SLOVENSKI STANDARD
SIST EN 2591-213:2001

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Aeropsace series - Elements of electrical and optical connection - Test methods - Part 213: Shielding effectiveness from 100 MHz to 1 GHz

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Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 213: Schirmwirkung von 100 MHz bis 1 GHz

Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 213: Efficacité du blindage de 100 MHz a 1 GHz

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ICS:

49.060	Letalska in vesoljska elektriļ na oprema in sistemi	Aerospace electric equipment and systems

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Aerospace series - Elements of electrical and optical connection - Test methods - Part 213: Shielding effectiveness from 100 MHz to 1 GHz

Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 213: Efficacité du blindage de 100 MHz à 1 GHz

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 213: Schirmwirkung von 100 MHz bis 1 GHz

This European Standard was approved by CEN on 22 June 1997.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 2591-213:1997 E

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies a method of measuring the shielding effectiveness from 100 MHz to 1 GHz of elements of connection fitted with screen clamping backshells.

It shall be used together with EN 2591.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 2591 Aerospace series - Elements of electrical and optical connection - Test methods - General

3 Preparation of specimens

3.1 Two alternatives:

- the insert shall be removed;
- or the insert without contacts shall have a suitable hole drilled through its centre.

A conductor of suitable geometry to match the inside diameter of the specimens and screen clamping backshells shall be installed inside the specimens to provide a coaxial line with a 50 Ω characteristic impedance.

Tapered accessories may be used for changing diameters to centre the conductor inside the specimens provided they do not introduce any significant discontinuity in the coaxial line.

3.2 Unless specified in the technical specification, the following details shall be stated:

- test frequencies;
- number of specimens;
- type of specimens and screen clamping backshells;
- attenuation;
- requirement.

4 Apparatus

The electromagnetic radiation detecting equipment (see figure 1) shall consist of an outer shell constructed to provide a coaxial line with a 50 Ω characteristic impedance with the outside part of the mated specimens, the coupling ring and screen clamping backshells.

The voltage standing wave ratio shall not exceed 1,5.

A sliding circumferential short shall be positioned between the specimen and the generator for tuning the outer coaxial line for maximum signal output at each test frequency.

The allowable travel of this short shall be greater than a half wave length at the lowest test frequency, i.e. approximately 1,6 m for a 100 MHz frequency.

The inner coaxial line shall be terminated with a 50 Ω load impedance situated at the rear of the connector on the detector side.

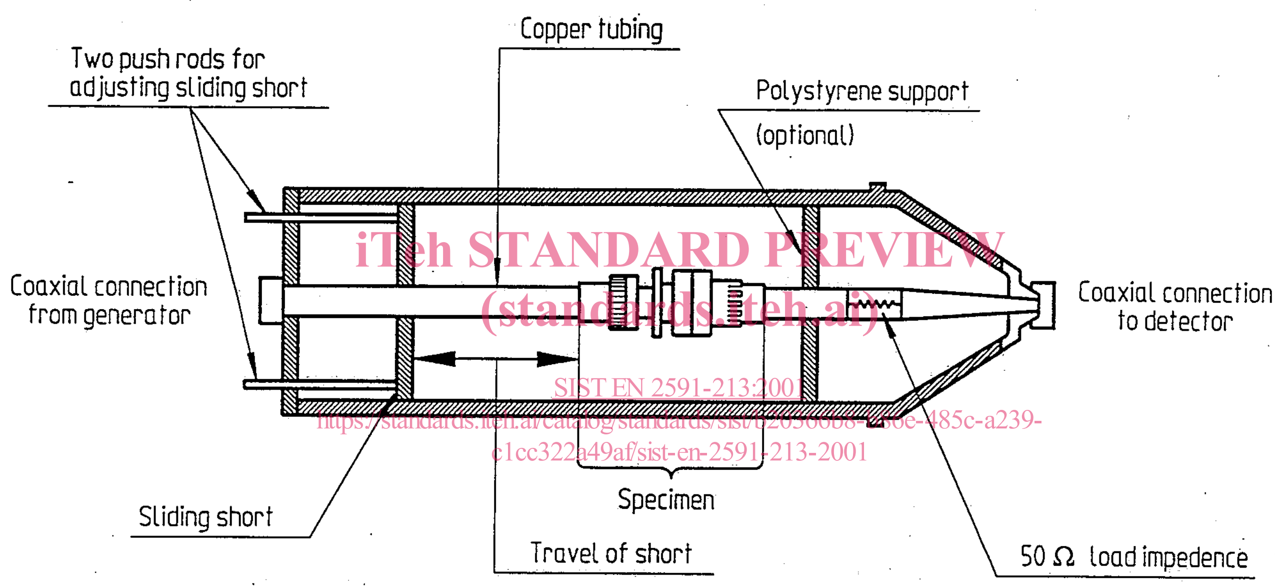

Figure 1 - Radiation detecting equipment

5 Method

5.1 Test setup

The test setup shall comply with figure 2.

