

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

**Circulation to: Ex Management Committee**

**Title: IECEx Re-assessment report for Nemko AS, as a continuing ExTL in accordance with the 5-year re-assessment plan for the surveillance and monitoring under the IECEx Scheme.**

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**INTRODUCTION**

This document contains the IECEx Re-assessment report for, Nemko AS, as a continuing Accepted ExTL within the IECEx Scheme, in accordance with the 5 year re-assessment plan for the surveillance and monitoring of bodies under the IECEx Scheme. During this re-assessment the IECEx Assessment Team also carried out an assessment for an extension of scope.

The re-assessment report is submitted for information and endorsement at the next ExMC Meeting to be held in Denver, September 2007.

ExMC Members are asked to consider NEMKO AS request for an extension of scope.

Please consider this report and return the completed voting form to the Secretariat by **2007/08/12**.

Your speedy response to the voting process will be very much appreciated.

*Chris Agius*  
**IECEx Secretariat**

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## IECEx RE-ASSESSMENT REPORT FOR NEMKO ExTL (IECEx TEST LABORATORY)

**Type of Assessment: (please mark)**

**Initial assessment for Candidate ExTL**

**Re-Assessment of ExTL** X

**Scope Extension of ExTL** X

### 1. OBJECT AND FIELD OF APPLICATION

**1.1. Country:**

Norway

**1.2. Name of Candidate TL**

Nemko AS

**1.3. Members of the Assessment Team**

Jim Munro	Lead assessor
Nick Ludlam	Assessor

**1.4. Place and Date of Assessment**

Gaustadalleen 30, PO Box 73 Blindern  
0314-Oslo Norway

20-22 November 2006

**1.5. Assessment References**

- i) IECEx 02 Second Edition 06 2003 IECEx Scheme rules of procedure
- ii) IECEx Operational Document OD/003 IECEx Assessment procedures
- iii) IECEx Operational Document OD/009 Issuing of CoCs, ExTRs and QARs
- iv) ISO/IEC 17025:2005 or 1999 (specify)
- v) IECEx Technical Guidance Documents (TGDs)
- vi) ExTAG decision sheets (DSs)
- vii) ExTL application documents dated 15 June 2006

**1.6. Scope of Application (to be selected)**

**Existing scope:**

EC 60079-0 Part 0: General requirements  
IEC 60079-1 Part 1: Flameproof enclosures 'd'  
IEC 60079-2 Part 2: Pressurized enclosures 'p'  
IEC 60079-7 Part 7: Increased safety 'e'  
IEC 60079-11 Part 11: Intrinsic safety 'i'

IEC 60079-18 Part 18: Construction, test and marking of type of protection encapsulation 'm' electrical apparatus

**Proposed additional scope:**

Number	Title
<u>60079-5</u>	Electrical apparatus for explosive gas atmospheres Part 5: Powder filling "q"
<u>60079-6</u>	Electrical apparatus for explosive gas atmospheres Part 6: Oil-immersion 'o'
<u>60079-7</u>	Electrical apparatus for explosive gas atmospheres Part 7: Increased safety 'e' – <b>to include 4th edition</b>
<u>60079-11</u>	Electrical apparatus for explosive gas atmospheres Part 11: Intrinsic safety 'i' – <b>to include 5th edition</b>
<u>60079-15</u>	Electrical apparatus for explosive gas atmospheres Part 15: Electrical apparatus with type of protection 'n' (Non-Sparking)
<u>60079-25</u>	Electrical apparatus for explosive gas atmospheres Part 25: Intrinsically safe systems
<u>60079-26</u>	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
<u>60079-27</u>	Electrical apparatus for explosive gas atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO) and Fieldbus non-incendive concept (FNICO)
<u>61241-0</u>	Electrical apparatus for use in the presence of combustible dust Part 0: General requirements
<u>61241-1</u>	Electrical apparatus for use in the presence of combustible dust Part 1: Protection by enclosures 'tD'
<u>61241-4</u>	Electrical apparatus for use in the presence of combustible dust Part 4: Type of protection 'pD'
<u>61241-11</u>	Electrical apparatus for use in the presence of combustible dust Part 11: Protection by intrinsic safety 'iD'
<u>61241-18</u>	Electrical apparatus for use in the presence of combustible dust Part 18: Protection by encapsulation 'mD'
<u>62013-1</u>	Caplights for use in mines susceptible to firedamp Part 1: General requirements - Construction and testing in relation to the risk of explosion
<u>62086-1</u>	Electrical apparatus for explosive gas atmospheres - Electrical resistance trace heating - Part 1: General and testing requirements

