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

**TITLE: IECEx Assessment Report for an extension of scope for TÜV SÜD Product Service GmbH, an Accepted Ex Testing Laboratory (ExTL), within the IECEx System Equipment Scheme 02, to include, IEC 60079-28 in their scope.**

**Circulation to: Members of the IECEx Management Committee, ExMC**

**INTRODUCTION**

This document contains the IECEx Assessment Report for TÜV SÜD Product Service GmbH, an existing Accepted Ex Test Laboratory, ExTL, within the IECEx System, Equipment Scheme 02, to include IEC 60079-28 within their scope.

The report is hereby submitted for voting by the ExMC.

***This document is hereby submitted for ExMC approval via correspondence using the IECEx on-line voting system.  ExMC Members are requested to submit their vote via the IECEx On-line*** [***Ballot System***](https://www.iecex.com/ballot) ***by the closing date 2020 06 10***

***Please refer to OD 050 for guidance on the “IECEx On-line voting system.”***

***Chris Agius***

**IECEx Secretariat**

|  |  |
| --- | --- |
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IEC System for certification to standards relating to equipment for use in Explosive Atmospheres (IECEx System)

IECEx Assessment Report Form

IECEx Assessment Report Form for use by IECEx Assessment Teams to report Assessments conducted according to the IECEx Assessment Procedures of

1. Operational Document IECEx OD003-2 for the Certified Equipment Scheme
2. Operational Document IECEx OD316-5 for the Certified Service Facility Scheme
3. Operational Document IECEx OD422 for the IECEx Conformity Mark Licensing System

IECEx ExTL assessment report for TÜV SÜD

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

CONTENTS

[1 Assessment information 5](#_Toc31277160)

[1.1 Type of Body covered by this assessment: 5](#_Toc31277161)

[1.2 Type of assessment: 5](#_Toc31277162)

[1.3 Details of body 5](#_Toc31277163)

[1.3.1 Country 5](#_Toc31277164)

[1.3.2 Name of body 5](#_Toc31277165)

[1.3.3 Name and title of nominated principal contact 5](#_Toc31277166)

[1.4 Assessment information 5](#_Toc31277167)

[1.4.1 Members of the assessment team 5](#_Toc31277168)

[1.4.2 Place(s) of assessment 5](#_Toc31277169)

[1.4.3 Assessment date(s) 5](#_Toc31277170)

[1.5 Application information and background information on the assessment 5](#_Toc31277171)

[1.6 Scopes 6](#_Toc31277172)

[1.6.1 ExCB scope for equipment certification scheme 6](#_Toc31277173)

[1.6.2 ExTL scope 8](#_Toc31277174)

[2 Common information 8](#_Toc31277175)

[2.1 Legal entity of body 8](#_Toc31277176)

[2.2 Financial support 8](#_Toc31277177)

[2.3 History 8](#_Toc31277178)

[2.4 Documentation 8](#_Toc31277179)

[2.4.1 Quality manual 8](#_Toc31277180)

[2.4.2 Procedures 8](#_Toc31277181)

[2.4.3 Work instructions 9](#_Toc31277182)

[2.4.4 Records (including test records where relevant) 9](#_Toc31277183)

[2.4.5 Document change control 9](#_Toc31277184)

[2.5 Confidentiality 9](#_Toc31277185)

[2.6 Communication with public and customers (Hard copy and Electronic) 9](#_Toc31277186)

[2.7 Recognitions and agreements 9](#_Toc31277187)

[2.8 Internal audit 9](#_Toc31277188)

[2.9 Management review 10](#_Toc31277189)

[2.10 Contracting, subcontracting and witness testing 10](#_Toc31277190)

[2.10.1 Contracting 10](#_Toc31277191)

[2.10.2 Subcontracting 10](#_Toc31277192)

[2.10.3 Witness testing 10](#_Toc31277193)

[2.11 Training and competence 10](#_Toc31277194)

[2.12 Complaints and appeals (including appeals to IECEx) 10](#_Toc31277195)

[2.13 Impartiality 10](#_Toc31277196)

[2.14 Commenting on ExTAG Documents 10](#_Toc31277197)

