



**INTERNATIONAL ELECTROTECHNICAL COMMISSION SCHEME
FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR
USE IN EXPLOSIVE ATMOSPHERES (IECEx SCHEME)**

Title: IECEx Assessment Report for the acceptance of *Korea Testing Laboratory (KTL)* as an IECEx Test Laboratory (ExTL) within the IECEx Scheme

To: Members of the IECEx Management Committee, ExMC

INTRODUCTION

This document contains the IECEx Assessment Report for the acceptance of *Korea Testing Laboratory (KTL)* as an IECEx Test Laboratory (ExTL) within the IECEx Scheme.

This report is hereby submitted for voting.

Please consider this assessment report and return the completed voting form (separate - in Word Format) to the Secretariat by **16th July 2008. Your speedy response to the voting process will be very much appreciated.**

Chris Agius

**Chris Agius
Secretary IECEx**

Address:

**SAI Global Building
286 Sussex Street
Sydney NSW 2000
Australia**

Contact Details:

**Tel: +61 2 8206 6940
Fax: +61 2 8206 6272
e-mail: chris.agius@iecex.com
<http://www.iecex.com>**



IECEX ASSESSMENT REPORT FOR KTL ExTL (IECEX TEST LABORATORY)

Type of Assessment: (please mark)

Initial Assessment for Candidate ExTL **X**

1. OBJECT AND FIELD OF APPLICATION

1.1. Country:

Republic of Korea

1.2. Name of Candidate TL

Korea Testing Laboratory (KTL)

1.3. Members of the Assessment Team

Xu Jianping – Director of NEPSI - IECEx Lead Assessor in Training and Team Leader

Jim Munro – Chairman Panel of Assessors – Lead IECEx Assessor

Ron Webb – FM Approvals Ltd - Expert Assessor

1.4. Place and Date of Assessment

Seoul Headquarters

222-13, Guro-dong, Guro-gu,

Seoul 152-718 Korea

Ansan Operation Center:

Gyeonggi Techno Park,

1271-12 Sa1-dong Sangnok-gu

Ansan-si Gyeonggi-do 426-901 Korea

Seoul: TEL +82-2-8601-309, FAX +82-2-8601-344

Ansan: TEL +82-31-500-6305, FAX +82-31-500-6301

Web: www.ktl.re.kr

28-30 November 2007

9 man-days

1.5. Assessment References

- i) IECEx 02 Third Edition 2006 11 IECEx Scheme rules of procedure
- ii) IECEx Operational Document OD 003/V1 IECEx Assessment procedures
- iii) IECEx Operational Document OD 009/V1 Issuing of CoCs, ExTRs and QARs
- iv) ISO/IEC 17025:2005
- v) IECEx Technical Guidance Documents (TGDs)
- vi) ExTAG decision sheets (DSs)
- vii) ExTL application documents dated March 2007

1.6. Scope of Application (to be selected)

Number	Title
60079-0	Explosive atmospheres - Part 0: Equipment - General requirements
60079-1	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures 'd'
60079-2	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosures 'p'
60079-5	Explosive atmospheres - Part 5: Equipment protection by powder filling 'q'
60079-6	Explosive atmospheres - Part 6: Equipment protection by oil immersion 'o'
60079-7	Explosive atmospheres - Part 7: Equipment protection by increased safety 'e'
60079-11	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety 'i'
60079-15	Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection 'n' electrical apparatus
60079-18	Electrical apparatus for explosive gas atmospheres - Part 18: Construction, test and marking of type of protection encapsulation 'm' electrical apparatus
60079-30-1	Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements
62086-1	Electrical apparatus for explosive gas atmospheres – Electrical resistance trace heating – Part 1: General and testing requirements

Note: The recognized scope for KTL is limited only for Group II, where relevant.

