

**Harmonized system of quality
assessment for electronic components**

Sectional specification: Radio frequency coaxial connectors — Series EIA Flange

The European Standard EN 122150:1993 has the status of a
British Standard

ICS 33.120.30

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee EPL/46, Cables, wires and waveguides, RF connectors and accessories for communication and signalling, to Subcommittee EPL/46/4, RF connectors, upon which the following bodies were represented:

- AEA Technology
- BEAMA Electrical Cable & Conductor Accessory Manufacturers
- British Telecommunications plc
- Federation of the Electronics Industry
- Ministry of Defence
- National Supervisory Inspectorate (BSI Pc)
- Society of Cable Television Engineers

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 August 1996

© BSI 04-2000

The following BSI references relate to the work on this standard:
Committee reference EPL/46/4
Draft announced in *BSI News* April 1996

ISBN 0 580 26233 2

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 122150	5
List of references	Inside back cover

National foreword

This British Standard has been prepared by Subcommittee EPL/46/4 and is the English language version of EN 122150:1993 *Harmonized system of quality assessment for electronic components: Sectional specification: Radio frequency coaxial connectors — Series EIA Flange*, published by the Electronic Components Committee (CECC) of the European Committee for Electrotechnical Standardization (CENELEC). It is identical to CECC 22150 Issue 1:1986 incorporating Erratum: 1987 and Amendment 1:1992.

Cross-references

Publication referred to	Corresponding British Standard
CECC 22000	BS CECC 22000:1993 <i>Harmonized system of quality assessment for electronic components — Generic specification — Radio frequency coaxial connectors (Parts I, II and III)</i>
IEC 68-2-1:1990	BS EN 60068 <i>Environmental testing</i> BS EN 60068-2 <i>Test methods</i> BS EN 60068-2-1:1993 <i>Tests A. Cold</i>

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 36, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Sectional Specification:
Radio Frequency Coaxial Connectors —
Series EIA Flange

Spécification intermédiaire:
Connecteurs coaxiaux pour fréquence
radioélectrique —
Série bride EIA

Rahmenspezifikation:
Hochfrequenz-Koaxial-Steckverbinder —
Serie EIA Flansch

This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 7 May 1993. CENELEC 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 General Secretariat of the CECC or to any CENELEC 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 CENELEC member into its own language and notified to the CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

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 CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized system for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby acceptable in all member countries without further testing.

This European Standard was prepared by CECC WG 22, RF Connectors.

The text of the draft based on document CECC 22150 Issue 1:1986 (with A1 and Erratum) was submitted to the formal vote for conversion to a European Standard; together with the voting report, circulated as document CECC (Secretariat) 3341 it was approved by CECC as EN 122150 on 7 May 1993.

The following dates were fixed:

- latest date of announcement of the EN at national level (doa) 1993-09-03
- latest date of publication of an identical national standard^a (dop) 1994-03-03
- latest date of withdrawal of conflicting national standards^a (dow) 1995-03-03

^a National Standard (excluding National implementation of IECQ Specifications)

Contents

	Page
Foreword	2
Introduction	5
Section 1. Scope	7
Section 2. Mating face and gauge information	
2.1 Dimensions	8
2.2 Drawings	8
2.3 Gauges for male centre contacts	21
Section 3. Properties	
3.1 Ratings and characteristics	24
Section 4. Test conditions and severities	
4.1 Measurement and recovery conditions	27
4.2 Visual examination	27
4.3 Dimensions	27
4.4 Electrical tests and measurements	27
4.5 Mechanical tests and measurements	28
4.6 Environmental tests and measurements	30
4.7 Endurance tests	33
Section 5. Quality assessment procedures	
5.1 Test schedules and inspection requirements	34
Figure 1	9
Figure 2	11
Figure 3	13
Figure 4	15
Figure 5	17
Figure 6	19
Figure 7 — Sizing and retention force gauges for male centre contacts	21
Table 1	10
Table 2	12
Table 3	14
Table 4	16
Table 5	18
Table 6	20
Table 7	21
Table 8 — Dimensions of sizing and retention force gauges, see Figure 7	22

Preface

This sectional specification (SS) was prepared by CECC Working Group 22: R.F. Connectors.

It is based, wherever possible, on the Publications of the International Electrotechnical Commission and in particular on IEC 339-2:1972: *General purpose rigid coaxial lines and their associated flange connectors*.

This SS and its associated blank detail specifications(s) BDS are specific to the six sizes of EIA FLANGE connectors and their related accessories.

