

ETSI EN 302 194-2 V1.1.2 (2007-08)

Harmonized European Standard (Telecommunications series)

**Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Navigation radar used on inland waterways;
Part 2: Harmonized EN covering essential requirements
of article 3.2 of the R&TTE Directive**



Reference

DEN/ERM-TG26-055-2

Keywords

EMC, maritime, navigation, radar, radio,
regulation

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Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This Harmonized European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

The present document is part 2 of a multi-part deliverable covering Navigation radar used on inland waterways, as identified below:

Part 1: "Technical characteristics and methods of measurement";

Part 2: "Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive".

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard, the reference of which will be published in the Official Journal of the European Communities referencing the Directive 1999/5/EC [1] of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity ("the R&TTE Directive").

Technical specifications relevant to Directive 1999/5/EC are given in annex A.

National transposition dates	
Date of adoption of this EN:	10 August 2007
Date of latest announcement of this EN (doa):	30 November 2007
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2008
Date of withdrawal of any conflicting National Standard (dow):	31 May 2009

1 Scope

The present document states the minimum technical characteristics and methods of measurement required for navigation radar used on inland waterways.

This radar equipment operates in the frequency range of 9 300 MHz to 9 500 MHz allocated to the radio navigation service as defined in article 5 of the Radio Regulations [2].

The present document is intended to cover the provisions of Directive 1999/5/EC [1] (R&TTE Directive) Article 3.2, which states that "... radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communications and orbital resources so as to avoid harmful interference".

In addition to the present document, other ENs that specify technical requirements in respect of essential requirements under other parts of Article 3 of the R&TTE Directive [1] may apply to equipment within the scope of the present.

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>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

- [1] Directive 1999/5/EC of The European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [2] International Telecommunication Union (ITU), Radio Regulations (2004).
- [3] ETSI EN 302 194-1 (V1.1.2): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Navigation radar used on inland waterways: Part 1: Technical characteristics and methods of measurement".
- [4] ETSI TR 100 028 (V1.4.1): "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics".

3 Definitions

For the purposes of the present document, the terms and definitions given in the R&TTE Directive [1] and the following apply:

environmental profile: range of environmental conditions under which equipment within the scope of the present document is required to comply with the provisions of the present document

supplier: entity referred to in the R&TTE Directive responsible for the placing on the market of an equipment within the scope of the Directive

4 Technical requirements

4.1 Environmental profile

Tests defined in the present document shall be carried out at representative points within the boundary limits of the declared operational environmental profile which, as a minimum, shall be that specified in the test conditions contained in the present document.

As technical performance varies subject to environmental conditions, tests shall be carried out under a sufficient variety of environmental conditions as specified in the present document to give confidence of compliance for the affected technical requirements (which shall also be within the boundary limits of the declared operational environmental profile).

4.2 Conformance requirements

4.2.1 Radiated emissions

4.2.1.1 Definition

The radar radiated emissions shall be as defined in EN 302 194-1 [3], clause 7.8.3.1.

4.2.1.2 Limit

The radar radiated emissions limit shall be as stated in EN 302 194-1 [3], clause 7.8.3.3.

4.2.1.3 Conformance

Conformance tests as defined in clause 5.3.1 shall be carried out.

4.2.2 Operating frequency

4.2.2.1 Definition

The radar operating frequency shall be as defined in EN 302 194-1 [3], clause 7.9.2.1.

4.2.2.2 Limit

The radar operating frequency limit shall be as stated in EN 302 194-1 [3], clause 7.9.2.3.

4.2.2.3 Conformance

Conformance tests as defined in clause 5.3.2 shall be carried out.

4.2.3 Transmitter pulse power

4.2.3.1 Definition

The transmitter pulse power shall be as defined in EN 302 194-1 [3], clause 7.9.3.1.

4.2.3.2 Limit

The transmitter pulse power limit shall be as stated in EN 302 194-1 [3], clause 7.9.3.3.

4.2.3.3 Conformance

Conformance tests as defined in clause 5.3.3 shall be carried out.

4.2.4 Out of band emissions

4.2.4.1 Definition

The out of band emissions shall be as defined in EN 302 194-1 [3], clause 7.9.4.1.

4.2.4.2 Limit

The out of band emissions limit shall be as stated in EN 302 194-1 [3], clause 7.9.4.3.

4.2.4.3 Conformance

Conformance tests as defined in clause 5.3.4 shall be carried out.