[2.15 Special facts to be noted 10](#_Toc31277198)

[2.16 Supporting documentation 10](#_Toc31277199)

[2.17 Recommendations 11](#_Toc31277200)

[3 ExTL for IECEx Certified Equipment Scheme 12](#_Toc31277201)

[3.1 Assessment references 12](#_Toc31277202)

[3.1.1 General references 12](#_Toc31277203)

[3.1.2 Additional references applied for this assessment 12](#_Toc31277204)

[3.2 Candidate ExTL persons interviewed 12](#_Toc31277205)

[3.3 Associated ExCB(s) 12](#_Toc31277206)

[3.4 Organisation 12](#_Toc31277207)

[3.4.1 Names, titles and experience of the senior executives 12](#_Toc31277208)

[3.4.2 Name, title and experience of the quality management representative 13](#_Toc31277209)

[3.4.3 Other relevant employees in ExTL activity 13](#_Toc31277210)

[3.5 Organizational structure 13](#_Toc31277211)

[3.6 Resources 13](#_Toc31277212)

[3.7 Test reports issued 13](#_Toc31277213)

[3.8 National accreditation 14](#_Toc31277214)

[3.9 Calibration 14](#_Toc31277215)

[3.10 Tests witnessed during the assessment visit 14](#_Toc31277216)

[3.11 Participation in IECEx Proficiency Testing Programs 14](#_Toc31277217)

[3.12 Comments (including issues found during assessment) 14](#_Toc31277218)

[4 Annexes 15](#_Toc31277219)

[Annex A Organisation Chart of ExCB and ExTL 16](#_Toc31277220)

[Annex B Accreditation Certificate for ISO/IEC 17025 17](#_Toc31277221)

# Assessment information

## Type of Body covered by this assessment:

|  |  |
| --- | --- |
| ExCB for IECEx Certified Equipment Scheme |  |
| ExTL for IECEx Certified Equipment Scheme | ✓ |
| ExCB for IECEx Certified Service Facilities Scheme |  |
| ExCB for IECEx Conformity Mark Licensing System |  |

NOTE 1 ExCB - IECEx Certification Body

NOTE 2 ExTL - IECEx Testing Laboratory

## Type of assessment:

|  |  |
| --- | --- |
| Pre-assessment for candidate body |  |
| Initial assessment for candidate body |  |
| Surveillance  |  |
| Re-assessment  |  |
| Scope extension | ✓ |

## Details of body

### Country

Germany

### Name of body

TÜV SÜD Product Service GmbH

### Name and title of nominated principal contact

|  |  |  |
| --- | --- | --- |
| Name | Title | E-mail address |
| Arno Butzke | Department Manager | Arno.Butzke@tuev-sued.de |

## Assessment information

### Members of the assessment team

|  |  |
| --- | --- |
| Name  | Role  |
| Dr Jim Munro | IECEx Lead Assessor |

### Place(s) of assessment

|  |  |
| --- | --- |
| TÜV SÜD Product Service GmbHDaimlerstr. 1185748 Garching | ExTL is located at (but not visited):TÜV SÜD Product Service GmbHGottlieb-Daimler-Str. 770794 Filderstadt GERMANY |

### Assessment date(s)

29 November 2019

## Application information and background information on the assessment

This scope extension recommendation covers IEC 60079-28 for ‘op is’ only and does not include 5.2.4 *Ignition tests*.

 The scope extension covers only the TÜV SÜD ExTL.  The ExCB already has IEC 60079-28 in its scope and so a formal report covering the ExCB was not deemed necessary.  However, during this assessment the competency matrix for ExCB staff was reviewed to ensure there are still people at the ExCB with appropriate competencies for the standard. It is noted that a current arrangement exists with TÜV NORD and Professional Testing (EMI) Inc., PTI, to both act as ExTL with TÜV SÜD ExCB which includes IEC 60079-28 in their ExTL scopes.

Optical radiation testing is done at the facility in Garching for local certification and for the IECEE System.

