



SLOVENSKI STANDARD

SIST EN 61580-4:1999

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Methods of measurement for waveguides - Part 4: Attenuation of waveguide and waveguide assemblies (IEC 61580-4:1997)

Methods of measurement for waveguides -- Part 4: Attenuation of waveguide and waveguide assemblies

Meßverfahren für Hohlleiter -- Teil 4: Dämpfung von Hohlleitern und Hohlleiterbauteilen

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Méthodes de mesure appliquées aux guides d'ondes -- Partie 4: Atténuation des guides d'ondes et des ensembles de guides d'ondes

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Ta slovenski standard je istoveten z: EN 61580-4:1998

ICS:

33.120.10 Koaksialni kabli. Valovodi Coaxial cables. Waveguides

SIST EN 61580-4:1999

en

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English version

**Methods of measurement for waveguides
Part 4: Attenuation of waveguide and waveguide assemblies
(IEC 61580-4:1997)**

Méthodes de mesure appliquées aux guides d'ondes
Partie 4: Atténuation des guides d'ondes et des ensembles de guides d'ondes
(CEI 61580-4:1997)

Meßverfahren für Hohlleiter
Teil 4: Dämpfung von Hohlleitern und Hohlleiterbauteilen
(IEC 61580-4:1997)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 46B/225/FDIS, future edition 1 of IEC 61580-4, prepared by SC 46B, Waveguides and their accessories, of IEC TC 46, Cables, wires, waveguides, R.F. connectors, and accessories for communication and signalling, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61580-4 on 1998-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 1999-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1999-01-01

Endorsement notice

The text of the International Standard IEC 61580-4:1997 was approved by CENELEC as a European Standard without any modification.

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**Méthodes de mesure appliquées
aux guides d'ondes –**

**Partie 4:
Atténuation des guides d'ondes
et des ensembles de guides d'ondes**

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**Part 4:
Attenuation of waveguide and
waveguide assemblies**

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

METHODS OF MEASUREMENT FOR WAVEGUIDES –

**Part 4: Attenuation of waveguide and
waveguide assemblies**

FOREWORD

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International Standard IEC 61580-4 has been prepared by subcommittee 46B: Waveguides and their accessories, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors and accessories for communication and signalling.

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

FDIS	Report on voting
46B/225/FDIS	46B/228/RVD

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

The contents of the corrigendum of July 2006 have been included in this copy.

METHODS OF MEASUREMENT FOR WAVEGUIDES –

Part 4: Attenuation of waveguide and waveguide assemblies

1 Scope and object

This part of IEC 61580 is applicable to attenuation of waveguides and waveguide assemblies. The objective of the test procedures given below is to characterize the attenuation.

2 General

The swept frequency method may be used to determine the attenuation.

The conditions for attenuation measurements on waveguides are characterized by access to only one end or a very low loss to be measured or else by both together.

Four methods are presented hereinafter in order to cover each case:

Method 1: insertion method using swept frequency. It is used for general purposes.

Method 2: reflection method using swept frequency. It is used when only one end is available but there may be some limitations on the insertion loss values that may be measured.

Method 3: reflection method using discrete frequencies. It is used when low attenuation is to be measured and where one end only is available.

Method 4: uses an automatic network analyser. The use of an automatic network analyser requires that, for measurement on long lengths of waveguide, particular attention must be given to the number of frequencies and the frequency sweep rate selected. Care must be taken to ensure that any sharp "peaks" or "troughs" in the amplitude response are not effectively smoothed out to produce an erroneous result.

3 Test equipment

Suitable test set-ups are shown in figures 1, 2 and 3. Other equivalent set-ups can be used by agreement between customer and supplier.

- a) **Sweep RF generator:** the sweep rate should be slow enough to allow the chart recorder or plotter to reproduce the peak values faithfully.
- b) **Isolator:** an isolator or an attenuator is included to prevent reflected waves affecting the output level of the generator.

c) **Low-pass filter:** a low-pass filter or a band-pass filter is included to eliminate spurious harmonic frequencies. In the case where the return loss of the low-pass filter is not good enough, it should be connected before the isolator providing the RF source is not adversely affected. Alternatively, if enough RF power is available, the filter match could be improved by using a suitable well-matched attenuator.

d) **Coupler:** the error signal at the coupler(s) detector ports shall be insignificant compared to the signal level being measured. The error signal can be reduced by ensuring that the coupler ports (including adaptors) are well-matched and that the coupler has a high value of directivity (typically better than 45 dB). Coupling values are usually 10 dB to 20 dB with a flat response across the required frequency band.

e) **Calibrated attenuators:** attenuators shall be calibrated in the frequency band of the test.

3.1 Method 1

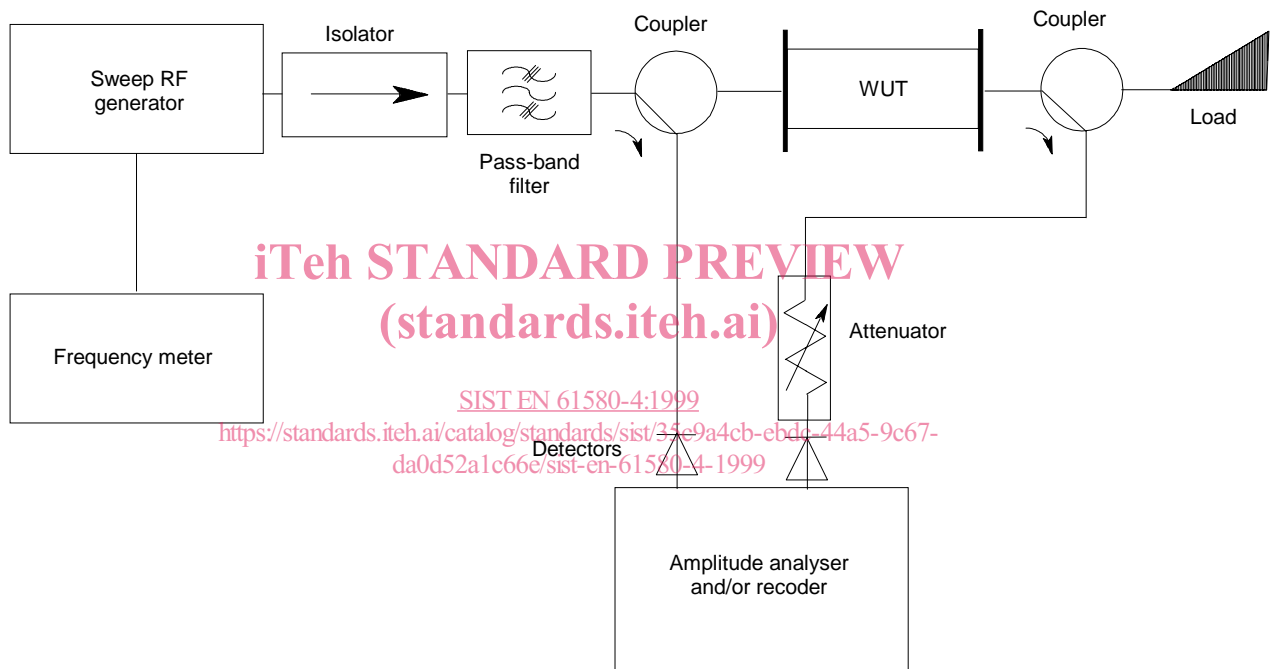


Figure 1 – Test set-up 1