IECEx Secretariat

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

Circulated to: Ex Management Committee, ExMC

TITLE: IECEx Assessment Report for the acceptance of *ZELM Explosionsschutz GmbH* as an accepted IECEx Test Laboratory (ExTL) within the IECEx Scheme.

INTRODUCTION

This document contains the IECEx Assessment Report for the acceptance of *ZELM Explosionsschutz GmbH* as an IECEx Test Laboratory (ExTL) within the IECEx Scheme.

The report is hereby submitted for voting.

Please consider the assessment report which is issued for final vote by 2008 05 12

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IECEx Secretariat

IECEx ASSESSMENT REPORT FOR ZELM

IECEx TEST LABORATORY ExTL

Type of Assessment:

Initial assessment for Candidate ExTL X

1. OBJECT AND FIELD OF APPLICATION

1.1. Country:
Germany

1.2. Name of Candidate ExCB
ZELM Explosionsschutz GmbH

1.3. Members of the Assessment Team
Jim Munro – Chairman Panel of Assessors – Lead IECEx Assessor
Heinz Berger – IECEx Officer, IECEx Assessor
Theo Pijpker- KEMA, IECEx Assessor

1.4. Place and Date of Assessment
Siekgraben 56, D-38124
Braunschweig. Germany

29-31 August 2007

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 25 April 2007

1.6 Scope of Application (to be selected)

Number	Title
60079-0	Electrical apparatus for explosive gas atmospheres Part 0: General requirements
60079-1	Electrical apparatus for explosive gas atmospheres Part 1: Construction and verification test of flameproof enclosures of electrical apparatus

Number	Title
60079-2	Electrical apparatus for explosive gas atmospheres Part 2: Electrical apparatus, type of protection 'p' (Pressurization)
60079-5	Electrical apparatus for explosive gas atmospheres Part 5: Powder filling "q"
60079-6	Electrical apparatus for explosive gas atmospheres Part 6: Oil-immersion 'o'
60079-7	Explosive atmospheres Part 7: Equipment protection by increased safety “e”
60079-11	Electrical apparatus for explosive gas atmospheres Part 11: Intrinsic safety 'i'
60079-15	Electrical apparatus for explosive gas atmospheres Part 15: Electrical apparatus with type of protection 'n' (Non-Sparking)
60079-18	Electrical apparatus for explosive gas atmospheres Part 18: Encapsulation 'm'
60079-25	Electrical apparatus for explosive gas atmospheres Part 25: Intrinsically safe systems
60079-26	Explosive atmospheres Part 26: Equipment with equipment protection level (EPL) Ga
60079-27	Electrical apparatus for explosive gas atmospheres Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO)
60079-28	Explosive atmospheres Part 28: Protection of equipment and transmissions systems using optical radiation. **Scope restricted to inherently safe optical radiation “op is”**
61241-0	Electrical apparatus for use in the presence of combustible dust Part 0: General requirements
61241-1	Electrical apparatus for use in the presence of combustible dust Part 1: Electrical apparatus protected by enclosures
61241-4	Electrical apparatus for use in the presence of combustible dust Part 4: Type of protection 'pD'
61241-11	Electrical apparatus for use in the presence of combustible dust Part 11: Protection by intrinsic safety 'iD'
61241-18	Electrical apparatus for use in the presence of combustible dust Part 18: Protection by encapsulation 'mD'
62086-1	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 1: General and testing requirements

1.7 Candidate TL Persons Interviewed

Harald Zelm	Dipl.- Ing
Thomas Zelm	Auditor (TGA/EOQ)
Adolph Gruber	Engineer
Karin Bock	Dipl-Ing
Toni Ott	Dipl-Wirtsch-Ing
Edward Brzostek	Dr-Ing
Stefan Voigtlander	Lab Technician
Carsten Ciecior	Lab Technician

1.8 Legal Entity of the Candidate TL

ZELM Explosionschutz GmbH is a registered company under number HRB 9963 since April 20, 2005. Prior to this date ZELM Ex e.K. was active as a sole proprietorship.

1.9 Associated ExCB

The ExTL is integral with ExCB at the same site.

1.10 Financial Support

There is no financial support. ZELM Explosionsschutz GmbH is self-funded from certification, testing and quality assessment activities.

1.11 History

In 1993 the company was founded as a consultancy company to help their customers obtain certification with other bodies.