Note: The above scope includes updating to the latest editions of 60079-7 and -11

**1.7. Candidate TL Persons Interviewed**

Rolf Hoel	Certification Manager. Ex Products
Lars Jørgen Aas	Quality Manager
Magne Løvaas	Resource Manager, Industrial Products

### 1.8. *Legal Entity of The Candidate TL*

The Norwegian Board for Testing and Approval of Electrical Equipment (NEMKO) is a private Foundation established pursuant to the Act of 23 May 1980 No. 11 on Foundations, etc. The Foundation was established with effect from 1 January 1991. It is a direct continuation of the electrical equipment testing and approval activity established by the Association of Norwegian Power Plants in 1933, separated-off as an independent institution in 1970. The main office of the Foundation is in Oslo.

### 1.9. *Associated ExCB*

The Nemko ExCB is integral with the ExTL.

### 1.10. *Financial Support*

Nemko is a not-for-profit organization and its testing is funded from income from its testing, certification and other activities.

### 1.11. *History*

Nemko started its activity in 1933 acting on behalf of the Government. In 1959, the activity was moved to the present address. Nemko became independent from the Government in 1990.

From 1991, Nemko became a private Foundation, and from 1996 Nemko AS was established as an operating company of the Foundation.

Since 1991 the Nemko Group has expanded internationally and is today present in many parts of the world:

Since January 2006 the two Norwegian Nemko companies Nemko certification AS and Nemko Comlab AS were merged and included in Nemko AS as one company.

## 2. ORGANISATION

### 2.1. Names, Titles and Experience of the Senior Executives

Name	Title	Experience
Rune Slapgard	Department Manager for Laboratory	25 years at Nemko
Magne Løvaas	Resource Manager, Industrial Products	8 years (3 in Ex)

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

Name	Title	Experience
Lars Jørgen Aas	Quality Manager	25 years including 6 as Quality Manager at Nemko.

### 2.3. Name and Title of Nominated Principal Contact

Name	Title
Rolf Hoel	Certification Manager, Ex Products

## 2.4. Employees

Name	Title	Experience
Arne Hortman		27 years (>20 in Ex)
Asle Kaastad		9 years (7 in Ex)
Stig Andre Norheim		6 years (3 in Ex)
Kjell Age Aune		8 years (3 in Ex)
Kenneth Rein-Heggenbakken		2 years (1 in Ex)
Kenneth Narvestard		6 years (2 in Ex)
*Terje Johansen		7 years (7 in Ex)

All the above are professional engineers.

\* About to leave but Nemko are about to recruit a replacement and one more engineer.

## 2.5. Organizational Structure

The organization structure is shown in Annexes 1 and 2.

## 3. RESOURCES

There are a total of 60 people in the testing department with 6 people in the laboratory for Ex testing. The manager of Ex testing is responsible for the resources, including people and facilities. The main technical expertise is with the testing engineers.

There is a competency matrix covering the standards and other areas such as manufacturer and workshop assessments. It covers certification and testing personnel. There is a CV listed for each person and this includes any courses done. In an example viewed there were records of course run on explosion-protection techniques. Supervised on the job training is provided for new people. To date the determination is based on recommendation by the engineer supervising the training but there are plans to introduce an exam for higher levels of competency.

## 4. DOCUMENTATION

### 4.1. Quality Manual

There are a number of Nemko bodies worldwide but Nemko AS is the body based in Oslo that has the Ex testing and certification as part of its scope. Nemko AS is in the process of producing one Quality Manual to cover the amalgamation of the three organizations into one. Most of this has now been done. The manual resides on the computer system with only two paper copies. One of these is signed off by the President.

