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European Standard (Telecommunications series)

**Environmental Engineering (EE);
European telecommunication standard
for equipment practice;
Part 2: Engineering requirements for racks and cabinets**



Reference

REN/EE-TMG004

Keywords

environment, equipment practice, rack

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Environmental Engineering (EE), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document is part 2 of a multi-part deliverable, aimed at setting out on a common basis, the installation engineering requirements for telecommunication practice, housing equipment forming part of a public telecommunications network. EN 300 119-1 [2] is a general introduction, and explains the terminology used. The present document specifies the engineering requirements for racks and cabinets and EN 300 119-3 [3] the engineering requirements for miscellaneous racks and cabinets. EN 300 119-4 [4] covers engineering requirements for subracks in miscellaneous racks and cabinets. EN 300 119-5 [5] covers the preferred thermal management solutions for subracks, racks/cabinets and miscellaneous racks/cabinets installed indoors in restricted access locations, for the removal of heat dissipated by one or more subracks in a rack complying to the requirements of this multi-part standard.

The present document applies to all telecommunication equipment forming part of public telecommunications network.

Illustrative figures are contained in annex A.

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [2].

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

1 Scope

The present document details requirements for racks/cabinets which are supplied fully equipped. The racks/cabinets shall be used for housing telecommunication equipment forming part of a public telecommunication network installed either on the public telecommunication operators' sites, or in the premises of operators' customers.

EN 300 119-1 [2] defines the meaning of rack or cabinet in the context of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.
- [2] ETSI EN 300 119-1: "Environmental Engineering (EE); European telecommunication standard for equipment practice; Part 1: Introduction and terminology".
- [3] ETSI EN 300 119-3: "Environmental Engineering (EE); European telecommunication standard for equipment practice; Part 3: Engineering requirements for miscellaneous racks and cabinets".
- [4] ETSI EN 300 119-4: "Environmental Engineering (EE); European telecommunication standard for equipment practice; Part 4: Engineering requirements for subracks in miscellaneous racks and cabinets".
- [5] ETSI EN 300 119-5: "Environmental Engineering (EE); European telecommunication standard for equipment practice; Part 5: Thermal management".
- [6] IEC publication 60917-2: "Modular order for the development of mechanical structures for electronic equipment practices - Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice".

3 Coordination dimensions for racks/cabinets

3.1 Height

The height dimension (H) includes covers, feet or castors if these are an integral part of the rack/cabinet structure.

For telecommunication centres, H shall be 2 200 mm.

For customer sites, H may be at any preferred height, as defined in IEC Publication 60917-2 [6], up to 2 200 mm. Provision shall be made for the possible fitment of height adaptors (for interfacing with overhead structures) as illustrated in figure A.1.

The racks/cabinets shall also be provided with devices which can be height-adjusted to compensate for any unevenness in the floor. The scope for height adjustment shall be at least 25 mm. The nominal rack/cabinet height shall be measured when the adjustment devices are at their fully retracted positions.

3.2 Width

The width dimension (W) includes covers if they are an integral part of the rack/cabinet.

W shall be one of four permitted dimensions: 150 mm, 300 mm, 600 mm or 900 mm.

The sides of any rack/cabinet shall not interfere with the assembly of adjacent racks/cabinets (into a straight line-up). The suppliers must ensure that the rack/cabinet will fit into the space between the grid lines, as illustrated in figure A.3. Manufacturing tolerances shall therefore be so arranged that this objective will always be achieved, even when racks/cabinets are delivered from different suppliers.

NOTE: If additional equipment at the end(s) of a suite of racks/cabinets is required, the associated coordination dimensions shall be specified as an integer multiple of the mounting pitch of 25 mm for each side during equipment practice design and should be agreed between supplier and user.

3.3 Depth

The depth dimension (D) includes:

- a) doors or covers of the rack/cabinet if present;
- b) all protruding parts e.g. switches, lamps, hinges, locks, electrostatic discharge points, etc.;
- c) connectors, cabling, cooling fins, etc.

For the doors or covers, a minimum reference value for aisle width shall be 750 mm. Doors or covers which are in the open position shall protrude from the front/rear line of racks/cabinets by a maximum of 150 mm. Doors or covers shall be designed so that when open, they do not in any way restrict access to the equipment for essential maintenance and installation operations.

