



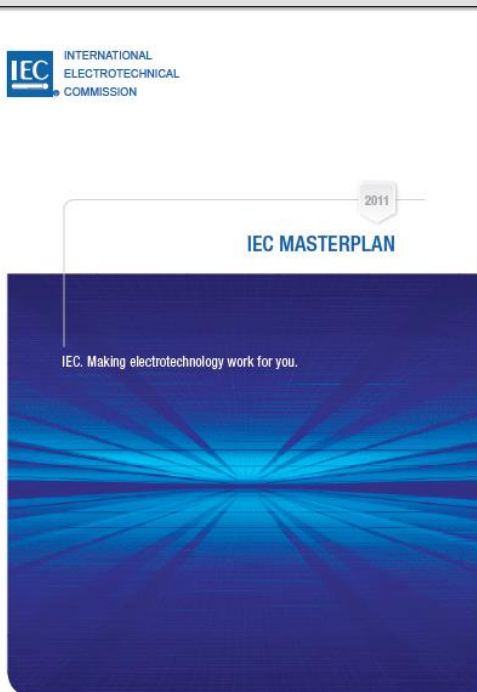
INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

IECEx: Conformity Assessment Solution for the Ex field



12 October 2014

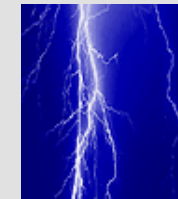
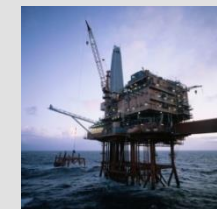
- **International Electrotechnical Commission**
- **Founded in 1906 - Promote international co-operation on all questions of standardization and related matters in the fields of electrotechnology, including Conformity Assessment.**



According to the IEC
Masterplan:

Standardisation
+
Conformity Assessment

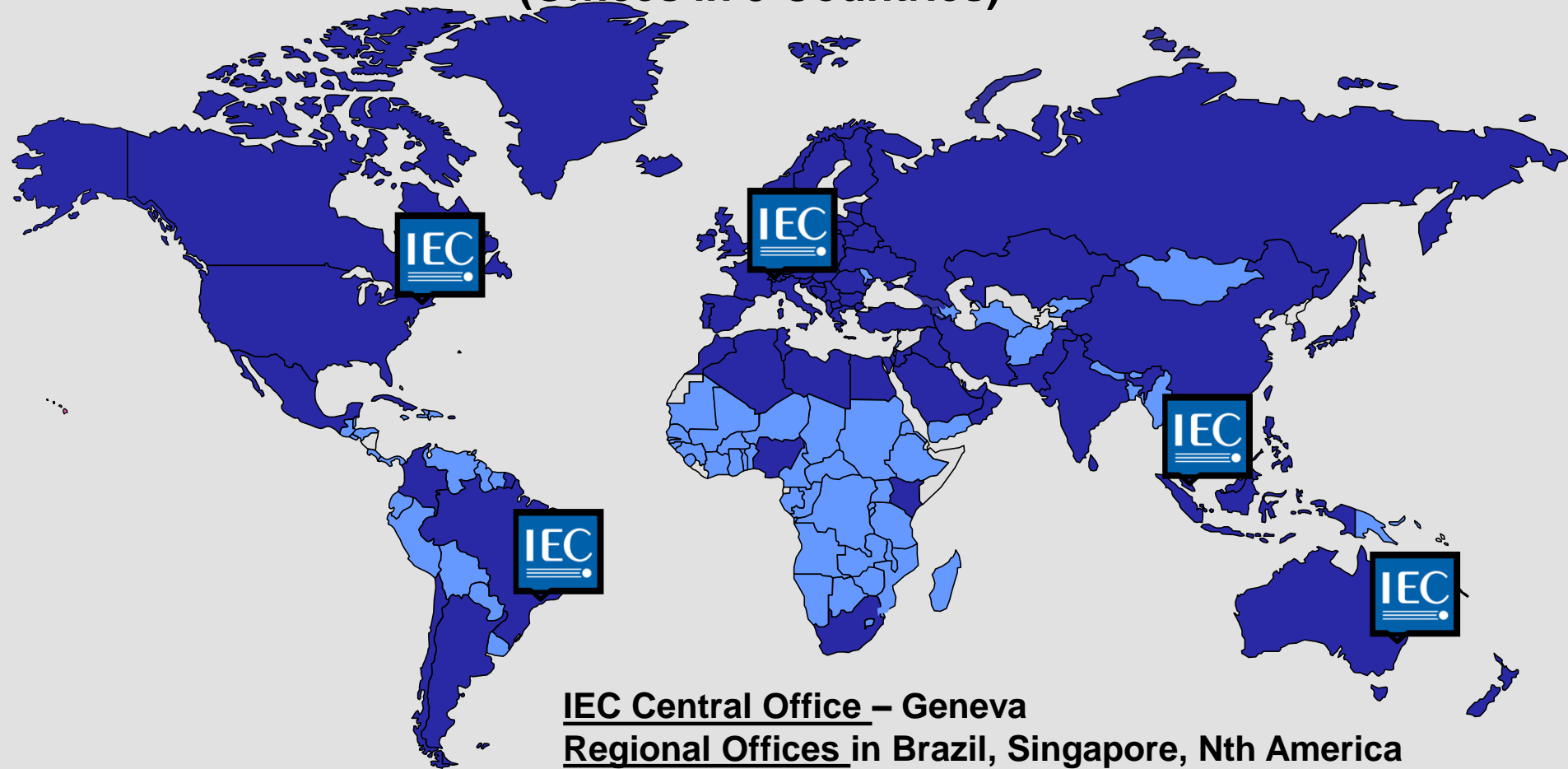
The 2 Pillars of IEC



83 Members

83 Affiliates

(Offices in 5 Countries)



IEC Central Office – Geneva

**Regional Offices in Brazil, Singapore, Nth America
and Australia**

IEC locations around the World



IEC Central Office



IEC Central Office

3, rue de Varembe
P.O. Box 131
1211 Geneva 20
Switzerland
Tel : + 41 22 919 02 11
 IEC Central Office

[More information about this Office](#)

IEC Asia-Pacific



IEC-APRC

2 Bukit Merah Central #15-04/05
(former SPRING Singapore building)
Singapore 159835
Singapore
Tel : + 65 6377 5173
 Dennis Chew

IEC Latin America



IEC-LARC

Av. Paulista, 1636 - andar 7, cj 706
Bela Vista
São Paulo - SP - CEP 01311-200
Brazil
Tel : + 55 11 3197 4536
 Amaury Santos

IEC North America



IEC-ReCNA

446 Main Street
16th Floor
Worcester, MA 01608
U.S.A.
Tel : + 1 508 755 5663
 Tim Rotti

IECEX / IECQ



IECEX / IECQ

The Executive Centre
Australia Square, Level 33
264 George Street, Sydney NSW 2000
Australia
Tel : +61 2 4628 4690
Chris Agius IECEX IECQ

Standards Work - New Technical committees:

- TC 114 “Marine Energy – Wave/Tidal/water current converters”
- TC 115 “High Voltage Direct Current Transmission - >100KV”
- TC 116 “Safety of motor operated electric tools”
- TC 117 “Solar Thermal electric plants”
- TC 118 “Smart grid user interface”
- TC 119 “Printed Electronics”
- TC 120 “Electrical Energy Storage”
- SC 31M “Non-Electrical Committee for Ex”



Conformity Assessment – New/Emerging Activities:

- IECEx Personnel Certification Scheme
- IECEE Energy Efficiency Scheme
- New IECQ Programme for “Counterfeit Avoidance - Electronic Components and Assemblies”
- Development of an IEC Scheme for Marine Energy Converters and Installations
- CA activity for Renewable Energies



Key Demand Drivers for IEC CA (eg IECEx)

- Removal of costly duplication of testing/Cert at local level + delays to accessing markets
- **Confidence** among Industry, Regulators + Stakeholders – equipment + Systems, high capital cost
- **Confidence** among Bodies (Labs + Certifiers), level playing field for CBs and TLs to compete
- Portability of assessment results + certs
- Ex Services + Personnel Cert not covered elsewhere
- Instant access to information, including “On-Line” Certificates – instant checking.

“CONFORMITY ASSESSMENT”

INTERNATIONAL
STANDARD

ISO/IEC
17000

NORME
INTERNATIONALE

First edition
Première édition
Первое издание
2004-11-01

МЕЖДУНАРОДНЫЙ
СТАНДАРТ

**Conformity assessment — Vocabulary
and general principles**

**Évaluation de la conformité —
Vocabulaire et principes généraux**

**Оценка соответствия. Словарь и
общие принципы**

nt

Test Report:-

- What Information is being conveyed by a Test Report?
- Who is the legal owner of the Test Report?
- Should an End User have free access to a Test Report, how?
- How long is a test report Valid, after its issue?



Certificate of Conformity (third Party according to ISO/IEC Guide 67)

- What Information is being conveyed by a Certificate?
- Who is the legal owner of the Certificate?
- Should an End User have free access to a Certificate, how?
- How long is a Certificate Valid, after its issue?



Ex - IEC 60079-0 Clause 28.1, 28.2, 28.3 +29.3

28.2 Certificate

The manufacturer shall prepare, or have prepared, a certificate confirming that the equipment is in conformity with the requirements of this standard along with its other applicable parts and additional standards mentioned in Clause 1. The certificate can relate to Ex equipment or an Ex Component.

An Ex Component certificate (Identified by the symbol “U” suffix to the certificate number) is prepared for parts of equipment that are incomplete and require further evaluation prior to incorporation in Ex equipment. The Ex Component certificate may include a Schedule of Limitations detailing specific additional evaluation required as part of incorporation into Ex equipment. An Ex Component certificate shall clarify that it is not an Ex equipment certificate.

Explosive atmospheres –
Part 0: Equipment – General requirements

29.3 Marking – General Item d)

d) the name or mark of the certificate issuer and the certificate reference in the following form: the last two figures of the year of the certificate followed by a “.” followed by a unique four character reference for the certificate in that year;

ISO/IEC 17000 Definitions

2.4

third-party conformity assessment activity

conformity assessment activity that is performed by a person or body that is independent of the person or organization that provides the object, and of user interests in that object

NOTE 1 Criteria for the independence of conformity assessment bodies and accreditation bodies are provided in the International Standards and Guides applicable to their activities (see Bibliography).