4.2.5 Radiated spurious domain emissions

4.2.5.1 Definition

The radiated spurious domain emissions shall be as defined in EN 302 194-1 [3], clause 7.9.5.1.

4.2.5.2 Limit

The radiated spurious domain emissions limit shall be as stated in EN 302 194-1 [3], clause 7.9.5.3.

4.2.5.3 Conformance

Conformance tests as defined in clause 5.3.5 shall be carried out.

5 Testing for compliance with technical requirements

5.1 Test conditions, power supply and ambient temperatures

These shall be as stated in EN 302 194-1 [3], clause 5.2.

The standard operating mode shall be as defined in EN 302 194-1 [3], clause 5.1.

5.2 Interpretation of the measurement results

The interpretation of the results recorded in a test report for the measurements described in the present document shall be as follows:

- the measured value related to the corresponding limit will be used to decide whether an equipment meets the requirements of the present document;
- the value of the measurement uncertainty for the measurement of each parameter shall be included in the test report;
- the recorded value of the measurement uncertainty shall be, for each measurement, equal to or lower than the figures in table 1.

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028 [4] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 1 is based on such expansion factors.

Table 1: Absolute measurement uncertainties (maximum values)

Parameter	Maximum uncertainty
RF frequency	$\pm 1 \times 10^{-7}$
RF pulse power	$\pm 1,5$ dB
Radiated emission of transmitter	± 6 dB

5.3 Essential radio test suites

5.3.1 Radiated emissions

The test specified in EN 302 194-1 [3], clause 7.8.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.1.2 in order to prove compliance with the requirement.

5.3.2 Operating frequency

The test specified in EN 302 194-1 [3], clause 7.9.2.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.2.2 in order to prove compliance with the requirement.

5.3.3 Transmitter pulse power

The tests specified in EN 302 194-1 [3], clause 7.9.3.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.3.2 in order to prove compliance with the requirement.

5.3.4 Out of band emissions

The test specified in EN 302 194-1 [3], clause 7.9.4.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.4.2 in order to prove compliance with the requirement.

5.3.5 Radiated spurious domain emissions

The test specified in EN 302 194-1 [3], clause 7.9.5.2 shall be carried out. The results obtained shall be compared to the limits in clause 4.2.5.2 in order to prove compliance with the requirement.

5.4 Other test specifications

There are no tests under this clause.

Annex A (normative): HS Requirement and conformance Test specifications Table (HS-RTT)

The HS Requirements and conformance Test specifications Table (HS-RTT) in table A.1 serves a number of purposes, as follows:

- it provides a statement of all the essential requirements in words and by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document;
- it provides a statement of all the test procedures corresponding to those essential requirements by cross reference to (a) specific clause(s) in the present document or to (a) specific clause(s) in (a) specific referenced document(s);
- it qualifies each requirement to be either:
 - Unconditional: meaning that the requirement applies in all circumstances; or
 - Conditional: meaning that the requirement is dependent on the manufacturer having chosen to support optional functionality defined within the schedule.
- in the case of Conditional requirements, it associates the requirement with the particular optional service or functionality;
- it qualifies each test procedure to be either:
 - Essential: meaning that it is included with the Essential Radio Test Suite and therefore the requirement shall be demonstrated to be met in accordance with the referenced procedures;
 - Other: meaning that the test procedure is illustrative but other means of demonstrating compliance with the requirement are permitted.

Table A.1: HS Requirements and conformance Test specifications Table (HS-RTT)

Harmonized Standard EN 302 194-2						
The following essential requirements and test specifications are relevant to the presumption of conformity under Article 3.2 of the R&TTE Directive						
Essential Requirement			Requirement Conditionality		Test Specification	
No	Description	Reference: Clause No	U/C	Condition	E/O	Reference: Clause No
1	Radiated emissions	4.2.1	U		E	5.3.1
2	Operating frequency	4.2.2	U		E	5.3.2
3	Transmitter pulse power	4.2.3	U		E	5.3.3
4	Out of band emissions	4.2.4	U		E	5.3.4
5	Radiated spurious domain emissions	4.2.5	U		E	5.3.5

Key to columns:**Essential Requirement:**

- No** A unique identifier for one row of the table which may be used to identify an essential requirement or its test specification.
- Description** A textual reference to the Essential Requirement.
- Clause Number** Identification of clause(s) defining the essential requirement in the present document unless another document is referenced explicitly.