##  Scopes

### ExCB scope for equipment certification scheme

The following is the existing scope for the ExCB which includes IEC 60079-28.

| Number  | Title  | Comments, eg if scope change |
| --- | --- | --- |
| IEC 60079-0 Edition 6.0 | Explosive atmospheres - Part 0: Equipment - General requirements  |  |
| IEC 60079-1Edition 7.0 | Explosive atmospheres - Part 1: Equipment protection by flameproofenclosures “d” |  |
| IEC 60079-2 Edition 6.0 | Explosive atmospheres - Part 2: Equipment protection by pressurizedenclosure «p» |  |
| IEC 60079-5Edition 4.0 | Explosive atmospheres - Part 5: Equipment protection by powder filling «q» |  |
| IEC 60079-6Edition 4.0  | Explosive atmospheres - Part 6: Equipment protection by oil immersion «o» |  |
| IEC 60079-7Edition 5.0 | Explosive atmospheres - Part 7: Equipment protection by increasedsafety "e" |  |
| IEC 60079-11Edition 6.0 | Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i” |  |
| IEC 60079-13Edition 1.0 | Explosive atmospheres - Part 13: Equipment protection by pressurized room 'p'  |  |
| IEC 60079-15Edition 4.0 | Explosive atmospheres – Part 15: Equipment protection by type of protection "n" |  |
| IEC 60079-18Edition 4.0 | Explosive atmospheres – Part 18: Equipment protection by encapsulation “m” |  |
| IEC 60079-25Edition 2.0 | Explosive atmospheres – Part 25: Intrinsically safe electrical systems |  |
| IEC 60079-26Edition 3.0 | Explosive atmospheres - Part 26: Equipment with equipment protectionlevel (EPL) Ga |  |
| \*IEC 60079-27Edition 2.0 | Explosive atmospheres – Part 27: Fieldbus intrinsically safe concept (FISCO) |  |
| IEC 60079-28Edition 2.0 | Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation Covering ‘op is’ only and not including 5.2.4 *Ignition tests* | Scope extension for ExTL addressed in this report |
| IEC 60079-29-1Edition 1.0 | Explosive atmospheres - Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases |  |
| IEC 60079-29-4Edition 1.0 | Explosive Atmospheres – Part 29-4: Gas detectors - Performance requirements of open path detectors for flammable gases |  |
| IEC/IEEE 60079-30-1Edition 1.0 | Explosive atmospheres – Part 30-1: Electrical resistance trace heating – General and testing requirements |  |
| IEC 60079-31Edition 2.0 | Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t" |  |
| IEC TS 60079-32-1Edition 1.0 | Explosive atmospheres - Part 32-1: Electrostatic hazards, guidance(may be used for testing purposes but not for issuing an IECEx Certificate of Conformity) |  |
| IEC 60079-32-2Edition 1.0 | Explosive atmospheres - Part 32-2: Electrostatics hazards - Tests(may be used for testing purposes but not for issuing an IECEx Certificate of Conformity) |  |
| IEC 60079-33Edition 1.0 | Explosive atmospheres – Part 33: Equipment protection by special protection “s” |  |
| IEC 60079-35-1Edition 1.0 | Explosive atmospheres – Part 35-1: Caplights for use in mines susceptible to firedamp – General requirements – Construction and testing in relation to the risk of explosion |  |
| IEC 60079-35-2Edition 1.0 | Explosive atmospheres – Part 35-2: Caplights for use in mines susceptible to firedamp – Performance and other safety-related matters |  |
| IS0 80079-36Edition 1.0 | Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres – Basic method and requirements |  |
| ISO 80079-37Edition 1.0 | Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres – Non electrical type of protection constructional safety ”c” control of ignition source ”b”, liquid immersion ”k” |  |
| IEC TS 60079-39Edition 1.0 | Explosive atmospheres-Part 39: Intrinsically safe systems with electronically controlled spark duration limitation  |  |
| IEC TS 60079-40Edition 1.0 | Explosive atmospheres-Part 40: Requirements for process sealing between flammable process fluids and electrical systems |  |
| ISO 16852 | Flame arrestors - Performance requirements., test methods and limits for use |  |
| \*IEC 61241-0Edition 1.0  | Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements |  |
| \*IEC 61241-1 Edition 1.0 | Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosure “tD” |  |
| \*IEC 61241-4 Edition 1.0 | Electrical apparatus for use in the presence of combustible dust - Part 4: Protection by pressurization "pD"  |  |
| \*IEC 61241-11Edition 1.0 | Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety 'iD' |  |
| \*IEC 61241-18Edition 1.0  | Electrical apparatus for use in the presence of combustible dust - Part 18: Protection by encapsulation "mD" |  |
| \*IEC 62013-1 Edition 2.0 | Caplights for use in mines susceptible to firedamp - Part 1: General requirements - Construction and testing in relation to the risk of explosion |  |
| \*IEC 62013-2 Edition 2.0 | Caplights for use in mines susceptible to firedamp - Part 2: Performance and other safety-related matters |  |
| IECEx DS2015/001A2015 10 09 | Equipment assemblies |  |