IEC 60079-0 Definitions

3.8 certificate

document that assures the conformity of a product, process, system, person, or organization with specified requirements

NOTE The certificate may be either the supplier's declaration of conformity or the purchaser's recognition of conformity or certification (as a result of action by a third party) as defined in ISO/IEC 17000

Long Standing Testing / Assessment Requirements for Ex Equipment

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE
NORME DE LA CEI

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC STANDARD

Publication 79-0

Deuxième édition — Second edition
1983

Matériel électrique pour atmosphères explosives gazeuses

Partie zéro: Règles générales

Electrical apparatus for explosive gas atmospheres

Part 0: General requirements



- **Verification of documents**
- **Compliance of Prototype with documents**
- **Marking Requirements**
- **Type Tests – include:**
 - **Mechanical Tests**
 - **Resistance to Impact**
 - **Thermal Tests**
 - **Insulation Resistance of plastic parts**
 - **Test in explosive mixtures**
 - **Test of clamping of cables**

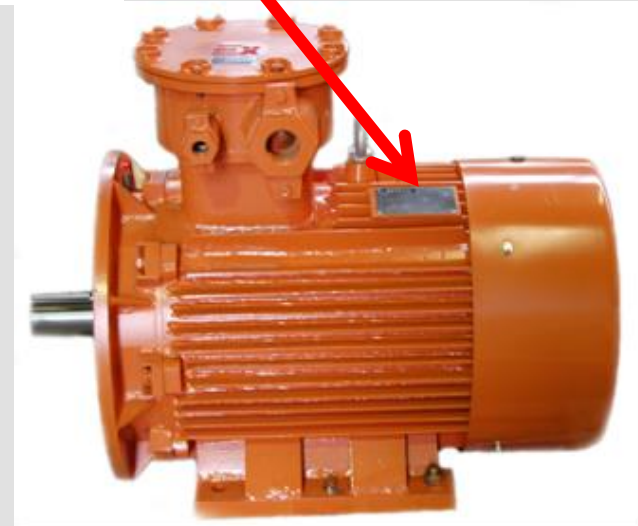


IEC 60079-0 Requires Certificate Number on the Product

| | | | | | | | | | |
|--|----|----|--------|-----|----------------------------------|------|-------|--------|-------|
| ○ ROTOTECH EX 3-AC Induction Motor ○ | | | | | IEC 60034-1 AS 1359 | | | | |
| Ex mark ExdI/IIB T4/T5 | | | | | Ex Cer. No.: IEC Ex ITA 10.0025X | | | | |
| TYPE | | | | | N° | | | kg | |
| kW | Hz | V | AMP | RPM | EFF. | COSφ | T.AMB | T.RISE | CONN. |
| | | | | | | | | | |
| Ins.CL. | S | IP | BRG DE | | | NDE | | | |
| ○ MEPS COMPLIANT | | | | | www.rototech.com.au ○ | | | | |



Under the IECEx Certified Equipment Scheme, the IECEx Certificate number displayed on the product matches the Master version on the website – provides instant verification of claims of IECEx Certification





What is IECEx?

“IECEx is the International Standard way of doing Ex Certification”

The IEC’s System with Schemes covering Certification to Standards that relate to Equipment, Services and Persons in areas relating to Explosive Atmospheres, to provide an Internationally accepted means of ***demonstrating claimed compliance with International Standards***

IECEx is a “**Conformity Assessment Tool**” providing confidence that Products, **Services and Personnel** covered by an IECEx Certificate meet specified requirements, (International Standards)

“Ex” is not an Industry of its own!

Ex is part of almost every Industry known to Man, Examples:

- Automotive refuelling stations or petrol stations
- Oil + gas extraction
- Oil refineries, rigs and processing plants
- Gas pipelines and distribution centres
- Chemical processing plants
- Printing industries, paper and textiles
- Hospital eg operating theatres
- Aircraft refuelling and hangars
- Surface coating industries
- Coal mining
- Sewerage treatment plants
- Grain handling and storage
- Woodworking areas
- Sugar refineries, storage , packaging + distribution
- Metal surface grinding, eg aluminium dusts and particles.
- Transportation
- Pharmaceuticals
- Food processing
- Furniture manufacturer
- Textiles - + Many others

FACT 1 – Ex is part of almost every industry known to mankind.



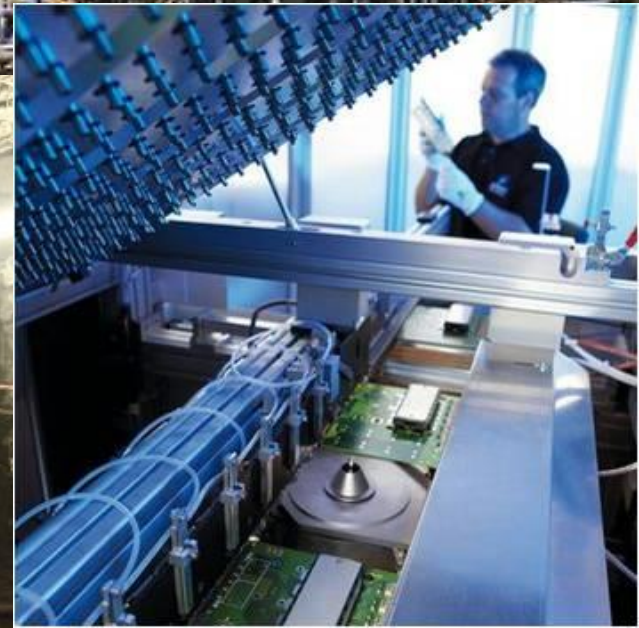
Ex Areas are Complex + Costly

Ex Equipment and Installation's are complex.

The Ex industry requires verification of compliance in every aspect from

- Installation Design
- Equipment and Systems
- Inspection
- Maintenance
- Repair
- Personnel

FACT 2 – Ex Equipment and Installations are Complex.



- Sunday 11th Dec 2005
- Over 40 people injured
- Burned for several days, destroying most of the site.
- Countless Millions (£) lost in damages, legal fees, loss of infrastructure, and loss of production.

FACT 3 - The goal of Standards and Conformity Assessment is to prevent this.





Schemes within the IECEx System

IECEX System

www.iecex.com

IECEX Equipment Scheme
Certification of Ex Equipment + Systems

Choice between:

IECEX "Certificate of Conformity"

IECEX "Component Certificate"

IECEX "Unit Verification" Cert.

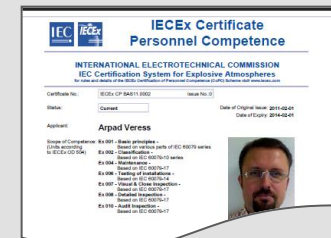
IECEX Conformity Mark License Scheme



IECEX Services Scheme
Certification of Ex Service Providers, eg Repair and overhaul workshops



IECEX Certified Persons Scheme (CoPC)
Competency to work in Ex field (New)



IECEX Equipment Scheme
Certification of Ex Equipment + Systems

Choice between:

**IECEX “Certificate of
Conformity”**

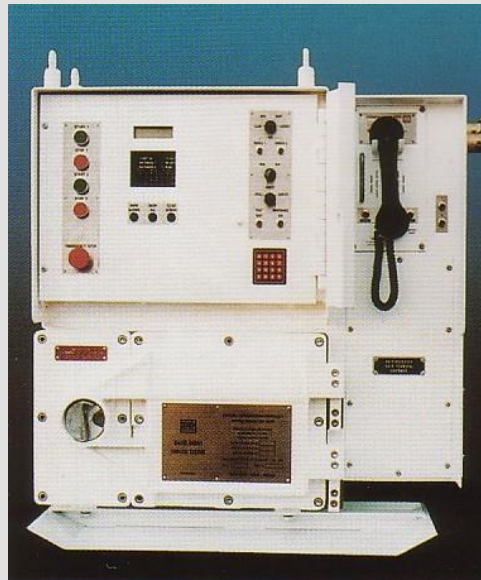
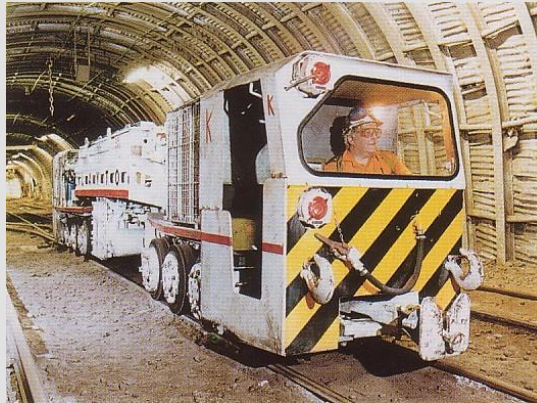
**IECEX “Component
Certificate”**

**IECEX “Unit
Verification” Cert.**



Examples of Equipment + Systems Covered by IECEx

- Transducers, Sensors etc
- Switchgear
- Control Stations
- Motors
- Luminaries and Lighting
- Underground vehicles
- Radios + Communication
- Junction boxes
- Control Modules
- Control Systems
- Instrumentation
- Analyser houses
- Ventilation Rooms
- Components
 - Terminals
 - Adaptors / Reducers
 - Cable terminations
 - Glands
- Many others





Flowserve Ex System

**Ex Digital Positioner
IECEX CoC**

**Ex Transducer
IECEX CoC**



**Interconnected
Cable**

Optional Accessories include:
IECEX Certified Junction Box
IECEX Certified Limit Switches
IECEX Certified Solenoids



IECEX Overview

Outlook Web App | Suggested Sites | Get more Add-ons | IECEX Home

INTERNATIONAL ELECTROTECHNICAL COMMISSION SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEX SYSTEM)

Information | Publications | Members' Area | Certificates & Licenses | Meetings & Events | Contact | Home

News Releases

- Explosions avoided**
IECEX, UNECE and IEC Brazilian NC conference on safety in the Ex field
- Preventing dust explosions**
IECEX certification provides high level of protection
- Mining: A high-risk activity**
IECEX ensures protection and safety for Ex equipment and workforce
- Competitive advantages**
IECEX present at Australasian Oil and Gas Exhibition and Conference
- IECEX launches first mobile app**
to show international certificates for equipment used in explosive atmospheres

IECEX Malaysia 2014
Kuala Lumpur 19-20 February 2014
Organized by the IEC and IECEX, together with Department of Standards Malaysia, and in conjunction with UNECE (United Nations Economic Commission for Europe), the 2014 IECEX International Conference will take place on 19 and 20 February 2014.
[More information from the meeting website](#)

Quick Links

- IECEX Certificates and Licences
- Certification Bodies (ExCBs) - Equipment
- Certification Bodies (ExCBs) - Service Facilities
- Certification Bodies (ExCBs) - Certified Persons
- Certification Bodies (ExCBs) - Conformity Mark
- EXTAG Decision Sheets List

Featured

- IECEX systems endorsed by UNECE
- IECEX mobile apps

IECEX Certificate of Conformity
INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

IECEX CoC Certified Service Facility
INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

IECEX Certificate Personnel Competence
INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