Requirement Conditionality:

- U/C** Indicates whether the requirement is to be *unconditionally* applicable (U) or is *conditional* upon the suppliers claimed functionality of the equipment (C).
- Condition** Explains the conditions when the requirement shall or shall not be applicable for a requirement which is classified "conditional".

Test Specification:

- E/O** Indicates whether the test specification forms part of the *Essential Radio Test Suite* (E) or whether it is one of the *Other Test Suite* (O).

NOTE: All tests whether "E" or "O" are relevant to the requirements. Rows designated "E" collectively make up the Essential Radio Test Suite; those designated "O" make up the Other Test Suite; for those designated "X" there is no test specified corresponding to the requirement. The completion of all tests classified "E" as specified with satisfactory outcomes is a necessary condition for a presumption of conformity. Compliance with requirements associated with tests classified "O" or "X" is a necessary condition for presumption of conformity, although conformance with the requirement may be claimed by an equivalent test or by manufacturer's assertion supported by appropriate entries in the technical construction file.

- Clause Number** Identification of clause(s) defining the test specification in the present, document unless another document is referenced explicitly. Where no test is specified (that is, where the previous field is "X") this field remains blank.

Annex B (informative): The EN title in the official languages

Language	EN title
Bulgarian	Електромагнитна съвместимост и въпроси на радиоспектъра (ERM). Радар за навигация, използван във вътрешните водни пътища. Част 2: Хармонизиран европейски стандарт (EN), покриващ съществените изисквания на член 3.2 от Директивата за радиосъоръжения и крайни далекосъобщителни устройства (R&TTED)
Czech	Elektromagnetická kompatibilita a rádiové spektrum (ERM) - Navigační radary používané na vnitrostátních vodních cestách - Část 2: Harmonizovaná EN pokrývající základní požadavky článku 3.2 Směrnice R&TTE
Danish	Elektromagnetisk kompatibilitet og RadiospektrumAnliggender (ERM); Navigations radar til brug på indre vandveje - Del 2: Harmoniseret EN, som dækker de væsentlige krav i R&TTE direktivetsartikel 3.2
Dutch	Elektromagnetische compatibiliteit en radiospectrumaangelegenheden (ERM); Navigatie radar voor gebruik op binnenwateren; Deel 2: Geharmoniseerde EN welke invulling geeft aan de essentiële eisen van artikel 3.2 van de R&TTE richtlijn.
English	Electromagnetic compatibility and Radio spectrum Matters (ERM); Navigation radar used on inland waterways; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive
Estonian	Elektromagnetilise ühilduvuse ja raadiospektri küsimused (ERM); Siseveekogudel kasutatavad navigatsiooni radarid. Osa 2: Harmoneeritud EN R&TTE direktiivi artikli 3.2 põhiolette alusel
Finnish	Sähkömagneettinen yhteensopivuus ja radiospektriasiat (ERM); Sisävesiliikenteessä käytettävät navigointitutkat; Osa 2: Yhdenmukaistettu standardi (EN), joka kattaa R&TTE-direktiivin artiklan 3.2 mukaiset olennaiset vaatimukset
French	Compatibilité électromagnétique et spectre électromagnétique (ERM) - Radar de navigation utilisé sur les voies d'eau intérieures - Partie 2 : norme EN harmonisée couvrant les exigences essentielles de l'article 3.2 de la Directive R & TTE
German	Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten (ERM) - Navigationsradar zur Verwendung auf Binnenwasserstraßen - Teil 2: Harmonisierte EN, die wesentliche Anforderungen nach Artikel 3.2 der R&TTE-Richtlinie enthält
Greek	Ηλεκτρομαγνητική Συμβατότητα και Θέματα Ραδιοφάσματος (ERM) - Ραντάρ ναυσιπλοΐας που χρησιμοποιείται σε χειρσαίους υδατόδρομους - Μέρος 2: Εναρμονισμένο EN για την κάλυψη των ουσιαστών απαιτήσεων του άρθρου 3.2 της Οδηγίας R&TTE
Hungarian	Elektromágneses összeférhetőségi és rádióspektrumügyek (ERM). Szárazföldi vízi utakon használatos hajózási radar. 2. rész: Az R&TTE-irányelv 3.2. cikkelyének alapvető követelményeit tartalmazó, harmonizált európai szabvány
Icelandic	
Italian	
Latvian	Elektromagnētiskā saderība un radiofrekvenču spektra jautājumi (ERM) - Navigācijas radars, ko izmanto iekšējos ūdensceļos
Lithuanian	Elektromagnetinio suderinamumo ir radijo dažnių spektro dalykai. Navigacinis radaras, naudojamas vidaus vandenų keliuose. 2 dalis. Darnusis Europos standartas, apimantis esminius 1999/5/EC direktyvos 3.2 straipsnio reikalavimus
Maltese	Kompatibilità elettromanjetika u materji relatati ma' spettru radjofoniku (ERM); Radar ta' navigazzjonali li jintuza f'kanali interni; Parti 2: EN armonizzata li jkopri rekwiżiti essenzjali ta' l-artiklu 3.2 tad-Direttiva R&TTE
Norwegian	Elektromagnetisk kompatibilitet og radiospektrum saker (ERM); Navigasjonsradar til bruk på kanaler; Del 2: Harmonisert EN som dekker de vesentligste krav i R&TTE
Polish	Kompatybilność elektromagnetyczna i zagadnienia widma radiowego (ERM); Radar Kompatybilność elektromagnetyczna i zagadnienia widma radiowego (ERM); Radar zapewniająca spełnianie zasadniczych wymagań artykułu 3.2 dyrektywy R&TTE
Portuguese	Assuntos de Espectro Radioelétrico e Compatibilidade Electromagnética (ERM); Radares de navegação utilizados em canais; Parte 2: EN harmonizada cobrindo os requisitos essenciais no âmbito do artigo 3.2 da Directiva R&TTE
Romanian	Compatibilitate electromagnetică și probleme de spectru radio (ERM); Radar de navigație utilizat pe căile navigabile interne; Partea 2: EN armonizat acoperind cerințele esențiale ale Articolului 3.2 al Directivei R&TTE
Slovak	Elektromagnetická kompatibilita a záležitosti rádiového spektra (ERM). Navigačný radar používaný na vnútrozemských vodných trasách. Časť 2: Harmonizovaná EN vzťahujúca sa na základné požiadavky podľa článku 3.2 smernice R&TTE
Slovenian	Elektromagnetna združljivost in zadeve v zvezi z radijskim spektrom (ERM) - Navigacijski radar za uporabo na celinskih vodnih poteh - 2. del: Harmonizirani EN, ki zajema bistvene zahteve člena 3.2 direktive R&TTE

