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INTERNATIONAL STANDARD



**Dynamic modules –
Part 3-3: Performance specification templates – Wavelength selective switches**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DYNAMIC MODULES –

Part 3-3: Performance specification templates – Wavelength selective switches

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62343-3-3 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) modification of the normative references;
- b) modification of the terms and definitions.

The text of this standard is based on the following documents:

FDIS	Report on voting
86C/1648/FDIS	86C/1655/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62343 series, published under the general title *Dynamic modules*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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INTRODUCTION

A wavelength selective switch (WSS) is a dynamic module (DM), which is mainly used in a reconfigurable optical add-drop multiplexer (ROADM) system to switch a particular wavelength signal to any output ports in DWDM networks. The WSS-module has one input port and a plurality of output ports (i.e. $1 \times N$ WSS) and can be used in reverse, with N input ports and one output port, depending on its application. It is controlled with software, which determines any wavelength signal among a DWDM signal from one input port to switch to a particular output port in case of $1 \times N$ application.

DYNAMIC MODULES –

Part 3-3: Performance specification templates – Wavelength selective switches

1 Scope

This part of IEC 62343 provides a performance specification template for wavelength selective switches. The object is to provide a framework for the preparation of detail specifications on the performance of wavelength selective switches.

Additional specification parameters ~~may be~~ are often included for detailed product specifications or performance specifications if necessary. However, specification parameters specified in this document ~~shall~~ are not ~~be~~ removed from the detail product specifications or performance specifications.

The technical information regarding wavelength selective switches and their applications in DWDM systems with single-mode fibres ~~will be~~ are described in IEC TR 62343-6-4, ~~currently under consideration.~~

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61290-7-1, *Optical amplifiers – Test methods – Part 7-1: Out-of-band insertion losses – Filtered optical power meter method*

IEC 61300-2-14, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-14: Tests – High optical power*

IEC 61300-3-2, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-2: Examination and measurements – Polarization dependent loss in a single-mode fibre optic device*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-14, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-14: Examinations and measurements – ~~Accuracy Error~~ and repeatability of the attenuation settings of a variable optical attenuator*

IEC 61300-3-21, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-21: Examinations and measurements – Switching time ~~and bounce time~~*

IEC 61300-3-29, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-29: Examinations and measurements – ~~Measurement techniques for characterizing the amplitude of the spectral transfer function of DWDM components~~ Spectral transfer characteristics of DWDM devices*

IEC 61300-3-32, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-32: Examinations and measurements – Polarization mode dispersion measurement for passive optical components*

IEC 61300-3-38, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-38: Examinations and measurements – Group delay, chromatic dispersion and phase ripple*

IEC 61753-021-2, *Fibre optic interconnecting devices and passive components performance standard – Part 021-2: Grade C/3 single-mode fibre optic connectors for category C – Controlled environment*

IEC 62074-1, *Fibre optic interconnecting devices and passive components – Fibre optic WDM devices – Part 1: Generic specification*

IEC 62343, *Dynamic modules – General and guidance*

IEC 62343-1, *Dynamic modules – Part 1: Performance standards – General conditions*

~~IEC 62343-4-1, *Dynamic modules – Part 4-1: Software and hardware interface standards – 1x9 wavelength selective switch*⁴~~

IEC 62343-5-2, *Dynamic modules – Part 5-2: Test methods – 1 x N fixed-grid WSS – Dynamic crosstalk measurement*

ITU-T Recommendation G.694.1, *Spectral grids for WDM applications: DWDM frequency grid*

~~ITU-T G.Sup39, *Optical system design and engineering considerations*~~

⁴~~Under consideration.~~

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Dynamic modules –
Part 3-3: Performance specification templates – Wavelength selective switches**

**Modules dynamiques –
Partie 3-3: Modèles de spécification de performance – Commutateurs sélectifs
en longueur d'onde**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DYNAMIC MODULES –

Part 3-3: Performance specification templates – Wavelength selective switches

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DYNAMIC MODULES –

Part 3-3: Performance specification templates – Wavelength selective switches

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IEC 62343-5-2, *Dynamic modules – Part 5-2: Test methods – 1 x N fixed-grid WSS – Dynamic crosstalk measurement*

ITU-T Recommendation G.694.1, *Spectral grids for WDM applications: DWDM frequency grid*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

MODULES DYNAMIQUES –

Partie 3-3: Modèles de spécification de performance – Commutateurs sélectifs en longueur d'onde

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La Norme internationale IEC 62343-3-3 a été établie par le sous-comité 86C: Systèmes et dispositifs actifs à fibres optiques, du comité d'études 86 de l'IEC: Fibres optiques.