D shall be 300 mm or 600 mm.

4 Accessibility and line-up of racks/cabinets

Racks/cabinets of different depths may be used in the same rack/cabinet line-up, but the fronts of all the racks/cabinets shall then be aligned, as illustrated in figure A.2.

Racks/cabinets with a depth of 300 mm shall be accessed only from the front, to allow them to be placed back-to-back or to the wall. The front of racks/cabinets arranged backwards shall be aligned to the rear line (see figure A.2).

5 External cable access

The rack/cabinet design shall enable the cabling for the telecommunication equipment to be routed either over a cable support structure, or under a raised floor, as required, i.e. cable access must be provided in both top and bottom of the rack/cabinet.

Direct rack/cabinet-to-rack/cabinet cabling is also allowed within rows.

6 Floor loading

The maximum permissible rack/cabinet weight depends on the rack's/cabinet's floor area. To calculate weight per unit area in kN/m^2 , the actual weight of the rack/cabinet should be divided by the floor area ($W \times D$ of the rack/cabinet). The weight per unit area added by the overhead support structure and cabling is also calculated by using the floor area of the supporting rack/cabinet.

The arrangement of racks/cabinets has to be planned by the installer to ensure that the average floor loading for a building is not exceeded. This will be a lower value than the weight per unit area and will depend, for example, on the centre distance of the rack/cabinet rows.

6.1 Weight per unit area of fully equipped rack/cabinet

For general applications, the weight per unit area of a fully equipped rack/cabinet, including internal cabling, etc. should not exceed 15 kN/m^2 . The maximum allowed weight per unit area shall be 20 kN/m^2 .

6.2 Weight per unit area of cable support structure and cabling

The weight per unit area exerted by the relevant portions of the cable support structure with cabling, should usually not exceed 3 kN/m^2 . The maximum allowed weight per unit area shall be 8 kN/m^2 .

6.3 Point loading

A point loading exerted by the base of the rack/cabinet on the floor shall not exceed 490 N/cm^2 .

NOTE: Other values for point loading may be adopted by agreement between the supplier and customer.

7 Structural load on a rack/cabinet

7.1 Static load

The rack/cabinet shall be able to support a static load of the superstructure with cabling, as described in clause 6.

7.2 Dynamic load

During installation, the rack/cabinet shall be able to support an additional load of 800 N for a rack/cabinet of $600 \text{ mm} \times 600 \text{ mm}$ or greater; pro rata values shall apply to the other smaller racks/cabinets.

