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

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**TITLE: Report from Convenor of ExTAG AdhocWG1 Modular concept for
electrical Ex Equipment**

This document, *Draft Operational Document - Guidance on the preparation of IECEx Equipment Certificates and Reports of a Modular Combination* serves as a report from the Convenor of ExTAG AdhocWG1 Modular concept for electrical Ex Equipment, Dr Detlev Markus, and has been issued for consideration during the ExTAG Dubai Meeting.

Julien Gauthier
ExTAG Secretary

Address:
IECEx Secretariat
Level 33 Australia Square
264 George Street
Sydney NSW 2000
Australia
Web: www.iecex.com

ExTAG Secretary
Mr Julien Gauthier
LCIE S.A.
33 Avenue du General Leclerc
92260 Fontenay-aux-Roses
FRANCE
Tel: +33 1 40 95 55 26
Fax: +33 1 40 95 89 37
Email : julien.gauthier@lcie.fr



IECEX OPERATIONAL DOCUMENT

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

IECEX Certified Equipment Scheme

**Guidance on the preparation of IECEx Equipment
Certificates and Reports of a Modular Combination**



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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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Guidance on the preparation of IECEx Equipment Certificates and Reports of a Modular Combination

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IECEX Operational Document OD XYZ

IECEX Certified Equipment Scheme

**Guidance on the preparation of IECEX Equipment
Certificates and Reports of a Modular Combination**

Introduction

This document is supplementary to the IECEX Rules, other IECEX Operational Documents and procedures operated by IECEX Certification Bodies (ExCBs that have been approved by the IECEX Management Committee to issue IECEX Certificates of Conformity (CoCs) for Equipment.

The purpose of IECEX Operational Documents (ODs) is to ensure that each ExCB accepted by the ExMC for the purposes of issuing IECEX CoCs and QARs does so in a consistent manner.

This Operational Document, OD XYZ provides guidance on the preparation of IECEX Equipment Certificates and Reports of a Modular Concept. This Operational Document, OD XYZ is a supplementary document to OD 009 and OD 034.

Document History

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Address:

IECEX Secretariat
Australia Square
Level 33, 264 George Street
Sydney NSW 2000 Australia

Contact Details:

Tel: +61 2 4628 4690
Email: info@iecex.com
Web: <http://www.iecex.com>

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INTRODUCTION

Divergent practices between IECEx Certification Bodies in respect of the number of different products that can be covered on a single certificate have potential implications for the easy management of certificates. These include the frequency of raising the issue level of a certificate, the listing of ExTR documents on the certificate for each new technical issue and a direct influence on the cost recovery of the scheme.

An example of such different products covered on a single certificate is a Modular Combination, a combination of separate certified Ex Products with all internal electrical and mechanical connections and structural components. To ease the handling and maintenance of such a combination this Operational Document provides guidance for the certification of a Modular Combination.

Without this approach, any revision of an individual built-in Ex Product Certificate necessitates in most cases a revision of the Ex Equipment Certificate of the combination. In case of a replacement or extension of an Ex Product, listed in the Ex Equipment Certificate of the combination, this Ex Equipment Certificate must be updated to list the new Ex Product with its type designation and certificate number.

The purpose of this Operational Document is to provide a standardised approach for the preparation of IECEx Certificates and Reports covering a Modular Combination.

A further point to note is the importance of being able to match the list of models covered by a certificate with the specific model reference as listed or displayed on each product produced. This is particularly important during installation, maintenance and repair.

Guidance on the preparation of IECEx Equipment Certificates and Reports of a Modular Combination

1 Scope

This document defines the structural and technical details for issuing an Ex Equipment Certificate for a Modular Combination. This Operational Document, OD XYZ is a supplementary document to OD 009 and OD 034.

The Modular Combination itself and this document are not covering assemblies in accordance with IEC 60079-46.

2 Normative references

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IECEX OD 009, *Operational Document - Procedures for the Issuing of IECEx Certificates of Conformity, IECEx Test Reports and IECEx Quality Assessment Reports*

IECEX OD 034, *Operational Document - Guidance on the preparation of IECEx Equipment Certificates and Reports covering more than one identifiable item of equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60079-0, as well as the following apply.

NOTE Additional definitions applicable to explosive atmospheres can be found in IEC 60050-426.

3.1 Modular Combination

a combination of separate certified Ex Products with all internal electrical and mechanical connections and structural components. The Modular Combination itself has one comprising Ex Equipment Certificate.

