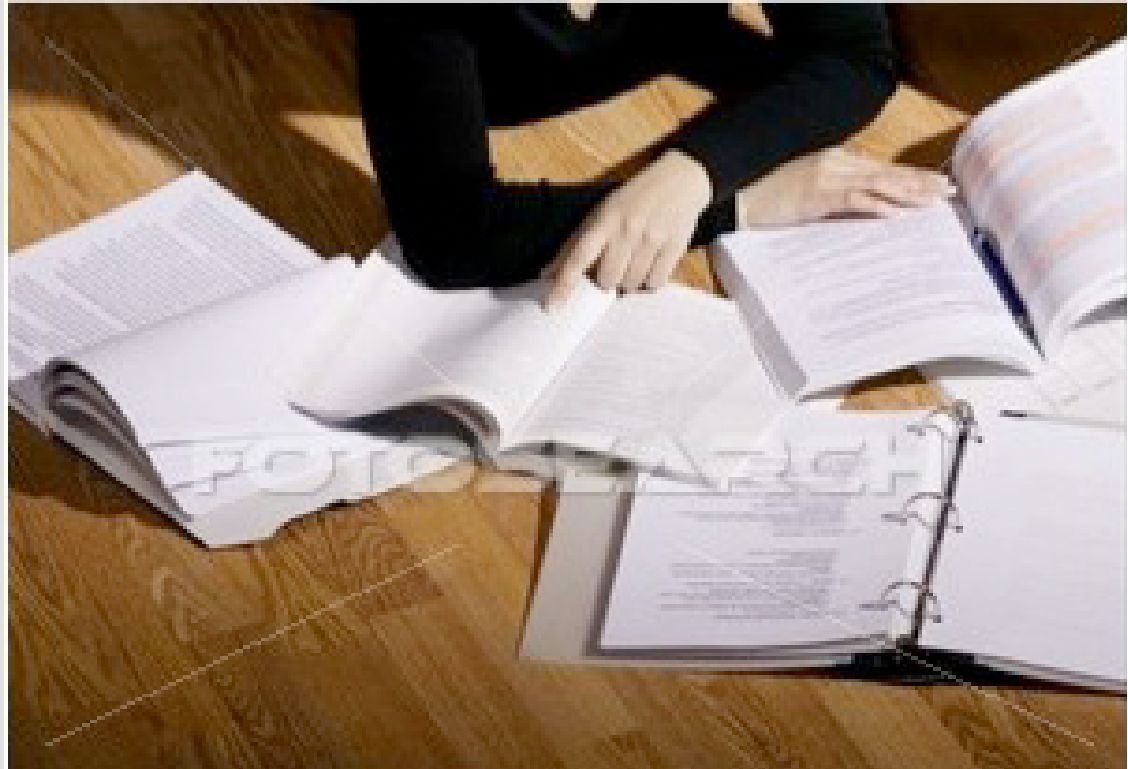
**It embodies the ability to transfer and apply skills and knowledge to new situations and environments.**

**In most countries legislation or regulations identify that the owner is responsible and accountable for the safety of the design, installation and maintenance of electrical equipment within their plant.**

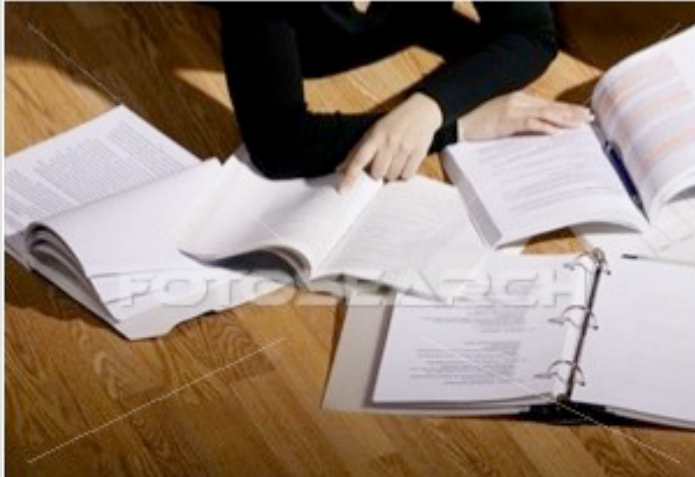
**This is usually achieved through Occupational Health & Safety legislation in most countries.**

- An owner or occupier can accept the responsibility of deeming his own personnel as competent however they would face the consequences if there was an incident.
- They could rely on their personnel being considered competent through a company or National scheme
- Now there is a new path through the IECEx Certification of Personnel Competence scheme