IECEX 05
Edition 1.0 2009-10

IECEX OD 504
Edition 1.0 2009-09

IECEX TEST REPORT
IEC 60079-0
Explosive atmospheres - Part 0:
Equipment - General requirements

IECEX PUBLICATION

IECEX OPERATIONAL DOC

All IECEX Certificates available "On-Line" - Full Transparency

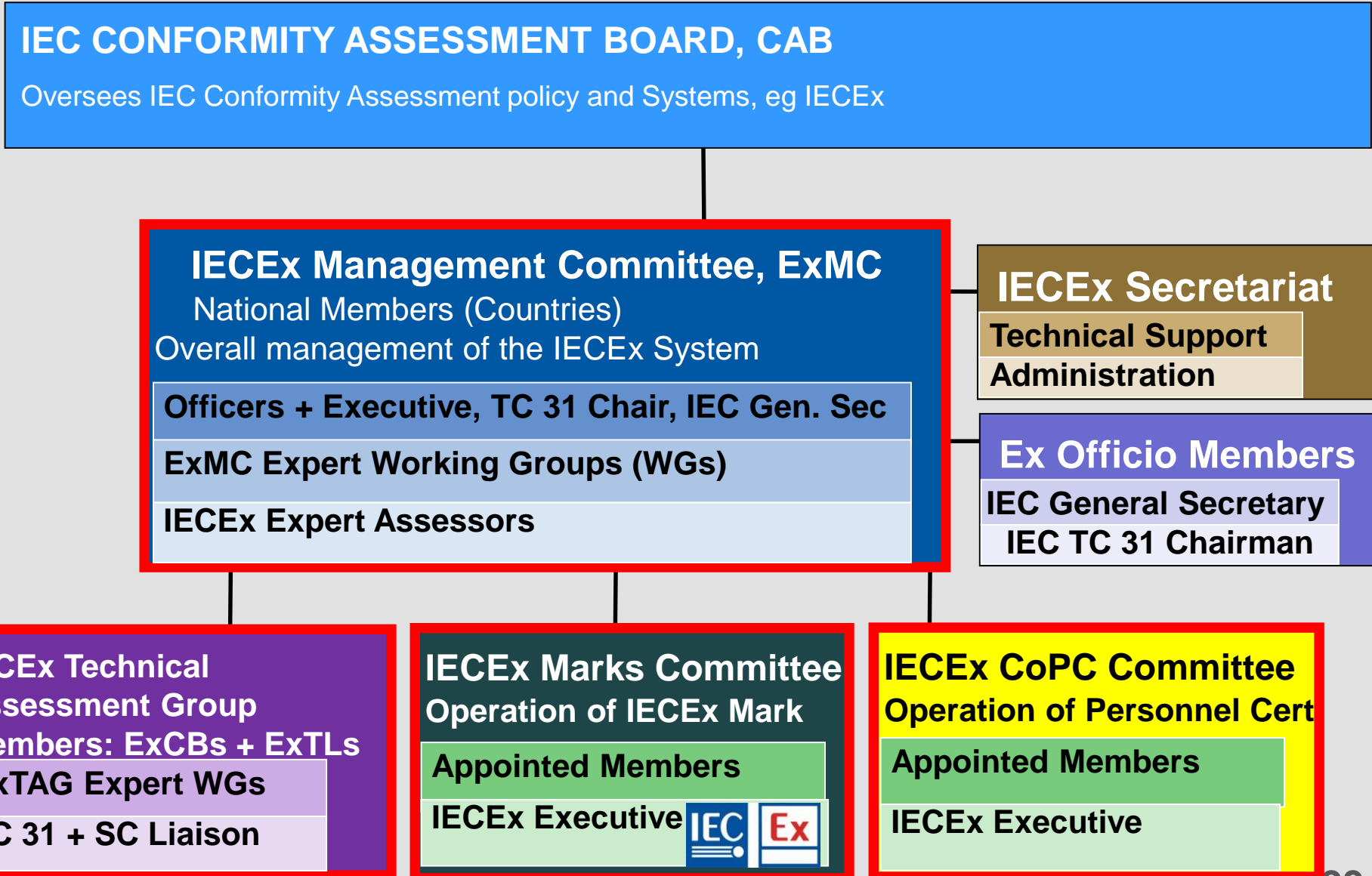
Baseefa

Standard Procedures + Rules

Standard Reporting formats

Logo + Mark





- **IECEX 02 Equipment Scheme:-**
 - ExCBs 48
 - ExTL = 56
- **IECEX 03 Service Facility Scheme (ExCBs 13)**
- **IECEX 04 Mark License System (ExCBs 14)**
- **IECEX 05 Personal Competence (ExCBs 8)**

- Web site version is the MASTER
- Certificates issued by ALL ExCBs in the one place – ***if not on IECEx website – then not issued !***
- Data Backed up by IEC Central Office, Geneva
- Certificate / Report Number automatically generated by system, *all Cert. Nos begin with “IECEX....”*
- Certificates + reports deleted only by Secretariat
- Editing only allowed during first 14 days after issue of the Certificate
- ExCBs only issue CoCs within their scope
- Supported by technical Secretariat.

1. Select "Certificate & Licenses"

Information | Publications | Members' Area | Certificates & Licenses | Meetings & Events | Contact | Home

News Releases

Exploiting silos
Staple support from IECEX

Knowledge supports safety in Ex areas
Chris Agius presents at the ATEX Forum in Denmark

Preventing dust explosions
IECEX certification provides high level of protection

Change under the surface
IECEX updates its digital presence

Restricting the blaze
Thorsten Arnold becomes IECEX Chairman

Quick Links

View IECEX Certificates and Licences (CoC Online)

- Certification Bodies (ExCBs) - Equipment
- Certification Bodies (ExCBs) - Service Facilities
- Certification Bodies (ExCBs) - Certified Persons
- Certification Bodies (ExCBs) - Conformity Mark
- ExTAG Decision Sheets List
- IEC TC31 & IECEX Meeting Schedule

Featured

- Malaysia Conference presentations available
- Meetings of the IECEX System 2014: The Hague, The Netherlands, 25-29 August 2014
- IECEX systems endorsed by UNECE
- IECEX mobile apps

Information | Publications | Members | Certificates | Meetings | Contact | Copyright © IEC-IECEX 2014. All rights reserved.

2. Select Type of IECEX Scheme:

- Certified Equipment, or
- Certified Service Provider
- Conformity Mark License, or
- Certified Persons

CoC ONLINE

Atmospheres (IECEX System)

Certified Equipment

IECEX System :: Certified Service Facility Scheme

Certified Service Facilities

IECEX System :: Conformity Mark License System

Conformity Mark Licenses

IECEX System :: Certified Person Scheme

Certified Persons
(coming soon)

Information | Publications | Members | Certificates | Meetings | Contact | Copyright © IEC 2009. All rights reserved.

3. Refer to IECEX OD 011 Part 1 for search and display options

IECEX Certificate of Conformity - Ex Equipment Program - Microsoft Internet Explorer

IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEX SYSTEM)

IECEX CoC Home > Certificates

IECEX Certified Equipment

You are welcomed in as an IECEX Guest User (IECEX System) and have full access to public information.

IECEX Certification Bodies please login to create or edit certificates (Password Protected): [ExCB Login]

Quick access: [] [view certificate]
Type in CoC ref. number (e.g.: "IECEX TSA 03.0001")

Free text search: [] [search]
You can use boolean operators "AND", "OR"

The IECEX Online Certified Equipment Scheme enables:

- IECEX Certification Bodies to issue new IECEX Certificates of Conformity "On-line"
- Full Public access to consult, view and print issued IECEX Certificates
- View Statistical Information
- Export data to an Excel worksheet

For any questions, please contact Mr. Chris Agius, IECEX Secretary.

Done

4. Master Controlled Version of Certificate now displayed

File Edit View Favorites Tools Help

IECEX Guest User | ExCB Login

Ex Certified Ex Equipment

quit print

IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEX Scheme visit www.iecex.com

View by:
 "All ExCBs" Certificates
 Certificate ref. number
 IECEX Cert. Body (ExCB)
 Applicant
 Applicant Location
 Manufacturer location
 Country/Standards/ExCBs
 Standard used
 ExTRs
 QARs

Services:
 Export to MS Excel

Certificate No.: IECEX UL 09.0024X Issue No.: 0 Certificate history: []

Status: **Current**

Date of Issue: **2009-07-31** Page 1 of 3

Applicant: **Adalet/ Scott Fetzer Company**
4801 W. 150th Street
Cleveland, OH 44135
United States of America

Electrical Apparatus: **Control Panel Enclosures**
Optional accessory:

Type of Protection: **Intrinsic Safety "i" and "n"**

Done



IECEX On-Line Certificate System

Certificate of Conformity: IECEX ITS 07.0008X - Microsoft Internet Explorer

File Edit View Favorites Tools Help



Address http://iecex.iec.ch/iecex/iecexweb.nsf/ae7eead0d12561594c1256d0200448859/607c74650e91a0e2c1257928002f3a9c?OpenDocument

[IECEX CoC Home](#) > [Certified Equipment Scheme](#) > [Certificate of Conformity](#)


important information !



- ieccx.iec.ch:
 - Home / Search
 - Certified Service Facilities
 - Conformity Mark Licenses
 - Certified Persons

- View by:
 - "All ExCBs" Certificates
 - Certificate ref. number
 - IECEX Cert. Body (ExCB)
 - Applicant
 - Applicant Location
 - Manufacturer location
 - Country/Standards/ExCBs
 - Standard used
 - EXTRs
 - QARs

- Services:
 - Export to MS Excel
 - Operational Manual



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com


| | | | |
|------------------|---|-------------|--------------------------------|
| Certificate No.: | <input type="text" value="IECEX ITS 07.0008X"/> | issue No.: | <input type="text" value="2"/> |
| Status: | <input type="text" value="Current"/> | | |
| Date of Issue: | 2011-12-21 | Page 1 of 5 | |

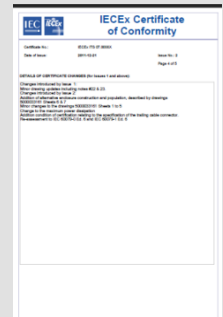
Certificate history:

- Issue No. 2 (2011-12-21)
- Issue No. 1 (2010-6-9)
- Issue No. 0 (2007-3-26)

Applicant: **Joy Mining Machinery**
 Thorn Hill Industrial Park
 177 Thorn Hill Road
 Warrendale
 PA 15086
United States of America

Electrical Apparatus: **Controller Enclosure 7LS1A / Type 5000033161**
Optional accessory:







IECEX On-Line Certificate System

IECEX Certificate of Conformity - Ex Equipme...