NOTE 1 Standards shown with an asterisk (\*) are superseded standards

NOTE 2 Unless otherwise indicated, earlier editions of standards (even if with a different number) are considered to be covered in the above scope for the purposes of the assessment.

NOTE 3 The above list highlights any extension of scope in the list above for new standards or later editions of standards already in scope.

### ExTL scope

This scope extension for the ExTL is only for IEC 60079-28 Edition 2.0 for “op is”.

# Common information

## Legal entity of body

The ExCB, ExTL and proposed subcontracted operation are all part of the same legal entity of TÜV SÜD Product Service GmbH. Hence, there is no need for a formal contract to enable this subcontracting to take place.

## Financial support

Not relevant for scope extension.

## History

Not relevant for scope extension.

## Documentation

### Quality manual

There are two relevant quality manuals, one for the ExTL and one for operation that will be doing the test for IEC 60079-28, as follows:

QM Manual Garching: ID64227 GER\_GAR\_MAN\_01.01

QM Manual Filderstadt: ID87430 GER\_FIL\_MAN\_01.01

### Procedures

Technical requirements are addressed in work instructions (see below).

### Work instructions

Most of the work instructions are linked in the Quality Manual Garching. During the assessment one work instruction for testing for continuous wave radiation was reviewed - Kurzanleitung\_Lichtstrommessung UK1700 & ISP 1000. This was in draft form and later issued. Also provided later was a work instruction for testing of pulsed radiation Kurzanleitung zur Energiemessung von gepulster Strahlung. Both work instructions appropriately addressed the testing processes, including the application of the test equipment in the laboratory.

### Records (including test records where relevant)

A test plan (Test Data Sheet) had been developed that clearly describes the work to be carried out in the Garching laboratory. At the assessment visit this was in draft form but was subsequently issued.

The process planned for production of an ExTR is that a test report will be prepared from Garching which presents the results of the testing, but will not draft any conclusions regarding compliance. This will be done by staff in the ExTL as part of the process of preparing the ExTR. During the assessment, evidence was provided that the staff of the ExTL have the necessary competence to perform this task.

A recent report of a project that had been done for ATEX was reviewed. Part of the report process included production of a report based on the IECEx ExTR format and an additional report was provided for the customer. The reports were comprehensive and provided information that would be appropriate for reporting for IECEx.

The equipment tested for this project was the same equipment that was used to demonstrate testing for this scope extension.

### Document change control

Not relevant for scope extension.

## Confidentiality

The staff at the Garching operation are under the same company system regarding confidentiality with details of the process included in the Quality Manual Garching in ID64227 GER\_GAR\_MAN\_01.01 – Clause 4.2 privacy - Code of Ethics.

## Communication with public and customers (Hard copy and Electronic)

Not relevant for scope extension.

## Recognitions and agreements

The laboratory has attained the following accreditations and recognitions:

* DAkkS (See accreditation certificate [D-PL-11321-09-00](https://www.dakks.de/as/ast/d/D-PL-11321-09-00.pdf))
* ZLS
* IECEE
* ENEC
* OSHA

## Internal audit

Not relevant for scope extension. However the internal programme will include the Garching location for IECEx operations.