- **Competency comprises:**
  - knowledge



- **Competency comprises:**
  - knowledge and
  - Skills





- **Equipment must be used correctly.**
- **Persons must know what they are doing.**
- **Personnel Competence Scheme supports other certification schemes.**
- **IECEx Certificate of Personnel Competence (CoPC) creates a Global scheme.**
- **Recognizes that both knowledge and skills are needed.**

- **Application of that knowledge and skill to the standards of performance required in the workplace.**
- **Competency includes all aspects of work performance and not only specific skills.**

- **Competency involves three elements.**
  - Qualifications  
(Off the Job)
  - Experience  
(On the Job)
  - Recent and Relevant Training  
(Off and On the Job)

Competence assessments require objective evidence that is:

- *Valid.*
- *Direct.*
- *Authentic.*
- *Current.*
- *Sufficient.*

- **The Scheme has been established to provide a consistent approach to the assessment of the Competence of personnel.**
- **It assesses the individual – not an organization.**
- **Independent of training to remove conflict so not concerned with how the knowledge and skills are obtained.**

## Standards references

**IEC 60079-14 Ed 4, Clause 4.4**

**IEC 60079-19 Ed 2, Clause 4.4**

## Owner/Operator Responsibility

**Responsible for plant safety**

**Use qualified persons**

**IECEX CoPC has developed:**

**IECEX05 - Scheme Rules based on:**  
**ISO/IEC17024; Guide 27; Guide 28 & Guide 65**

**Operational Documents for:**

*OD501 - Assessment Procedures for ExCBs;*

*OD502 - Application for Personnel Competence;*

*OD503 - ExCB Procedures for issuing and maintaining  
certificates*

*OD504 - Specification for Units of Competence Assessment  
Outcomes.*

## Key details included:

- Suspension or withdrawal
- Compliance with rules
- Appeals
- Withdrawal
- Suspension
- Complaints
- Typical Forms for application
- Governing of the IECEx Scheme for Competency
- Principles of the IECEx Certification of Personnel Competencies Scheme
- Confidentiality
- Participating countries
- IECEx instruments
- Certification procedure
- Acceptance of certification bodies
- Complaints



## The different types of work are covered by “Units of Competency”

- A unit of competency is the competency required for a useful work function and which resides with an individual. It must include the ability to apply both the theory and the practical skills.
- This should not be confused with a job description which may comprise a number of units of competency.

Different type of work is by  
“Units of Competence”

Each IECEx Unit of Competence comprises:

- *Scope*
- *Pre-requisites*
- *Elements and performance criteria*
- *Scope Limitations*

## The ten “Units of Competency” are:

- Apply basic principles of protection in explosive atmospheres
- Perform classification of hazardous areas
- Install explosion-protected equipment and wiring systems
- Maintain equipment in explosive atmospheres
- Overhaul and repair of explosion-protected equipment
- Test electrical installations in or associated with explosive atmospheres
- Perform visual & close inspection of electrical installations in or associated with explosive atmospheres
- Perform detailed inspection of electrical installations in or associated with explosive atmospheres
- Design electrical installations in or associated with explosive atmospheres
- Perform audit inspection of electrical installations in or associated with explosive atmospheres

## Scope limitations:

- *Type of explosion protection*
- *Product type*
- *Groups*
- *Voltages*
- *Other – which may be related to specific National requirements*