### 4.2. Test Methods/Procedures

There are also procedures for various parts of the system, including for certification and for testing. Within certification there is a specific procedure for the IECEx Scheme, C320. This lists the critical documents for the Scheme. At the time of the assessment this was being updated to include reference to the relevant documents for the IECEx Scheme, and there was no reference to the ExTAG decision sheets. The later revision of the C320 included reference to relevant IECEx documents including the ExTAG decision sheets.

There were a number of procedures in the test area that were not part of the quality system. This was subsequently corrected.

The new system involves the use of 'test plans' for the various standards with the instruments for the various tests specified. These were under development at the time of the assessment and provide an uncertainty budget allocated for each instrument. This is a common approach that will be implemented throughout Nemko. At the time of the assessment a test plan had been developed for 60079-0 and draft ones had been produced for a number of the other standards. But drafts were available for some standards on the scope change. Subsequently test plans for all the standards in the proposed scope were provided.

#### **4.3. Test Records**

At the time of assessment test records are retained in hard copy form but the aim is to keep all records electronically.

#### **4.4. Document Change Control**

In the flameproof testing area there were charts used for obtaining the correct gas mixture using the oxygen analyzer and to do span and calibration checks. Neither of these were part of the quality system. This was subsequently corrected

### **5. TEST REPORTS**

#### **5.1. Test Reports Issued**

Nemko has issued 9 ExTRs over the past two years covering Ex d and Ex i. Samples were reviewed as part of the assessment.

### **6. CALIBRATION**

The oxygen analyzer used for flameproof testing and for the intrinsic safety spark test apparatus was subject to span and zero checks but did not have any calibration. There was a similar situation for the oxygen analyzer used for Ex p testing. Subsequently these were calibrated and evidence of that calibration provided to the assessment team.

The majority of test equipment is calibrated within house at Nemko. All test equipment examined had an indication of the calibration status. Original copies of the calibration certificates for all apparatus is stored in filing cabinets in the two calibration rooms, scanned/electronic versions are available on the intranet. A random sample of the test equipment used in Ex was chosen and the records for these examined. One item, a Fluke 189 (N4057) did not have its manufacturer's serial number recorded in either the electronic database or the paper system. This item is requested on the new instrument registration form. Nemko subsequently advised that the serial numbers are recorded in the database, but due to a software error they were not on the printed versions. They have advised that this will be fixed.

### **7. CONFIDENTIALITY**

Staff are required to sign a declaration of secrecy when they are employed. Examples were sighted. There are also requirements specified in the quality manual Part 2.12 on ensuring confidentiality of material. The various parts of Nemko are secured by key card access or by keys.

## 8. NATIONAL ACCREDITATION

Accreditation for ISO/IEC 17025 is from Norwegian Accreditation (NA) certificate number TEST 033 (Annex 3). At the time of the assessment that accreditation (See Annex 4) did not cover the additional standards applied for the IECEx Scheme by Nemko. However, an assessment by NA is scheduled. The revised scope should be submitted to the assessment team and the IECEx Secretary when it is received.

## 9. RECOGNITION AND AGREEMENTS

Nemko have inter-laboratory agreements; these include FM Approvals in the USA, CQST in China, KOSHA in Korea, CSA International in Canada and the US Coast Guard, and have been accepted by the Japanese Government as a designated foreign testing body.

## 10. INTERNAL AUDIT AND PERIODIC REVIEW

The requirements for internal audits are covered in Section 3.8 and Annex 5 of the Quality Manual. The audit system has recently been changed to do 'vertical audits'. There is an audit plan developed for the year. This covers the various areas and also a product audit for CENELEC.

Annual review is in section 3.7 and Annex 5 of the Quality Manual. A standard agenda is used for these meetings covering the critical elements of the Quality System and the meeting is chaired by the President. The report for the meeting of 14 March 2006 was viewed. There is also a monthly quality meeting.

## 11. COMPLAINTS AND APPEALS (Including appeals to IECEx)

Complaints are handled by the Internal Procedures Unit (IPU). Details are included on Annex 6B of the Quality Manual. Nemko also has an appeals procedure that is addressed in the Quality Manual Part 9. There is an appeals committee within Nemko which consists of people from outside Nemko to handle appeals. Provision is made in the procedures to advise applicants of the further rights of appeal including those related to 'international cooperation'.