1.7. Candidate TL Persons Interviewed

Name	Position
Jeon Chul-Jin	Deputy President
Jin-Heung, Yoo	Executive Director, Machinery & Material Center
Kang Jun-Gu	Director/Chief Researcher, Electrical Safety Team
Ki-Seuk Lee	Director Global Cooperation Team
Chang-Ho Ko	Quality Manager
Ji-Hoon Kim	Senior Researcher, Equipment safety team
Duncan Kim	Senior Researcher, Equipment safety team
Min Yeong Seung	Researcher, Equipment safety team
Yoo, Sung Ho	Director General, Ansan Operation Center

1.8. Legal Entity Of The Candidate TL

Korea Testing Laboratory (KTL) is a non-profit affiliated organization under the Ministry of Commerce, Industry and Energy founded to provide public safety

performing certification, product testing, factory inspection and calibration services to clients.

KTL was founded in April 1966, originally named as Korea Fine Instrument Center (Article 41 of the Promotion of the Industrial Technology Innovation Law and the Decree 7494 in the Civil Law), and it is registered to the Taxation Department of Korea under the registration number 113-82-06228.

As a third party testing and certification institute in Korea, KTL was officially appointed as a National Certification Body under the “Industrial safety & Health Law” since Jan 21, 1998. Ever since its foundation KTL has been working constantly and mainly for the safety of electrical and electronic apparatuses for use in explosive atmospheres. Also KTL has participated in wide range of national and international scheme such as IECEE CB Scheme and IECQ Scheme since 1990.

1.9. **Associated ExCB**

The ExTL is integral with the certification body ExCB-KTL. The assessment team is satisfied that the quality management system and operational procedures provide sufficient separation of the testing and certification functions.

1.10. **Financial Support**

KTL is funded by the Korean Government and exempted from taxation on any profits, having the financial stability and resources required for its operation.

1.11. **History**

See Clause 1.8 above.

2. ORGANISATION

2.1. Names, Titles and Experience of the Senior Executives

Name	Title	Experience
Jeon Chul-Jin	Deputy President	10 years in Ex, 25 years at KTL
Jin-Heung, Yoo	Executive Director, Machinery & Material Center	15 years in Ex, 27 years at KTL
Kang Jun-Gu	Director/Chief Researcher Electrical Safety Team	16 years in Ex, 13 years at KTL
Ki-Seuk Lee	Director Global Cooperation Team	8 years at KTL

2.2. Name, Title and Experience of the Quality Management Representative

Name	Title	Experience
Chang-Ho Ko	Quality Manager	30 years at KTL, 4 years in quality

2.3. Name and Title of Nominated Principal Contact

Name	Title	Comments
Chang-Min Lee	Researcher Certification Management Team	changmin@ktl.re.kr

2.4. Employees

Name	Title	Experience
Ji-Hoon Kim	Senior Researcher, Equipment safety team	3 years in Ex at KTL
Duncan Kim	Senior Researcher, Equipment safety team	4 years in Ex at KTL
Min, Yeong-Seung	Researcher, Equipment safety team	3 years in Ex at KTL
Chang-Ho Kim	Senior researcher, Equipment safety team	10 years in Ex, 28 years at KTL
Hong-Suk Jang	Researcher, Equipment safety team	4 years in Ex at KTL

2.5. Organizational Structure

See Annex 1 for the overall organization chart of KTL, and Annex 2 for the organization chart of KTL Ex operation.

3. RESOURCES

KTL has two well equipped operation premises, one in Seoul running as Headquarters, and the other in Ansan which was initiated in 2003. The main operation of ExTL is currently centralized in Seoul. There are about 400 staff in total within KTL, from which there are 10 competent staff for the Ex field covering the testing, certification, management and auditing. The laboratories have a wide range of test facilities including all aspects of Ex testing on the scope. The specific operation is supported by a comprehensive range of manuals, procedures and guidelines. The Organistaion Chart, Annex 2, shows all staff who may operate at either location.

The Seoul site deals with Ex testing while the Ansan site covers only relative tests such as climate tests relating to Ex equipment.

4. DOCUMENTATION

4.1. Quality Manual

KTL maintains a comprehensive quality manual system. In the KTL Group level, there is a general Quality Manual QM001. In addition, there are four additional Quality Manuals on testing & inspection, product certification, education & training and calibration supporting IECEx operation at KTL.