## Validity

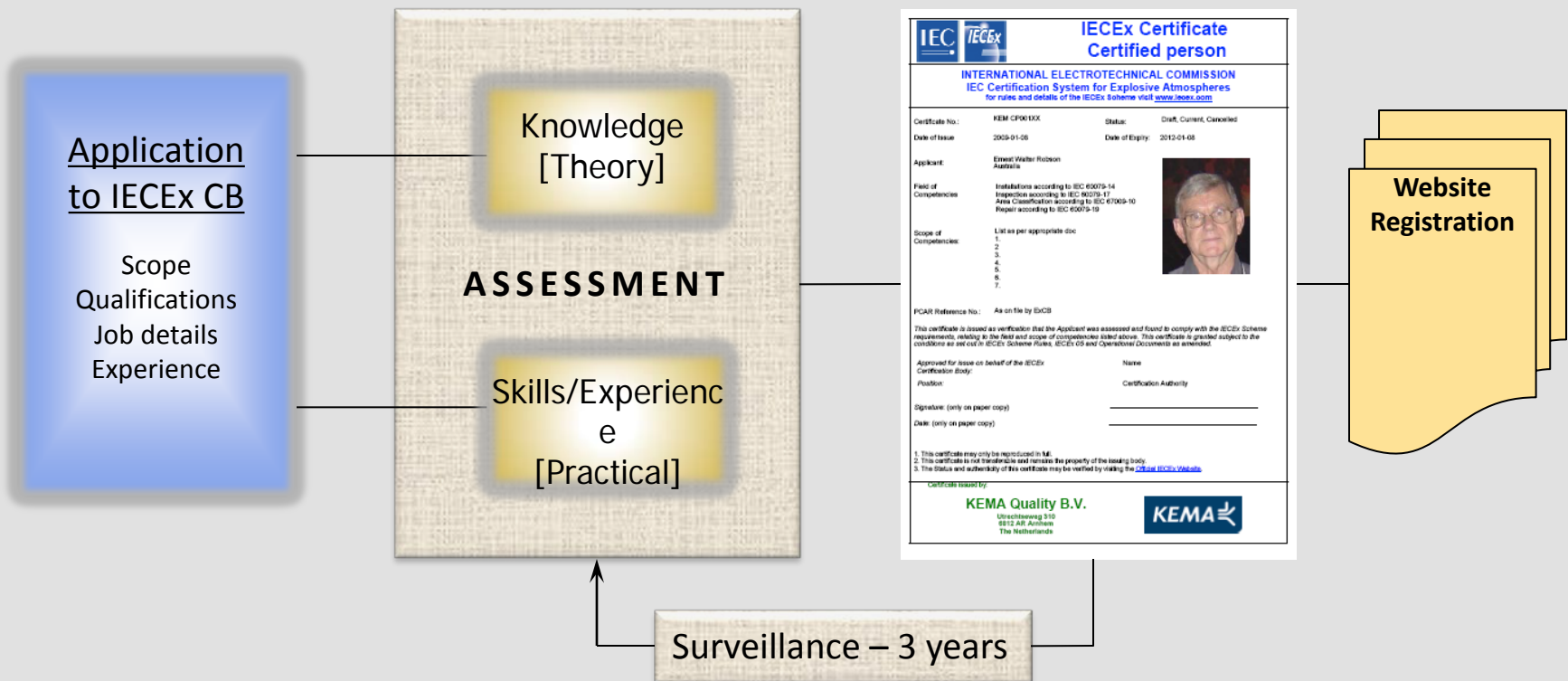
- *Surveillance*
- *Re-assessment every 3 years.*

**An applicant is expected to provide:**

- **Evidence of education and training:**
  - Work experience in both non-hazardous and hazardous areas
  - Validation of the information
- **Personal details sufficient to uniquely identify the individual**
- **Scope of Competence being requested**
- **Declaration**

- *Application Form*
- *A Certificate of Personnel Competence [CoPC]*
- *A Personnel Competence Assessment Report [PCAR]*
- *An Identification Card (credit card size)*

Details of the Certificate, ID Card and PCAR can be verified on-line at [www.iecex.com](http://www.iecex.com)



## In addition to the Rules and Operational Documents:

- A simple language Guidance Document IECEx05A has been released and is intended for use by any person seeking a CoPC or any organization requiring to verify they are using Competent persons. It is also very useful for organizations wanting to use competent persons
- A databank of assessment questions and tests for use by the ExCBs conducting assessment is under development.



- **Recognizes Hazardous Area requirements**
- **Areas (units) of Competence**
- **Global Scheme with Regional requirement allowance**
- **Assists in maintaining plant integrity and function**
- **Independent of training**
- **Sets the Competence benchmark for use in any regulatory framework**
- **Endorsement by United Nations, via the UNECE, as the best practice model for verification of compliance with International Standards.**

- **Compliance with ISO/IEC17024.**
- **Certification Committee**
- **Appointment of Assessors.**
- **Development of Questions.**
- **Facilities for Practical Skills assessment.**
- **Verification of acceptance of evidence.**
- **Use of additional Regional or National Standards.**
- **Separation of Training.**

**At the September 2011 meeting of the IECEx System Management Committee is was agreed to seek approval from the Conformity Assessment Board for the formation of a new Certification Committee for the CoPC Scheme.**

**This new Certification Committee [ExPCC] is established *"To maintain and enhance the policies and procedures relating to the operation of the CoPC Scheme within IECEx System. This includes the responsibility for the Scheme Rules, Operational Documents and Guide as well as any other documentation relevant to the scheme."***