In the year 1997 the operation changed its direction to set itself up as a certification and testing body

Since the 2nd of December 1998 ZELM has been accredited by the ZLS as a European Notified Body according EN45001 and 45011 with Notified Body number 0820. They produce test reports and issue EC-Type-Certificates of Conformity in every type of protection which are valid throughout Europe. In addition ZELM has accreditation according EN45012 and is able to issue certificates for quality systems based on the EN13980.

Since August 1999 ZELM has had an agreement with Factory Mutual (FM) in the USA. This agreement covers the complete test laboratory and allows them to make tests needed for the North American market. Test reports are exchanged to facilitate the issuing of certificates.

2. ORGANISATION

2.1. Names, Titles and Experience of the Senior Executives

Name	Title	Experience
Harald Zelm	Dipl.- Ing	24 years
Adolf Gruber	Engineer	44 years

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

Name	Title	Experience
Thomas Zelm	Auditor (TGA/EOQ)	8

2.3. Name and Title of Nominated Principal Contact

Name	Title	Contact
Thomas Zelm	Auditor (TGA/EOQ)	tzelm@zelm.de

2.4. Employees

Name	Title	Experience in Ex
Harald Zelm	Dipl.- Ing	24
Thomas Zelm	Auditor (TGA/EOQ)	8
Adolf Gruber	Engineer	44
Susanne Klimars	Dipl.-Phys.	3
Karin Bock	Dipl-Ing	2
Toni Ott	Dipl-Wirtsch-Ing	6
Edward Brzostek	Dr-Ing	12
Stefan Voigtlander	Lab Technician	9
Carsten Ciecior	Lab Technician	5

2.5. Organizational Structure

See **Annex 1** for the organization chart of the ExTL.

The CVs of personnel involved in IECEx testing activities were checked and found to be acceptable.

3. RESOURCES

ZELM is well resourced with equipment to do testing for the scope of standards applied for. There is some limitation in the size of some of the test equipment such as for dust testing (although a larger chamber is on order) and Ex d flame transmission testing. There are 8 staff involved in the ExTL. Staff interviewed had a good knowledge of the standards and the necessary testing techniques. Two of the senior staff, Harald Zelm and Adolf Gruber have very many years' of experience in this field. The laboratory conditions are suitable for the testing.

4. DOCUMENTATION

4.1. Quality Manual

There is a comprehensive quality manual that defines how the body operates. This incorporates details on how ZELM will operate in the IECEx Scheme and the scope of standards to be covered.

4.2. Test Methods/Procedures

There are some general test procedures where there is specialized equipment; for example for flameproof testing and charging tests. For much of the other testing the

assessment engineers generate a test instruction that details the requirements to be met from the standards for relevant tests, including the conditions to be applied and the equipment to be used. These are sent to the testing staff to be used when testing the equipment. Also produced is a test sample document which clearly defines the sample, complete with a picture. This document is then referenced in any testing to clearly make the link between the testing done and the equipment tested.

4.3. Test Records

A test protocol to contain all the test data is available for each test. In most instances data is entered directly into the protocols computer system with the resultant completed test protocols printed out and placed on the customer's file. The test instructions are stored separately. Where records are produced by hand, for example logs of the conditions in the environmental chambers, they are retained in hard copy form.

4.4. Document Change Control

Document change control is described in the QM chapter 5, clause 5.2.4. Document control is handled by the Quality Manager as the sole owner of the change control password.

5. TEST REPORTS

5.1. Test Reports Issued

Number of test reports issued under the IECEx, national or regional schemes in the preceding four years for each type of protection:

Standards	**Number of Ex certificates issued for ATEX**				
Gas atmosphere	**2003**	**2004**	**2005**	**2006**	
IEC 60079-0/ EN 50014					part 0 included in below numbers
IEC 60079-1/ EN 50018	12	10	21	12	55
IEC 60079-2 / EN 50016	0	1	9	4	14
IEC 60079-5/ EN 50017	2	2	1	1	6
IEC 60079-6/ EN 50015	0	0	0	0	0
IEC 60079-7/ EN 50019	18	12	20	9	59
IEC 60079-11/ EN 50020	39	28	51	45	163
IEC 60079-15/ EN 50021	5	3	7	9	24
IEC 60079-18 / EN 50028	9	5	10	9	33
IEC 60079-25/ EN 50039	0	0	0	0	0
IEC 60079-26/ EN 50284	7	5	14	7	33
IEC 60079-27	0	0	0	0	0
IEC 60079-28	0	0	0	0	0
Combustible dust					
IEC 61241-0					part 0 included in below numbers
IEC 61241-1	0	0	1	4	5
IEC 61241-1-1/ EN 50281-1-1	16	14	27	16	73