4.2. Test Methods/Procedures

The laboratory has a variety of documents that cover procedures, guidelines and guidance, in which about 23 are for technical activities. These were reviewed and satisfactory.

4.3. Test Records

There is a prescribed procedure for quality & technical records management. All the test records are retained in hard copy form, although majority of them are records in electronic form. The retention of records is clearly specified in the Procedure for Certification Testing of Electrical Equipments for Explosive Atmospheres (P251).

4.4. Document Change Control

A well controlled system of document changes as part of the Quality Management System. The assessment team noted that the relevant updated documents are readily available by intranet. And the hard copy of document where necessary are properly identified as specified.

5. TEST REPORTS

5.1. Test Reports Issued

Number of application, certificates and test reports issued in the preceding two years for each type of protection:

Number of application, certificates and test reports issued									
Standards	Year								
	2005			2006			2007(as of September)		
	A	C	T	A	C	T	A	C	T
60079-1	169	167	2	136	132	4	85	81	4
60079-2	22	20	2	31	31	-	2	2	-
60079-5	-	-	-	-	-	-	-	-	-
60079-6	-	-	-	-	-	-	-	-	-
60079-7	30	30	-	42	42	-	22	22	-
60079-11	37	37	-	53	53	-	7	7	-
60079-15	16	14	2	16	14	2	38	32	6
60079-18	11	11	-	8	8	-	1	1	-
60079-30-1	-	-	-	-	-	-	-	-	-
62086-1	-	-	-	-	-	-	-	-	-
Sum	285	279	6	286	280	6	155	145	10

NOTE: 60079-0 is incorporated in the above.

- A : Application; - C : Certificates issued; - T : Test reports issued.

6. CALIBRATION

Within KTL, there is a Standards & Measurement Center in Ansan acting as a comprehensive calibration laboratory accredited by KOLAS since April 2001. The corresponding procedures are well documented, and the testing equipment and measuring instruments at KTL are mainly calibrated by the Center. Examples of calibration certificates were sighted and satisfactory.

The assessment team also noted that there was a lack of clarity in the processes associated with calibrating and checking the oxygen analyzer. This was subsequently resolved to the satisfaction of the assessment team.

7. CONFIDENTIALITY

Confidentiality is described in Quality Manual QM001, and a procedure for confidentiality was available. All KTL staff are subjected to the strict confidentiality requirements with the



assessment team verifying the availability of signed confidentiality agreements on KTL records.

The assessment team also noted that the confidentiality agreement signed by the members of certification and assessment committee had not been retained in the record system. Arrangements have been made to have them sign again with the records being retained.

8. NATIONAL ACCREDITATION

As attached in Annexes 3, 4, 5 and 6, KTL Seoul and Ansan hold accreditations from the Korea Laboratory Accreditation Scheme (KOLAS) as testing and calibration laboratory against ISO/IEC 17025:2005. All Ex protection techniques under the application scope for IECEx operations are covered by KOLAS accreditation. While 62086-1 and 60079-30-1 (Heat Trace cables) are not explicitly listed in the schedule to the KOLAS Accreditation these Ex principles are covered by other standards falling within the scope of accreditation e.g. IEC 60079-0 and 7.

9. RECOGNITION AND AGREEMENTS

There are mutual agreements with KEMA in Netherlands, TUV Rhineland in Germany, NEPSI in China, LCIE in France, TIIS in Japan in the field of Ex testing.

The assessment team also noted more extensive accreditations and cooperation, which include:

- Accreditation at National Level for various activities
- IECEE CB Scheme
- IECQ Scheme
- Various other Bilateral Recognitions

10. INTERNAL AUDIT AND PERIODIC REVIEW

The procedure for internal audit is P112. The Internal audit is carried out in each area at least once a year. A summary report is prepared to cover all the audits that have been done for the year. This indicated that the Ex area and the operation at Ansan were covered in the internal audits. The internal audits cover ISO/IEC Guide 65, 17025 and will include assessment against additional IECEx scheme requirements e.g. compliance with IECEx Operational documents and Rules. Individual reports include any non-conformities raised. Technical staff is used as part of the audit team to provide cross-checking of activities in order technical areas.