Cette deuxième édition annule et remplace la première édition publiée en 2014. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) modifications des références normatives;
- b) modification des termes et définitions.

Le texte de cette norme est issu des documents suivants:

FDIS	Rapport de vote
86C/1648/FDIS	86C/1655/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 62343, publiées sous le titre général *Modules dynamiques*, peut être consultée sur le site web de l'IEC.

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- amendé.

INTRODUCTION

Un commutateur sélectif en longueur d'onde (WWS) est un module dynamique (DM), qui est principalement utilisé dans un système de multiplexage optique d'insertion-extraction reconfigurable (ROADM) pour commuter un signal de longueur d'onde particulière vers tout port de sortie dans des réseaux DWDM. Le WWS a un port d'entrée et plusieurs ports de sortie (par exemple $1 \times N$ WWS) et il peut être utilisé de manière inverse, avec N ports d'entrée et un seul port de sortie, en fonction de son application. Il est commandé par un logiciel, qui discrimine un signal de n'importe quelle longueur d'onde parmi un signal DWDM provenant d'un port d'entrée pour le commuter vers un port de sortie particulier dans le cas d'une application $1 \times N$.

MODULES DYNAMIQUES –

Partie 3-3: Modèles de spécification de performance – Commutateurs sélectifs en longueur d'onde

1 Domaine d'application

La présente partie de l'IEC 62343 présente un modèle de spécification de performance pour les commutateurs sélectifs en longueur d'onde. Il est destiné à fournir un cadre pour l'établissement de spécifications particulières sur les performances des commutateurs sélectifs en longueur d'onde.

Des paramètres de spécification supplémentaires sont souvent inclus pour les spécifications détaillées de produit ou les spécifications de performances, si nécessaire. Toutefois, les paramètres de spécification stipulés dans le présent document ne sont pas retirés des spécifications particulières de produit ou de performances.

Les informations techniques concernant les commutateurs sélectifs en longueur d'onde et leurs applications dans des systèmes DWDM avec fibres unimodales sont décrites dans l'IEC TR 62343-6-4.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61290-7-1, *Amplificateurs optiques – Méthodes d'essai – Partie 7-1: Pertes d'insertion hors-bande – Méthode par puissance-mètre optique filtré*

IEC 61300-2-14, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 2-14: Essais – Puissance optique élevée*

IEC 61300-3-2, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-2: Examen et mesures – Perte en fonction de la polarisation dans un dispositif pour fibres optiques unimodales*

IEC 61300-3-6, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-6: Examens et mesures – Affaiblissement de réflexion*

IEC 61300-3-14, *Dispositifs d'interconnexion et composants fibroniques – Procédures fondamentales d'essais et de mesures – Partie 3-14: Examens et mesures – Erreur et répétabilité des positions d'affaiblissement d'un affaiblisseur optique variable*

IEC 61300-3-21, *Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures – Partie 3-21: Examens et mesures – Temps de commutation*

IEC 61300-3-29, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-29: Examens et mesures – Caractéristiques de transfert spectral pour des dispositifs DWDM*

IEC 61300-3-32, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-32: Examens et mesures – Mesure de la dispersion de mode de polarisation pour composants optiques passifs*

IEC 61300-3-38, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Méthodes fondamentales d'essais et de mesures – Partie 3-38: Examens et mesures – Retard de groupe, dispersion chromatique et fluctuation de phase*

IEC 61753-021-2, *Norme de qualité de fonctionnement des dispositifs d'interconnexion et composants passifs à fibres optiques – Partie 021-2: Connecteurs à fibres optiques unimodales de classe C/3 pour la catégorie C – Environnement contrôlé*

IEC 62074-1, *Dispositifs d'interconnexion et composants passifs à fibres optiques – Dispositifs WDM à fibres optiques – Partie 1: Spécification générique*

IEC 62343, *Dynamic modules – General and guidance* (disponible en anglais seulement)

IEC 62343-1, *Modules dynamiques – Partie 1: Normes de performance – Conditions générales*

IEC 62343-5-2, *Modules dynamiques – Partie 5-2: Méthodes d'essai – Commutateurs sélectifs en longueur d'onde à grille fixe 1 x N – Mesure de diaphonie dynamique*

Recommandation UIT-T G.694.1, *Grilles spectrales pour pour les applications de multiplexage par répartition en longueurs d'onde: grille dense DWDM*