Page Safety Tools

IECEX Guest User | ExCB Login



IECEX Certified Ex Equipment

IEC System for Certification to Standards relating to Equipment for use in Explosive Atmospheres (IECEX System)

[IECEX CoC Home](#) > [Certified Equipment Scheme](#) > Listing

View by Certificate ref. number : (Anonymous)

[Previous Page](#) | [Next Page](#) | [First Page](#) | [Last Page](#) | [Expand](#) | [Collapse](#)

(Selection: All | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003)



- ieccx.iec.ch:
 - Home / Search
 - Certified Service Facilities
 - Conformity Mark Licenses
 - Certified Persons

- View by:
 - "All ExCBs" Certificates
 - Certificate ref. number
 - IECEX Cert. Body (ExCB)
 - Applicant
 - Applicant Location
 - Manufacturer location
 - Country/Standards/ExCBs
 - Standard used

| Certificate No | Status | Manufacturer country / location | Manufacturer name | Protection type | Tested standard |
|----------------------------|---------|---------------------------------|-------------------------|-------------------------|-------------------------|
| IECEX ZLM 12.0005X issue 0 | Current | Germany | Pepperl+Fuchs GmbH | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 12.0004X issue 0 | Current | United States of America | GE Infrastructure Se... | flameproof enclosure | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 12.0003X issue 0 | Current | Germany | PEPPERL + FUCHS GmbH... | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 12.0002X issue 0 | Current | Switzerland | Camille Bauer AG | Intrinsic Safety, du... | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 12.0001X issue 0 | Current | Italy | ABB SpA | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0010X issue 0 | Current | Japan | Endress+Hauser Yaman... | flameproof enclosure... | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0007X issue 0 | Current | United States of America | GRACO Inc. | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0006X issue 0 | Current | Italy | ABB S.p.A. | Flameproof Enclosure... | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0005 issue 1 | Current | Germany | ifm prover gmbh | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0004 issue 1 | Current | Germany | ifm prover gmbh | Intrinsic Safety | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 11.0003X issue 1 | Current | Germany | Siemens AG | Intrinsic Safety, No... | IEC 60079-0 (Ed.5); ... |
| IECEX ZLM 10.0002 issue 3 | Current | Germany | ABB Automation Produ... | Intrinsic Safety, No... | IEC 60079-0 (Ed.6.0)... |
| IECEX ZLM 10.0002 issue 2 | Current | Germany | ABB Automation Produ... | Intrinsic Safety, No... | IEC 60079-0 (Ed.5); ... |
| IECEX ZLM 09.0013X issue 1 | Current | Germany | perma-tec GmbH & Co... | Intrinsic Safe | IEC 60079-0 (Ed.6.0)... |
| IECEX VTT 12.0009 issue 0 | Current | Finland | Centaura Oy | Ex e mb/ Ex tb or Ex... | IEC 60079-0 (Ed.6.0)... |
| IECEX VTT 12.0008X issue 1 | Current | Finland | Manufacturing Site | Ex ib | IEC 60079-0 (Ed.6.0)... |
| IECEX VTT 12.0008X issue 0 | Current | Finland | Manufacturing Site | Ex ib | IEC 60079-0 (Ed.6.0)... |
| IECEX VTT 12.0007X issue 2 | Current | Finland | Manufacturing Site | Ex ib | IEC 60079-0 (Ed.6.0)... |
| IECEX VTT 12.0007X issue 1 | Current | Finland | Manufacturing Site | Ex ib | IEC 60079-0 (Ed.6.0)... |

Internet

100%

Search Desktop



IECEX On-Line Certificate System

IECEX Certified Ex Equipment

quit | print

[Ex CoC Home](#) > [Certified Equipment Scheme](#) > [Certificate of Conformity](#)

important

Certificate



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: issue No.:

Status:

Date of Issue: 2013-07-03 Page 1 of 3

Applicant: **Martin Decker NOV, Div of National Oilwell Varco LLP**
1200 Cypress Creek Road
Cedar Park, TX 78613
United States of America

Electrical Apparatus: **The IIBOP is a self-contained battery powered sensing device which monitors the position of and conditions on a well-drilling apparatus providing the status via a RF signal.**

Optional accessory:



Standard IECEx Certificate Number

IECEX UL 13.0049

IECEX Certification

Certificate Issuing Body

Year of Issue

Certificate Issued in that year

IECEX UL 13.0049

Normal Certificate Number

IECEX UL 13.0049X

Conditions of Product Use
Apply


IECEX UL 13.0049U

Component Certificate

Certificate Number appears on Product Marking

Also Provides for adding an Attachment / Annex to the online certificate for Additional Product Information

| IEC | | IECEX | | IECEX Certificate of Conformity | |
|---|---|-------------|---|--|--|
| INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres <small>for rules and details of the IECEx Scheme visit www.iecex.com</small> | | | | | |
| Certificate No.: | IECEX BAS 08.0111X | Issue No.: | 1 | Certificate history: Issue No. 1 (2010-2-10) Issue No. 0 (2009-2-16) | |
| Status: | Current | | | | |
| Date of issue: | 2010-02-10 | Page 1 of 4 | | | |
| Applicant: | Hawke International A Division of Hubbell Limited A Member of the Hubbell Group of Companies Oxford Street West Ashton-under-Lyne Lancashire OL7 0NA United Kingdom | | | | |
| Electrical Apparatus: | PR411 and PR453 Cable Glands | | | | |
| Optional accessory: | | | | | |
| Type of Protection: | Flameproof, Increased Safety and Dust | | | | |
| Marking: | Ex d IIC Ex e II Ex ID A21 IP66 (-60°C ≤ ta ≤ +80°C) for the PR453, or +100°C for the PR411 | | | | |
| Approved for issue on behalf of the IECEx Certification Body: | R S Sindair | | | | |
| Position: | Managing Director | | | | |
| Signature: (for printed version) | | | | | |
| Date: | | | | | |
| 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: | Baseefa Rockhead Business Park Staden Lane Buxton Derbyshire SK17 9RZ United Kingdom | |  | | |

| | | |
|---|---|------------------|
| Baseefa Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom |  | |
| ANNEX to IECEx BAS 08.0111X | Issue No. 0 | Date: 2009/02/13 |

Each of the following gland types may be manufactured in brass, stainless steel or aluminum and may be supplied with specified alternative entry thread forms.

Variant 0.1 - Type PR 411

The Type PR 411 cable gland is intended for use with an effectively filled circular cable in flameproof applications. For other protection concepts the cable gland is intended for use with effectively filled circular, unarmoured, armoured, steel basket weave armoured or braided (screened) cable and comprises the following components :-

- An entry component in the size ranges Os to F (M16 to M75)
- A compressible sealing ring
- A nylon skid washer
- A threaded compression spigot

Variant 0.2 - Type PR 453

The Type PR 453 cable gland is intended for use with an effectively filled and circular armoured or braided cable and comprises the following components :-

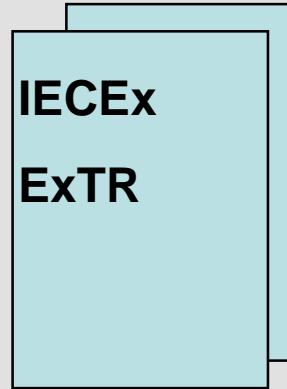
- An entry component, in the size range Os to F (M16 to M75)
- A compressible sealing ring
- A combined compression spigot and armour clamping cone
- A dedicated armour, or braid, clamping ring
- A middle nut
- An outer seal assembly (sleeve seal and support ring Os-F)
- A back nut



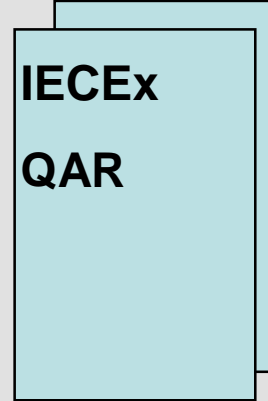
IECEX Certification – Equipment Scheme Production and Unit Covered

IECEX Certificate
of Conformity
according to
OD 009

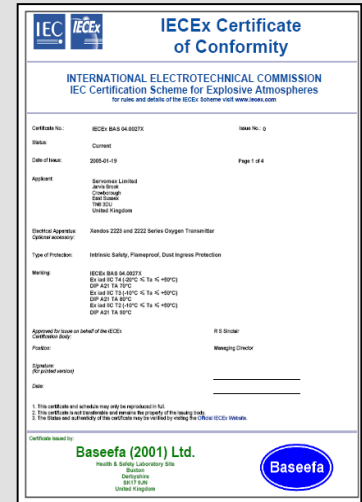
*Product
Assess/Testing*



*Factory Audit
+ surveillance*

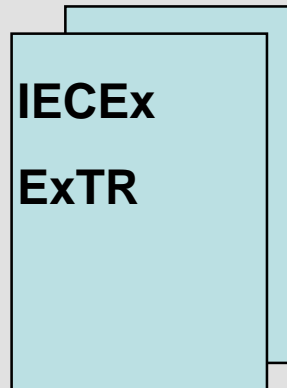


IECEX CoC



IECEX Unit
Verification
Certificate
according to
OD 033

*Product
Assess/Testing*

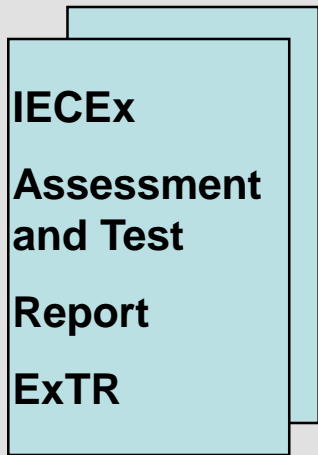




IECEx Certification – Unit Verification

Each Unit must be tested / assessed by the IECEx Body And identified on the Certificate, by serial No.