Management review is carried out once a year in December. Data is sought from each department and a report is compiled by the quality manager. An agenda is prepared and discussed by the President with the directors prior to the meeting. The review meeting includes the top managers from each department. A report is made of the meeting and reviewed and signed off by the President. It then goes back to the departments. The report of the last meeting held on 18 December 2006 was viewed, and the management review for the year of 2007 was scheduled in December 2007. P102 covers the procedure for this process.

11. COMPLAINTS AND APPEALS (Including appeals to IECEx)

The requirements and arrangements for complaints and appeals are well defined and documented. Arrangement of appeal is described in the clause 5.12 of the Quality Manual of KTL QM005, Manual for Product Certification and P115, Procedure for Controls of Resolution of Complaints.

At the time of the assessment the procedures on appeals did not cover appeals to the IECEx Scheme or how this is conveyed to customers. The procedures were subsequently revised to meet the scheme's requirements.

12. SPECIAL FACTS TO BE NOTED

12.1. *Supporting Documentation*

Copies of additional supporting information for this initial assessment have been provided to the applicant and the IECEx Secretariat. These include:

- A site assessment report that includes details of issues raised and how these have been resolved
- Checklist for ISO/IEC 17025:2005
- Completed technical guidance documents (TGDs) for Ex d, p, e, i, n and m
- Photos of the facilities and tests witnessed

12.2. *Tests Witnessed*

The following tests were witnessed during the initial assessment visit:

- Pressure determination for Ex d enclosure
- Flame transmission using hydrogen for Ex d enclosure
- IP54 test to IEC60529
- Temperature rise test for an Ex e luminaire
- Spark ignition test on a power supply
- Tests for temperature rise/determination of the maximum short circuit current on a high capacity battery according to 10.5.3 of IEC 60079-11 Ed5

The assessment team concluded that all of the tests witnessed were conducted in accordance with requirements of the standards and by appropriately trained and competent testing staff with required instrumentation and facilities.

12.3. *Production of Reports*

It was noted that KTL rarely issue test reports for the local system. However, they have developed experience in the drafting of comprehensive test reports of the nature required for ExTRs for the purpose of ATEX certification. Examples viewed included the techniques of Ex i, Ex m and Ex d. The assessment team felt these provided sufficient evidence of their ability to produce ExTRs.

13. COMMENTS (Including issues found during assessment)

In general the laboratory sites were found to have competent staff, excellent facilities, and appropriate management structures and procedures.

There were a few issues found during the initial assessment, mainly regarding calibration of equipment and control of software. A report of the findings is held by the secretariat. It should be noted that all issues were well resolved to the satisfaction of the assessment team. Full details are held by the IECEx Scheme Secretariat, together with other



supporting information from this initial assessment.

14. RECOMMENDATION

Based on the initial assessment performed on 28-30 November 2007, and a follow-up review of all documents, KTL is recommended for acceptance in the IECEx scheme as an IECEx Testing Laboratory (ExTL) according to the scope of the standards listed in this document.