## 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)
- Photos of the facilities

### 12.2. *Witnessed tests*

The following tests were witnessed during the assessment;

- Temperature testing of a luminaire.
- A pressure determination test for Ex d with hydrogen.
- IP6X test to IEC 60529.

### **13. COMMENTS (Including issues found during assessment)**

A number of issues were found during the assessment related to uncontrolled documents, lack of or draft procedures, and calibration. Some details are noted earlier. These are further detailed in the site report together with information on how they were all resolved.

### **14. RECOMMENDATION**

Based on the re-assessment performed on 20 to 22 November 2006 Nemko is recommended for continued acceptance in the IECEX scheme as a Testing Laboratory (ExTL) according to the scope of the standards listed in this document, including the extension of scope.

Jim Munro  
Team Leader

Nick Ludlam  
Expert Assessor

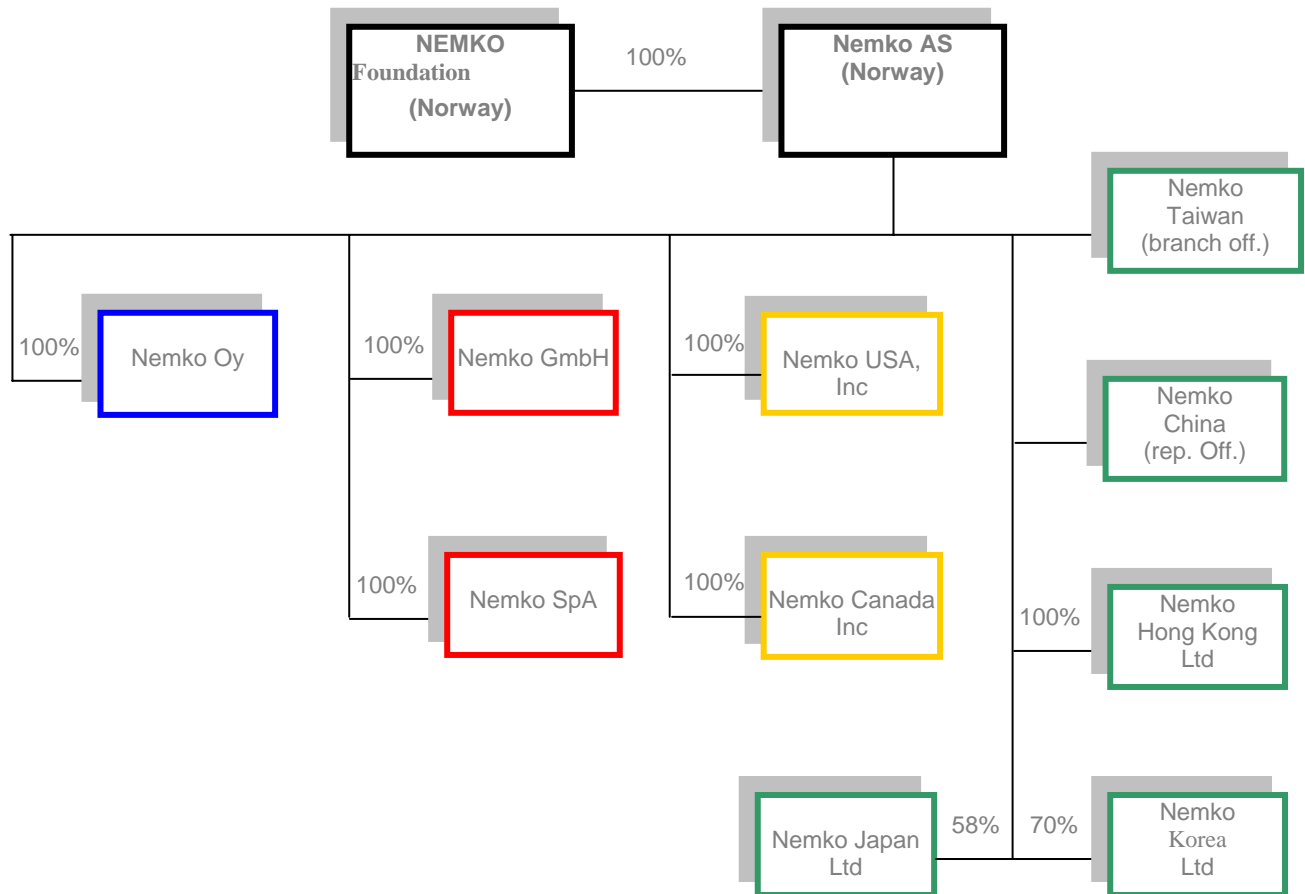
Date: 4 April 2007

### **List of Annexes:**

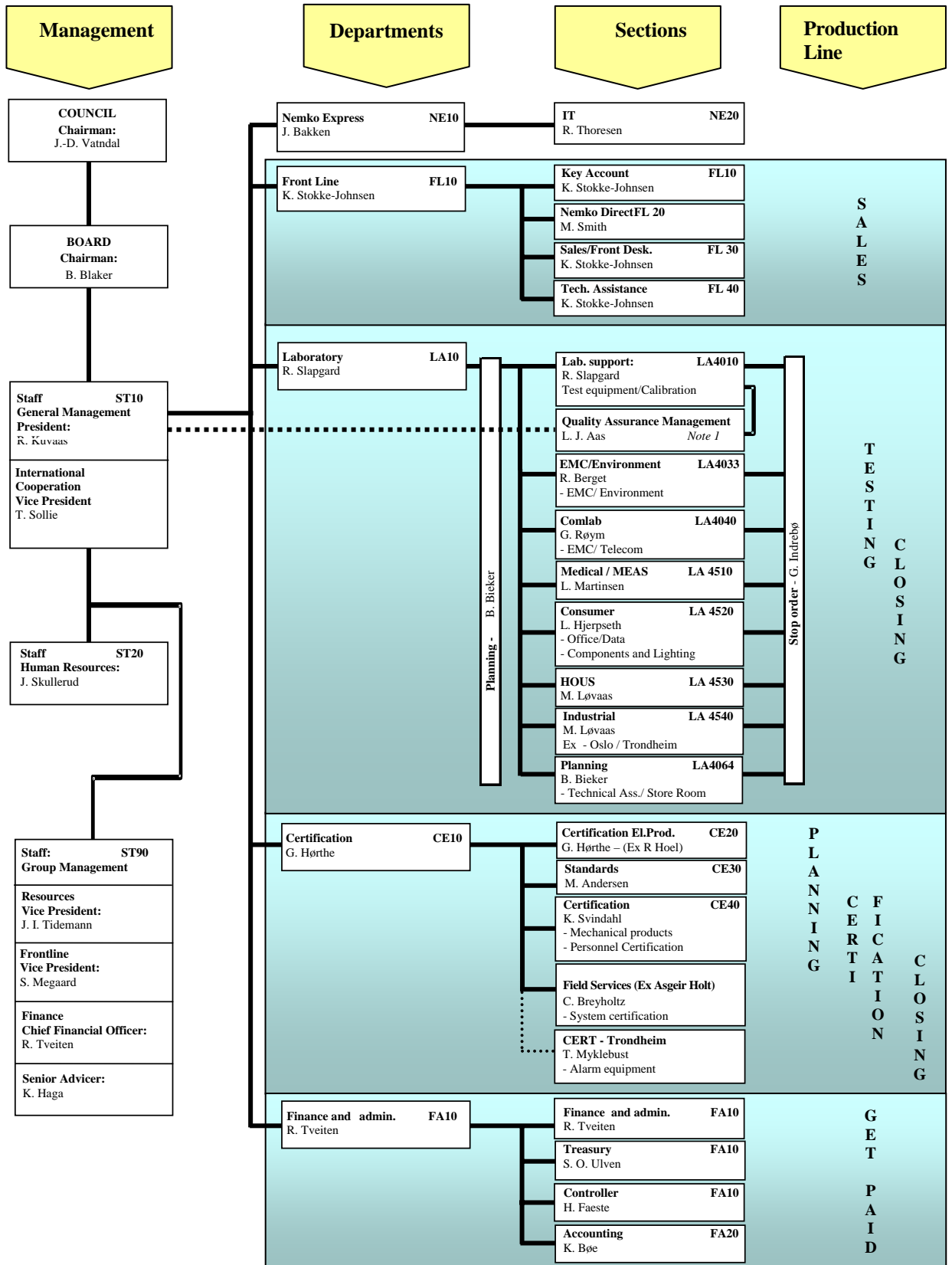
1. Overall Organization Chart for the Nemko Group
2. Organization Chart of Nemko AS
3. Accreditation Certificate for ISO/IEC 17025
4. Scope of accreditation for ISO/IEC 17025