3.2 Fixed Device

a non-interchangeable IECEx certified Ex Product defined by its type name

3.3 Modular Device

an interchangeable IECEx certified Ex Product with a defined set of safety relevant parameters

3.4 Safety relevant parameter

characteristic variable used to obtain information about the structure and performance of the Modular Combination and of the Ex Products

4 Construction of a Modular Combination

4.1 General

The determination of whether an Ex Product is a Fixed or a Modular Device depends on the individual Modular Combination to be approved. The comprising Ex Equipment Certificate of the Modular Combination covers the listed Fixed Devices and a set of Modular Devices.

Every individually certified Modular Device that meets the safety-relevant parameters, specified in the Ex Equipment Certificate of the Modular Combination, can be equipped in the Modular Combination without the need to update the Ex Equipment Certificate of the Modular Combination.

An example of the conceptual structure of a Modular Combination is shown in **Error! Reference source not found.**

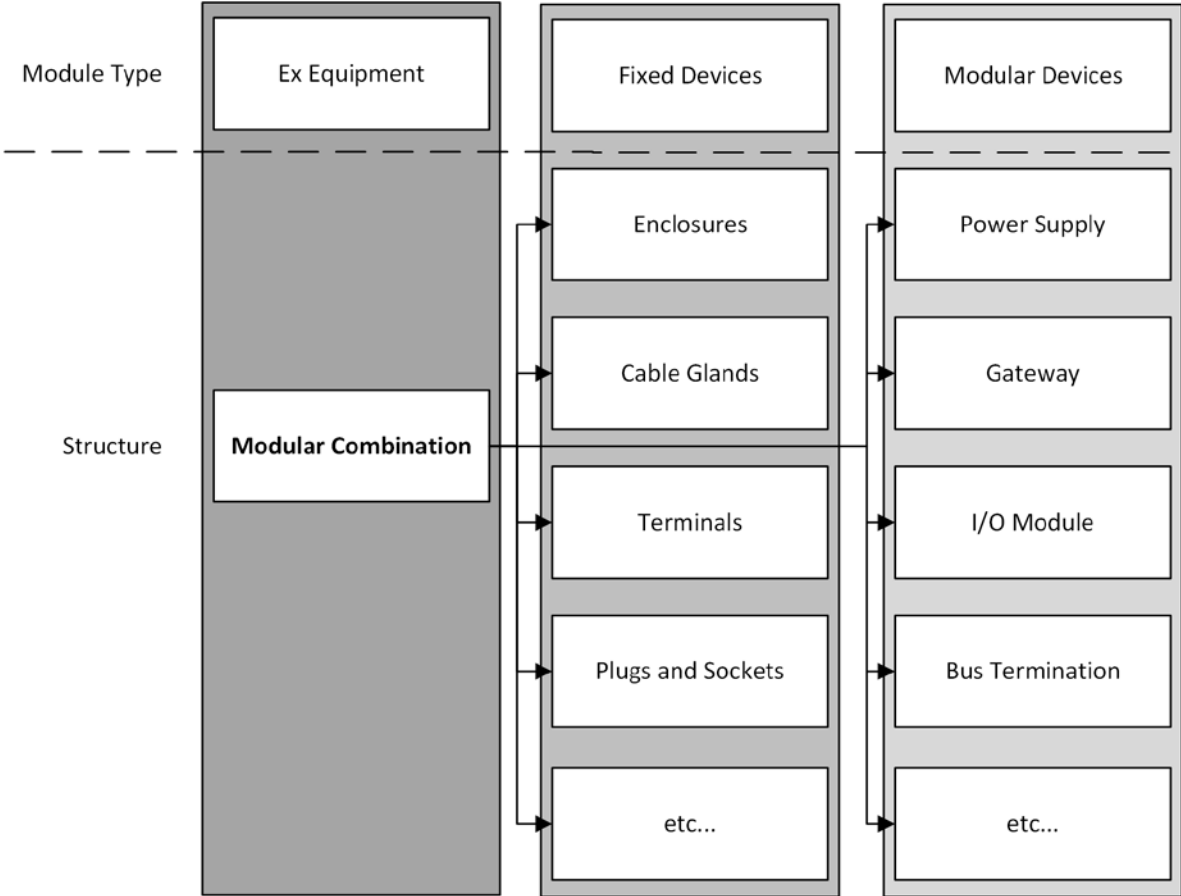


Figure 1 – Exemplary structure of a Modular Combination

4.2 Concept Document of the Modular Combination

An overall descriptive document (Concept Document) for the specific Modular Combination shall be prepared by the manufacturer as part of the schedule drawings of the Ex Equipment Certificate. This Concept Document defines a set of safety-relevant parameters which must be met by each Modular Device, as well as a list of Fixed Devices. The IECEx TL/CB evaluates the Concept Document and includes the safety-relevant parameters as technical data in the ExTR of the Modular Combination.