The main reasons for establishing this new committee:

- To satisfy many of the requirements of ISO/IEC 17024 in the role of a certification committee. These requirements were in ISO/IEC 17024:2004, Clauses 4.2.3, 4.3.2, 4.3.3, 4.3.4, 6.4.2.
- To formalize the management and operation of CoPC Scheme.
- Have the ability to create WGs in order to facilitate significant areas of work that are ongoing. e.g. Question Bank
- To better control the functioning of the CoPC Scheme ensuring active involvement of all participating ExCBs
- Participating ExCBs are encouraged to have a supplementary Certification Committee particularly with aspects of technical input and feedback / review details for submission to CoPC-CC

**Standards for hazardous locations require the use of special equipment to avoid ignition of the atmosphere.**

**If that special equipment is NOT installed correctly it may no longer provide the explosion protection integrity and therefore cause the installation to be unsafe.**

**The use of Competent persons ensures that equipment will be used correctly and the explosion protection integrity for the life of the equipment will be maintained.**

**Competent persons are able to identify faults which could become potential sources of ignition.**

**IECEX CoPC opens the way for a global scheme to provide consistency in the assessment of competent persons. It is structured to provide separation from any training schemes and therefore gives the highest level of integrity of assessment.**

**This Scheme recognizes that the knowledge and skills could be obtained by any means such as tertiary education, internal company training, external private training, on the job mentoring, etc.**

**The IECEx CoPC is the ideal Scheme to benchmark competency requirements for use within any framework providing essential support for the overall package of compliance requirements for hazardous areas.**



# The practical application of the IECEx Certification of Personnel Competence Scheme

**Mr Thierry Houeix**

Certification Officer & Technical Advisor

IECEx Lead Assessor

- **In order to ensure the safety of all!**
  - The site owner is responsible for the maintenance and the repair of his equipment regarding the risk of explosion
  - All the necessary measures must be taken to ensure that the workplace and the working equipment are maintained to minimize the risks of explosion
  - The methods and the rules to achieve this goal must be defined by the employer responsible for the workplace



# Examples of some defects



## You need to:

1. Choose the required Ex units
2. Select an IECEx Certification Body (ExCB)
3. Fill the application form
4. The application form need to be allowable
5. Pass the knowledge assessment of each required Ex units
6. Pass the practical assessment if required for the Ex units
7. Succeed the knowledge assessment and the practical assessment
8. Receive the IECEx certificate and the IECEx ID card

# 1. Choose the Ex units required

In the IECEx CoPC scheme, there are 10 units:

Référence	Titre	Scope limitation <sup>a</sup>
Unit Ex 001	Apply basic principles of protection in explosive atmospheres	Not applicable
Unit Ex 002	Perform classification of hazardous areas	3
Unit Ex 003	Install explosion-protected equipment and wiring systems	1, 2, 3, 4
Unit Ex 004	Maintain equipment in explosive atmospheres	1, 2, 4
Unit Ex 005	Overhaul and repair of explosion-protected equipment	1, 2, 4
Unit Ex 006	Test electrical installations in or associated with explosive atmospheres 3, 4	3, 4
Unit Ex 007	Perform visual & close inspection of electrical installations in or associated with explosive atmospheres	3, 4
Unit Ex 008	Perform detailed inspection of electrical installations in or associated with explosive atmospheres	3, 4
Unit Ex 009	Design electrical installations in or associated with explosive atmospheres	3, 4
Unit Ex 010	Perform audit inspection of electrical installations in or associated with explosive atmospheres	3, 4

# 1. Choose the Ex units limitations

## a) Limitation by:

1. Explosion-protection technique: 'd', 'e', 'i', 'm', 'o', 'p', 'q', 't'...
2. Product Type: Gas detectors, Trace heating, Motors ...
3. Group: I, II and III
4. Voltage: 50 V, 380 V, 10 kV

## 2. Select an IECEx Certification Body (ExCB)

The list of Accepted ExCB is available on the IECEx website:

<http://www.iecex.com/directory/bodies/bodies4.asp?id=170>

Country	ExCB	Ex Units
France	<a href="#">INERIS</a>	1-10
Netherlands	<a href="#">DEKRA</a>	1
United Kingdom	<a href="#">BASEEFA</a>	1-10
	<a href="#">SIRA</a>	1-2