Independently reviewed by the IECEx Secretariat 2008

Xu Jianping Team Leader	Jim Munro Lead Assessor	Ron Webb Assessor
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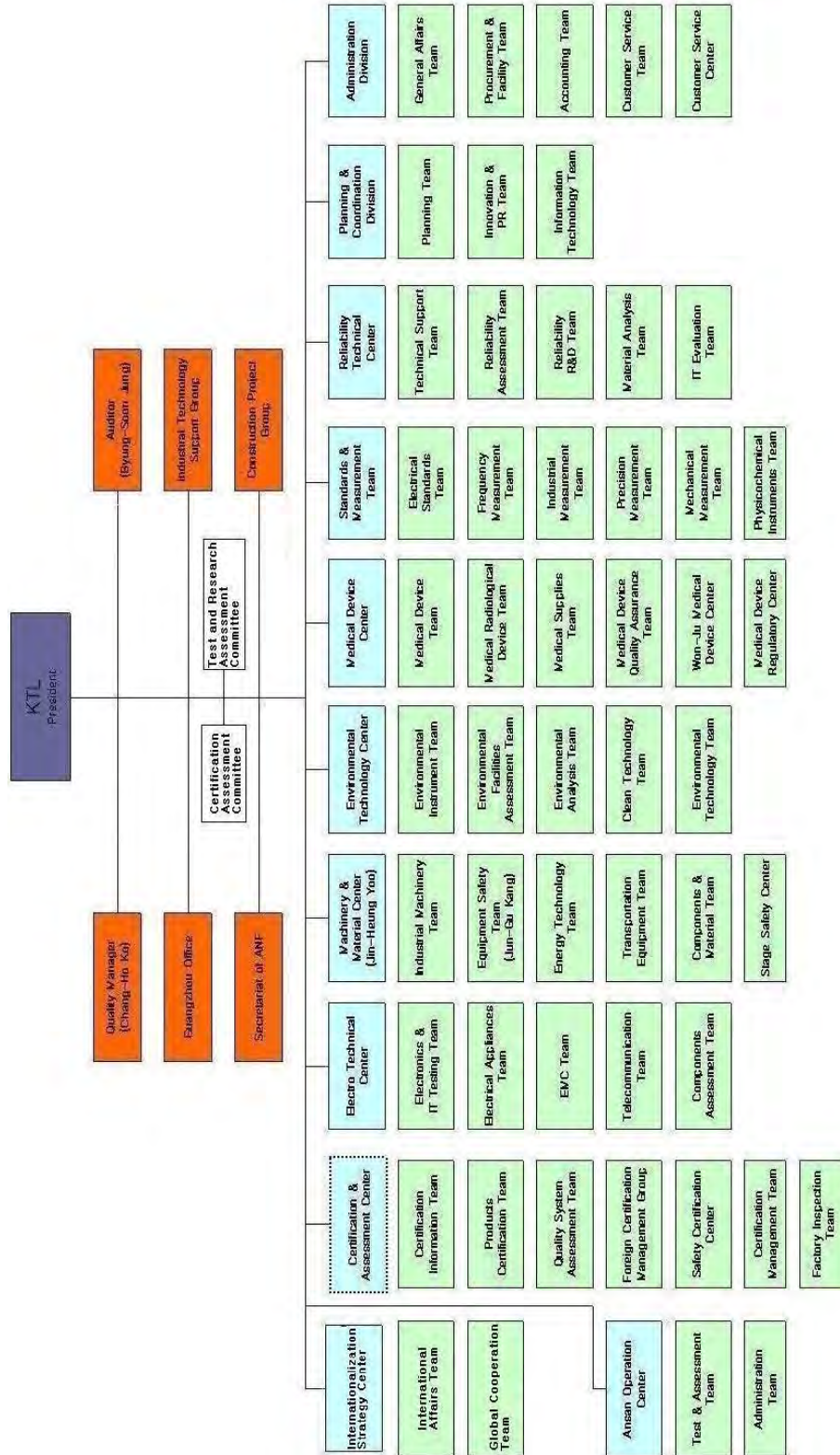
Date: 16 February, 2008