## Management review

Management review is done every year. More detailed information is covered in the quality manual of Garching; see ID64227 GER\_GAR\_MAN\_01.01 and GER\_P\_01.04D Management Review.

## Contracting, subcontracting and witness testing

### Contracting

The tests are not done by contracting. The test is done according the procedures and work instructions at Garching and hence is subcontracting.

### Subcontracting

Subcontracting procedures are covered in the quality manual of Filderstadt, in ID 87430 GER\_FIL\_MAN\_01 01- Clause 6.6 *Subcontracting*

The following are the tests that will be subcontracted for IEC 60079-28:

|  |  |  |
| --- | --- | --- |
| Standard | Clause  | Test |
| IEC 60079-28 | 5.2.2.2 | Optical power |
| IEC 60079-28 | 5.2.2.3 | Optical irradiance |
| IEC 60079-28 | 5.2.3 | Pulsed radiation |

The tests are subcontracted to:

TÜV SÜD Product Service GmbH

Daimlerstr. 11

85748 Garching

### Witness testing

There will be no witness testing according to OD 024.

## Training and competence

Evidence was provided of appropriate training. In addition, the competency matrices relevant to the ExCB, the ExTL and the operation at Garching were viewed and found to be appropriate.

Details of staff competencies are included in the site assessment report.

## Complaints and appeals (including appeals to IECEx)

Not relevant for scope extension.

## Impartiality

Not relevant for scope extension.

## Commenting on ExTAG Documents

Not relevant for scope extension.

## Special facts to be noted

None.

## Supporting documentation

Copies of additional supporting information for this assessment have been provided to the applicant and the IECEx Secretariat. These are included in a site assessment report or provided separately and include:

* Details of issues raised and how these have been resolved
* Completed Technical Capability Document (TCD) for IEC 60079-28
* Photos of the facilities/tests witnessed are included in the above TCD
* Assessor’s notes

## Recommendations

Based on the assessment performed on 29 November 2019 TÜV SÜD Product Service GmbH is recommended for the scope extension for IEC 60079-28 in the IECEx scheme as:

* An ExTL in the IECEx Certified Equipment Scheme

|  |
| --- |
| Dr Jim Munro |
| IECEx Lead Assessor |

Date: April 2020

#  ExTL for IECEx Certified Equipment Scheme

## Assessment references

### General references

1. IECEx02 IECEx Certified Equipment Scheme covering equipment for use in explosive atmospheres – Rules of Procedure
2. IECEx OD003-2 Assessment, surveillance assessment and re-assessment of ExCBs and ExTLs operating in the IECEx 02, IECEx Certified Equipment Scheme
3. IECEx OD009 Issuing of CoCs, ExTRs and QARs
4. ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories
5. IECEx Technical Capability Document (TCD)
6. ExTAG decision sheets (DSs)
7. OD 202 IECEx Certified Equipment Scheme – IECEx Proficiency Testing Program

NOTE The latest editions of the above documents were applied.

### Additional references applied for this assessment

No additional references were relevant for this assessment.

## Candidate ExTL persons interviewed

|  |  |
| --- | --- |
| Name | Position |
| Arno Butzke | Department Manager |
| Uli Jacobs  | SPS ATEX/IECEx |
| Thorsten Siemen | Project Manager |
| Jan Steinshorn  | Project Manager |
| Karim Mahmoud  | Project Manager |
| Kim Abenthum  | Test Engineer |
| Deng Yuxi | Project Engineer (visiting from China) |

## Associated ExCB(s)

The associated ExCB is:

TÜV SÜD Product Service GmbH

Ridlerstr.65

80339 Munich

GERMANY

## Organisation

### Names, titles and experience of the senior executives

|  |  |  |
| --- | --- | --- |
| Name | Title | Experience |
| Jens Butenandt | CTO | >10 years |
| Peter Havel | CEO | >10 years |

### Name, title and experience of the quality management representative

|  |  |  |
| --- | --- | --- |
|  Name | Title | Experience  |
| Reinhard Fresia | QMB | >10 years |

### Other relevant employees in ExTL activity

The following are the ExTL employees who will be used for testing and production of ExTRs for