The Concept Document should contain all information about the Modular Combination. The intention of this document is specifying the safety relevant technical data of the Modular Combination comprising electrical equipment and their interfaces. The following is an example of the information:

- Nomenclature for the Modular Devices
- General information (EPL, gas group, temperature classification, general electrical / mechanical information, placement of devices, ...)
- Detailed information and safety relevant parameters (Ex rating, type, electrical information, segregation requirements, temperature assessment (e.g. power dissipation, interaction between different parts), ...)

NOTE 1 This listing is an example and can be adjusted where necessary

NOTE 2 The list of safety-relevant parameters is an agreement between the manufacturer and the IECEx TL/CB. It is listed as a confidential document in the ExTR to prevent a free assembly by the user.

NOTE 3 For the future maintenance of the Ex Equipment Certificate it is possible to add certain new safety-relevant parameters, e.g. for implementing a new Ex product which was originally not covered by the Modular Combination.

Figure 2 shows the requirements for the individual parts of the Modular Combination.

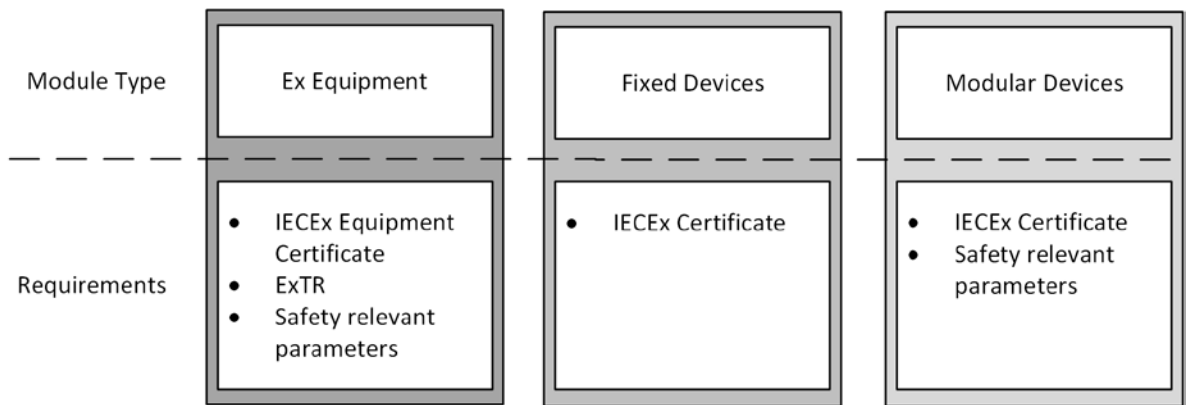


Figure 2 – Requirements of a Modular Combination

4.3 Certification of the Modular Combination

In support of the Ex Equipment Certificate of the Modular Combination the ExTR includes the Concept Document of the Modular Combination, the List of Fixed Devices and all necessary documents required by the related standards. The List of Fixed Devices is part of the schedule drawings and includes at least their type name, Ex marking and certificate number. The Ex Equipment Certificate of the Modular Combination also has to include a reference to instructions.

NOTE The instructions provided with the Modular Combination have to be followed in detail.

During the assessment of the Modular Combination the IECEx TL/CB must define together with the applicant the worst-case thermal setup of the Modular Combination. The thermal setup must cover the maximum possible installed Modular Devices and the maximum power consumption for the Modular Combination, to allow for flexibility to revise or add Modular Devices without the need of a reassessment. The thermal setup must also consider the position of the devices within the enclosure and the service temperatures of critical non-metallic parts. A thermal assessment as a type test has to be done in accordance with IEC 60079-0.

5 Documentation

The manufacturer will maintain a record of all design verifications, including data used, calculations and comparisons made, and the result of tests carried out. These design verification test records form part of the manufacturer's intellectual property. Such proprietary information will not normally be made available to any third party including the user, except at the manufacturer's sole discretion.

NOTE These design verification procedure form part of the QAR to retrace the technical design by the ExCB.

6 Considerations

Certain Ex Products may not be considered as Modular Devices but only as Fixed Devices. This needs to be carefully considered by the manufacturer of the Modular Combination and the ExCB. Examples for such Ex Products may include

- Batteries,
- Lasers or other continuous wave sources,
- Radio frequency sources,
- Rotating electrical machines,
- Pressurization control systems.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

3, rue de Varembe PO Box 131
CH-1211 Geneva 20 Switzerland

Tel: + 41 22 919 02 11
Fax: + 41 22 919 03 00

info@iec.ch
www.iec.ch