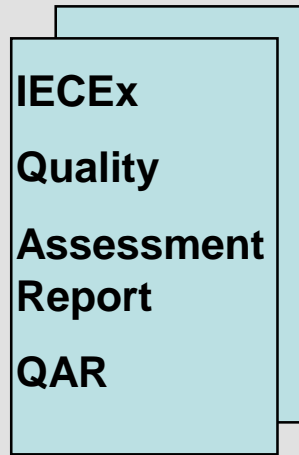
**Product
Test/Asses.**



Testing of
Samples
(Type Testing)

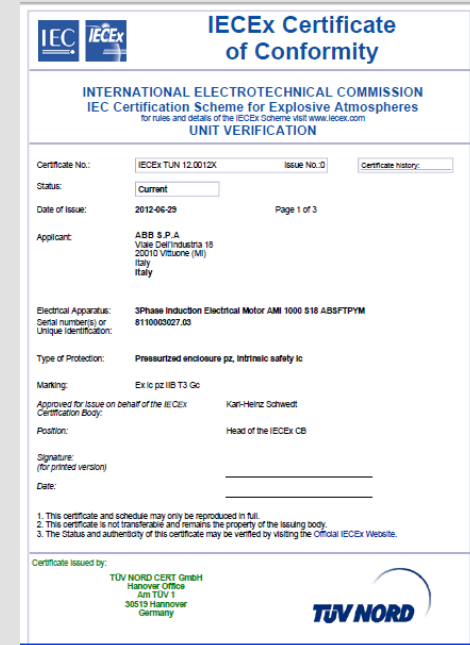
IEC/TC 31
International
Standards

**Factory Audit
+ Ongoing
surveillance**



Assessment of
Manufacturers
Quality System

ISO/IEC 80079-34 In
line with EN 13980
and Based on
ISO 9001



Live “On-Line”
System
In-built controls
Consistent format
Search capabilities
Covers only
Units identified



IECEX Unit Verification Certificate - Option

IEC **IECEX**

IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

UNIT VERIFICATION

Certificate No.: issue No.:

Status:

Date of Issue: 2012-06-29 Page 1 of 3

Applicant: **ABB S.P.A**
 Viale Dell'Industria 18
 20010 Vittuone (MI)
 Italy
 Italy

Electrical Apparatus: 3Phase Induction Electrical Motor AMI 1000 S18 ABSFTPYM
 Serial number(s) or Unique Identification: 8110003027.03

Type of Protection: Pressurized enclosure pz, intrinsic safety ic

Marking: Ex ic pz IIB T3 Gc

Approved for issue on behalf of the IECEx Certification Body: Karl-Heinz Schw...

- Issued on the basis of Satisfactory ExTR
- Only covers items actually assessed/tested
- Not require Factory inspection nor ongoing surveillance
- Items traceable on certificate via serial numbers/etc
- Can cover more than 1 item but all serial Nos appear .

IECEX Services Scheme

**Certification of Ex Service Providers, eg
Repair and overhaul workshops**





IECEX Services Scheme – Repair Workshops

Guide to IECEx Service Facility Certification
As per OD-013

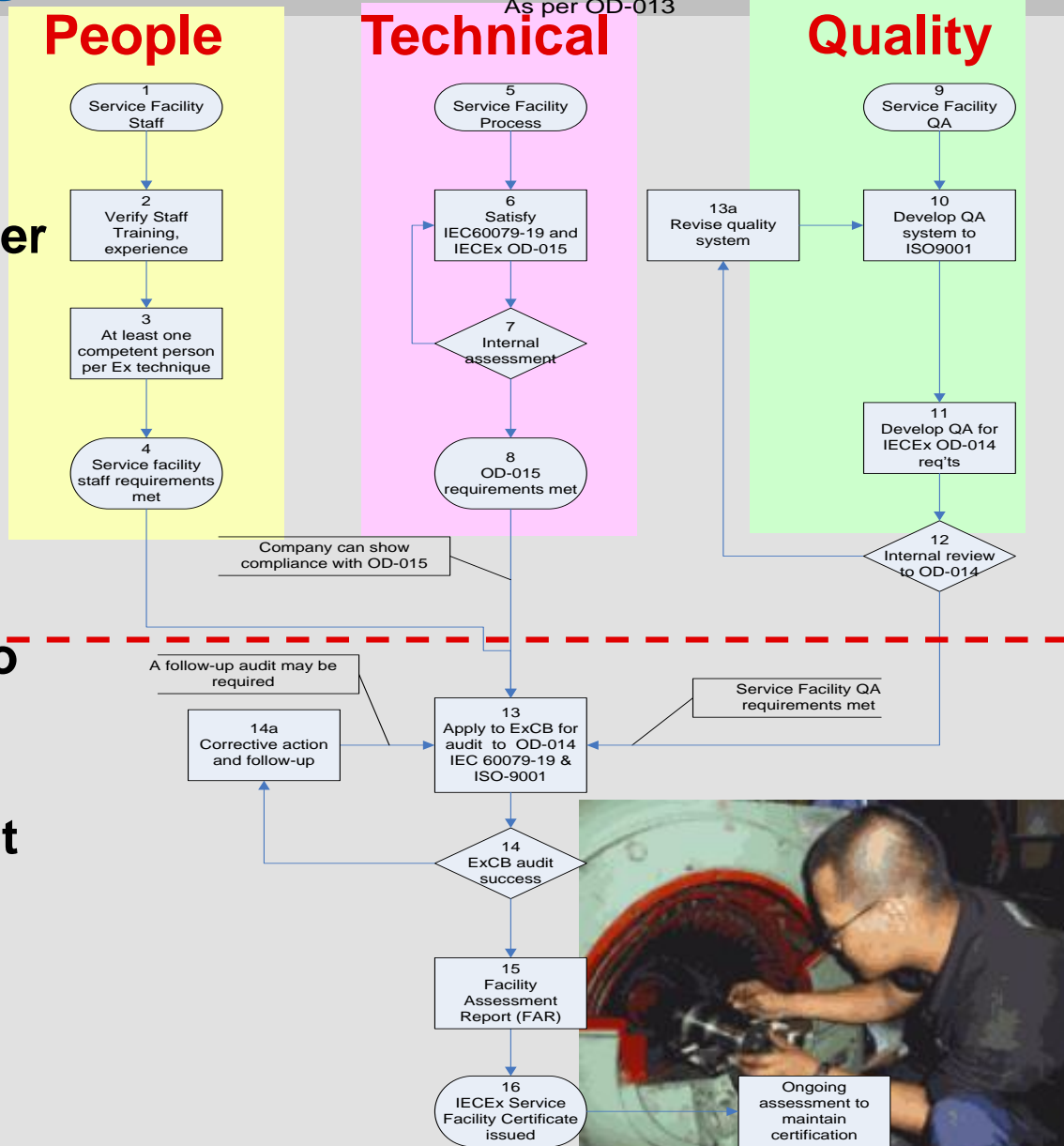
Ex Equipment High Capital cost

Ex Equipment usually Cheaper to Repair than Replace!

Incorrect Repairs can compromise inherent Ex protection

IECEX Certifies Workshops to IEC 60079-19

IECEX 03A Guide to Applicant Workshops www.iecex.com





iecex.iec.ch:

[Home / Search](#)[Certified Equipment](#)[Conformity Mark Licenses](#)[Certified Persons](#)

View by:

["All ExCBs" Certificates](#)[Certificate ref. number](#)[IECEX Cert. Body \(ExCB\)](#)[Applicant](#)[Applicant Location](#)[FARs](#)

Services:

[Export to MS Excel](#)[Operational Manual](#)

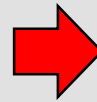
IECEX CoC Certified Service Facility

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com

| | | | |
|--|--|---------------------------|--|
| Certificate No.: | IECEX BAS S0013 | issue No.:1 | Certificate history: Issue No. 1 (2012-6-13) Issue No. 0 (2011-1-27) |
| Status: | Current | Date of Issue: 2012-06-13 | |
| Applicant: | ABB Pte Ltd 2 Tuas Lane 638611 Singapore | | |
| Type of Service: | Repair and Overhaul according to IEC 60079-19 | | |
| Type of Protection: | Flameproof Enclosure "d" Increased Safety "e" Type of Protection "n" | | |
| Scope of Service: | On site Repair and Overhaul of Exd, Exe, Exde, Exn Rotating Machine and enclosures . Off site work limited to replacement of machine bearings. | | |
| Locations covered by this Certificate: | as above | | |

**IECEX Certified Persons
Scheme (CoPC)
Competency to work in Ex field (New)**



**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

Certificate No.: **IECEX CP-BAS11.0002** Issue No.: **0**

Status: **Current** Date of Original Issue: **2011-02-01**
Date of Expiry: **2014-02-01**

Applicant: **Arpad Veress**

Scope of Competence: **Ex 001 - Basic principles -**
Based on various parts of IEC 60070 series
(Units according to IECEx OD 504)

Ex 002 - Classification -
Based on IEC 60070-10 series

Ex 004 - Maintenance -
Based on IEC 60070-17

Ex 006 - Testing of installations -
Based on IEC 60070-14

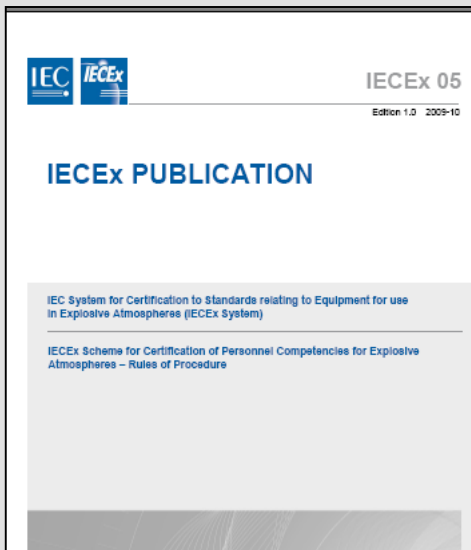
Ex 007 - Visual & Close Inspection -
Based on IEC 60070-17

Ex 008 - Detailed Inspection -
Based on IEC 60070-17

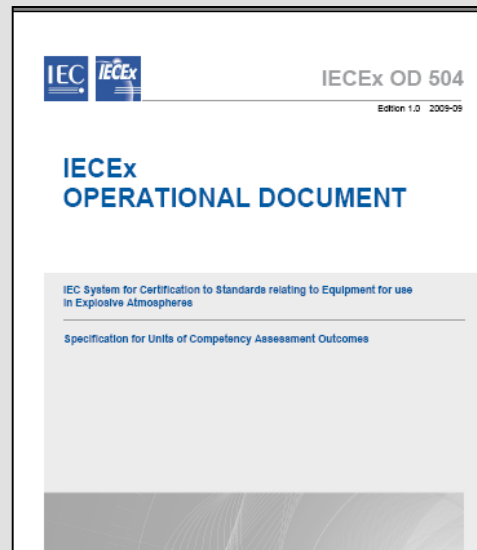
Ex 010 - Audit Inspection -
Based on IEC 60070-17



- Same IEC TC 31 Standards already used by IECEx apply, 60079-10, -19, -14, -17
- **Certifies a Person's Competence to be able to apply the Standards**
- **Manufacturers now interested**