8 Dimensions of packaged rack/cabinet

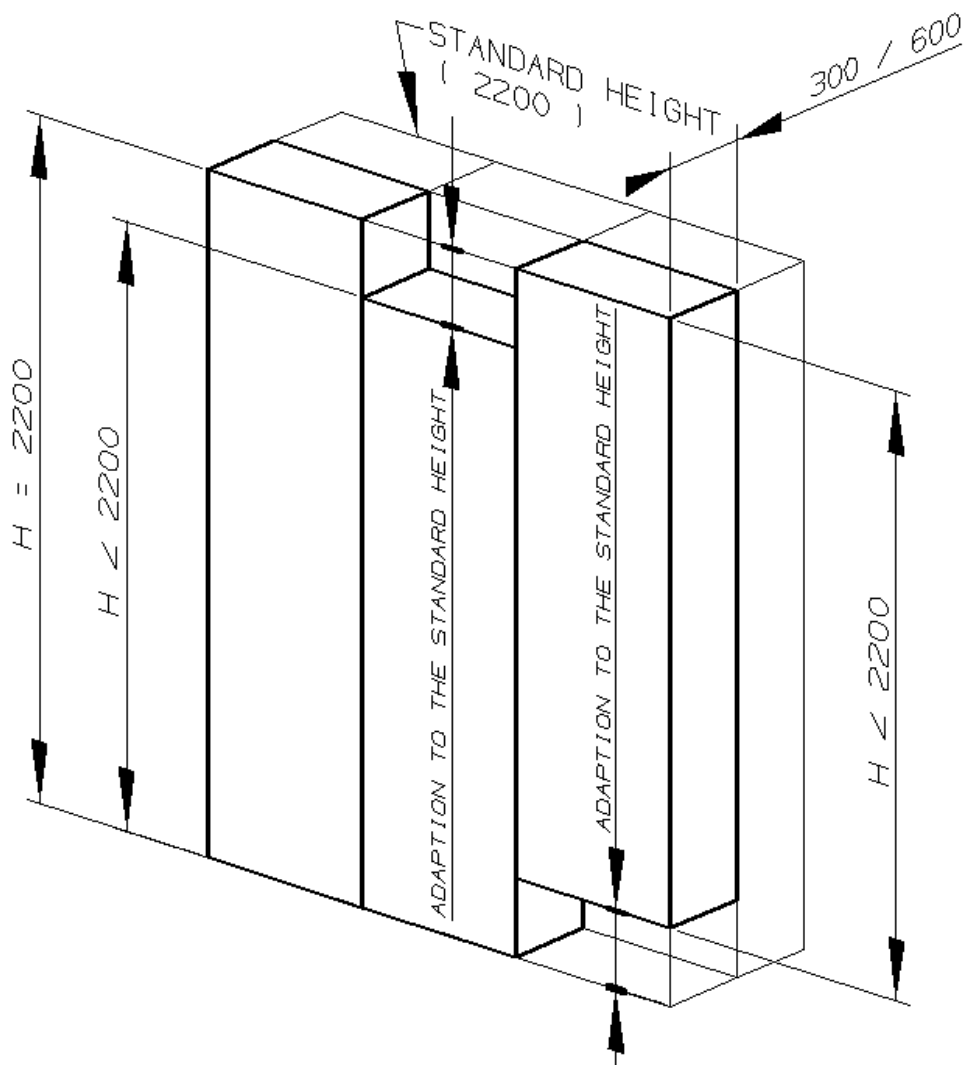
The maximum dimensions of a packaged rack/cabinet shall not exceed $2\,500 \text{ mm} \times 1\,200 \text{ mm} \times 900 \text{ mm}$.

These maximum dimensions are stated to allow transportation when using normal lifts, hallways and doors.

9 Electromagnetic compatibility and electrostatic discharge requirements

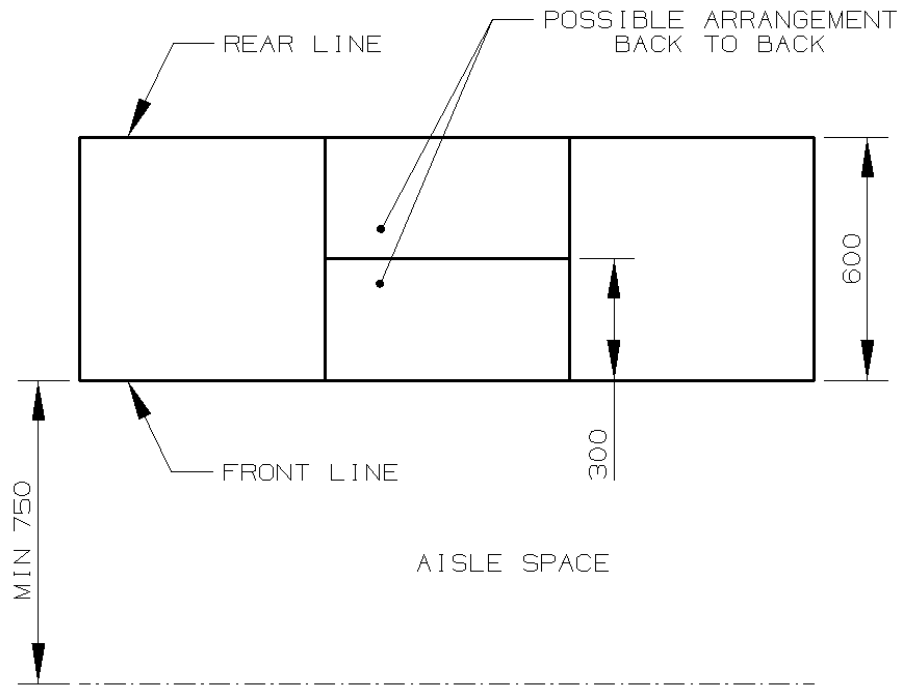
All new equipment designs must take account of the EEC Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility (Directive 89/336/EEC [1]). In accordance with the terms of this Directive, due regard shall be taken of the appropriate existing and emerging standards concerning electromagnetic compatibility phenomena.