Independently reviewed by the IECEx Secretariat

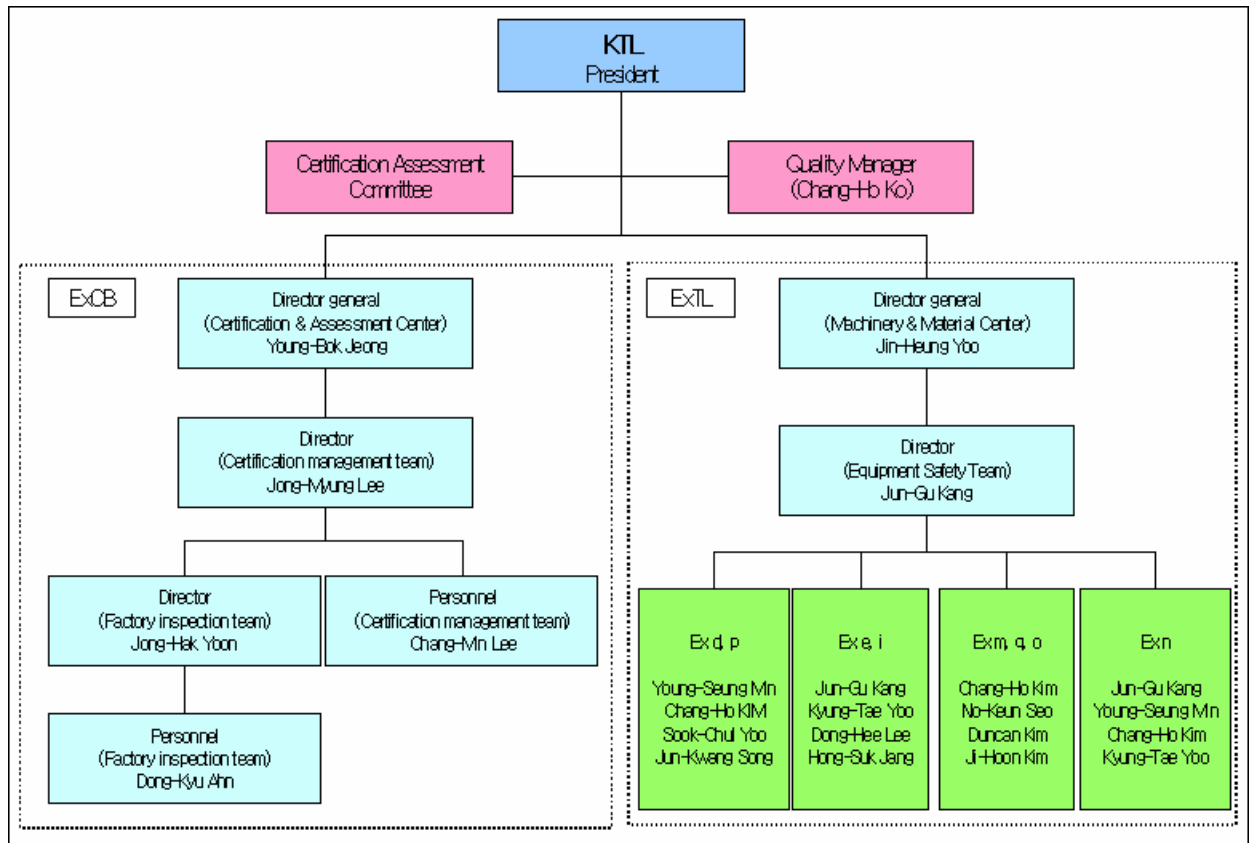
List of Annexes:

1. Overall Organization Chart of KTL
2. Organization Chart of KTL Ex-Team
3. Accreditation Certificate from KOLAS to ISO/IEC 17025 (as a testing laboratory for Seoul Headquarters)
4. Extracts from the Scope for the Accreditation Certificate No.9 (pages 22-24) (as a testing laboratory for Seoul Headquarters)
5. Accreditation Certificate No. 305 from KOLAS to ISO/IEC 17025 (as a testing laboratory, Ansan Operation Center)
6. Accreditation Certificate No. KC01-028 from KOLAS to ISO/IEC 17025 – (as a calibration laboratory for Seoul and Ansan)

Annex 1 Overall Organization Chart of KTL



Annex 2 Organization Chart of KTL Ex-Team



Annex 3
Accreditation Certificate from KOLAS to ISO/IEC 17025
(as a testing laboratory for Seoul Headquarters)



No. 9 (1/58)

CERTIFICATE OF ACCREDITATION

Name of Laboratory : Korea Testing Laboratory

Representative : Hong, Jong Hee

Address of Headquarters : 222-13, Kuro-dong, Kuro-gu, Seoul, Korea

Address of Laboratory : 222-13, Kuro-dong, Kuro-gu, Seoul, Korea

Duration : December 30, 2006 ~ December 30, 2010

Scope of Accreditation
(Scope of Accreditation is described in the accompanying Annex)

This is to certify that the above Laboratory is accredited as Testing Laboratory in accordance with the provisions of Article 14 of the National Standards Act.