Staff in Filderstadt:

|  |  |  |
| --- | --- | --- |
| Name | Title/responsibility | Experience in Ex |
| Karim Mahmoud | Project manager | 4 years  |
| Jan Steinshorn | Project manager | 5 years |
| Arno Butzke | Dept. manager | >10 years |
| Ulrich Jacobs | Senior Product Specialist | >10 years |
| Andreas Pfeil | Project manager | >10 years |
| Frank Zhu | Project manager | 9 years |
| Kristof De Gersem | Section Manager | >10 years |
| Jason Chen |  | 5 years |
| Hongbin Liu | Project manager | >10 years |
| Chen Wei | Project manager | 6 years |
| Deng Yuxi | Project manager | 3 years |
| Nathan Li | Project manager | 3 years |
| Ryan Jiang | Project manager | 4 years |

Staff in Garching:

|  |  |  |
| --- | --- | --- |
|  Name | Title/responsibility | Experience in Ex |
| Fabian Fligge | Product specialist | < 1 year; optical: 9 years |
| Florian Hockel | Dept. Manager | < 1 year; optical: >10 years |
| Thorsten Siemon | Product specialist | < 1 year; optical: 4 years |

## Organizational structure

Refer to the organization structure shown in Annex B. For certification to IEC 60079-28 three parts of TÜV SÜD Product Service GmbH will be involved; the ExCB located in Munich, the ExTL located in Filderstadt and the optical radiation testing which will be done in Garching.

## Resources

TÜV SÜD Product Service GmbH demonstrated that it has the appropriate staff resources at its ExCB, ExTL and subcontracted operation in Garching for certification, assessment and testing to IEC 60079-28 for ‘op is’. In addition, there are appropriate work instructions and test equipment to carry out the testing to this standard.

## Test reports issued

Number of test reports issued under for the preceding four years for IEC 60079-28 for ATEX:

|  |  |  |  |
| --- | --- | --- | --- |
| Standard numbers | Type of protection or other identifying information | Number of issued reports (ExTRs) (for last 4 years) | Total |
|  | 2016 | 2017 | 2018 | 2019 |  |
| EN 60079-28 | Explosive atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation | 0 | 0 | 1 | 1 | 2 |

**NOTE 1 Above include reports to IEC 60079-0 unless otherwise shown**

**NOTE 2 Where the number of reports is low, assessors are expected to carefully check current capability and document the process in this report.**

## National accreditation

The operation in Garching carries out optical radiation tests for standards other than IEC 60079-28. It holds national accreditation for these standards to ISO/IEC 17025, number D-PL-11321-9-00 (see Annex B). An example of a standard in the scope accreditation that includes testing of optical radiation is: IEC 62471:2006 *Photobiological safety of lamps and lamp systems.*

It is recommended that with the above accreditation and assessments by IECEE, annual surveillance should not be necessary to cover this standard.

## Calibration

Calibration is addressed in the quality manual of Garching - See ID64227 GER\_GAR\_MAN\_01.01 - Clause 6.4. There is an appropriate system in place to ensure equipment is calibrated and fit for purpose. All equipment viewed during the assessment visit was in calibration.

## Tests witnessed during the assessment visit

The following tests were witnessed during the assessment visit:

|  |  |  |  |
| --- | --- | --- | --- |
| Standard and edition | Clause number | Test | Comments |
| IEC 60079-28 Edition 2.0 | 5.2.2.2 | Measurement of optical power for continuous power  | The test was performed competently  |
| IEC 60079-28 Edition 2.0 | 5.2.2.3 | Measurement of optical irradiance for continuous power  | The test was performed competently |

## Participation in IECEx Proficiency Testing Programs

There is currently no relevant proficiency testing program for IEC 60079-28.

## Comments (including issues found during assessment)

Some issues were raised during the assessment visit regarding issuing work instructions and a technical data sheet, and updating of the ExTL competency matrix to include IEC 60079-28. These were subsequently resolved to the satisfaction of the assessor.

#  Annexes

1. Organisation Chart of ExCB and ExTL

Filderstadt:



Garching

****

1. Accreditation Certificate for ISO/IEC 17025