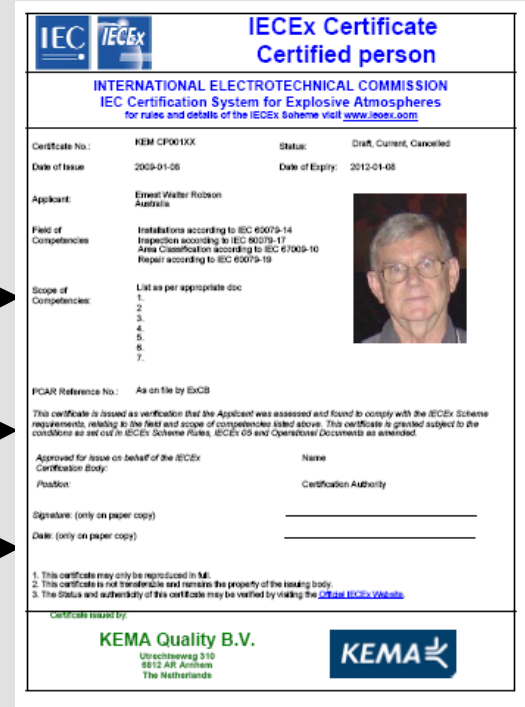
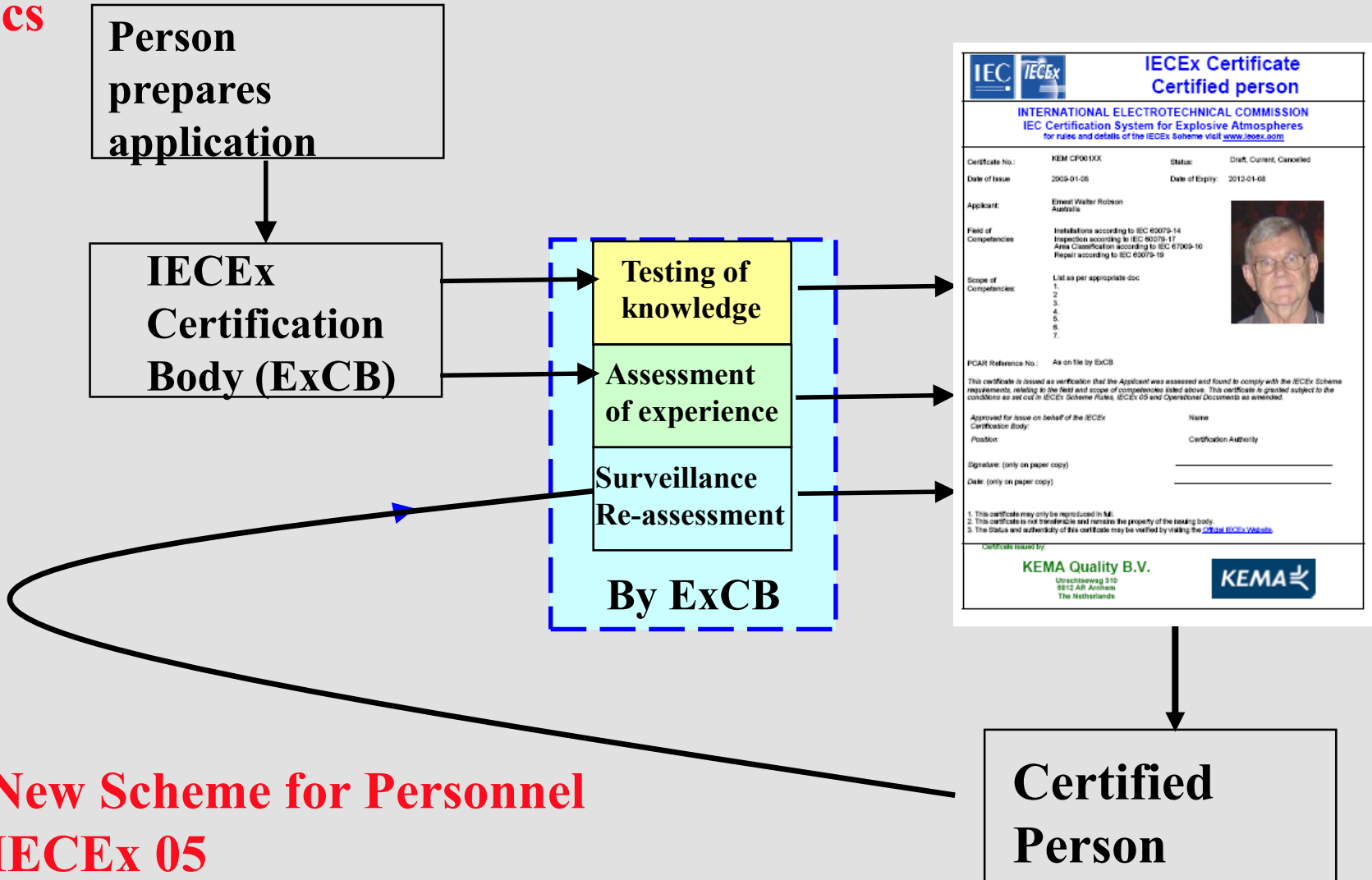
Scheme Rules



Operational Documents

| |
|---|
| Unit Ex 001 – Basic principles of protection in explosive atmospheres |
| Unit Ex 002 – Perform classification of hazardous areas |
| Unit Ex 003 – Install explosion-protected equipment and wiring systems |
| Unit Ex 004 – Maintain equipment in explosive atmospheres |
| Unit Ex 005 – Overhaul and repair of explosion-protected equipment |
| Unit Ex 006 – Test electrical installations |
| Unit Ex 007 – Perform visual & close inspection |
| Unit Ex 008 – Perform detailed inspection |
| Unit Ex 009 – Design electrical installations |
| Unit Ex 010 – Perform audit inspection of installations |

According to ISO/IEC 17024 + IECEx Rules + Operational Docs



**New Scheme for Personnel
IECEX 05**

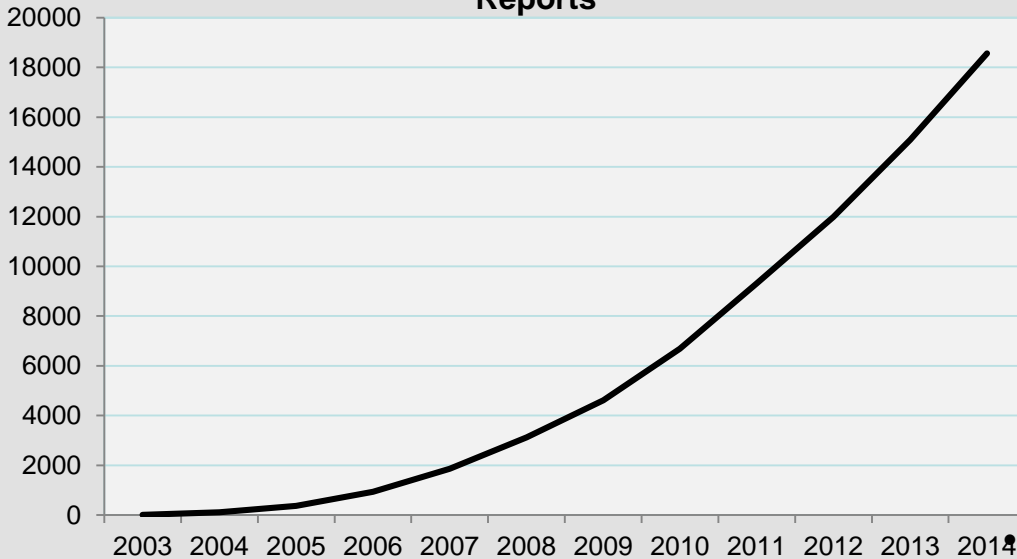
Examples of errors due to lack of competence



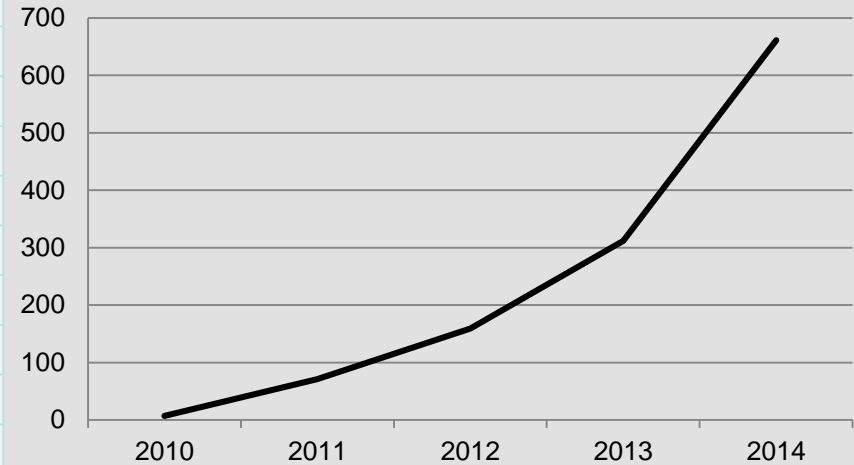


Year Statistics end Sep 2014

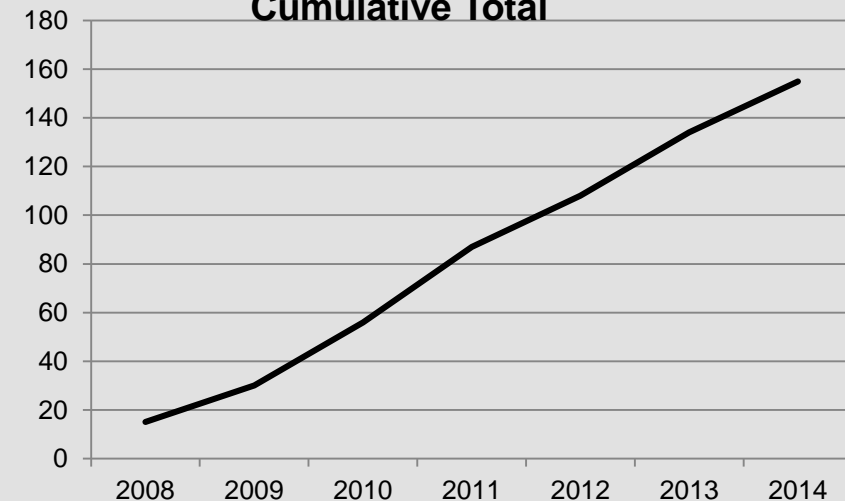
Cumulative Growth of IECEx Equipment CoCs and Reports



Certified Personnel Scheme - Cumulative Total



Service Facility Certificates - Cumulative Total



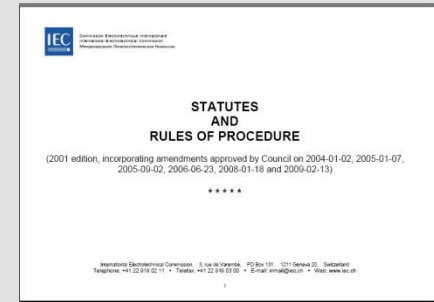
Sustained Growth and demand continues towards end 2014

- Increased inquiries received by Secretariat from industry
- Total Certificates + Reports issued across ALL IECEx Schemes at end Dec 2013 = **35768** [**>42,000 at Oct 2014**]
- Financially Stable: Gen. Reserves CHF 1'151'475