# 3. Fill the application form (1/5)



## IECEX CoPC Application Form

APPLICATION FOR PERSONAL COMPETENCY		
This form shall be used as an application for a new certificate / renewal of certificate		
<b>To be sent to</b>  <b>INERIS</b> Direction de la Certification B.P.2 F-60550 Verneuil-en-Halatte or to  IECEXCoPC@ineris.fr	<input type="checkbox"/> New certificate	<input type="checkbox"/> Renewal / change / of certificate or recertification of certificate no.: INE _ _ . _ _ _
	Applicant name and postal address	
<b>Detailed information about the applicant</b>		
Applicant employer and postal address	e-post address / WEB address	Date of birth
License number	Telephone:  Cell phone:	Telefax

# 3. Fill the application form (2/5)

Invoice address	Normative documents IEC 60079-14 IEC 60079-10 IEC 60079-17 IEC 60079-19 Special requirements for certification according to IECEx Competency IECEx 05 OD 501 OD 502 OD 504
<p><b>DECLARATION</b></p> <p>I am aware of and familiar to all valid normative documents for IECEx Personal Competency Certification. Should my application for certification be accepted, I am aware of that these requirements shall be fulfilled.</p> <p>I declare that no other application was signed with other ExCB</p> <p><b>I commit myself to:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> to comply with existing normative documents</li> <li><input type="checkbox"/> to only give correct information by marketing about scope of IECEx Personal Competency Certification</li> <li><input type="checkbox"/> to pay the expenses in connection with my application for certificate as described in the valid standard / normative document and special requirements</li> </ul> <p style="text-align: right;"><b>Date:</b></p> <p style="text-align: right;"><b>Applicants signature</b></p>	

# 3. Fill the application form (3/5)

## 1 Scope of Certification

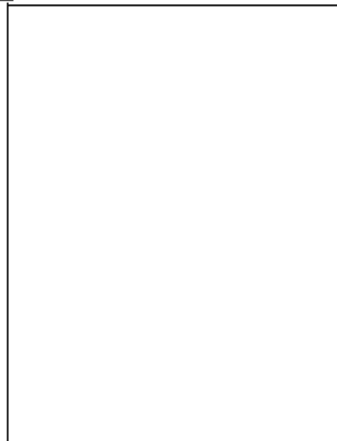
<input type="checkbox"/> Unit Ex 001	<input type="checkbox"/> Unit Ex 006
<input type="checkbox"/> Unit Ex 002	<input type="checkbox"/> Unit Ex 007
<input type="checkbox"/> Unit Ex 003	<input type="checkbox"/> Unit Ex 008
<input type="checkbox"/> Unit Ex 004	<input type="checkbox"/> Unit Ex 009
<input type="checkbox"/> Unit Ex 005	<input type="checkbox"/> Unit Ex 010

## 2 Language of assessment

English       French

## 3 Certificate in pocket format

Yes I include picture (Passport picture, or electronic sent by e- mail)





# 3. Fill the application form (4/5)

**4 Limitation of scope**

**4.1 Types of protection**

<input type="checkbox"/> All without limitation	<input type="checkbox"/> "o": oil immersion
<input type="checkbox"/> "d": flameproof enclosure	<input type="checkbox"/> "p": pressurization
<input type="checkbox"/> "e": increased safety	<input type="checkbox"/> "q": powder filling
<input type="checkbox"/> "i": intrinsic safety	<input type="checkbox"/> "t": protection by enclosure
<input type="checkbox"/> "m": encapsulation	<input type="checkbox"/> "op"Optical radiation
<input type="checkbox"/> "n": type of protection 'n'	<input type="checkbox"/> Gas detection

**4.2 Product types**

<input type="checkbox"/> All without limitation	<input type="checkbox"/> Communication equipment
<input type="checkbox"/> Rotating machines	<input type="checkbox"/> Heating equipment
<input type="checkbox"/> Switchgear	<input type="checkbox"/> Trace heating
<input type="checkbox"/> Instrumentation	<input type="checkbox"/> Power transformers

**4.3 Groups**

<input type="checkbox"/> All without limitation	<input type="checkbox"/> Group II
<input type="checkbox"/> Group I	<input type="checkbox"/> Group III

**4.4 • Voltages**

<input type="checkbox"/> All without limitation	<input type="checkbox"/> 380 V
<input type="checkbox"/> 50 V	<input type="checkbox"/> 1500 V