**Annex 1**  
**Organization chart for Nemko Group**



**Annex 2**  
**Organization chart for Nemko AS, Norway**



**Annex 3**  
**Accreditation Certificate for ISO/IEC 17025**



**AKKREDITERINGSBEVIS**  
ACCREDITATION CERTIFICATE

**Nemko A/S**


er første gang akkreditert den 27.03.1995 av Norsk Akkreditering  
*is accredited on 27.03.1995 by the Norwegian Accreditation*  
som prøvingslaboratorium og tilfredstiller kravene i NS-EN ISO/IEC 17025.  
*as a testing laboratory according to the requirements of NS-EN ISO/IEC 17025.*

Prøvings- og kalibreringslaboratorier som etterlever kravene i denne internasjonale standarden, følger et kvalitetssystem for sine prøvings- og kalibreringsaktiviteter som også møter kravene i ISO 9001 når de er engasjert i design/ utvikling av nye metoder, og/ eller utvikling av testprogrammer som kombinerer standard og ikke-standard prøvings- og kalibreringsmetoder, og ISO 9002 når de kun benytter standard metoder.  
*Testing and calibration laboratories that comply with requirements of this International Standard operate a quality system for their testing and calibration activities that also meets the requirements of ISO 9001 when they engage in the design/development of new methods, and/or develop test programmes combining standard and non-standard test and calibration methods, and ISO 9002 when they only use standard methods.*

Akkrediteringens omfang og varighet fremgår av gjeldende akkrediteringsdokument, og akkrediteringen forutsetter regelmessig oppfølging.

*The scope and conditions of the accreditation are specified in the accreditation document, and the accreditation requires regular surveillance.*

Akkrediteringsnummer: **TEST 033**  
*Accreditation number*

**NORSK AKKREDITERING**  
*Norwegian Metrology and Accreditation Service*  
  
avdelingsdirektør/Director Norwegian Accreditation

Norsk Akkreditering er en avdeling i Justervesenet  
*Norwegian Accreditation is a department in Norwegian Metrology and Accreditation Service*

## Annex 4

### Scope of Accreditation for ISO/IEC 17025



Accreditation document  
Accreditation no. TEST 033

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The administrative/geographical unit:  
Nemko AS, Oslo  
Postboks 73 Blindern  
0314 OSLO

Permanent laboratory – Gaustadalléen 30, Oslo

#### P20 Safety

Object	Parameter	Reference Standard	Internal Method Identity	Comments
Electrical apparatus for explosive gas atmospheres.	General requirements	EN 50014	P32301	Includes also standards referring to or based on the reference standard, including A1 and A2. § 23.4.7.5 is not included in the accreditation.
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50016	P32302	Includes also standards referring to or based on the reference standard.
Pressurized apparatus 'p'				
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50018	P32303	Includes also standards referring to or based on the reference standard.
Flameproof enclosure "d"				
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50019	P32304	Includes also standards referring to or based on the reference standard. § 6.6.2 is not included in the accreditation.
Increased safety 'e'				
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50039	P32305	Includes also standards referring to or based on the reference standard.
Intrinsically safe electrical systems 'i'				
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50020	P32305	Includes also standards referring to or based on the reference standard.
Intrinsically safety 'i'				
Electrical apparatus for potentially explosive gas atmospheres.	Safety	EN 50028	P32306	Includes also standards referring to or based on the reference standard.
Encapsulation "m"				

22.09.2006  
Date

  
Technical Director