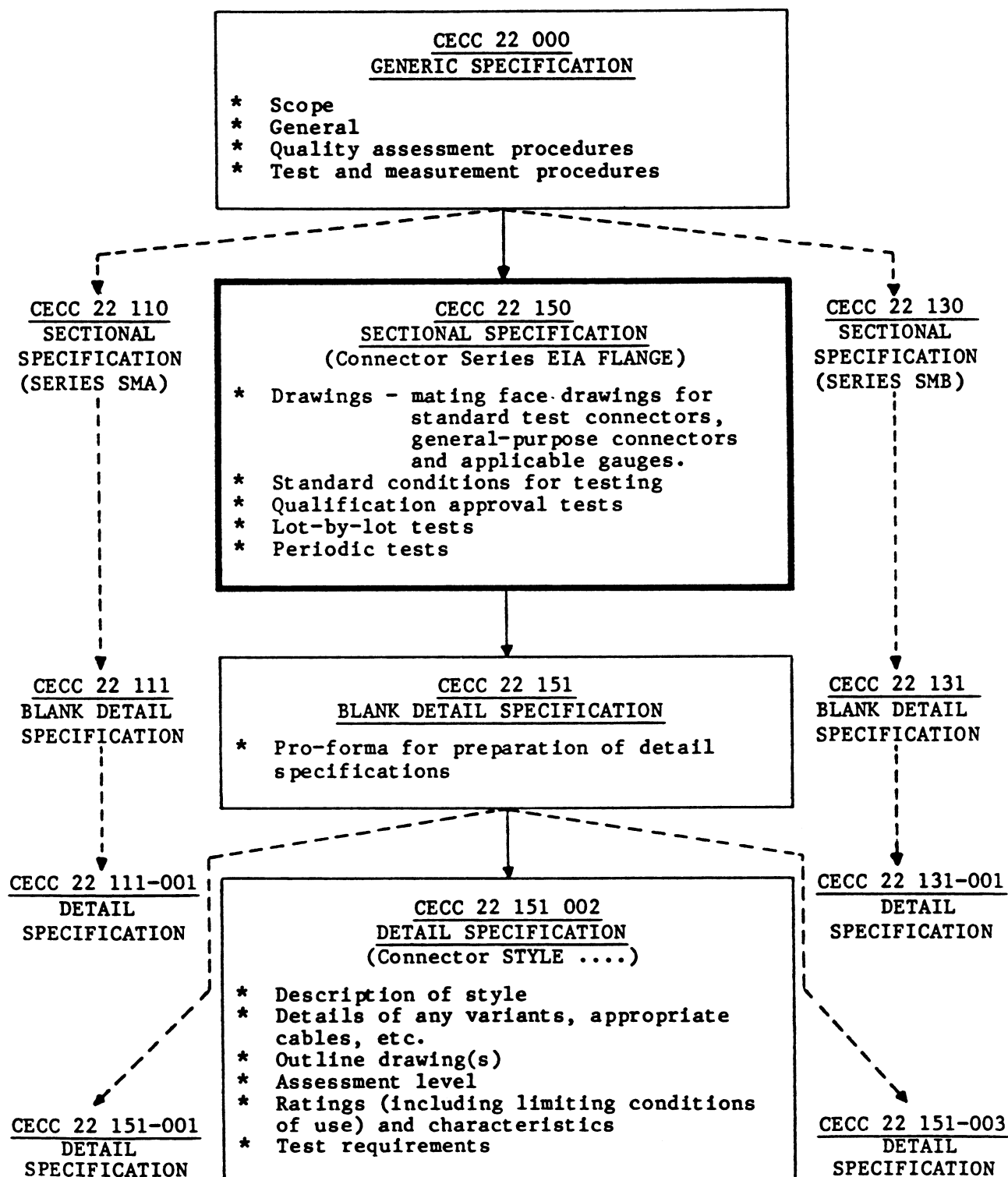
The text of this specification was circulated to the CECC for voting in the documents listed below and was ratified by the President of the CECC for printing as a CECC specification:

Document	Voting Date	Report on the Voting
CECC(Secretariat)1710	July 1985	CECC(Secretariat)1852

Series EIA FLANGE connectors of the types covered by this SS are available in six sizes, each size having a different mating face but employing structurally similar principles of mechanical construction. The connections described are derived from EIA and IEC standards, and include versions for both 50 Ω and 75 Ω systems.

Document numbering for r.f. connector specifications follows 2.2 1) of CECC 00400-III, in order to permit the issue of more than nine sectional specifications. The approved numbering system applicable to r.f. connector specifications is illustrated in the diagram below.

CECC SPECIFICATION SYSTEM FOR R.F. CONNECTORS



NOTE A detail specification is a "completed" blank detail specification.

Introduction

Although EIA FLANGE connectors were originally intended for use with rigid coaxial air lines only, they are currently available in a number of additional styles and variants, suitable for use with semi-flexible cables having convoluted outer conductors.