The signal from the generator shall be fed through a 10 dB attenuator to a parallel circuit comprising a coaxial switch connected so that the signal can be fed alternatively to the radiation detecting equipment and to a variable 0 dB to 100 dB reference attenuator.

This attenuator calibrated to ± 3 dB shall be adjustable in 1 dB steps.

The level of signal power shall be indicated by a detector isolated from the test circuit by a 3 dB to 10 dB attenuator.

Care shall be taken to ensure that the signal is a result of high frequency radiation in the specimen and not due to a faulty termination inside the test setup.

The connectors used to couple together the various elements of the test circuit shall be of a low radiation type with a nominal impedance of 50 Ω, a voltage standing wave ratio of less than 1,5 and a minimum attenuation of the shield of 100 dB.

The nominal impedance of the generator output and the nominal impedance of the detector input shall be 50 Ω with a voltage standing wave ratio of 1,5.

The input and output voltage standing wave ratio of the reference attenuator shall be less than 1,5 in the 20 dB to 100 dB range.

All terminations shall have a radiation of at least 10 dB less than the test requirements.

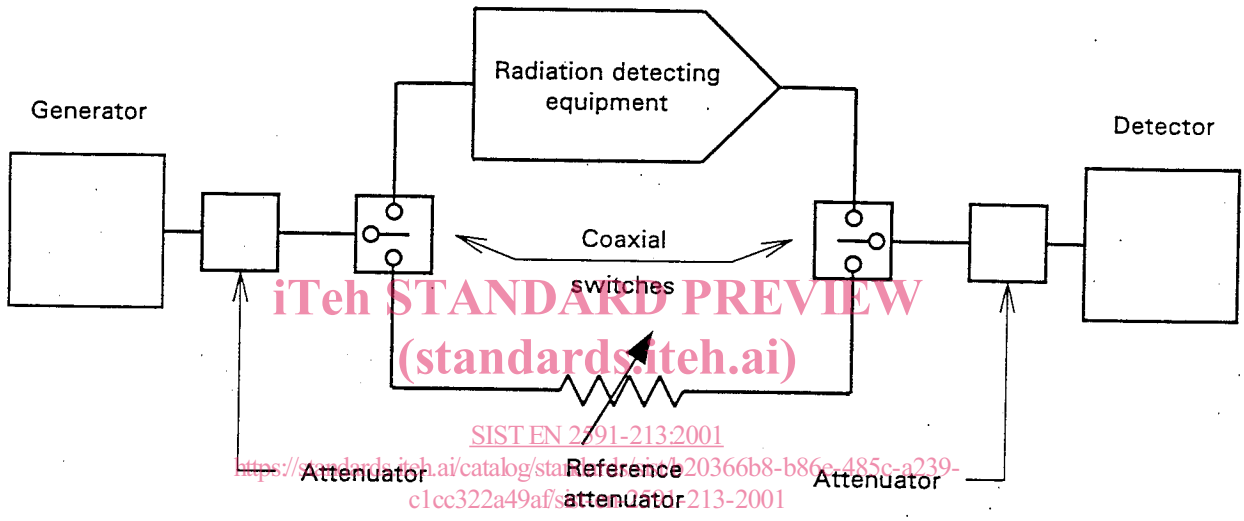

Figure 2 - Test setup

5.2 Procedure

The shielding effectiveness shall be measured by the radiation detecting equipment. The radiation from the conductor inside the specimen into the outer coaxial line shall be measured at the specified frequencies to ± 5 %.

Tune the outer coaxial line to obtain the maximum signal output by sliding the short.

Read the signal level on the detector.

Switch the generator output and the detector input to the reference attenuator by means of the coaxial switches. Adjust the reference attenuator output signal level to equal the signal level read before. The radiation loss in the radiation detector can be read directly on the reference attenuator.

5.3 Requirement

Attenuation shall not be less than that specified.