IEC 61241-4	0	0	0	1	1
IEC 61241-11	5	2	2	5	14
IEC 61241-18	0	0	0	0	0
IEC 62086-1	0	0	0	0	0

6. CALIBRATION

At the time of the assessment visit only some items of equipment were calibrated externally by an accredited laboratory. But in a number of cases viewed there was no certificate of calibration traceable to national standards provided. There was a significant amount of internal calibration carried out. Subsequently Zelm substantially changed their approach to calibration. The approach is now to have most equipment calibrated externally with certificates traceable to national standards. For those equipment still calibrated internally, procedures have been revised where necessary and equipment used for calibration have certificates traceable to national standards.

7. CONFIDENTIALITY

The confidentiality issue is described in QM chapter 1. The confidentiality declaration is signed by all employees and presented during the assessment. Furthermore, there is a clause in the work contract covering the confidentiality issue.

8. NATIONAL ACCREDITATION

ZELM holds an accreditation for ISO/IEC17025 from the German Accreditation Service Zentralstelle der Länder für Sicherheitstechnik, ZLS, (see Annex 2) and a Notification Certificate from the Federal Ministry of Labour and Social Affairs of Germany for the ATEX Directive 94/9/EG. The Notified Body number is 0820. The specific standards covered do not appear in the accreditation but the notification covers to all standards under the ATEX directive.

9. RECOGNITION AND AGREEMENTS

ZELM has a co-operation with Factory Mutual Research Corporation, Norwood, Massachusetts, USA. The scope of the agreement deals with the exchange of test reports concerning ENs and ANSI/ISA. The agreement was signed in August 1999 and is still valid.

10. INTERNAL AUDIT AND PERIODIC REVIEW

The process for internal audits is described in QM chapter 17. All chapters of the QM are checked during a one year period. Management reviews are described in the QM in chapter 1, clause 1.8. and are performed once a year, usually at the end of November.

11. COMPLAINTS AND APPEALS (Including appeals to IECEx)

The appeal procedure is described in the QM chapter 19.5.

12. SPECIAL FACTS TO BE NOTED

12.1. *Supporting Documentation*

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

- Details of issues raised and how these have been resolved
- Checklist for ISO/IEC 17025

- Completed technical guidance notes (TGDs) for Ex e, m, n, p, d and i, and for dusts and optical radiation.

12.2. Tests Witnessed

The following tests were witnessed during the assessment:

- Ex d reference pressure, conducted on an enclosure with threaded joints using hydrogen
- Ex d flame propagation test, conducted on the same enclosure as used for the reference pressure test
- Spark ignition test, conducted on an RC circuit
- Temperature test, conducted on a PCB
- IP5x dust test, conducted on a torch.
- IPx4 water test, conducted on an enclosure provided with a glass window

13. COMMENTS (Including issues found during assessment)

There were a number of issues identified during the assessment. These included issues with calibration, IP water testing procedures, and procedures for purchasing of supplies. All issues were subsequently resolved to the satisfaction of the assessment team,

ZELM showed some experience with the technique of Ex p through review of design but had not done any testing. They do have the capability to do the testing.

ZELM did not have the test capability for all types of optical equipment and hence only their ability to assess to inherently safe optical radiation “op is” could be assessed.

14. RECOMMENDATION

Based on the initial assessment from 29 to 31 August 2007, the assessment team recommends acceptance of Zelm as an ExTL..

However, due to the lack of evidence, it is recommended that the first ExTR produced for Ex p be reviewed.

It is recommended that the scope of IEC 60079-28 be restricted to inherently safe optical radiation “op is”.

