SLOVENSKI STANDARD
SIST EN 61580-8:1998

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Methods of measurement for waveguides - Part 8: Waveguide power holding capability (IEC 61580-8:1996)

Methods of measurement for waveguides -- Part 8: Waveguide power holding capability

Meßverfahren für Hohlleiter -- Teil 8: Übertragbare Leistung eines Hohlleiters

Méthodes de mesure appliquées aux guides d'ondes -- Partie 8: Aptitude d'un guide d'ondes à la tenue en puissance

Ta slovenski standard je istoveten z: EN 61580-8:1996

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33.120.10 Koaksialni kabli. Valovodi Coaxial cables. Waveguides

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Methods of measurement for waveguides
Part 8: Waveguide power holding capability
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aux guides d'ondes
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CENELEC

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

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Foreword

The text of document 46B/209/FDIS, future edition 1 of IEC 1580-8, 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 61580-8 on 1996-07-02.

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) 1997-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-04-01

Endorsement notice

The text of the International Standard IEC 1580-8:1996 was approved by CENELEC as a European Standard without any modification.

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Methods of measurement for waveguides –

Part 8: Waveguide power holding capability

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METHODS OF MEASUREMENT FOR WAVEGUIDES –

Part 8: Waveguide power holding capability

FOREWORD

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International Standard IEC 1580-8 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/209/FDIS	46B/216/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.

METHODS OF MEASUREMENT FOR WAVEGUIDES –

Part 8: Waveguide power holding capability

1 Scope

This part of IEC 1580 describes the measurement of the power holding of a waveguide by the use of a multiplying loop. In this case, the input power required is much less (–10 dB to –12 dB) than when the WUT is directly connected to a high power source.

2 Test equipment

The test set-up shown in figure 1 includes:

a) water load;

b) variable coupler;

c) monitoring couplers (PE, PS, PR);

d) phase shifter;

e) attenuators;

f) slide screw tuner.

3 Principle of operation

A portion of the input power (P_0) from the source is coupled into the loop via the variable coupler. By adjusting the phase shifter to give a resonance length of loop, the power circulating in the loop (P) can be maximized. At resonance, depending upon loop attenuation, P can be much greater than P_0. The gain in the loop is given by:

$$\text{Gain} = \left(\frac{P}{P_0}\right) = \left[\frac{C}{1 - \left(10^{-\frac{A}{20}} \times \sqrt{1 - C^2}\right)}\right]^2$$

where

A is the attenuation in the loop, in dB;

C is the input coupling factor.

The curves of figure 2 give loop gain variation as a function of loop attenuation and coupling factor.

Loop power is measured via coupler PS, and reverse power via PR. A slide screw tuner may be included in the loop to minimise the reflected wave. It is important to minimize loop loss in order to maximize loop power.

4 Procedure

By adjusting the phase length in the loop, circulating energy combines in phase with coupled energy from the source to give a cumulative effect. Power builds up in the loop until limited by the factors discussed in clause 3.

Power in the WUT is then measured via coupler PS. If required the temperature attained by the WUT can be measured.

NOTE – The water load should be capable of handling the full input power P_0 when the loop is off resonance, or when power breakdown occurs in the loop.

5 Reference document

[1] K. Tomiyasu: Attenuation in resonant ring circuit, IRE Trans MTT8, pp 253-254.

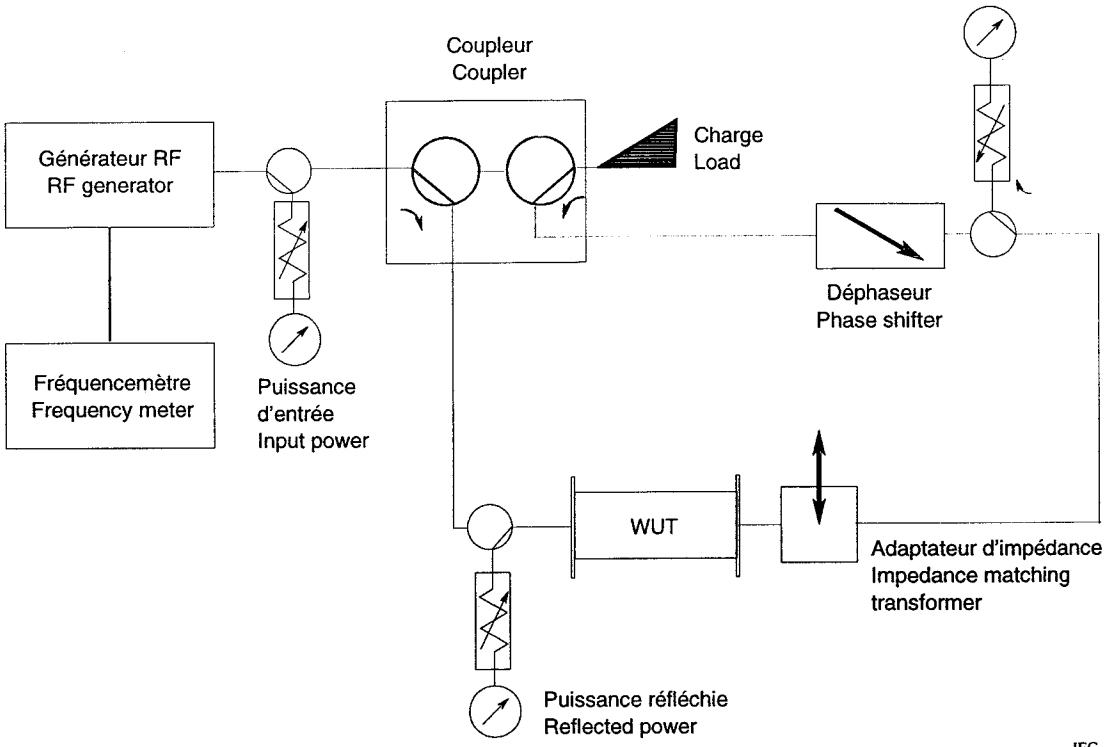

Figure 1 – Boucle résonante
Multiplying loop