**4.5 Other limitations**

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

## 3. Fill the application form (5/5)

- 5 Evidence of education and training
  - 5.1 General qualifications not specific to Explosive Atmospheres
  - 5.2 Documentation specific to Explosive Atmospheres
  
- 6 Work experience both Hazardous and Non-Hazardous Areas
  - 6.1 Work experience in Non-Hazardous Areas
  - 6.2 Work experience in or associated with Hazardous Areas

## 4. The application form need to be allowable

- The ExCB will verify that you have the prerequisites required for the Ex units requested.
- For example for the unit Ex 003, the following prerequisites are requested:
  - The applicant shall have the level of technical education (or equivalent) attained, relevant to the application, through documents such as College Certificates and Vocational qualifications etc.
  - A minimum 3 years experience in industrial electrical installation practice is required.
  - Competence in this unit shall be assessed either concurrently with or after Unit Ex 001

# 5. Pass the knowledge assessment of each units (1/3)

- The knowledge assessment consists of multiple choice questions and constructed questions

Units of Competency	Item types		Total number of items
	Selected response	Constructed response	
Unit Ex 001 – Apply basic principles of protection in explosive atmospheres	30	10	40
Unit Ex 002 – Perform Classification of Hazardous Areas	35	25	60
Unit Ex 003 – Install explosion-protected equipment and wiring systems	55	25	80
Unit Ex 004 – Maintain equipment in explosive atmospheres	60	20	80
Unit Ex 005 – Overhaul and repair of explosion-protected equipment	50	30	80
Unit Ex 006 – Test electrical installations in or associated with explosive atmospheres	60	20	80
Unit Ex 007 – Perform Visual & Close Inspection of electrical installations in or associated with explosive atmospheres	40	20	60
Unit Ex 008 – Perform Detailed Inspection of electrical installations in or associated with explosive atmospheres	50	30	80
Unit Ex 009 – Design electrical installations in or associated with explosive atmospheres	40	40	80
Unit Ex 010 – Perform audit inspection of electrical installations in or associated with explosive atmospheres	50	30	80

### Examples of knowledge question:

**What is the “ignition temperature” of a flammable substance?**

1. Lowest temperature of a heated surface which, under specified conditions, will ignite a flammable substance in the form of a gas or vapour mixture with air
2. Lowest liquid temperature at which a liquid gives off vapours in quantity such as to be capable of forming an ignitable vapour/air mixture
3. Flash point of a liquid ready to ignite

### Examples of knowledge question:

**An equipment is marked: Ex d [ia] IIB T4. What kind of equipment is it?**

1. A flameproof enclosure connected to a sensor in increased safety
2. A flameproof enclosure connected to a sensor in intrinsic safety
3. An enclosure in increased safety connected to an intrinsic safety barrier
4. A flameproof enclosure incorporating an intrinsic safety barrier

## 6. Pass the practical assessment if required for the units

### Some units need practical assessment as:

- Unit Ex 002: do a zone classification in Gas and in Dust area.
- Unit Ex 003: do installation of several equipment as 'd' enclosure, 'e' terminal box and intrinsic safety barriers and sensors by following wiring diagram
- Unit Ex 004: do maintenance of installation by doing the preparation, the check and the report
- Unit Ex 005: do the repair of a motor
- Unit Ex 006: do installation testing by doing the preparation, conducting testing and writing the report

## 6. Pass the practical assessment if required for the units

### Some units need practical assessment as:

- Unit Ex 007: do visual inspections by doing the preparation, conducting visual inspections and writing the report
- Unit Ex 008: do detailed inspections by doing the preparation, conducting detailed inspections and writing the report
- Unit Ex 009: do installation design by interpreting area classification, selecting equipment and wiring systems and checking equipment certification for suitability for a given classified area
- Unit Ex 010: do audit inspection by doing all previous practical assessment.





**In accordance with the IECEx OD 503, the following is applied:**

- Knowledge assessment: All items in a knowledge test designated as absolute shall be answered correctly and 70% of the remaining items answered correctly.
- Practical assessment: All items shall be correctly demonstrated.