Jim Munro	Heinz Berger	Theo Pijpker
Team Leader	Expert Assessor	Expert Assessor

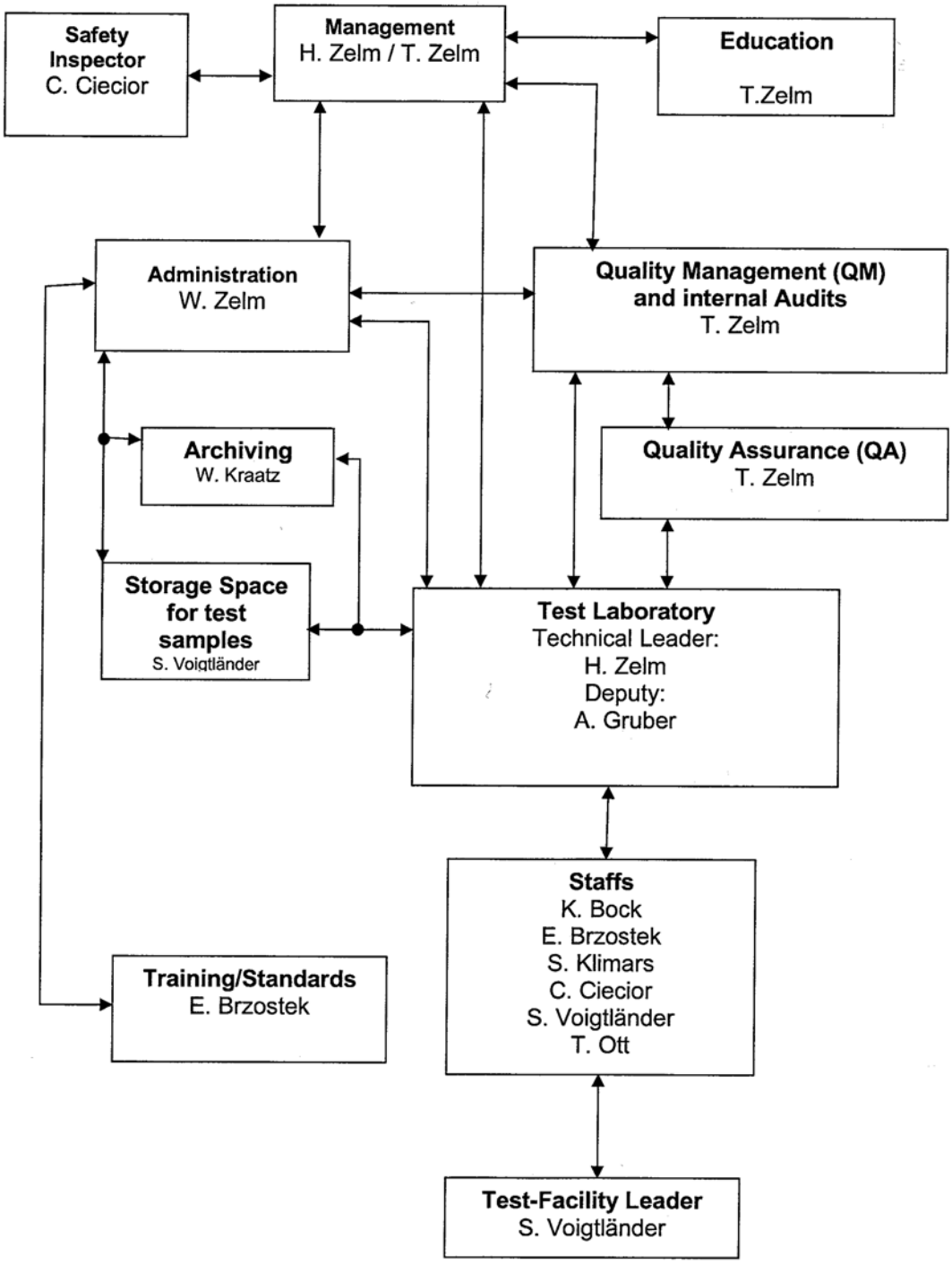
Date: 14 February 2008

Independently reviewed by the IECEx Secretariat 2008 03 28

List of Annexes:

1. Organization Chart of ZELM ExTL
2. Accreditation Certificate from ZLS to ISO/IEC 17025

Annex 1
Organization Chart of ZELM ExTL



Annex 2
Accreditation Certificate from ZLS to ISO/IEC 17025

AKKREDITIERUNG

Die Zentralstelle der Länder für Sicherheitstechnik (ZLS)

bestätigt hiermit, dass die

Prüf- und Zertifizierungsstelle ZelmEx

Siekgraben 56, D-38124 Braunschweig

die Anforderungen des § 11 Abs. 1 des Geräte- und Produktsicherheitsgesetzes erfüllt und die Kompetenz besitzt,

Geräte zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

im Geltungsbereich des GPSG und der EG-Richtlinie 94/9/EG
entsprechend den Bestimmungen des Akkreditierungsbescheides
Nr. ZLS/3926-1/100/05
zu prüfen.

Die Akkreditierung ist gültig bis zum 31.12.2008
Reg.-Nr.: **ZLS-P-575/05**

München, den 07.03.2005

Dipl.-Wirtsch.-Ing. (FH) Huber
Leiter der ZLS

ZLS im Bayerischen Staatsministerium für Umwelt, Gesundheit und Verbraucherschutz,
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