IECEX Foundation – it's *DNA*

- Being part of IEC: Statutes + Rules
- Industry Based Management Committee
- One single set of Rules and Operational Procedures for TLs + CBs
- ALL TLs and CBs undergo the same qualification process to join, use of peer assessment.
- Common Test Report and Certificate Format used by ALL TLs and CBs but always maintaining CB Brand
- Use of Internet “On-Line” Systems for Certificates. [Equipment](#), [Services](#), [Personnel](#)
- Technical Secretariat - Day to Day Management





IECEX Promotional Activities: IECEX 2012 Dubai Conference

Sponsors

2 Day Conference Hosted jointly by



PRESENTERS:

- Hiromichi Fujisawa IEC V/P
- Kerry McManama
- Jim Munro
- Lorenza Jachia
- Chris Agius
- Patrick Leroux
- Peter Thurnherr
- John Allen
- Ralph Wigg
- Gerold Klotz-Engmann
- Ron Sinclair
- UAE Governmental
- Others



2014 IECEX INTERNATIONAL CONFERENCE

Equipment and Services in Explosive Atmospheres
Kuala Lumpur, Malaysia 19-20 February 2014

IEC System for Certification to Standards relating to Equipment for use
in Explosive Atmospheres (IECEX)



<http://www.iecex.com/malaysia/>

- **Information on**
 - **Standards**
 - **Conformity Assessment**
- **Information on Regulations**
- **Practical Presentations / tuition**
 - **Area Classification**
 - **Installation requirements**
 - **Inspection**
 - **Maintenance**
 - **Repair**



IECEX ACTIVITIES: Continued

- **IECEX/UNECE Paper at PCIC Europe Conference Prague, June 2012**
- **Joint IECEx/UN Technical Paper Presented at 1st PCIC Middle East Conference Abu Dhabi November 2012, by Head of UNECE Regulatory Unit**
- **Joint Paper to PCIC Nth America 2012 “Personal Competence in IECEx” by Marty Cole + Kerry McManama**
- **IECEX Vice Chairman, Dr Zalogin presentation EU-Russia Industrialists' Roundtable meeting in Kazan, RU, Oct. 2012**
- **2 Day IECEx African Training Workshop + Capacity Building by Thierry Houiex + Peter Thurnherr, 2012 – Very Successful**
- **HazardxEx Presentations + regular articles Ron Sinclair, Jim Munro**

- **22+23 April 2015 : 2 Day International Conference to be held in Poland**

2015 IECEx INTERNATIONAL CONFERENCE
Equipment and Services in Explosive
Atmospheres

Gdansk, Poland 22+23 April 2015

IEC System for Certification to Standards relating to
Equipment for use in Explosive Atmospheres (IECEX)



- **During 2014 Upgrading of the iPhone/Android App**
- **During 2014 Enhanced Search features for the IECEx On-Line Certificate System.**
- **18-22 May 2015: IECEx series of Operational meetings in Toronto Canada**
- **14-18 Sep 2015: IECEx annual Meetings, NZ**

- **Sept. 2014: IECEx Annual Meetings, NL Hosts.**
 - IEC V/President (Dr Fujisawa) along with IEC General Secretary (Mr Vreeswijk) attended

- **May/June 2014: 7 Days of IECEx Operational Meetings hosted by ESMA in United Arab Emirates**
 - WG1/WG5 – IECEx 02 Rules and Factory Auditing
 - WG 13 – IECEx Business Development
 - ExPCC/WG 4 – Training Body Certification
 - WG 15 – Non Electrical Standards
 - ExPCC – IECEx CoPC Committee
 - ExMarkCo – IECEx Mark Overseeing Committee
 - IECEx Executive – Oversight of the IECEx System

Future Annual IECEx Meetings Planned

- **2015: Australia/New Zealand**
- **2016: South Africa**
- **2017: USA**
- **2018: France**
- **2019: UAE**
- **2020: Canada**
- **2021: Japan**

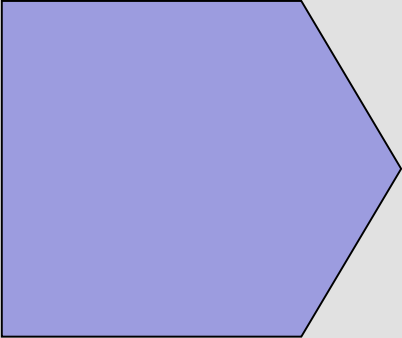
The background image shows the United Nations Secretariat Building in New York City. The building is a large, classical-style structure with a prominent portico supported by columns. In the foreground, there is a large, ornate sculpture of a globe on a pedestal. To the right of the globe, a long row of colorful national flags is flying on poles. A tall flagpole with the United Nations flag is visible in the center-left. The sky is clear and blue.

**United Nations, via its
UNECE Endorses IECEx –**

REGULATORY DIALOGUE AT THE UNITED NATIONS



To promote trade as a means of development



To protect the safety of workers and consumers & preserve the natural environment



To foster the international transfer of knowledge & technology



The United Nations System

UN Principal Organs

General Assembly

Security Council

Economic and Social Council

Secretariat

International Court of Justice

Trusteeship Council⁵

Subsidiary Bodies
Main and other sessional committees
Disarmament Commission
Human Rights Council
International Law Commission
Standing committees and ad hoc bodies

Subsidiary Bodies
Counter-terrorism committees
International Criminal Tribunal for Rwanda (ICTR)
International Criminal Tribunal for the former Yugoslavia (ICTY)

Military Staff Committee
Peacekeeping operations and political missions
Sanctions committees (ad hoc)
Standing committees and ad hoc bodies

Programmes and Funds
UNCTAD United Nations Conference on Trade and Development
• **ITC** International Trade Centre (UNCTAD/WTO)
UNDP United Nations Development Programme
• **UNCDF** United Nations Capital Development Fund
• **UNV** United Nations Volunteers
UNEP United Nations Environment Programme
UNFPA United Nations Population Fund

UN-HABITAT United Nations Human Settlements Programme
UNHCR Office of the United Nations High Commissioner for Refugees
UNICEF United Nations Children's Fund
UNODC United Nations Office on Drugs and Crime
UNRWA¹ United Nations Relief and Works Agency for Palestine Refugees in the Near East
UN-Women United Nations Entity for Gender Equality and the Empowerment of Women
WFP World Food Programme

Research and Training Institutes
UNICRI United Nations Interregional Crime and Justice Research Institute
UNIDIR¹ United Nations Institute for Disarmament Research

UNITAR United Nations Institute for Training and Research
UNRISD United Nations Research Institute for Social Development
UNSSC United Nations System Staff College
UNU United Nations University

Other Entities
UNAIDS Joint United Nations Programme on HIV/AIDS
UNISDR United Nations International Strategy for Disaster Reduction
UNOPS United Nations Office for Project Services

Related Organizations
CTBTO PrepCom Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization
IAEA² International Atomic Energy Agency
OPCW Organisation for the Prohibition of Chemical Weapons
WTO³ World Trade Organization

Advisory Subsidiary Body
UN Peacebuilding Commission

Specialized Agencies⁴
IMF International Monetary Fund
ICAO International Civil Aviation Organization
IMO International Maritime Organization
ITU International Telecommunication Union
UPU Universal Postal Union
WMO World Meteorological Organization
WIPO World Intellectual Property Organization
IFAD International Fund for Agricultural Development
UNIDO United Nations Industrial Development Organization
UNWTO World Tourism Organization

World Bank Group
• **IBRD** International Bank for Reconstruction and Development
• **IDA** International Development Association
• **IFC** International Finance Corporation
• **MIGA** Multilateral Investment Guarantee Agency
• **ICSID** International Centre for Settlement of Investment Disputes

Functional Commissions
Crime Prevention and Criminal Justice
Narcotic Drugs
Population and Development
Science and Technology for Development
Social Development
Statistics
Status of Women
Sustainable Development
United Nations Forum on Forests

Regional Commissions
ECA Economic Commission for Africa
ECE Economic Commission for Europe
ESCAP Economic and Social Commission for Asia and the Pacific
ESCAP Economic and Social Commission for Asia and the Pacific
ESCWA Economic and Social Commission for Western Asia

Other Bodies
Committee for Development Policy
Committee of Experts on Public Administration
Committee on Non-Governmental Organizations
Permanent Forum on Indigenous Issues
United Nations Group of Experts on Geographical Names
Other sessional and standing committees and expert, ad hoc and related bodies

Departments and Offices
EOSG Executive Office of the Secretary-General
DESA Department of Economic and Social Affairs
DFS Department of Field Support
DGACM Department for General Assembly and Conference Management

DM Department of Management
DPA Department of Political Affairs
DPI Department of Public Information
DPKO Department of Peacekeeping Operations
DSS Department of Safety and Security
OCHA Office for the Coordination of Humanitarian Affairs

OHCHR Office of the United Nations High Commissioner for Human Rights
OIOS Office of Internal Oversight Services
OLA Office of Legal Affairs
OSAA Office of the Special Adviser on Africa
OSRSG/CAAC Office of the Special Representative of the Secretary-General for Children and Armed Conflict

UNODA Office for Disarmament Affairs
UNOG United Nations Office at Geneva
UN-OHRLS Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
UNON United Nations Office at Nairobi
UNOV United Nations Office at Vienna

NOTES:
¹ UNRWA and UNIDIR report only to the General Assembly.
² IAEA reports to the Security Council and the General Assembly.
³ WTO has no reporting obligation to the General Assembly (GA) but contributes on an ad-hoc basis to GA and ECOSOC work inter alia on finance and developmental issues.
⁴ Specialized agencies are autonomous organizations working with the UN and each other through the coordinating machinery of ECOSOC at the intergovernmental level, and through the Chief Executive Board for Coordination (CEB) at the inter-secretariat level. This section is listed in order of establishment of these organizations as specialized agencies of the United Nations.
⁵ The Trusteeship Council suspended operation on 1 November 1994 with the independence of Palau, the last remaining United Nations Trust Territory, on 1 October 1994.

This is not an official document of the United Nations, nor is it intended to be authoritative.

United Nations Endorsement of IECEx

New United Nations Publication, March 2011 endorsing IEC TC 31 Standards + IECEx as “world’s best practice”.



 **UNECE** United Nations Economic Commission for Europe

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Press Release

[\[Index\]](#)

Helping smaller countries protect their populations from danger in explosive environments New UNECE publication offers regulatory framework

Geneva, 22 March 2011 --

The United Nations Economic Commission for Europe (UNECE) has just issued a publication that helps address the hazards in environments with a high risk of explosion such as mines, refineries, chemical plants and mills.

The booklet “*Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere*” can be used by countries that lack regulation in this sector as a blueprint for their legislation, and also for aligning existing national regulations with internationally harmonized best practice.