These criteria encompass the requirements of ISO/IEC 17025:2005.

April 27, 2007



**Administrator,
Korea Laboratory Accreditation Scheme(KOLAS)**

Annex 4
Extracts from the Scope for the Accreditation Certificate No. 9 (pages 22-24)
(as a testing laboratory for Seoul Headquarters)



No. 9 (22/58)

3.006 Industrial electric equipments

Test method	Standard designation
IEC 60034-1:2004	Rotating electrical machines - Part 1: Rating and performance
IEC 60079-0:2004	Electrical apparatus for explosive gas atmospheres - General requirements
IEC 60079-1:2003	Electrical apparatus for explosive gas atmospheres - Flameproof enclosures "d"
IEC 60079-2:2001	Electrical apparatus for explosive gas atmospheres - Pressurized enclosure "p"
IEC 60079-5:1997	Electrical apparatus for explosive gas atmospheres - Powder filling "q"
IEC 60079-6:1995	Electrical apparatus for explosive gas atmospheres - Oil immersion "o"
IEC 60079-7:2001	Electrical apparatus for explosive gas atmospheres - Increased safety "e"
IEC 60079-11:1999	Electrical apparatus for explosive gas atmospheres - Intrinsic safety "i"
IEC 60079-15:2001	Electrical apparatus for explosive gas atmospheres - Type of protection "n"
IEC 60079-18:2004	Electrical apparatus for explosive gas atmospheres - Encapsulation "m"
IEC 60112:2003	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions
IEC 60529:2001	Degrees of protection provided by enclosures (IP Code)
IEC 60742:1983	Isolating transformers and safety isolating transformers - Requirements
IEC 60745-1:2003	Safety of hand-held motor-operated electric tools - Part 1: General requirements
IEC 60745-2-1:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for drills
IEC 60745-2-2:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for screwdrivers and impact wrenches
IEC 60745-2-3:1984	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for grinders, polishers and disk-type sanders
IEC 60745-2-4:2002	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for sanders



No. 9 (23/58)

3.006 Industrial electric equipments

Test method	Standard designation
IEC 60745-2-5:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for circulars saw and circular knives
IEC 60745-2-14:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for planers
IEC 60974-1:1998	Arc welding equipment - Part 1: Welding power sources
IEC 61558-1:1998	Safety of power transformers, power supply units and similar-Part 1: General requirements and tests
EN 50014:1997	Electrical apparatus for potentially explosive atmospheres - General requirements
EN 50015:1977	Electrical apparatus for potentially explosive atmospheres - Oil immersion "o"
EN 50016:2002	Electrical apparatus for potentially explosive atmospheres - Pressurized apparatus "p"
EN 50017:1977	Electrical apparatus for potentially explosive atmospheres - Powder filling "q"
EN 50018:2000	Electrical apparatus for potentially explosive atmospheres - Flameproof enclosures "d"
EN 50019:2000	Electrical apparatus for potentially explosive atmospheres - Increased safety "e"
EN 50020:2002	Electrical apparatus for potentially explosive atmospheres - Intrinsic safety "i"
EN 50021:1999	Electrical apparatus for potentially explosive atmospheres - Type of protection "n"
EN 50028:1987	Electrical apparatus for potentially explosive atmospheres - Encapsulation "m"
EN 60112:2003	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions
EN 60529:1992	Degrees of Protection Provided by Enclosures (IP Code)
K 60034-1:2000	Rotating electrical machines. - Part 1: Rating and performance
K 60112:2003	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions
K 60529:2003	Degrees of protection provided by enclosures (IP Code)
K 60742:2002	Isolating transformers and safety isolating transformers. Requirements
K 60745-1:2003	Safety of hand-held motor-operated electric tools - Part 1: General requirements