**Following the IECEx WG12 the following is requested for the next edition of OD 503**

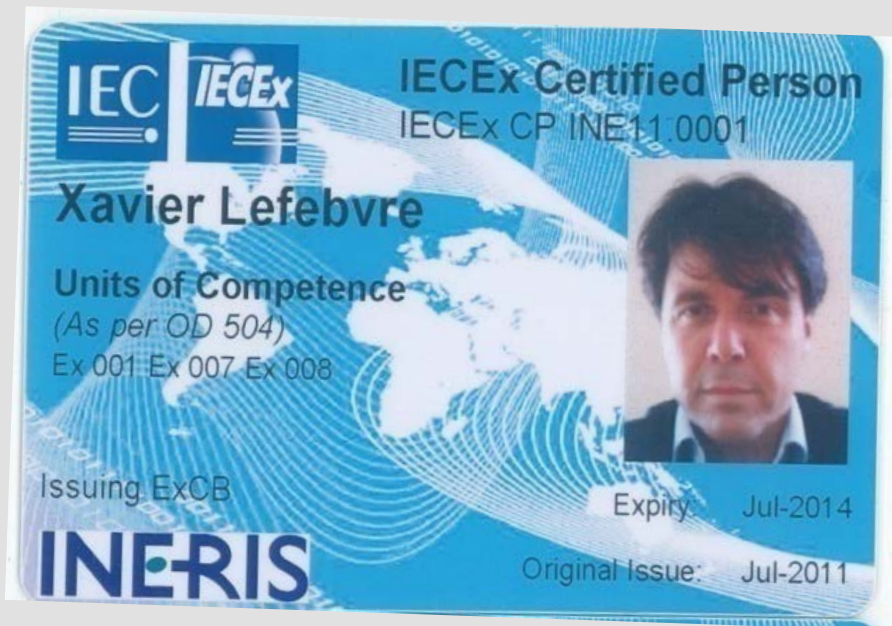
- Knowledge assessment:

- 80 % of correct answers

- 40 % of absolute questions which will require 100 % of correct answers

The certificates for Personal Competencies are as for equipment, online certificates

The qualified person will receive a certificate and an ID card which is a summary of the certificate





## IECEX Certificate Personnel Competence

### INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Certification of Personnel Competence (CoPC) Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX CP INE11.0001** issue No.:0

Status: **Current**

Date of Original Issue: **2011-07-08**

Date of Expiry: **2014-07-08**

Applicant: **Xavier Lefebvre**

Scope of Competence: **Ex 001 - Basic principles -**  
(Units according Based on various parts of IEC 60079 series  
to IECEx:OD 504) **Ex 007 - Visual & Close Inspection -**  
Based on IEC 60079-17  
**Ex 008 - Detailed Inspection -**  
Based on IEC 60079-17



For Detailed information on Scope Application in accordance with IECEx:OD 502 click on P-CAR Number below:

P-CAR Reference No.: **FR/INE/PCAR11.0001/00**

*This certificate is issued as verification that the Applicant was assessed and found to comply with the IECEx CoPC Scheme requirements, relating to the scope of Competence and referenced Standards listed above. This certificate is granted subject to the conditions as set out in IECEx CoPC Scheme Rules, IECEx:05 as amended.*

Approved for issue on behalf of the IECEx Certification Body: **Thierry Houeix**

Position: **Ex Certification Officer**

Signature:

Date:

**2011-07-13**

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

**Institut National de l'Environnement Industriel et des Risques**  
BP n2  
Parc Technologique ALATA  
F-60550 Verneuil-En-Halatte  
France



## IECEX Certificate Personnel Competence

### INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Certification of Personnel Competence (CoPC) Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX CP INE11.0002** issue No.:0

Status: **Current**

Date of Original Issue: **2011-07-08**

Date of Expiry: **2014-07-08**

Applicant: **Maurizio Toninelli**

Scope of Competence: **Ex 001 - Basic principles -**  
(Units according Based on various parts of IEC 60079 series  
to IECEx:OD 504) **Ex 007 - Visual & Close Inspection -**  
Based on IEC 60079-17  
**Ex 008 - Detailed Inspection -**  
Based on IEC 60079-17



For Detailed information on Scope Application in accordance with IECEx:OD 502 click on P-CAR Number below:

P-CAR Reference No.: **FR/INE/PCAR11.0002/00**

*This certificate is issued as verification that the Applicant was assessed and found to comply with the IECEx CoPC Scheme requirements, relating to the scope of Competence and referenced Standards listed above. This certificate is granted subject to the conditions as set out in IECEx CoPC Scheme Rules, IECEx:05 as amended.*

Approved for issue on behalf of the IECEx Certification Body: **Thierry Houeix**

Position: **Ex Certification Officer**

Signature:

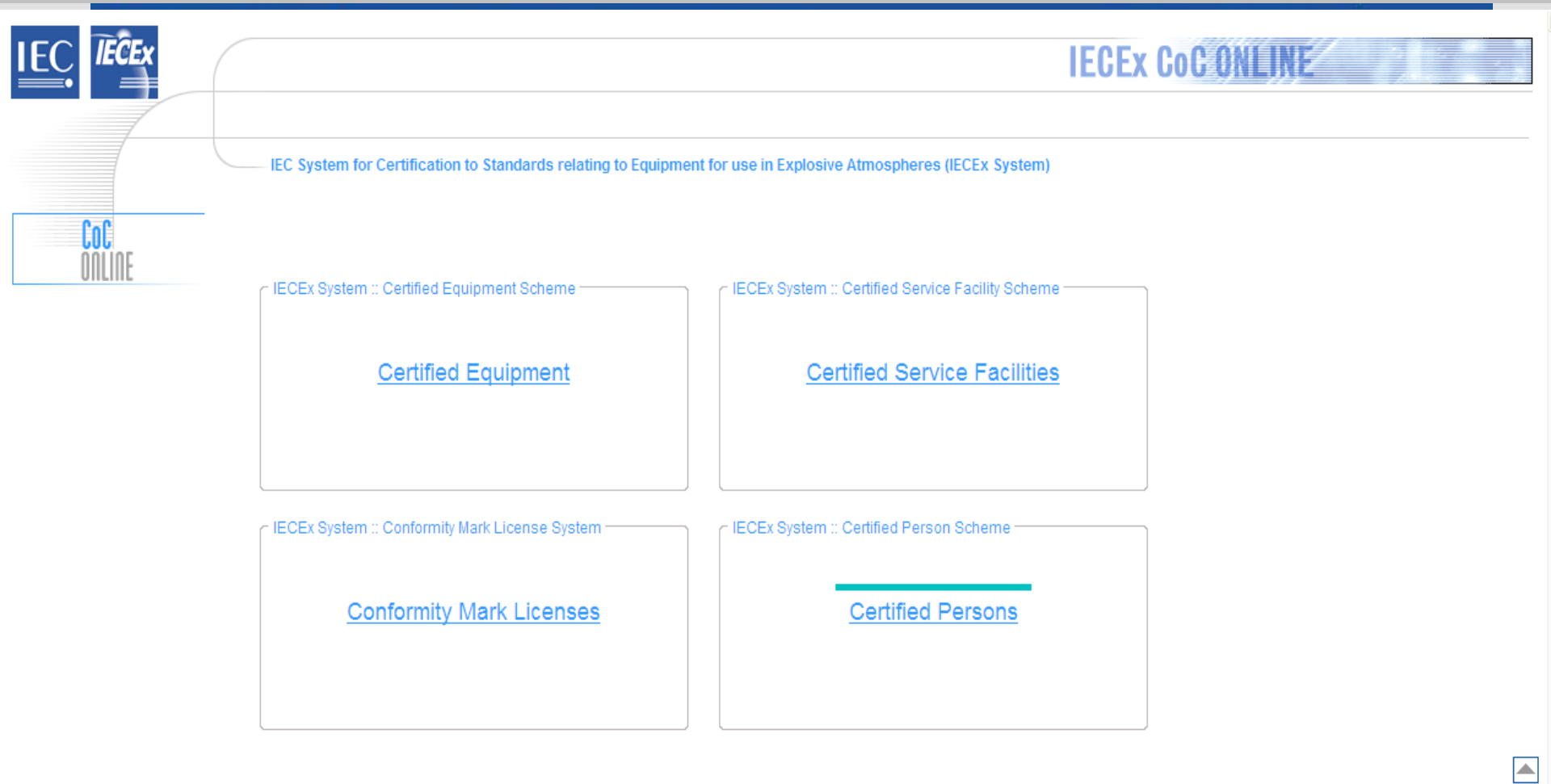
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BP n2  
Parc Technologique ALATA  
F-60550 Verneuil-En-Halatte  
France



**Thank you very much for your attention  
and for the opportunity to present  
this information on Competence**

**Ralph C. WIGG**

Chair - IECEx ExPCC  
IECEX Lead Assessor

Compliance Professional  
E-x Solutions International Pty Ltd  
[ralph.wigg@exsolutions.com.au](mailto:ralph.wigg@exsolutions.com.au)

**Thierry HOUÉIX**

Certification Officer & Technical  
Advisor

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Certification Division

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# IECEX International Conference 2012

## End of Session



**IECEX Certification of  
Personnel Competence Scheme**