“Ex-equipment” for use in such hazardous environments needs to be specially designed, installed, maintained and repaired to eliminate potential sparks and open flames. This heterogeneous sector plays an important part in many areas of economic activity, and represents an important component of international trade.

This equipment therefore undergoes severe testing and certification, which is very costly. Because differing legislation often does not allow countries to accept the testing and certification done in another country, manufacturers generally must have devices re-tested and re-certified whenever they want to enter a new market. For some companies, this



[Full Text](#)

http://www.unece.org/press/pr2011/11trade_p03e.htm

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

A Common Regulatory Framework for Equipment Used in Environments with an Explosive Atmosphere



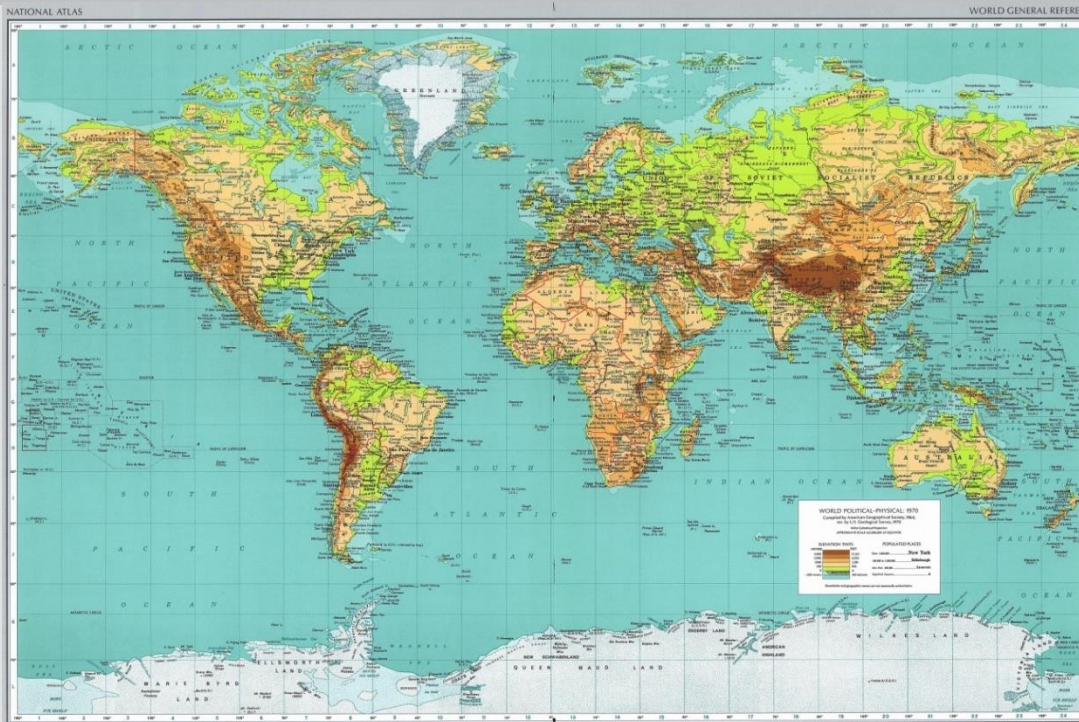
UNITED NATIONS

United Nations Endorsement of IECEx

10. The CROs are drawn up with reference to international standards and conformity assessment procedures developed by IEC and ISO and to best practice in the assessment of conformity to such standards, within the IECEx.
11. The CROs address the requirements both for electrical and mechanical equipment being placed on the market (part one of the present document) and for the safe installation and use of the equipment in the workplace (part two of the present document).
12. Explosion protection in industry can be assured through a variety of legitimate means. The present document is based on one of them, namely, the “IEC Zone Concept, in accordance with IEC 60079-10 Parts 1 + 2”. This concept classifies hazardous locations as high, medium and low risk zones based on a standard risk-assessment methodology.

B. Definition of applicable conformity assessment procedures

22. Compliance with this CROs shall be by use of an international certification scheme such as the IECEx for direct market acceptance of products carrying IECEx Certification. Alternatively, where national legislation does not allow for use of IECEx Certificates, national certification of compliance should be based on IECEx testing and assessments.



Manufacturers trade Globally

Re-testing/ Re-certification

- Adds undue costs
- Results in delays to access markets
- Denies smaller countries access to new products/technology

IECEX Provides a Single Global Process :-

a) Issuing of Test/Audit Reports and International Certificates that can either:

- Be exchanged among participating Certifiers (ExCBs)
- Be used both on a voluntary (purchasing requirements) or Regulatory basis.

b) Qualifying and Monitoring the operation of credible Certifiers + Labs 55

- **Demand for Oil and Gas (excluding biofuels) continues to grow steadily expected to reach 99 million barrels per day by 2035 – 15 mb/d up on 2009. (*IEA Report 2011*)**
- **Despite the concerns of the late 1970s/80s Fossil Fuel is in super abundant supply**
- **Developing economies are expected to account for largest growth in energy demand hence demand for Ex Equipment, Services and Competent Persons continue to grow**
- **Demand for CA Services covered by IECEx will continue.**

Oil and Gas will continue to meet 60% of the world's energy needs thru to 2040 due to a growing population

There is enough Gas resources to meet the current demand and consumption for more than 200 years.

It is estimated that by 2030 the demand of Oil and Gas will rise by 50%



In 2012 **84,141,209** cars and commercial vehicles were produced globally.

In 2010 Over **1 billion** cars were on the road. Every Petrol Station is an Ex Installation.

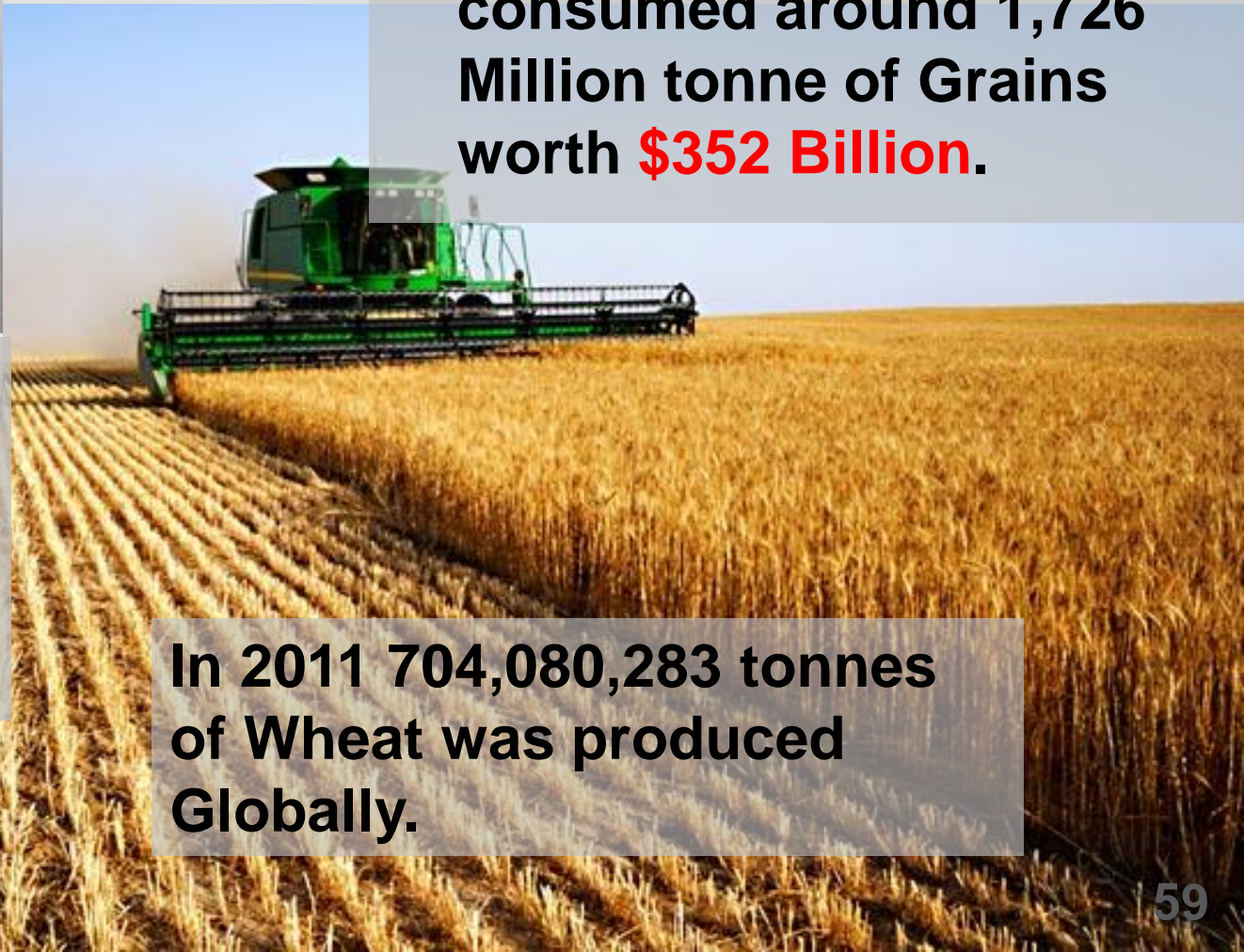
It is projected that by 2014 there will be **3.3 Billion** airline passengers annual worldwide. (IATA) – Every airport in the world is an Ex installation.





In 2011 The global production of Sugarcane was 1,794 Million Tonne

In 2010 the world consumed around 1,726 Million tonne of Grains worth **\$352 Billion.**



In 2011 704,080,283 tonnes of Wheat was produced Globally.

- Coal is mined commercially from over 50 countries worldwide with the 2011 top 5 producers:
 - China =3,471 Million tonnes
 - USA =1,004 Million tonnes
 - India = 585 Million tonnes
 - Australia = 414 Million tonnes
 - Indonesia = 376 Million tonnes
- **'In 2011 coal's share in global primary energy consumption increased to 30.3% - the highest since 1969.'** (IEA)
- Coal provides **30.3%** of global primary energy needs and generates **42%** of the world's electricity
- 'Total world coal production reached a record level of 7,678Mt in 2011, increasing by 6.6% over 2010. The average annual growth rate of coal since 1999 was 4.4%.' (IEA and BP)
- **There are 1004 billion tones of coal reserves left, equivalent to 130 years of global coal output in 2011.** (German Federal Institute for Geosciences and Natural Resources (BGR))

- 1,652.6 Thousand Million Barrels of oil as proven Oil reserves (end 2011)
- Natural Gas Reserves grew to 208.4 Trillion cubic meters in 2011
- In addition to Oil and Natural gas is the relatively new fossil fuel industry of **“Shale Gas”** which only commenced large scale production as late as the 1990s
- With Coal considered twice as bad for CO₂, Gas is becoming the preferred fuel for power stations



INTERNATIONAL
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Thank You