No. 9 (24/58)

3.006 Industrial electric equipments

Test method	Standard designation
K 60745-2-1:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for drills
K 60745-2-2:2000	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for screwdrivers and impact wrenches
K 60745-2-3:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for grinders, polishers and disk-type sanders
K 60745-2-4:2000	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for sanders
K 60745-2-5:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for circulars saw and circular knives
K 60745-2-14:2003	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for planers
K 60745-2-15:2000	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for hedge trimmer
K 60745-2-16:2000	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for tackers
K 60745-2-17:2000	Safety of hand-held motor-operated electric tools - Part 2: particular requirements for routers and trimmers
K 60974-1:2001	Arc welding equipment - Part 1: Welding power sources
K 61558-1:2003	Safety of power transformers, power supply units and similar - Part 1: General requirements and tests
KS C IEC 60079-0:2006	Electrical apparatus for explosive gas atmospheres-General requirements
KS C IEC 60079-1:2006	Electrical apparatus for explosive gas atmospheres-Flameproof enclosures "d"
KS C IEC 60079-2:2006	Electrical apparatus for explosive gas atmospheres-Pressurized enclosure "p"
KS C IEC 60079-5:2001	Electrical apparatus for explosive gas atmospheres-Powder filling "q"
KS C IEC 60079-6:2001	Electrical apparatus for explosive gas atmospheres-Oil immersion "o"
KS C IEC 60079-7:2006	Electrical apparatus for explosive gas atmospheres-Increased safety "e"
KS C IEC 60079-11:2001	Electrical apparatus for explosive gas atmospheres-Intrinsic safety "i"
KS C IEC 60079-15:2006	Electrical apparatus for explosive gas atmospheres-Type of protection "n"
KS C IEC 60079-18:2006	Electrical apparatus for explosive gas atmospheres-Encapsulation "m"

Annex 5
Accreditation Certificate No. 305 from KOLAS to ISO/IEC 17025
(as a testing laboratory, Ansan Operation Center)



No 305 (1/12)

CERTIFICATE OF ACCREDITATION

Name of Laboratory : Korea Testing Laboratory (Ansan Operation Center)

Representative : Hong, Jong Hee

Address of Headquarters : 222-13, Kuro-dong, Kuro-gu, Seoul, Korea

Address of Laboratory : 1271-12, Sa-1-dong, Sangnok-gu, Ansan-si, Gyeonggi-do, Korea

Duration : Dec. 26. 2006 ~ Dec. 25 2010

Scope of Accreditation
(Scope of Accreditation is described in the accompanying Annex)

This is to certify that the above Laboratory is accredited as Testing Laboratory in accordance with the provisions of Article 23 of the National Standards Act.

These criteria encompass the requirements of ISO/IEC 17025:1999.

Dec. 26, 2006



Administrator,
Korea Laboratory Accreditation Scheme(KOLAS)

Annex 6
Accreditation Certificate No. KC01-028 from KOLAS to ISO/IEC 17025
(as a calibration laboratory for Seoul and Ansan)



No. KC01-028

CERTIFICATE OF ACCREDITATION

Name of Laboratory : Korea Testing Laboratory

Representative : Jong-Hee Hong

Address of Headquarters : 222-13, Guro-dong, Guro-gu, Seoul, Korea

Address of Laboratory : 222-13, Guro-dong, Guro-gu, Seoul, Korea
1271-12, Sa-dong, Sangnok-gu, Ansan-si, Gyeonggi-do, Korea

Duration : Dec. 20, 2005 ~ Dec. 19, 2009

Scope of Accreditation
(Scope of Accreditation is described in the accompanying Annex)

This is to certify that the above Laboratory is accredited as a Calibration Laboratory in accordance with the provisions of Article 14 of the National Standards Act.

These criteria encompass the requirements of ISO/IEC 17025:2005.

Aug. 16, 2007



Administrator,
Korea Laboratory Accreditation Scheme(KOLAS)

"Refer to the specified on the backside"