

European Radon Harmonization Group



Protection from Radon in Buildings

Radon EuroCode

Harmonized European Code of Design & Construction Practice

Construction Products Directive 89/106/EEC

EuroCodes - European Building Codes of Practice

Benefits & Opportunities of EuroCodes are:-

- To provide common building design criteria and methods to fulfil specified building performance requirements ... including aspects of reliability, durability and economy ;
- To provide a common understanding of building design between owners, operators, users, designers, contractors and manufacturers of construction products ;
- To facilitate the exchange of construction services between the European Union Member States ;
- To facilitate the marketing and use of construction products throughout the European Union ;
- To facilitate the marketing and use of materials and product constituent components, the properties of which enter into design decision making ... throughout the European Union ;
- To be the common basis for research and development in the European Construction Sector ;
- To allow the preparation of common design aids, decision support tools and computer software ;
- To increase the competitiveness of European construction firms, contractors, designers and product manufacturers in their worldwide activities.

Radon EuroCode

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- **1st European Round Table Discussion - Dublin, 21st May 2003**
.... Launch of Radon EuroCode & Informal Network

Communication with European Commission (3 DG's)

- **2nd European Round Table Discussion - Prague, 17th September 2004**
.... Wider Promotion of Radon EuroCode

Extension of Network - Practical, Multi-Disciplinary & Multi-Sectoral, with IP Protection
Linking of WebSites, etc.

- **The 6th Working Draft available for download in January 2005**

Are you interested in this work ?
Would you like to join the European Radon Harmonization Group ?
Can you make a positive contribution to this work ?

Protection from Radon in Buildings

<p>National Authorities Having Jurisdiction & Scientists</p>
<p>1957 Euratom Treaty (1986 Single European Act) (1992 Maastricht Treaty) (1997 Amsterdam Treaty) a high level of public health mandated the precautionary principle</p>
<p>National Public Safety Safety? Risk? Reliable Statistics? Consultation? Scientific, Medical, Economic & Political Considerations What is an acceptable number of deaths per year ?</p>
<p>Decision Support Tools Radon Risk Prediction Maps Building Interior Radon Test Results <u>And</u> Integration of Geology</p>

<p>Building Designers & Employers, Construction Organizations, Product Manufacturers/Suppliers</p>
<p>1997 Amsterdam Treaty National Building Regulations European Safety at Work Legislation Product 'Fitness for Intended Use' Construction Products Directive 89/106/EEC</p>
<p>Protection of Health in Buildings Building Occupants, Users, Visitors, Neighbours, Employees Cannot assume patterns of use !</p>
<p>Decision Support Tools Site Investigation Test Results Construction Product (& System) Test Reports & ETA's EN ISO/IEC 17025</p>

Radon EuroCode

Harmonized European Code of Design & Construction Practice

Construction Products Directive 89/106/EEC : European Commission DG Enterprise

Essential Requirement 3: Hygiene, Health & the Environment

' The construction works (building) must be designed and built in such a way that it will not be a threat to the hygiene or health of the occupants or neighbours.'

The drafting of Essential Requirement 3 is weak.

Interpretative Document 3 ignores protection from radon in buildings.

There are no Harmonized European Standards for radon products or test methods.

There are no independent, accredited European Test Laboratories (EEA).

The **Radon EuroCode** will provide design principles and operational rules for application

The **Principles**, denoted as **(P)** in the text, comprise general statements, requirements and definitions for which no alternatives are permitted, unless specifically stated.

The **Application Rules**, denoted as **(A)** in the text, are generally recognized rules which follow the statements and satisfy the requirements in the Principles. If a 'competent person' wishes to use an alternative design rule which differs from the Application Rules given in the EuroCode, this may be done provided that the necessary justification is produced to show that the alternative rule complies with the Principles.

Radon EuroCode

NORM & Indoor Air Quality - Radon (Rn^{222} , Rn^{220} , Rn^{219} , RnD)

Natural Radon Activity in Buildings (Bq/m^3)					
Legal Remediation Levels		Recommended Safety Levels		Target Health Level	
Schools & Pre-Schools	>150	New Buildings	<100	All Buildings	average 10-40 max. 60
Dwellings	>200				
Workplaces	>300	Existing Buildings	<200		

Maximum Contaminant Levels (Rn^{222} Bq/litre)		Target Contaminant Levels (Rn^{222} Bq/litre)	
Fresh Water Supplies	150	Fresh Water Supplies	<15
Recycled Water Supplies	150	Recycled Water Supplies	<15
Gas Supplies	150	Gas Supplies	<15

Maximum Contaminant Level (Ra^{226} Bq/Kg)		Target Contaminant Level (Ra^{226} Bq/Kg)	
Building Products & Materials	300	Building Products & Materials	<30

Test results must indicate measurement uncertainty ... and must not be obscured by correction factors.

Indoor Ventilation Performance Indicator - Carbon Dioxide (CO_2)
Carbon Dioxide concentrations in a building should not significantly exceed average external levels, i.e. typically within the range of 300-500 parts per million(ppm), but should at no time exceed 800ppm.

Radon EuroCode

Design, Construction & Management Objective

To achieve a sufficiently low level of Radon, or radon associated ionization activity, in the superstructure spaces, cavities and voids of a (any) building - over the full life cycle of that building - such that a significant hazard is not posed to human health.

Reliability

Radon Protection Measures, both passive and active, are not 100% reliable.
'Defence-in-Depth' - a multi-layered approach to radon prevention, protection and mitigation in buildings - is the advised strategy.

Design Competence & Construction Quality

Both are factors to be considered in the design process itself.

Identification of Supporting Documents

Harmonized European Standards (CEN) - Products, Systems, Performance & Test Methods
European Technical Approvals (EOTA) / [European Agrément Certificates]
National Standards / National Agrément Certificates
Regional Design Manuals in Local Languages