Annex A (informative): Illustrative figures



NOTE: Dimensions are in millimetres.

Figure A.1: Combination of cabinets or rack structures of different height (example)



NOTE: Dimensions are in millimetres.

Figure A.2: Possible floor arrangement (example)

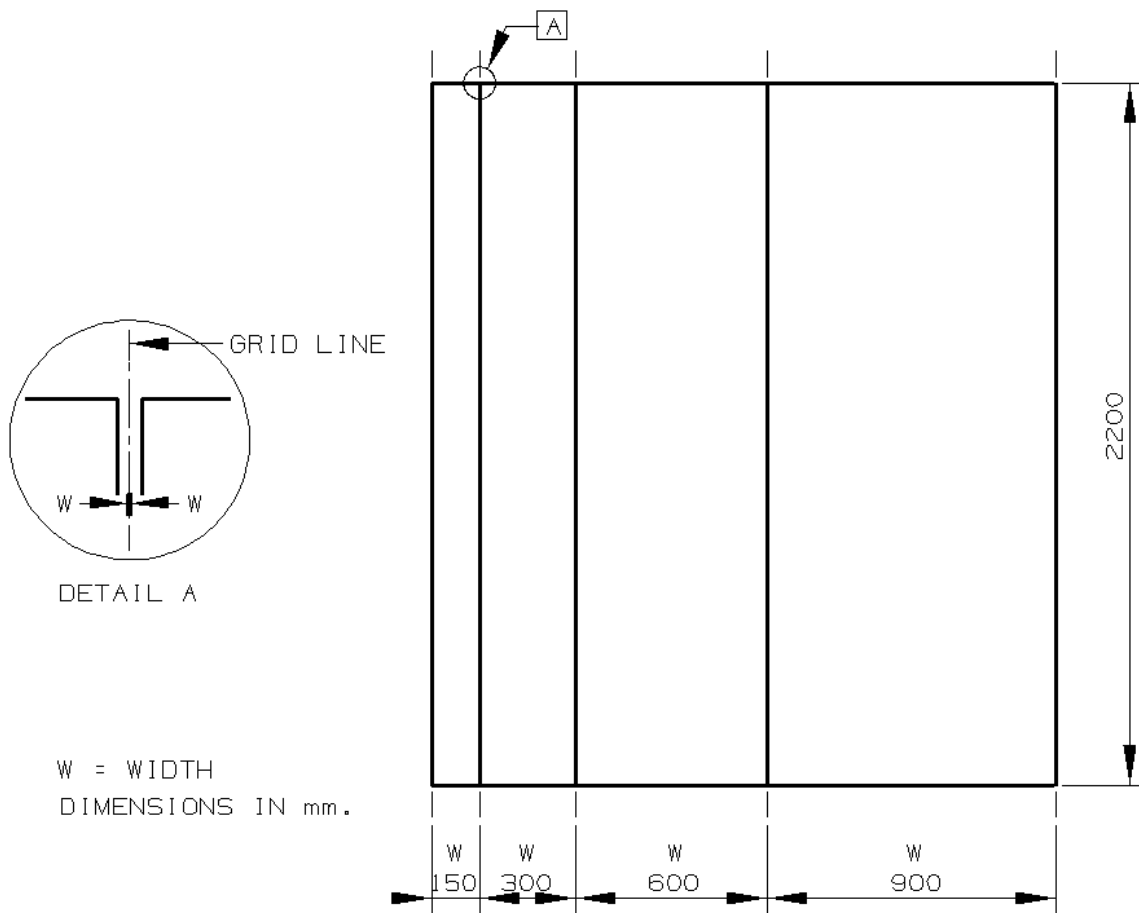


Figure A.3: Front view to racks/cabinets

Annex B (informative): Bibliography

- ETSI EN 300 019: "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".

History

Document history		
Edition 1	January 1994	Publication as ETS 300 119-2
V2.1.0	May 2004	One-step Approval Procedure OAP 20040924: 2004-05-26 to 2004-09-24