Language	EN title
Spanish	Cuestiones de Compatibilidad Electromagnética y Espectro de Radiofrecuencia (ERM); Radar de Navegación usado en vías fluviales; Parte 2: Norma Europea (EN) armonizada, cubriendo los requisitos esenciales según el artículo 3,2 de la Directiva R&TTE
Swedish	Elektromagnetisk kompatibilitet och radiospektrumfrågor (ERM); Navigeringsradar för användning på farleder inomlands; Harmoniserad EN omfattande väsentliga krav enligt artikel 3.2 i R&TTE-direktivet

Annex C (informative): Bibliography

- "Regional Arrangement concerning the Radiotelephone service on Inland Waterways; Basel, 6 April 2000".
- www.ccr-zkr.org
- ZKR 1989-II-33 1990: "Regulations regarding the minimum requirements and test conditions for radar equipment used for inland waterways navigation. (Vorschriften betreffend die Mindestanforderungen und Prüfbedingungen für Navigationsradaranlagen für die Binnenschifffahrt)".
- ZKR 1989-II-34 1990: "Regulations regarding the minimum requirements and test conditions for rate of turn indicators used for inland waterways navigation. (Vorschriften betreffend die Mindestanforderungen und Prüfbedingungen für Wendegeschwindigkeitsanzeiger für die Binnenschifffahrt)".
- ZKR 1989-II-35 1990: "Regulations regarding the installation and function test for radar equipment and rate of turn indicators used for inland waterways navigation. (Vorschriften betreffend den Einbau und die Funktionsprüfung von Navigationsradaranlagen und Wendegeschwindigkeitsanzeiger für die Binnenschifffahrt)".
- ZKR 2001-I-16 2001: "Inland ECDIS Standard".

History

Document history		
V1.1.2	August 2006	Public Enquiry PE 20061229: 2006-08-30 to 2006-12-29
V1.1.2	June 2007	Vote V 20070810: 2007-06-11 to 2007-08-10
V1.1.2	August 2007	Publication