The outer conductor mating interface is sexless, each half of a mated pair having an identical coupling flange. Two intermateable versions of the coupling flange are available, fixed and rotatable (swivel type). Connectors with fixed flanges have IEC type designations ending – 2. Swivel type flange connectors have IEC designations ending in – 3.

With both fixed and swivel type flange connectors, the inner conductor connection is by means of a separate coupling element comprising a double-ended male contact and insulator assembly (Bullet). When the connector is used in conjunction with rigid lines, the Bullet may form the only mechanical support for the centre conductor.

The connector sizes relate to the nominal outside diameter of the rigid coaxial transmission line with which they were intended to be used. The size was originally expressed in fractional inches, but the IEC type designation for rigid coaxial lines includes both the nominal characteristic impedance, and the outside diameter in millimetres rounded to a convenient whole number.

SUMMARY OF DIMENSIONS

50 Ω Line Size

Rigid Line 339 IEC 50-	Outer Conductor			Inner Conductor	
	Original Inch O/D	Nominal O/D mm	Nominal I/D mm	Nominal O/D mm	Nominal I/D mm
22-1	7/8 (0,875)	22,23	20,00	8,70	7,40
40-1	1.5/8 (1,625)	41,30	38,80	16,90	15,00
80-1	3.1/8 (3,125)	79,40	76,80	33,40	31,30
105-1	4.1/2 (4,173)	106,00	103,00	44,80	42,80
125-1	— (4,850)	123,20	120,00	52,10	50,10
155-1	6.1/8 (6,125)	155,60	151,92	66,00	64,00

75 Ω Line Size

Rigid Line 339 IEC 75-	Outer Conductor			Inner Conductor	
	Original Inch O/D	Nominal O/D mm	Nominal I/D mm	Nominal O/D mm	Nominal I/D mm
22-1	7/8 (0,875)	22,23	20,00	5,80	4,50
40-1	1.5/8 (1,625)	41,30	38,80	11,10	9,60
80-1	3.1/8 (3,125)	79,40	76,80	22,10	20,30

UPPER FREQUENCY LIMITS

The upper frequency limit of operation is determined by the cut-off frequency of higher order “waveguide” modes of propagation, and the effect which they have on the impedance and transmission characteristics of the normal TEM coaxial transmission line mode. The lowest cut-off frequency occurs with the TE_{11} waveguide mode, and this cut-off frequency in an air dielectric line is the upper frequency limit of a practical coaxial transmission line.

In general it is not advisable to operate coaxial systems at frequencies greater than 95 % of the TE_{11} mode cut-off frequency; this particularly applies in the vicinity of discontinuities such as undercuts and support insulators.

The table below lists the recommended upper frequency limits for both straight and right-angle EIA FLANGE connectors of both 50 Ω and 75 Ω impedance.

50 Ω Line Size

Rigid Line 339 IEC 50-	Theoretical TE ₁₁ mode f_c (GHz)	Straight Connector $f_c \times 0,95$	Right Angle Connector $f_c \times 0,665$
22-1	6,65	6,32	4,42
40-1	3,43	3,26	2,28
80-1	1,73	1,64	1,15
105-1	1,29	1,23	0,86
125-1	1,11	1,05	0,74
155-1	0,88	0,83	0,58

75 Ω Line Size

Rigid Line 339 IEC 75-	Theoretical TE ₁₁ mode f_c (GHz)	Straight Connector $f_c \times 0,95$	Right Angle Connector $f_c \times 0,665$
22-1	7,40	7,03	4,92
40-1	3,83	3,64	2,54
80-1	1,93	1,83	1,28

Section 1. Scope

This sectional specification (SS) provides information and rules for the preparation of detail specifications (DS) for general purpose connectors Series EIA Flange.

It prescribes mating-face dimensions for general purpose connectors, together with gauging information and mandatory tests, selected from CECC 22000, applicable to all DS relating to Series EIA FLANGE connectors.

This specification indicates the recommended performance characteristics to be considered when writing a DS, and covers test schedules and inspection requirements for Assessment Levels H, M and U.

Section 2. Mating interface and gauge information

2.1 Dimensions

Inch dimensions are original dimensions. All undimensioned pictorial configurations are for reference purposes only.

2.2 Drawings

Drawings, Figure 1 to Figure 6 inclusive, provide mating interface details for the six sizes of EIA FLANGE connector, the relevant dimensions being shown in Table 1 to Table 6.

The following NOTES apply to all six drawings:—

NOTE 1 Swivel type flanges shall be free to rotate.

NOTE 2 Diameters D, g, s and t shall be on, or capable of taking up, a common axis relative to datum diameter A (M).

NOTE 3 Contact diameter C and chamfer shall meet mechanical and electrical performance requirements after slotting and forming. The number, width and depth of slots is optional.

NOTE 4 The fitting of locating pins is optional and to be regarded as inactive for new designs.

